DRAFT ENVIRONMENTAL IMPACT REPORT

GUENOC VALLEY MIXED USE PLANNED DEVELOPMENT PROJECT

APPENDICES

FEBRUARY 2020

LEAD AGENCY:

Lake County Community
Development Dept.
255 N Forbes St # 330
Lakeport, CA 95453

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255 N Forbes St # 330
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APPENDIX AIR

AIR QUALITY MODELING AND CALCULATIONS

Land Uses - Guenoc Valley Mixed Use Planned Development Project
Lake County, CA

Land Uses - Phase 1A								
SPOD Land Use Group	**SPOD Land Use**	**CalEEMod Land Use Type**	**CalEEMod Land Use Subtype**	**Size[2]**	**Units**	**Lot Size[1]** (acre)	**Square Feet**	**Population** (# employees or residents)
Maha Farm	Maha Farm Hotel	Recreational	Hotel	91	Room	59.00	59,200	
	Maha Farm Village Commercial Cluster	Retail	Regional Shopping Center	30	1000sq ft		30,000	
	Maha Farm Special Events	Recreational	User-Defined Recreational	6.5	1000sq ft		6,500	
	Maha Farm Residence Club	Recreational	User-Defined Recreational	26	1000sq ft		26,000	
	Maha Farm Support	Recreational	User-Defined Recreational	27	1000sq ft		27,000	
	Maha Farm Village Restaurant	Recreational	Quality Restaurant	11.8	1000sq ft		11,800	
	Sales Center at the Hilltop Lodge	Recreational	Quality Restaurant	23	1000sq ft	47.22	23,000	
		Commercial	General Office Building	12.6	1000sq ft		12,600	
	Winery at Maha Farm	Commercial	User-Defined Commercial	13	1000sq ft	21.87	21,000	
	Estate Winery	Commercial	User-Defined Commercial	5.0	1000sq ft	18.49	77,200	
	Parking Lot (Maha Farm)	Parking	Parking Lot	2.78	acre	2.78	Default	
	Agricultural Barns	Industrial	User-Defined Industrial	35	1000sq ft	38.37	56,000	
	Maha Farm Resort-Residential	Residential	Single Family Housing	45	Dwelling units	52.15	Default	
Bohn Ridge Resort	Bohn Ridge Resort	Recreational	Hotel	61	Room	45.17	90,500	
	Bohn Ridge Resort-Residential	Residential	Single Family Housing	30	Dwelling units	10.25	Default	
Equestrian Center	Clubhouse Restaurant	Recreational	Quality Restaurant	10.6	1000sq ft	93.03	10,600	
	Clubhouse Support	Recreational	User-Defined Recreational	24.6	1000sq ft		24,600	
	Stables/Pony Camp/Indoor Arena	Recreational	User-Defined Recreational	71.9	1000sq ft		71,900	
	Equestrian Lodge	Recreational	Hotel	13	Room	16.09	11,000	
	Equestrian Center Resort-Residential	Residential	Single Family Housing	13	Dwelling units	8.03	Default	
Red Hill Estates	Hotel	Recreational	Hotel	81	Room	31.97	189,900	
	Red Hill Resort-Residential	Residential	Single Family Housing	40	Dwelling units	21.21	Default	
Renaissance Golf Course	Golf Course	Recreational	Golf Course	18	hole	475.53	46,100	
Resort at Trout Flat	Resort at Trout Flat	Recreational	Hotel	27	Room	148.03	131,800	
	Trout Flat Resort-Residential	Residential	Single Family Housing	13	Dwelling units	6.01	Default	
Spa	Spa	Recreational	Health Club	118.2	1000sq ft	26.80	118,200	
Wilderness Camp	Wilderness Camp	Recreational	Hotel	20	Room	28.15	27,300	
Supporting Facilities	Emergency Center	Commercial	Medical Office Building	8.4	1000sq ft	17.63	8,400	
	Entourage Hotel	Recreational	Hotel	50	Room		28,600	
	Central BOH Operations	Commercial	General Office Building	116.7	1000sq ft	54.53	116,700	
	Aerial Site Access	Commercial	General Office Building	1.4	1000sq ft	2.85	1,400	
	Workforce Housing	Residential	Apartments Low-Rise	35	Dwelling units	138.73	52,100	
	Off-Site Workforce Housing	Residential	Apartments Low-Rise	50	Dwelling units	12.75	Default	

Notes

1. Lot acerage from EIR Figure 3 Phase 1 Site Plan
2. Size from SPOD August 22 Submittal

CalEEMod Default Construction Schedule and Equipment List - Guenoc Valley Mixed Use Planned Development Project
Lake County, CA

Expected hours of construction	**M-F 6am-6pm**	

Construction Schedule[1]					
Sub-Phase	**Start Date**	**End Date**	**Number of Days per Week**	Total Days	**Notes**
Demolition	4/1/2020	4/29/2020	7	28	Demolition involves removing buildings or structures.
Site Preparation	4/1/2020	4/1/2022	7	730	Site Preparation involves clearing vegetation (grubbing and tree/stump removal) and removing stones and other unwanted material or debris prior to grading.
Grading	5/1/2020	5/1/2022	7	730	Grading involves the cut and fill of land to ensure that the proper base and slope is created for the foundation.
Building Construction	6/1/2020	12/1/2023	7	1278	Building Construction involves the construction of the foundation, structures and buildings.
Paving	7/1/2020	12/1/2023	7	1248	Paving involves the laying of concrete or asphalt such as in parking lots, roads, driveways, or sidewalks.
Architectural Coating	7/1/2021	12/1/2023	7	883	Architectural Coating involves the application of coatings to both the interior and exterior of buildings or structures, the painting of parking lot or parking garage striping, associated signage and curbs, and the painting of the walls or other components such as stair railings inside parking structures.

CalEEMod Default Construction Schedule and Equipment List - Guenoc Valley Mixed Use Planned Development Project
Lake County, CA

Equipment List							
Sub-Phase	**Equipment**	**Quantity (from CalEEMod defaults)**	**Revised Quantity (based on construction schedule)**	**Usage Hours per Day**	**Horsepower**	**Load Factor**	**Engine Tier (If known)**
Demolition	Concrete/Industrial Saws	1	1	10	81	0.73	Tier 4
	Excavators	3	3	10	158	0.38	Tier 4
	Rubber Tired Dozers	2	2	10	247	0.4	Tier 4
	Other Offroad Equipment?						Tier 4
Site Preparation	Rubber Tired Dozers	3	16	10	247	0.4	Tier 4
	Tractors/Loaders/Backhoes	4	5	10	97	0.37	Tier 4
	Crushing/Proc. Equipment	0	2	10	85	0.78	Default
	Other Offroad Equipment?						
Grading	Excavators	2	20	10	158	0.38	Tier 4
	Graders	1	11	10	187	0.41	Tier 4
	Rubber Tired Dozers	1	5	10	247	0.4	Tier 4
	Scrapers	2	4	10	367	0.48	Tier 4
	Tractors/Loaders/Backhoes	2	4	10	97	0.37	Tier 4
	Crushing/Proc. Equipment	0	2	10	85	0.78	Default
	Other Offroad Equipment?						
Building Construction	Cranes	1	10	10	231	0.29	Tier 4
	Forklifts	3	10	10	89	0.2	Tier 4
	Generator Sets	1	10	10	84	0.74	Tier 4
	Tractors/Loaders/Backhoes	3	4	10	97	0.37	Tier 4
	Welders	1	8	10	46	0.45	Tier 4
	Crushing/Proc. Equipment	0	2	10	85	0.78	Default
	Other Offroad Equipment?						
Paving	Pavers	2	11	10	130	0.42	Default
	Paving Equipment	2	11	10	132	0.36	Default
	Rollers	2	11	10	80	0.38	Default
	Other Offroad Equipment?						Tier 4
Architectural Coating	Air Compressors	1	8	10	78	0.48	Tier 4

CalEEMod Default Construction Schedule and Equipment List - Guenoc Valley Mixed Use Planned Development Project
Lake County, CA

Soil Transported for Construction			
Soil Quantity for Construction - Building area	Imported	[cubic yards]	0
	Exported	[cubic yards]	37,647

Total Acres Graded		
Grading - Roads and Building area	653.35	acres

Construction Phase	Units	Value
Demolition	Demolished Building Square Feet	33,830

Construction Trips						
Sub-Phase Name	Worker One-way Trip Number (trips/day)	Vendor One-way Trip Number (trips/day)	Hauling One-way Trip Number (total trips) (Note: If haul trips are not known, please provide average haul capacity of trucks or we can use CalEEMod default for truck	Worker Trip Length (miles/trip)	Vendor Trip Length (miles/trip)	Hauling Trip Length (miles/trip)
Demolition	5	0	10	7	6.6	20
Site Preparation	60	0	4706	7	6.6	20
Grading	180	0	0	7	6.6	20
Building Construction	750	238	0	7	6.6	20
Paving	100	0	0	7	6.6	20
Architectural Coating	150	0	0	7	6.6	20

Operational Assumptions and Data Needs - Guenoc Valley Mixed Use Planned Development Project
Lake County, CA

Project build-out date or date of first occupancy	2022

Transportation

Land Use	Size Metric	Project Trips (rate/size/day)			Trip Length (miles)						Primary	Divert	Pass-By	Res H-W	Res H-S	Res H-O	NonRes	NonRes	NonRes
		Weekday	Saturday	Sunday	Res H-W	Res H-S	Res H-O	NonRes C-C	NonRes C-W	NonRes C-NW	Trip %	Trip %	Trip %	%	%	%	C-C %	C-W %	C-NW %
Apartments Low Rise	Dwelling Unit	4.39	4.39	4.39	0	7	7	0	0	0	100	0	0	42.3	19.6	38.1	0	0	0
General Office Building	1000sqft	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Golf Course	Hole	10.33	10.33	10.33	0	0	0	37.5	0.0	7.0	100	0	0	0	0	0	48.0	33.0	19.0
Health Club	1000sqft	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel	Room	3.14	3.14	3.14	0	0	0	37.5	0.0	7.0	100	0	0	0	0	0	61.6	19.4	19.0
Medical Office Building	1000sqft	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking Lot	Acre	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quality Restaurant	1000sqft	41.92	41.92	41.92	0	0	0	37.5	0.0	7.0	100	0	0	0	0	0	69.0	12.0	19.0
Regional Shopping Center	1000sqft	18.88	18.88	18.88	0	0	0	37.5	0.0	7.0	100	0	0	0	0	0	64.7	16.3	19.0
Single Family Housing	Dwelling Unit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
User Defined Commercial	User Defined Unit	22.98	22.98	22.98	0	0	0	37.5	0.0	7.0	100	0	0	0	0	0	61.6	19.4	19.0
User Defined Industrial	User Defined Unit	1.69	1.69	1.69	0	0	0	37.5	0.0	7.0	100	0	0	0	0	0	28.0	59.0	13.0
User Defined Recreational	User Defined Unit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Area Sources

Fireplaces / Hearths

Land Use Type	Woodstoves		Fireplaces		
	Catalytic	Non-Catalytic	Wood	Gas	Propane
	0	0	0	0	0

Consumer Products

Emission Factors	Value	Units
General Emission Factor	1.62E-05	lb ROG/sq ft/day
Degreaser Emissions Factor (Parking)	3.542E-07	lb ROG/sq ft/day
Pesticides/Fertilizer Emissions factor (City Park/Golf Course)	5.152E-08	lb ROG/sq ft/day

Landscaping equipment	No landscaping equipment to be used

Operational Assumptions and Data Needs - Guenoc Valley Mixed Use Planned Development Project
Lake County, CA

Energy Use

Land Use Type[2]	Energy Use				
	Electricity			Natural Gas	
	Title 24	Non Title 24	Lighting	Title 24	Non Title 24
	kWh/1000sqft/yr			kBtu/1000sqft/yr	
Apartments Low Rise	775.93	3,172.76	810.36	9,200.58	1,599.00
General Office Building	3.63	3.98	3.45	19.54	0.00
Golf Course	0.00	0.00	0.00	0.00	0.00
Health Club	0.62	1.85	1.81	3.20	0.31
Hotel	2.02	2.87	2.57	20.71	0.05
Medical Office Building	3.63	3.98	3.45	19.54	0.00
Parking Lot	0.00	0.00	0.35	0.00	0.00
Quality Restaurant	4.00	15.83	4.74	27.65	88.55
Regional Shopping Center	5.01	2.81	5.70	7.21	0.00
Single Family Housing	912.41	6,155.97	1,608.84	10,517.50	1,599.00
User Defined Commercial	4.00	15.83	4.74	27.65	88.55
User Defined Industrial	3.63	3.98	3.45	19.54	0.00
User Defined Recreational	4.00	15.83	4.74	27.65	88.55

Water Use

Land Use Type	Water Use	
	Indoor	Outdoor
	gal/year	
Apartments Low Rise	5,748,750	0
General Office Building	3,825,930	23,461,272
Golf Course	390,915	46,401,182
Health Club	383,250	4,040,552
Hotel	13,673,813	33,627,823
Medical Office Building	906,660	0
Parking Lot	0	0
Quality Restaurant	39,600	1,303,404
Regional Shopping Center	604,440	1,303,404
Single Family Housing	13,481,640	9,580,019
User Defined Commercial	678,840	0
User Defined Industrial	102,368	5,865,318
User Defined Recreational	1,002,582	651,702

Solid Waste

Land Use Type	Solid Waste Generation Rate
	tons/yr
Apartments Low Rise	39.1
General Office Building	121.55
Golf Course	2.4
Health Club	673.74
Hotel	185.06
Medical Office Building	90.72
Parking Lot	0
Quality Restaurant	41.43
Regional Shopping Center	31.5
Single Family Housing	145.08
User Defined Commercial	31.5
User Defined Industrial	2.4
User Defined Recreational	31.5

Operational Assumptions and Data Needs - Guenoc Valley Mixed Use Planned Development Project
Lake County, CA

Mitigation Measures

Land Use Change	Vegetation Type	Initial Acres	Final Acres
	Forest Land/Trees	410	0

Sequestration	Tree Type	Number of trees
Will the Project plant new trees?	No	N/A

Guenoc Phase 1A CalEEMod Inputs

Mitigation Measures

Construction Mitigation Measures			
Mitigation Category	**Mitigation Input**	**Type of input / unit**	**Inputs**
Off-Road Equipment	Equipment Type	Engine Tier / DPF Level	Tier 4 / Level 3
Fugitive Dust	Soil Stabilizer for Unpaved Roads	PM10 (% Reduction)	10%
		PM2.5 (% Reduction)	10%
	Replace Ground Cover Of Area Disturbed	PM10 (% Reduction)	N/A
		PM2.5 (% Reduction)	N/A
	Water Exposed Area	Frequency (per day)	2
		PM10 (% Reduction)	55%
		PM2.5 (% Reduction)	55%
	Unpaved Road Mitigation	Moisture Content (%)	N/A
		Vehicle speed (mph)	15
	Clean Paved Road	% PM Reduction	N/A

Traffic Mitigation Measures			
Mitigation Category	**Mitigation Input**	**Type of input / unit**	**Inputs**
Land Use & Site Enhancement			
Land Use	Increase Density	Dwelling Units/acre	N/A
		Jobs/Job acre	
	Increase Diversity	Yes/No	
	Improve Walkability Design	Intersection/Square Miels	
	Improve Destination Accessibility	Distance to Dwntwn/Job Ctr (Miles)	
	Increase Transit Accessibility	Distance to Transit Station (Miles)	
	Integrate Below Market Rate Housing	% Dwelling Units Below Market Rate	
Neighborhood Enhancements	Improve Pedestrian Network		
	Provide Traffic Calming Measures	% Streets with Improvement	
		% Intersection with Improvement	
	Implement NEV Network	Yes/No	

Guenoc Phase 1A CalEEMod Inputs

Parking Policy/Pricing	Limit Parking Supply	% Reduction in Spaces	
	Unbundle parking Costs	Monthly Parking Costs ($)	
	On-Street Market Pricing	% Increase in Price	
Transit Improvements	Provide BRT System	% Lines BRT	
	Expand Transit Network	% Increase Transit Coverage	
	Increase Transit Frequency	Level of Implementation	
		% Reduction in Headways	
Commute			
Commute Trip	Implement Trip Reduction Program	% employee eligible	N/A
		Program Type	
	Transit Subsidy	% employee eligible	
		Daily Transit Subsidy Amount ($)	
	Implement Employee Parking "Cash-Out"	% employee eligible	
	Workplace Parking Charge	% employee eligible	
		Daily Parking Charge ($)	
	Encourage Telecommuting and Alternative Work schedules	% employee work 9/80	
		% employee work 4/40	
		% employee telecommute 1.5 days	
	Market Commute Trip Reduction Option	% employee eligible	
	Employee Vanpool/Shuttle	% employee eligible	
		% vanpool mode share	
	Provide Ride Sharing Program	% employee eligible	
School Trip	Implement School Bus Program	% family using	

Area Mitigation Measures			
Mitigation Category	**Mitigation Input**	**Type of input / unit**	**Inputs**
Hearth	Natural Gas Hearth/No Hearth	Yes/No	No Hearth
	Use low VOC Paint (Residential Interior)	EF (g/L)	250
	Use low VOC Paint (Residential Exterior)	EF (g/L)	250

Guenoc Phase 1A CalEEMod Inputs

Architectural Coating	Use low VOC Paint (Non-residential interior)	EF (g/L)	250
	Use low VOC Paint (Non-residential exterior)	EF (g/L)	250
	Use low VOC Paint (Parking)	EF (g/L)	250
Landscape Equipment	% Electric Lawnmower	%	N/A
	% Electric Leafblower	%	N/A
	% Electric Chainsaw	%	N/A
Consumer Products for General Category	Use Low VOC Cleaning Supplies	Yes/No	Yes

Energy Mitigation Measures			
Mitigation Category	**Mitigation Input**	**Type of input / unit**	**Inputs**
Building Energy	Exceed Title 24	% Improvement	53
	Install High Efficiency Lighting	% Lighting Energy Reduction	N/A
Alternative Energy	On-site Renewable Energy	kWh Generated	N/A
		% of Electricity Use Generated	100
Energy Efficient Appliances	ClothWasher	% Improvement	N/A
	DishWasher	% Improvement	N/A
	Fan	% Improvement	N/A
	Refrigerator	% Improvement	N/A

Water Mitigation Measures			
Mitigation Category	**Mitigation Input**	**Type of input / unit**	**Inputs**
Water Conservation Strategy	Apply Water Conservation Strategy	% Reduction Indoor	N/A
		% Reduction Outdoor	N/A
Water Supply	Use Reclaimed Water	% Indoor Water Use	N/A
		% Outdoor Water Use	25%
	Use Grey Water	% Indoor Water Use	N/A
		% Outdoor Water Use	N/A
Indoor Water Use	Install Low-flow Bathroom Faucet	% Reduction in flow	32
	Install Low-flow Kitchen Faucet	% Reduction in flow	18

Guenoc Phase 1A CalEEMod Inputs

Indoor Water Use	Install Low-flow Toilet	% Reduction in flow	20
	Install Low-flow Shower	% Reduction in flow	20
Outdoor Water Use	Turf Reducion	Turf Reduction Area (acres)	N/A
		% Reduction turf	N/A
	Use Water-Efficient Irrigation Systems	% Reduction	N/A
	Water Efficient Landscape	MAWA (gal/yr)	N/A
		ETWU (gal/yr)	N/A

Water Mitigation Measures			
Mitigation Category	**Mitigation Input**	**Type of input / unit**	**Inputs**
Solid Waste	Institute Recycling and Composting Services	% Reduction in waste disposed	60%

Land Uses - Guenoc Valley Mixed Use Planned Development Project
Lake County, CA

Land Uses - Phase 1B and 1C								
SPOD Land Use Group	**SPOD Land Use**	**CalEEMod Land Use Type**	**CalEEMod Land Use Subtype**	**Size[2]**	**Units**	**Lot Size[1]** (acre)	**Square Feet**	**Population** (# employees or residents)
Maha Farms	Residential Villas	Residential	Single Family Housing	146	Dwelling units	635.32	Default	
Equestrian Center	Residential Villas	Residential	Single Family Housing	87	Dwelling units	259.75	Default	
Red Hill Estates	Residential Villas	Residential	Single Family Housing	89	Dwelling units	724.95	Default	
Bohn Ridge Resort	Residential Villas	Residential	Single Family Housing	39	Dwelling units	201.18	Default	
Resort at Trout Flat	Residential Villas	Residential	Single Family Housing	29	Dwelling units	150.81	Default	
Spa	Residential Villas	Residential	Single Family Housing	11	Dwelling units	81.96	Default	

Notes

1. Lot acerage from EIR Figure 3 Phase 1 Site Plan
2. Size from SPOD August 22 Submittal

CalEEMod Default Construction Schedule and Equipment List - Guenoc Valley Mixed Use Planned Development Project
Lake County, CA

Expected hours of construction	M-F 6am-6pm	Weekend hours?

Construction Schedule[1]

Instructions: At a minimum, please set Start Date for Demolition sub-phase. If no Demolition, then ignore and set a Start Date for Site Preparation Sub-Phase. If information is available, please set all other Start Dates and End Dates after the Demolition (or Site Preparation) phase. If information is not available, then we can use CalEEMod defaults.

Sub-Phase	Start Date	End Date	Number of Days per Week	Total Days	Notes
Demolition	NA	NA	NA	NA	Demolition involves removing buildings or structures.
Site Preparation	12/1/2023	2/15/2024	7	76	Site Preparation involves clearing vegetation (grubbing and tree/stump removal) and removing stones and other unwanted material or debris prior to grading.
Grading	2/15/2024	9/2/2024	7	200	Grading involves the cut and fill of land to ensure that the proper base and slope is created for the foundation.
Building Construction	9/2/2024	2/18/2030	7	1995	Building Construction involves the construction of the foundation, structures and buildings.
Paving	2/18/2030	7/8/2030	7	140	Paving involves the laying of concrete or asphalt such as in parking lots, roads, driveways, or sidewalks.
Architectural Coating	7/8/2030	11/25/2030	7	140	Architectural Coating involves the application of coatings to both the interior and exterior of buildings or structures, the painting of parking lot or parking garage striping, associated signage and curbs, and the painting of the walls or other components such as stair railings inside parking structures.

CalEEMod Default Construction Schedule and Equipment List - Guenoc Valley Mixed Use Planned Development Project
Lake County, CA

Equipment List[2]

Instructions: This table can be filled in with default information from CalEEMod based on land use types and sizes from the Land Uses tab. If specific equipment lists are available, please review Equipment list by Sub-Phase and enter in any additional equipment and Quantity. Equipment types are shown on the list. If specific information on Usage Hours per Day, Horsepower, or Load Factor are available, please fill in. Otherwise, CalEEMod default data can be used.

Sub-Phase	Equipment	Quantity (from CalEEMod defaults)	Revised Quantity (based on construction schedule)	Usage Hours per Day	Horsepower	Load Factor	Engine Tier (If known)
Demolition	Concrete/Industrial Saws	0	0	10	81	0.73	Tier 4
	Excavators	0	0	10	158	0.38	Tier 4
	Rubber Tired Dozers	0	0	10	247	0.4	Tier 4
	Other Offroad Equipment?	0					Tier 4
Site Preparation	Rubber Tired Dozers	3	16	10	247	0.4	Tier 4
	Tractors/Loaders/Backhoes	4	5	10	97	0.37	Tier 4
	Other Offroad Equipment?						Tier 4
Grading	Excavators	2	20	10	158	0.38	Tier 4
	Graders	1	11	10	187	0.41	Tier 4
	Rubber Tired Dozers	1	5	10	247	0.4	Tier 4
	Scrapers	2	4	10	367	0.48	Tier 4
	Tractors/Loaders/Backhoes	2	4	10	97	0.37	Tier 4
	Other Offroad Equipment?						Tier 4
Building Construction	Cranes	1	10	10	231	0.29	Tier 4
	Forklifts	3	10	10	89	0.2	Tier 4
	Generator Sets	1	10	10	84	0.74	Tier 4
	Tractors/Loaders/Backhoes	3	4	10	97	0.37	Tier 4
	Welders	1	8	10	46	0.45	Tier 4
	Other Offroad Equipment?						Tier 4
Paving	Pavers	2	11	10	130	0.42	Default
	Paving Equipment	2	11	10	132	0.36	Default
	Rollers	2	11	10	80	0.38	Default
	Other Offroad Equipment?						Tier 4
Architectural Coating	Air Compressors	1	8	10	78	0.48	Tier 4

CalEEMod Default Construction Schedule and Equipment List - Guenoc Valley Mixed Use Planned Development Project
Lake County, CA

Soil Transported for Construction			
Instructions: Please enter in quantity of imported and exported soil. Default data are not available.			
Soil Quantity for Construction - Building area	Imported	[cubic yards/day]	0
	Exported	[cubic yards/day]	0

Total Acres Graded		
Instructions: Please enter acres of graded area.		
Grading - Roads and Building area	38,750	acres

Construction Phase	Units	Value
Demolition	Demolished Building Square Feet	0

Construction Trips

Instructions: If available, please enter in the number of Worker One-way Trips and Vendor One-way Trips by construction sub-phase. Otherwise, we can use CalEEMod defaults for these fields. Please enter in the number of Hauling One-way Trips by construction sub-phase.

Sub-Phase Name	Worker One-way Trip Number (trips/day)	Vendor One-way Trip Number (trips/day)	Hauling One-way Trip Number (total trips) (Note: If haul trips are not known, please provide average haul capacity of trucks or we can use CalEEMod default for truck	Worker Trip Length (miles/trip)	Vendor Trip Length (miles/trip)	Hauling Trip Length (miles/trip)
Demolition	0	0	0	16.8	6.6	20
Site Preparation	53	0	0	16.8	6.6	20
Grading	110	0	0	16.8	6.6	20
Building Construction	144	43	0	16.8	6.6	20
Paving	83	0	0	16.8	6.6	20
Architectural Coating	29	0	0	16.8	6.6	20

Operational Assumptions and Data Needs - Guenoc Valley Mixed Use Planned Development Project
Lake County, CA

Project build-out date or date of first occupancy	2022

Transportation

Land Use	Size Metric	Project Trips (rate/size/day)			Trip Length (miles)						Primary	Divert	Pass-By	Res H-W	Res H-S	Res H-O	NonRes	NonRes	NonRes
		Weekday	Saturday	Sunday	Res H-W	Res H-S	Res H-O	NonRes C-C	NonRes C-W	NonRes C-NW	Trip %	Trip %	Trip %	%	%	%	C-C %	C-W %	C-NW %
Single Family Housing	Dwelling Unit	5.89	5.89	5.89	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default

Area Sources

Fireplaces/Hearths

Land Use Type	Woodstoves		Fireplaces		
	Catalytic	Non-Catalytic	Wood	Gas	Propane
	0	0	0	0	0

Consumer Products

Emission Factors	Value	Units
General Emission Factor	1.62E-05	lb ROG/sq ft/day
Degreaser Emissions Factor (Parking)	Default	lb ROG/sq ft/day
Pesticides/Fertilizer Emissions factor (City Park/Golf Course)	Default	lb ROG/sq ft/day

Landscaping equipment	No landscaping equipment to be used

Operational Assumptions and Data Needs - Guenoc Valley Mixed Use Planned Development Project
Lake County, CA

Energy Use

Land Use Type[2]	Energy Use				
	Electricity			Natural Gas	
	Title 24	Non Title 24	Lighting	Title 24	Non Title 24
	kWh/1000sqft/yr			kBtu/1000sqft/yr	
Apartment Low-Rise	Default	Default	Default	Default	Default
Apartment Mid-Rise	Default	Default	Default	Default	Default
Single Family Units	Default	Default	Default	Default	Default
Regional Shopping Center	Default	Default	Default	Default	Default
Quality Restaurant	Default	Default	Default	Default	Default
City Park	Default	Default	Default	Default	Default
Bay Trail Development	Default	Default	Default	Default	Default
Terminal on existing Pier	Default	Default	Default	Default	Default
Terminal Parking Structure	Default	Default	Default	Default	Default
Office Park	Default	Default	Default	Default	Default

Water Use

Land Use Type	Water Use	
	Indoor	Outdoor
	gal/year	
Apartment Low-Rise	Default	
Apartment Mid-Rise		
Single Family Units		
Regional Shopping Center		
Quality Restaurant		
Office Park		
Bay Trail Development		
Terminal on existing Pier		
Terminal Parking Structure		
City Park/Bay Trail Development	No water use	

Solid Waste

Land Use Type	Solid Waste Generation Rate tons/yr
Apartment Low-Rise	Default
Apartment Mid-Rise	
Single Family Units	
Regional Shopping Center	
Quality Restaurant	
Office Park	
Bay Trail Development	
Terminal on existing Pier	
Terminal Parking Structure	
City Park/Bay Trail Development	No Solid Waste Generation

Land Uses - Guenoc Valley Mixed Use Planned Development Project
Lake County, CA

Land Uses - Future Phases								
SPOD Land Use Group	**SPOD Land Use**	**CalEEMod Land Use Type**	**CalEEMod Land Use Subtype**	**Size[2]**	**Units**	**Lot Size[1]** (acre)	**Square Feet**	**Population** (# employees or residents)
	Retail	Retail	Regional Shopping Center	16	1000sq ft	0.37	16,000	
	Restaurant	Recreational	Quality Restaurant	14	1000sq ft	0.32	14,000	
	Resort Hotel	Recreational	Hotel	565	Room	18.83	820,380	
	Winery	Commercial	User-Defined Commercial	5	1000sq ft	16	5,000	
	Agriculture	Industrial	User-Defined Industrial	25	1000sq ft	16	25,000	
	Golf Course	Recreational	Golf Course	18	hole	125.66	0	
	Single Family Homes (Villas)	Residential	Single Family Housing	1,000	Dwelling Units	324.68	1,800,000	2,860
	Workforce Housing	Residential	Apartments Low-Rise	200	Dwelling Units	12.5	200,000	572

Notes

1. Lot acerage from EIR Figure 3 Phase 1 Site Plan
2. Size from SPOD August 22 Submittal

CalEEMod Default Construction Schedule and Equipment List - Guenoc Valley Mixed Use Planned Development Project
Lake County, CA

Expected hours of construction	M-F 6am-6pm	Weekend hours?

Construction Schedule[1]

Instructions: At a minimum, please set Start Date for Demolition sub-phase. If no Demolition, then ignore and set a Start Date for Site Preparation Sub-Phase. If information is available, please set all other Start Dates and End Dates after the Demolition (or Site Preparation) phase. If information is not available, then we can use CalEEMod defaults.

Sub-Phase	Start Date	End Date	Number of Days per Week	Total Days	Notes
Demolition	NA	NA	NA	NA	Demolition involves removing buildings or structures.
Site Preparation	11/26/2030	3/17/2031	5	80	Site Preparation involves clearing vegetation (grubbing and tree/stump removal) and removing stones and other unwanted material or debris prior to grading.
Grading	3/17/2031	12/30/2031	5	207	Grading involves the cut and fill of land to ensure that the proper base and slope is created for the foundation.
Building Construction	12/30/2031	11/21/2039	5	2060	Building Construction involves the construction of the foundation, structures and buildings.
Paving	11/21/2039	6/11/2040	5	146	Paving involves the laying of concrete or asphalt such as in parking lots, roads, driveways, or sidewalks.
Architectural Coating	6/11/2040	12/31/2040	5	146	Architectural Coating involves the application of coatings to both the interior and exterior of buildings or structures, the painting of parking lot or parking garage striping, associated signage and curbs, and the painting of the walls or other components such as stair railings inside parking structures.

CalEEMod Default Construction Schedule and Equipment List - Guenoc Valley Mixed Use Planned Development Project
Lake County, CA

Equipment List[2]

Instructions: This table can be filled in with default information from CalEEMod based on land use types and sizes from the Land Uses tab. If specific equipment lists are available, please review Equipment list by Sub-Phase and enter in any additional equipment and Quantity. Equipment types are shown on the list. If specific information on Usage Hours per Day, Horsepower, or Load Factor are available, please fill in. Otherwise, CalEEMod default data can be used.

Sub-Phase	Equipment	Quantity (from CalEEMod defaults)	Revised Quantity (based on construction schedule)	Usage Hours per Day	Horsepower	Load Factor	Engine Tier (If known)
Demolition	Concrete/Industrial Saws	0	0	10	81	0.73	Tier 4
	Excavators	0	0	10	158	0.38	Tier 4
	Rubber Tired Dozers	0	0	10	247	0.4	Tier 4
	Other Offroad Equipment?						Tier 4
Site Preparation	Rubber Tired Dozers	3	16	10	247	0.4	Tier 4
	Tractors/Loaders/Backhoes	4	5	10	97	0.37	Tier 4
	Other Offroad Equipment?						Tier 4
Grading	Excavators	2	20	10	158	0.38	Tier 4
	Graders	1	11	10	187	0.41	Tier 4
	Rubber Tired Dozers	1	5	10	247	0.4	Tier 4
	Scrapers	2	4	10	367	0.48	Tier 4
	Tractors/Loaders/Backhoes	2	4	10	97	0.37	Tier 4
	Other Offroad Equipment?						Tier 4
Building Construction	Cranes	1	10	10	231	0.29	Tier 4
	Forklifts	3	10	10	89	0.2	Tier 4
	Generator Sets	1	10	10	84	0.74	Tier 4
	Tractors/Loaders/Backhoes	3	4	10	97	0.37	Tier 4
	Welders	1	8	10	46	0.45	Tier 4
	Other Offroad Equipment?						Tier 4
Paving	Pavers	2	11	10	130	0.42	Default
	Paving Equipment	2	11	10	132	0.36	Default
	Rollers	2	11	10	80	0.38	Default
	Other Offroad Equipment?						Tier 4
Architectural Coating	Air Compressors	1	8	10	78	0.48	Tier 4

CalEEMod Default Construction Schedule and Equipment List - Guenoc Valley Mixed Use Planned Development Project
Lake County, CA

Soil Transported for Construction			
Instructions: Please enter in quantity of imported and exported soil. Default data are not available.			
Soil Quantity for Construction - Building area	Imported	[cubic yards/day]	0
	Exported	[cubic yards/day]	221,000

Total Acres Graded		
Instructions: Please enter acres of graded area.		
Grading - Roads and Building area	2,325	acres

Construction Phase	Units	Value
Demolition	Demolished Building Square Feet	0

Construction Trips

Instructions: If available, please enter in the number of Worker One-way Trips and Vendor One-way Trips by construction sub-phase. Otherwise, we can use CalEEMod defaults for these fields. Please enter in the number of Hauling One-way Trips by construction sub-phase.

Sub-Phase Name	Worker One-way Trip Number (trips/day)	Vendor One-way Trip Number (trips/day)	Hauling One-way Trip Number (total trips) (Note: If haul trips are not known, please provide average haul capacity of trucks or we can use CalEEMod default for truck	Worker Trip Length (miles/trip)	Vendor Trip Length (miles/trip)	Hauling Trip Length (miles/trip)
Demolition	15	0	227	10.8	7.3	20
Site Preparation	18	0	0	10.8	7.3	20
Grading	30	0	0	10.8	7.3	20
Building Construction	2002	466	26812	10.8	7.3	20
Paving	15	0	0	10.8	7.3	20
Architectural Coating	400	0	0	10.8	7.3	20

Notes:
1. The construction schedule sequence is based on the CalEEMod default schedule for construction and based on information from the Project sponsor.
2. The equipment list is based on CalEEMod default values.

Operational Assumptions and Data Needs - Guenoc Valley Mixed Use Planned Development Project
Lake County, CA

Project build-out date or date of first occupancy	2030

Transportation

Land Use	Size Metric	Project Trips (rate/size/day)			Trip Length (miles)						Primary	Divert	Pass-By	Res H-W	Res H-S	Res H-O	NonRes	NonRes	NonRes
		Weekday	Saturday	Sunday	Res H-W	Res H-S	Res H-O	NonRes C-C	NonRes C-W	NonRes C-NW	Trip %	Trip %	Trip %	%	%	%	C-C %	C-W %	C-NW %
Apartments Low Rise	Dwelling Unit	2.49	2.49	2.49	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default
Golf Course	Hole	10.33	10.33	10.33	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default
Hotel	Room	2.54	2.54	2.54	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default
Quality Restaurant	1000sqft	41.92	41.92	41.92	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default
Regional Shopping Center	1000sqft	18.88	18.88	18.88	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default
Single Family Housing	Dwelling Unit	5.89	5.89	5.89	Default	7.1	7.9	0	0	0	86	11	3	42.3	19.6	38.1	0	0	0
User Defined Commercial	User Defined Unit	22.98	22.98	22.98	Default	7.1	7.9	0	0	0	86	11	3	42.3	19.6	38.1	0	0	0
User Defined Industrial	User Defined Unit	1.69	1.69	1.69	Default	7.1	7.9	0	0	0	86	11	3	42.3	19.6	38.1	0	0	0

Area Sources

Fireplaces/Hearths

Land Use Type	Woodstoves		Fireplaces		
	Catalytic	Non-Catalytic	Wood	Gas	Propane
	0	0	0	0	0

Consumer Products

Emission Factors	Value	Units
General Emission Factor	1.62E-05	lb ROG/sq ft/day
Degreaser Emissions Factor (Parking)	3.542E-07	lb ROG/sq ft/day
Pesticides/Fertilizer Emissions factor (City Park/Golf Course)	5.152E-08	lb ROG/sq ft/day

Landscaping equipment	No landscaping equipment to be used

Operational Assumptions and Data Needs - Guenoc Valley Mixed Use Planned Development Project
Lake County, CA

Energy Use

Land Use Type[2]	Energy Use				
	Electricity			Natural Gas	
	Title 24	Non Title 24	Lighting	Title 24	Non Title 24
	kWh/1000sqft/yr			kBtu/1000sqft/yr	
Apartments Low Rise	Default				
Golf Course					
Hotel					
Quality Restaurant					
Regional Shopping Center					
Single Family Housing					
User Defined Commercial					
User Defined Industrial					

Water Use

Land Use Type	Water Use	
	Indoor	Outdoor
	gal/year	
Apartments Low Rise	Default	
Golf Course		
Hotel		
Quality Restaurant		
Regional Shopping Center		
Single Family Housing		
User Defined Commercial		
User Defined Industrial		

Solid Waste

Land Use Type	Solid Waste Generation Rate
	tons/yr
Apartments Low Rise	Default
Golf Course	
Hotel	
Quality Restaurant	
Regional Shopping Center	
Single Family Housing	
User Defined Commercial	
User Defined Industrial	

Guenoc Valley Mixed Use Planned Development Project - Phase 1A

Lake County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	116.70	1000sqft	54.53	116,700.00	0
General Office Building	1.40	1000sqft	2.85	1,400.00	0
General Office Building	12.60	1000sqft	0.00	12,600.00	0
Medical Office Building	8.40	1000sqft	17.63	8,400.00	0
User Defined Commercial	13.00	User Defined Unit	21.87	21,000.00	0
User Defined Commercial	5.00	User Defined Unit	18.49	77,200.00	0
User Defined Industrial	35.00	User Defined Unit	38.37	56,000.00	0
Parking Lot	2.78	Acre	2.78	121,096.80	0
Golf Course	18.00	Hole	475.53	0.00	0
Health Club	118.20	1000sqft	26.80	118,200.00	0
Hotel	91.00	Room	59.00	59,200.00	0
Hotel	61.00	Room	45.17	90,500.00	0
Hotel	13.00	Room	16.09	11,000.00	0
Hotel	81.00	Room	31.97	189,900.00	0
Hotel	27.00	Room	148.03	131,800.00	0
Hotel	20.00	Room	28.15	27,300.00	0
Hotel	50.00	Room	0.00	28,600.00	0
Quality Restaurant	11.80	1000sqft	0.00	11,800.00	0
Quality Restaurant	23.00	1000sqft	47.22	23,000.00	0
Quality Restaurant	10.60	1000sqft	93.03	10,600.00	0

User Defined Recreational	6.50	User Defined Unit	0.00	6,500.00	0
User Defined Recreational	26.00	User Defined Unit	0.00	26,000.00	0
User Defined Recreational	27.00	User Defined Unit	0.00	27,000.00	0
User Defined Recreational	24.60	User Defined Unit	0.00	24,600.00	0
User Defined Recreational	71.90	User Defined Unit	0.00	71,900.00	0
Apartments Low Rise	35.00	Dwelling Unit	138.73	52,100.00	100
Apartments Low Rise	50.00	Dwelling Unit	12.75	50,000.00	143
Single Family Housing	45.00	Dwelling Unit	52.15	81,000.00	129
Single Family Housing	30.00	Dwelling Unit	10.25	54,000.00	86
Single Family Housing	13.00	Dwelling Unit	8.03	23,400.00	37
Single Family Housing	40.00	Dwelling Unit	21.21	72,000.00	114
Single Family Housing	13.00	Dwelling Unit	6.01	23,400.00	37
Regional Shopping Center	30.00	1000sqft	0.00	30,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	67
Climate Zone	1			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Guenoc Valley Mixed Use Planned Development Project - Phase 1A - Lake County, Annual

Project Characteristics - Project operational year = 2022

Land Use - Lot acerage and sizing from Phase 1 Site Plan and SPOD.

Construction Phase - Construction duration is from 4/1/2020 to 12/1/2023.

Off-road Equipment - Notes

Off-road Equipment - Notes

Off-road Equipment - Construction equipment list updated to match inputs provided by developer.

Off-road Equipment - Notes

Off-road Equipment - Notes

Off-road Equipment - Notes

Trips and VMT - Worker trips based on on-site construction employee estimates provided by developer. Worker Trip Length reduced based off expected on-site construction camps.

Demolition -

Grading - Based on earthwork calculations provided by Sherwood Design Engineers.

Architectural Coating -

Water Mitigation - Based on Water Supply Memo.

Waste Mitigation - Based on 75% solid waste diversion for commercial uses (AB 341). Assumed 80% commercial uses based on Phase 1A total building sqaure footage.

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3

tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	23.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	23.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	13.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
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tblConstructionPhase	NumDays	11,000.00	884.00
tblConstructionPhase	NumDays	155,000.00	1,279.00
tblConstructionPhase	NumDays	10,000.00	29.00
tblConstructionPhase	NumDays	15,500.00	731.00
tblConstructionPhase	NumDays	11,000.00	1,249.00
tblConstructionPhase	NumDays	6,000.00	731.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConsumerProducts	ROG_EF	2.14E-05	1.62E-05
tblEnergyUse	LightingElect	0.00	4.74
tblEnergyUse	LightingElect	0.00	3.45
tblEnergyUse	LightingElect	0.00	4.74
tblEnergyUse	NT24E	0.00	15.83
tblEnergyUse	NT24E	0.00	3.98
tblEnergyUse	NT24E	0.00	15.83
tblEnergyUse	NT24NG	0.00	88.55

tblEnergyUse	NT24NG	0.00	88.55
tblEnergyUse	T24E	0.00	4.00
tblEnergyUse	T24E	0.00	3.63
tblEnergyUse	T24E	0.00	4.00
tblEnergyUse	T24NG	0.00	27.65
tblEnergyUse	T24NG	0.00	19.54
tblEnergyUse	T24NG	0.00	27.65
tblFireplaces	FireplaceDayYear	82.00	0.00
tblFireplaces	FireplaceDayYear	82.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	NumberGas	46.75	0.00
tblFireplaces	NumberGas	77.55	0.00
tblFireplaces	NumberNoFireplace	8.50	0.00
tblFireplaces	NumberNoFireplace	14.10	0.00
tblFireplaces	NumberWood	29.75	0.00
tblFireplaces	NumberWood	49.35	0.00
tblFleetMix	HHD	0.02	0.02
tblFleetMix	HHD	0.02	0.02
tblFleetMix	HHD	0.02	0.02
tblFleetMix	HHD	0.02	0.02
tblFleetMix	HHD	0.02	0.02
tblFleetMix	HHD	0.02	0.02
tblFleetMix	HHD	0.02	0.02
tblFleetMix	HHD	0.02	0.02

tblFleetMix	HHD	0.02	0.02
tblFleetMix	HHD	0.02	0.02
tblFleetMix	HHD	0.02	0.02
tblFleetMix	HHD	0.02	0.02
tblFleetMix	HHD	0.02	0.02
tblFleetMix	LDA	0.52	0.52
tblFleetMix	LDA	0.52	0.52
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tblFleetMix	LDA	0.52	0.52
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tblFleetMix	LDA	0.52	0.52
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tblFleetMix	LDT1	0.04	0.04
tblFleetMix	LDT1	0.04	0.04
tblFleetMix	LDT1	0.04	0.04
tblFleetMix	LDT1	0.04	0.04
tblFleetMix	LDT1	0.04	0.04
tblFleetMix	LDT1	0.04	0.04

tblFleetMix	LDT1	0.04	0.04
tblFleetMix	LDT1	0.04	0.04
tblFleetMix	LDT1	0.04	0.04
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tblFleetMix	LDT2	0.21	0.22
tblFleetMix	LDT2	0.21	0.22
tblFleetMix	LDT2	0.21	0.22
tblFleetMix	LDT2	0.21	0.22
tblFleetMix	LDT2	0.21	0.22
tblFleetMix	LDT2	0.21	0.22
tblFleetMix	LDT2	0.21	0.22
tblFleetMix	LDT2	0.21	0.22
tblFleetMix	LDT2	0.21	0.22
tblFleetMix	LDT2	0.21	0.22
tblFleetMix	LDT2	0.21	0.22
tblFleetMix	LDT2	0.21	0.22
tblFleetMix	LDT2	0.21	0.22
tblFleetMix	LDT2	0.21	0.22
tblFleetMix	LDT2	0.21	0.22
tblFleetMix	LHD1	0.04	0.03
tblFleetMix	LHD1	0.04	0.03
tblFleetMix	LHD1	0.04	0.03
tblFleetMix	LHD1	0.04	0.03
tblFleetMix	LHD1	0.04	0.03
tblFleetMix	LHD1	0.04	0.03
tblFleetMix	LHD1	0.04	0.03
tblFleetMix	LHD1	0.04	0.03
tblFleetMix	LHD1	0.04	0.03
tblFleetMix	LHD1	0.04	0.03

tblFleetMix	LHD1	0.04	0.03
tblFleetMix	LHD1	0.04	0.03
tblFleetMix	LHD1	0.04	0.03
tblFleetMix	LHD2	6.0900e-003	5.5750e-003
tblFleetMix	LHD2	6.0900e-003	5.5750e-003
tblFleetMix	LHD2	6.0900e-003	5.5750e-003
tblFleetMix	LHD2	6.0900e-003	5.5750e-003
tblFleetMix	LHD2	6.0900e-003	5.5750e-003
tblFleetMix	LHD2	6.0900e-003	5.5750e-003
tblFleetMix	LHD2	6.0900e-003	5.5750e-003
tblFleetMix	LHD2	6.0900e-003	5.5750e-003
tblFleetMix	LHD2	6.0900e-003	5.5750e-003
tblFleetMix	LHD2	6.0900e-003	5.5750e-003
tblFleetMix	LHD2	6.0900e-003	5.5750e-003
tblFleetMix	LHD2	6.0900e-003	5.5750e-003
tblFleetMix	LHD2	6.0900e-003	5.5750e-003
tblFleetMix	MCY	5.5630e-003	5.3480e-003
tblFleetMix	MCY	5.5630e-003	5.3480e-003
tblFleetMix	MCY	5.5630e-003	5.3480e-003
tblFleetMix	MCY	5.5630e-003	5.3480e-003
tblFleetMix	MCY	5.5630e-003	5.3480e-003
tblFleetMix	MCY	5.5630e-003	5.3480e-003
tblFleetMix	MCY	5.5630e-003	5.3480e-003
tblFleetMix	MCY	5.5630e-003	5.3480e-003
tblFleetMix	MCY	5.5630e-003	5.3480e-003
tblFleetMix	MCY	5.5630e-003	5.3480e-003

tblFleetMix	MCY	5.5630e-003	5.3480e-003
tblFleetMix	MCY	5.5630e-003	5.3480e-003
tblFleetMix	MDV	0.13	0.13
tblFleetMix	MDV	0.13	0.13
tblFleetMix	MDV	0.13	0.13
tblFleetMix	MDV	0.13	0.13
tblFleetMix	MDV	0.13	0.13
tblFleetMix	MDV	0.13	0.13
tblFleetMix	MDV	0.13	0.13
tblFleetMix	MDV	0.13	0.13
tblFleetMix	MDV	0.13	0.13
tblFleetMix	MDV	0.13	0.13
tblFleetMix	MDV	0.13	0.13
tblFleetMix	MDV	0.13	0.13
tblFleetMix	MH	1.5840e-003	1.4010e-003
tblFleetMix	MH	1.5840e-003	1.4010e-003
tblFleetMix	MH	1.5840e-003	1.4010e-003
tblFleetMix	MH	1.5840e-003	1.4010e-003
tblFleetMix	MH	1.5840e-003	1.4010e-003
tblFleetMix	MH	1.5840e-003	1.4010e-003
tblFleetMix	MH	1.5840e-003	1.4010e-003
tblFleetMix	MH	1.5840e-003	1.4010e-003
tblFleetMix	MH	1.5840e-003	1.4010e-003
tblFleetMix	MH	1.5840e-003	1.4010e-003
tblFleetMix	MH	1.5840e-003	1.4010e-003
tblFleetMix	MH	1.5840e-003	1.4010e-003

tblFleetMix	MH	1.5840e-003	1.4010e-003
tblFleetMix	MHD	0.02	0.02
tblFleetMix	MHD	0.02	0.02
tblFleetMix	MHD	0.02	0.02
tblFleetMix	MHD	0.02	0.02
tblFleetMix	MHD	0.02	0.02
tblFleetMix	MHD	0.02	0.02
tblFleetMix	MHD	0.02	0.02
tblFleetMix	MHD	0.02	0.02
tblFleetMix	MHD	0.02	0.02
tblFleetMix	MHD	0.02	0.02
tblFleetMix	MHD	0.02	0.02
tblFleetMix	MHD	0.02	0.02
tblFleetMix	MHD	0.02	0.02
tblFleetMix	OBUS	1.2570e-003	1.2350e-003
tblFleetMix	OBUS	1.2570e-003	1.2350e-003
tblFleetMix	OBUS	1.2570e-003	1.2350e-003
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tblFleetMix	OBUS	1.2570e-003	1.2350e-003
tblFleetMix	OBUS	1.2570e-003	1.2350e-003
tblFleetMix	OBUS	1.2570e-003	1.2350e-003
tblFleetMix	OBUS	1.2570e-003	1.2350e-003
tblFleetMix	OBUS	1.2570e-003	1.2350e-003
tblFleetMix	OBUS	1.2570e-003	1.2350e-003
tblFleetMix	OBUS	1.2570e-003	1.2350e-003
tblFleetMix	OBUS	1.2570e-003	1.2350e-003
tblFleetMix	OBUS	1.2570e-003	1.2350e-003

tblFleetMix	SBUS	1.1340e-003	1.1130e-003
tblFleetMix	SBUS	1.1340e-003	1.1130e-003
tblFleetMix	SBUS	1.1340e-003	1.1130e-003
tblFleetMix	SBUS	1.1340e-003	1.1130e-003
tblFleetMix	SBUS	1.1340e-003	1.1130e-003
tblFleetMix	SBUS	1.1340e-003	1.1130e-003
tblFleetMix	SBUS	1.1340e-003	1.1130e-003
tblFleetMix	SBUS	1.1340e-003	1.1130e-003
tblFleetMix	SBUS	1.1340e-003	1.1130e-003
tblFleetMix	SBUS	1.1340e-003	1.1130e-003
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tblFleetMix	SBUS	1.1340e-003	1.1130e-003
tblFleetMix	SBUS	1.1340e-003	1.1130e-003
tblFleetMix	UBUS	1.0530e-003	1.0180e-003
tblFleetMix	UBUS	1.0530e-003	1.0180e-003
tblFleetMix	UBUS	1.0530e-003	1.0180e-003
tblFleetMix	UBUS	1.0530e-003	1.0180e-003
tblFleetMix	UBUS	1.0530e-003	1.0180e-003
tblFleetMix	UBUS	1.0530e-003	1.0180e-003
tblFleetMix	UBUS	1.0530e-003	1.0180e-003
tblFleetMix	UBUS	1.0530e-003	1.0180e-003
tblFleetMix	UBUS	1.0530e-003	1.0180e-003
tblFleetMix	UBUS	1.0530e-003	1.0180e-003
tblFleetMix	UBUS	1.0530e-003	1.0180e-003
tblFleetMix	UBUS	1.0530e-003	1.0180e-003
tblGrading	AcresOfGrading	8,680.63	653.35

tblGrading	MaterialExported	0.00	37,647.00
tblLandUse	LandUseSquareFeet	0.00	21,000.00
tblLandUse	LandUseSquareFeet	0.00	77,200.00
tblLandUse	LandUseSquareFeet	0.00	56,000.00
tblLandUse	LandUseSquareFeet	18,876.00	11,000.00
tblLandUse	LandUseSquareFeet	29,040.00	27,300.00
tblLandUse	LandUseSquareFeet	39,204.00	131,800.00
tblLandUse	LandUseSquareFeet	72,600.00	28,600.00
tblLandUse	LandUseSquareFeet	88,572.00	90,500.00
tblLandUse	LandUseSquareFeet	117,612.00	189,900.00
tblLandUse	LandUseSquareFeet	132,132.00	59,200.00
tblLandUse	LandUseSquareFeet	0.00	24,600.00
tblLandUse	LandUseSquareFeet	0.00	26,000.00
tblLandUse	LandUseSquareFeet	0.00	27,000.00
tblLandUse	LandUseSquareFeet	0.00	6,500.00
tblLandUse	LandUseSquareFeet	0.00	71,900.00
tblLandUse	LandUseSquareFeet	35,000.00	52,100.00
tblLandUse	LotAcreage	0.03	2.85
tblLandUse	LotAcreage	2.68	54.53
tblLandUse	LotAcreage	0.29	0.00
tblLandUse	LotAcreage	0.19	17.63
tblLandUse	LotAcreage	0.00	21.87
tblLandUse	LotAcreage	0.00	18.49
tblLandUse	LotAcreage	0.00	38.37
tblLandUse	LotAcreage	125.66	475.53
tblLandUse	LotAcreage	2.71	26.80
tblLandUse	LotAcreage	0.43	16.09

tblLandUse	LotAcreage	0.67	28.15
tblLandUse	LotAcreage	0.90	148.03
tblLandUse	LotAcreage	1.67	0.00
tblLandUse	LotAcreage	2.03	45.17
tblLandUse	LotAcreage	2.70	31.97
tblLandUse	LotAcreage	3.03	59.00
tblLandUse	LotAcreage	0.24	93.03
tblLandUse	LotAcreage	0.27	0.00
tblLandUse	LotAcreage	0.53	47.22
tblLandUse	LotAcreage	2.19	138.73
tblLandUse	LotAcreage	3.13	12.75
tblLandUse	LotAcreage	4.22	8.03
tblLandUse	LotAcreage	4.22	6.01
tblLandUse	LotAcreage	9.74	10.25
tblLandUse	LotAcreage	12.99	21.21
tblLandUse	LotAcreage	14.61	52.15
tblLandUse	LotAcreage	0.69	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	10.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	20.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	10.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	10.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	11.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	11.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	11.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	11.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	5.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	16.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	8.00
tblOffRoadEquipment	UsageHours	6.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	7.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	7.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblSolidWaste	SolidWasteGenerationRate	187.79	185.06

tblSolidWaste	SolidWasteGenerationRate	0.00	31.50
tblSolidWaste	SolidWasteGenerationRate	0.00	2.40
tblSolidWaste	SolidWasteGenerationRate	0.00	31.50
tblTripsAndVMT	HaulingTripNumber	154.00	10.00
tblTripsAndVMT	WorkerTripLength	16.80	7.00
tblTripsAndVMT	WorkerTripLength	16.80	7.00
tblTripsAndVMT	WorkerTripLength	16.80	7.00
tblTripsAndVMT	WorkerTripLength	16.80	7.00
tblTripsAndVMT	WorkerTripLength	16.80	7.00
tblTripsAndVMT	WorkerTripLength	16.80	7.00
tblTripsAndVMT	WorkerTripNumber	15.00	5.00
tblTripsAndVMT	WorkerTripNumber	58.00	60.00
tblTripsAndVMT	WorkerTripNumber	115.00	180.00
tblTripsAndVMT	WorkerTripNumber	632.00	750.00
tblTripsAndVMT	WorkerTripNumber	83.00	100.00
tblTripsAndVMT	WorkerTripNumber	126.00	150.00
tblVehicleEF	HHD	0.54	0.02
tblVehicleEF	HHD	9.9690e-003	0.05
tblVehicleEF	HHD	0.19	0.00
tblVehicleEF	HHD	2.66	6.28
tblVehicleEF	HHD	1.06	0.40
tblVehicleEF	HHD	4.30	5.3000e-003
tblVehicleEF	HHD	2,668.25	1,039.23
tblVehicleEF	HHD	1,627.06	1,409.20
tblVehicleEF	HHD	10.25	0.04
tblVehicleEF	HHD	14.65	5.34
tblVehicleEF	HHD	4.72	2.66

tblVehicleEF	HHD	19.89	2.36
tblVehicleEF	HHD	0.10	2.6000e-003
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.03	0.04
tblVehicleEF	HHD	0.05	0.02
tblVehicleEF	HHD	1.4700e-004	0.00
tblVehicleEF	HHD	0.10	2.5000e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.5200e-003	8.9000e-003
tblVehicleEF	HHD	0.04	0.02
tblVehicleEF	HHD	1.3500e-004	0.00
tblVehicleEF	HHD	2.9400e-004	0.00
tblVehicleEF	HHD	0.01	1.0000e-004
tblVehicleEF	HHD	0.83	0.42
tblVehicleEF	HHD	1.3900e-004	0.00
tblVehicleEF	HHD	0.17	0.03
tblVehicleEF	HHD	3.5420e-003	0.00
tblVehicleEF	HHD	0.18	0.00
tblVehicleEF	HHD	0.03	9.7000e-003
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	1.7600e-004	0.00
tblVehicleEF	HHD	2.9400e-004	0.00
tblVehicleEF	HHD	0.01	1.0000e-004
tblVehicleEF	HHD	0.94	0.49
tblVehicleEF	HHD	1.3900e-004	0.00
tblVehicleEF	HHD	0.20	0.07
tblVehicleEF	HHD	3.5420e-003	0.00

tblVehicleEF	HHD	0.20	0.00
tblVehicleEF	HHD	0.51	0.02
tblVehicleEF	HHD	0.01	0.05
tblVehicleEF	HHD	0.18	0.00
tblVehicleEF	HHD	1.95	6.28
tblVehicleEF	HHD	1.08	0.40
tblVehicleEF	HHD	3.90	5.3000e-003
tblVehicleEF	HHD	2,824.59	1,039.23
tblVehicleEF	HHD	1,627.06	1,409.20
tblVehicleEF	HHD	10.25	0.04
tblVehicleEF	HHD	15.11	5.34
tblVehicleEF	HHD	4.55	2.66
tblVehicleEF	HHD	19.85	2.36
tblVehicleEF	HHD	0.09	2.6000e-003
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.03	0.04
tblVehicleEF	HHD	0.05	0.02
tblVehicleEF	HHD	1.4700e-004	0.00
tblVehicleEF	HHD	0.08	2.5000e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.5200e-003	8.9000e-003
tblVehicleEF	HHD	0.04	0.02
tblVehicleEF	HHD	1.3500e-004	0.00
tblVehicleEF	HHD	6.8300e-004	0.00
tblVehicleEF	HHD	0.01	1.0000e-004
tblVehicleEF	HHD	0.78	0.42
tblVehicleEF	HHD	3.3200e-004	0.00

tblVehicleEF	HHD	0.17	0.03
tblVehicleEF	HHD	3.4160e-003	0.00
tblVehicleEF	HHD	0.17	0.00
tblVehicleEF	HHD	0.03	9.7000e-003
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	1.6900e-004	0.00
tblVehicleEF	HHD	6.8300e-004	0.00
tblVehicleEF	HHD	0.01	1.0000e-004
tblVehicleEF	HHD	0.89	0.49
tblVehicleEF	HHD	3.3200e-004	0.00
tblVehicleEF	HHD	0.20	0.07
tblVehicleEF	HHD	3.4160e-003	0.00
tblVehicleEF	HHD	0.19	0.00
tblVehicleEF	HHD	0.58	0.02
tblVehicleEF	HHD	0.01	0.05
tblVehicleEF	HHD	0.18	0.00
tblVehicleEF	HHD	3.64	6.28
tblVehicleEF	HHD	1.08	0.40
tblVehicleEF	HHD	3.93	5.3000e-003
tblVehicleEF	HHD	2,452.36	1,039.23
tblVehicleEF	HHD	1,627.06	1,409.20
tblVehicleEF	HHD	10.25	0.04
tblVehicleEF	HHD	14.01	5.34
tblVehicleEF	HHD	4.56	2.66
tblVehicleEF	HHD	19.85	2.36
tblVehicleEF	HHD	0.12	2.6000e-003
tblVehicleEF	HHD	0.06	0.06

tblVehicleEF	HHD	0.03	0.04
tblVehicleEF	HHD	0.05	0.02
tblVehicleEF	HHD	1.4700e-004	0.00
tblVehicleEF	HHD	0.12	2.5000e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.5200e-003	8.9000e-003
tblVehicleEF	HHD	0.04	0.02
tblVehicleEF	HHD	1.3500e-004	0.00
tblVehicleEF	HHD	8.0000e-004	0.00
tblVehicleEF	HHD	0.02	1.0000e-004
tblVehicleEF	HHD	0.89	0.42
tblVehicleEF	HHD	5.2100e-004	0.00
tblVehicleEF	HHD	0.17	0.03
tblVehicleEF	HHD	3.9880e-003	0.00
tblVehicleEF	HHD	0.17	0.00
tblVehicleEF	HHD	0.02	9.7000e-003
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	1.7000e-004	0.00
tblVehicleEF	HHD	8.0000e-004	0.00
tblVehicleEF	HHD	0.02	1.0000e-004
tblVehicleEF	HHD	1.01	0.49
tblVehicleEF	HHD	5.2100e-004	0.00
tblVehicleEF	HHD	0.20	0.07
tblVehicleEF	HHD	3.9880e-003	0.00
tblVehicleEF	HHD	0.19	0.00
tblVehicleEF	LDA	8.2420e-003	1.8000e-003
tblVehicleEF	LDA	0.01	0.05

tblVehicleEF	LDA	0.86	0.52
tblVehicleEF	LDA	2.62	2.15
tblVehicleEF	LDA	262.90	239.59
tblVehicleEF	LDA	60.09	50.81
tblVehicleEF	LDA	0.09	0.03
tblVehicleEF	LDA	0.18	0.17
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	2.0100e-003	1.3000e-003
tblVehicleEF	LDA	2.7270e-003	1.7000e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	1.8550e-003	1.2000e-003
tblVehicleEF	LDA	2.5080e-003	1.6000e-003
tblVehicleEF	LDA	0.08	0.04
tblVehicleEF	LDA	0.21	0.09
tblVehicleEF	LDA	0.06	0.04
tblVehicleEF	LDA	0.02	6.6000e-003
tblVehicleEF	LDA	0.06	0.03
tblVehicleEF	LDA	0.18	0.21
tblVehicleEF	LDA	2.6370e-003	2.4000e-003
tblVehicleEF	LDA	6.4700e-004	5.0000e-004
tblVehicleEF	LDA	0.08	0.04
tblVehicleEF	LDA	0.21	0.09
tblVehicleEF	LDA	0.06	0.04
tblVehicleEF	LDA	0.03	9.6000e-003
tblVehicleEF	LDA	0.06	0.03
tblVehicleEF	LDA	0.20	0.23
tblVehicleEF	LDA	9.0920e-003	1.8000e-003

tblVehicleEF	LDA	0.01	0.05
tblVehicleEF	LDA	1.00	0.52
tblVehicleEF	LDA	2.01	2.15
tblVehicleEF	LDA	281.29	239.59
tblVehicleEF	LDA	60.09	50.81
tblVehicleEF	LDA	0.08	0.03
tblVehicleEF	LDA	0.16	0.17
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	2.0100e-003	1.3000e-003
tblVehicleEF	LDA	2.7270e-003	1.7000e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	1.8550e-003	1.2000e-003
tblVehicleEF	LDA	2.5080e-003	1.6000e-003
tblVehicleEF	LDA	0.17	0.04
tblVehicleEF	LDA	0.24	0.09
tblVehicleEF	LDA	0.12	0.04
tblVehicleEF	LDA	0.02	6.6000e-003
tblVehicleEF	LDA	0.05	0.03
tblVehicleEF	LDA	0.14	0.21
tblVehicleEF	LDA	2.8230e-003	2.4000e-003
tblVehicleEF	LDA	6.3600e-004	5.0000e-004
tblVehicleEF	LDA	0.17	0.04
tblVehicleEF	LDA	0.24	0.09
tblVehicleEF	LDA	0.12	0.04
tblVehicleEF	LDA	0.03	9.6000e-003
tblVehicleEF	LDA	0.05	0.03
tblVehicleEF	LDA	0.16	0.23

tblVehicleEF	LDA	8.6950e-003	1.8000e-003
tblVehicleEF	LDA	0.01	0.05
tblVehicleEF	LDA	0.93	0.52
tblVehicleEF	LDA	2.07	2.15
tblVehicleEF	LDA	273.25	239.59
tblVehicleEF	LDA	60.09	50.81
tblVehicleEF	LDA	0.08	0.03
tblVehicleEF	LDA	0.16	0.17
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	2.0100e-003	1.3000e-003
tblVehicleEF	LDA	2.7270e-003	1.7000e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	1.8550e-003	1.2000e-003
tblVehicleEF	LDA	2.5080e-003	1.6000e-003
tblVehicleEF	LDA	0.18	0.04
tblVehicleEF	LDA	0.36	0.09
tblVehicleEF	LDA	0.13	0.04
tblVehicleEF	LDA	0.02	6.6000e-003
tblVehicleEF	LDA	0.07	0.03
tblVehicleEF	LDA	0.15	0.21
tblVehicleEF	LDA	2.7420e-003	2.4000e-003
tblVehicleEF	LDA	6.3700e-004	5.0000e-004
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tblVehicleEF	LDA	0.36	0.09
tblVehicleEF	LDA	0.13	0.04
tblVehicleEF	LDA	0.03	9.6000e-003
tblVehicleEF	LDA	0.07	0.03

tblVehicleEF	LDA	0.16	0.23
tblVehicleEF	LDT1	0.03	3.8000e-003
tblVehicleEF	LDT1	0.05	0.07
tblVehicleEF	LDT1	3.00	0.87
tblVehicleEF	LDT1	10.46	2.34
tblVehicleEF	LDT1	333.98	287.73
tblVehicleEF	LDT1	76.88	61.75
tblVehicleEF	LDT1	0.37	0.07
tblVehicleEF	LDT1	0.56	0.24
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	3.8430e-003	1.7000e-003
tblVehicleEF	LDT1	6.5140e-003	2.2000e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	3.5410e-003	1.5000e-003
tblVehicleEF	LDT1	5.9940e-003	2.0000e-003
tblVehicleEF	LDT1	0.35	0.09
tblVehicleEF	LDT1	0.80	0.18
tblVehicleEF	LDT1	0.23	0.08
tblVehicleEF	LDT1	0.08	0.02
tblVehicleEF	LDT1	0.59	0.08
tblVehicleEF	LDT1	0.74	0.32
tblVehicleEF	LDT1	3.3840e-003	2.8000e-003
tblVehicleEF	LDT1	9.5600e-004	6.0000e-004
tblVehicleEF	LDT1	0.35	0.09
tblVehicleEF	LDT1	0.80	0.18
tblVehicleEF	LDT1	0.23	0.08
tblVehicleEF	LDT1	0.12	0.02

tblVehicleEF	LDT1	0.59	0.08
tblVehicleEF	LDT1	0.81	0.35
tblVehicleEF	LDT1	0.04	3.8000e-003
tblVehicleEF	LDT1	0.04	0.07
tblVehicleEF	LDT1	3.38	0.87
tblVehicleEF	LDT1	7.91	2.34
tblVehicleEF	LDT1	355.82	287.73
tblVehicleEF	LDT1	76.88	61.75
tblVehicleEF	LDT1	0.33	0.07
tblVehicleEF	LDT1	0.50	0.24
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	3.8430e-003	1.7000e-003
tblVehicleEF	LDT1	6.5140e-003	2.2000e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	3.5410e-003	1.5000e-003
tblVehicleEF	LDT1	5.9940e-003	2.0000e-003
tblVehicleEF	LDT1	0.78	0.09
tblVehicleEF	LDT1	0.91	0.18
tblVehicleEF	LDT1	0.50	0.08
tblVehicleEF	LDT1	0.09	0.02
tblVehicleEF	LDT1	0.54	0.08
tblVehicleEF	LDT1	0.58	0.32
tblVehicleEF	LDT1	3.6080e-003	2.8000e-003
tblVehicleEF	LDT1	9.1100e-004	6.0000e-004
tblVehicleEF	LDT1	0.78	0.09
tblVehicleEF	LDT1	0.91	0.18
tblVehicleEF	LDT1	0.50	0.08

tblVehicleEF	LDT1	0.13	0.02
tblVehicleEF	LDT1	0.54	0.08
tblVehicleEF	LDT1	0.64	0.35
tblVehicleEF	LDT1	0.03	3.8000e-003
tblVehicleEF	LDT1	0.04	0.07
tblVehicleEF	LDT1	3.17	0.87
tblVehicleEF	LDT1	8.14	2.34
tblVehicleEF	LDT1	346.27	287.73
tblVehicleEF	LDT1	76.88	61.75
tblVehicleEF	LDT1	0.32	0.07
tblVehicleEF	LDT1	0.50	0.24
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	3.8430e-003	1.7000e-003
tblVehicleEF	LDT1	6.5140e-003	2.2000e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	3.5410e-003	1.5000e-003
tblVehicleEF	LDT1	5.9940e-003	2.0000e-003
tblVehicleEF	LDT1	0.87	0.09
tblVehicleEF	LDT1	1.54	0.18
tblVehicleEF	LDT1	0.59	0.08
tblVehicleEF	LDT1	0.09	0.02
tblVehicleEF	LDT1	0.73	0.08
tblVehicleEF	LDT1	0.60	0.32
tblVehicleEF	LDT1	3.5090e-003	2.8000e-003
tblVehicleEF	LDT1	9.1500e-004	6.0000e-004
tblVehicleEF	LDT1	0.87	0.09
tblVehicleEF	LDT1	1.54	0.18

tblVehicleEF	LDT1	0.59	0.08
tblVehicleEF	LDT1	0.12	0.02
tblVehicleEF	LDT1	0.73	0.08
tblVehicleEF	LDT1	0.66	0.35
tblVehicleEF	LDT2	0.01	2.9000e-003
tblVehicleEF	LDT2	0.02	0.06
tblVehicleEF	LDT2	1.23	0.70
tblVehicleEF	LDT2	4.25	2.74
tblVehicleEF	LDT2	370.21	307.00
tblVehicleEF	LDT2	85.69	66.18
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tblVehicleEF	LDT2	0.42	0.26
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	1.9280e-003	1.3000e-003
tblVehicleEF	LDT2	2.9010e-003	1.7000e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	1.7730e-003	1.2000e-003
tblVehicleEF	LDT2	2.6680e-003	1.6000e-003
tblVehicleEF	LDT2	0.12	0.06
tblVehicleEF	LDT2	0.30	0.12
tblVehicleEF	LDT2	0.09	0.06
tblVehicleEF	LDT2	0.03	0.01
tblVehicleEF	LDT2	0.17	0.05
tblVehicleEF	LDT2	0.29	0.29
tblVehicleEF	LDT2	3.7160e-003	3.0000e-003
tblVehicleEF	LDT2	9.3200e-004	7.0000e-004
tblVehicleEF	LDT2	0.12	0.06

tblVehicleEF	LDT2	0.30	0.12
tblVehicleEF	LDT2	0.09	0.06
tblVehicleEF	LDT2	0.04	0.02
tblVehicleEF	LDT2	0.17	0.05
tblVehicleEF	LDT2	0.32	0.32
tblVehicleEF	LDT2	0.01	2.9000e-003
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tblVehicleEF	LDT2	0.16	0.06
tblVehicleEF	LDT2	0.37	0.26
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	1.9280e-003	1.3000e-003
tblVehicleEF	LDT2	2.9010e-003	1.7000e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	1.7730e-003	1.2000e-003
tblVehicleEF	LDT2	2.6680e-003	1.6000e-003
tblVehicleEF	LDT2	0.26	0.06
tblVehicleEF	LDT2	0.33	0.12
tblVehicleEF	LDT2	0.19	0.06
tblVehicleEF	LDT2	0.03	0.01
tblVehicleEF	LDT2	0.15	0.05
tblVehicleEF	LDT2	0.23	0.29
tblVehicleEF	LDT2	3.9710e-003	3.0000e-003
tblVehicleEF	LDT2	9.1400e-004	7.0000e-004

tblVehicleEF	LDT2	0.26	0.06
tblVehicleEF	LDT2	0.33	0.12
tblVehicleEF	LDT2	0.19	0.06
tblVehicleEF	LDT2	0.05	0.02
tblVehicleEF	LDT2	0.15	0.05
tblVehicleEF	LDT2	0.26	0.32
tblVehicleEF	LDT2	0.01	2.9000e-003
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tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	1.9280e-003	1.3000e-003
tblVehicleEF	LDT2	2.9010e-003	1.7000e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	1.7730e-003	1.2000e-003
tblVehicleEF	LDT2	2.6680e-003	1.6000e-003
tblVehicleEF	LDT2	0.26	0.06
tblVehicleEF	LDT2	0.50	0.12
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tblVehicleEF	LDT2	0.03	0.01
tblVehicleEF	LDT2	0.21	0.05
tblVehicleEF	LDT2	0.24	0.29
tblVehicleEF	LDT2	3.8590e-003	3.0000e-003

tblVehicleEF	LDT2	9.1600e-004	7.0000e-004
tblVehicleEF	LDT2	0.26	0.06
tblVehicleEF	LDT2	0.50	0.12
tblVehicleEF	LDT2	0.21	0.06
tblVehicleEF	LDT2	0.05	0.02
tblVehicleEF	LDT2	0.21	0.05
tblVehicleEF	LDT2	0.27	0.32
tblVehicleEF	LHD1	6.2510e-003	4.8000e-003
tblVehicleEF	LHD1	0.06	8.4000e-003
tblVehicleEF	LHD1	0.04	0.01
tblVehicleEF	LHD1	0.16	0.18
tblVehicleEF	LHD1	3.01	0.77
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tblVehicleEF	LHD1	9.43	9.11
tblVehicleEF	LHD1	705.41	776.98
tblVehicleEF	LHD1	28.48	10.85
tblVehicleEF	LHD1	0.10	0.07
tblVehicleEF	LHD1	3.25	0.94
tblVehicleEF	LHD1	1.36	0.30
tblVehicleEF	LHD1	1.1360e-003	9.0000e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	0.01	9.9000e-003
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tblVehicleEF	LHD1	1.5640e-003	2.0000e-004
tblVehicleEF	LHD1	1.0870e-003	9.0000e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.5520e-003	2.5000e-003

tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.4380e-003	2.0000e-004
tblVehicleEF	LHD1	5.5100e-003	1.8000e-003
tblVehicleEF	LHD1	0.22	0.07
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	2.3250e-003	1.0000e-003
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tblVehicleEF	LHD1	0.94	0.20
tblVehicleEF	LHD1	0.48	0.07
tblVehicleEF	LHD1	9.4000e-005	1.0000e-004
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tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.3250e-003	1.0000e-003
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tblVehicleEF	LHD1	6.2510e-003	4.8000e-003
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tblVehicleEF	LHD1	0.16	0.18
tblVehicleEF	LHD1	3.10	0.77
tblVehicleEF	LHD1	4.54	0.99
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tblVehicleEF	LHD1	28.48	10.85
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tblVehicleEF	LHD1	1.26	0.30
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tblVehicleEF	LHD1	0.01	9.9000e-003
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.5640e-003	2.0000e-004
tblVehicleEF	LHD1	1.0870e-003	9.0000e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.5520e-003	2.5000e-003
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.4380e-003	2.0000e-004
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tblVehicleEF	LHD1	0.24	0.07
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	5.0350e-003	1.0000e-003
tblVehicleEF	LHD1	0.28	0.10
tblVehicleEF	LHD1	0.91	0.20
tblVehicleEF	LHD1	0.45	0.07
tblVehicleEF	LHD1	9.4000e-005	1.0000e-004
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tblVehicleEF	LHD1	0.01	1.8000e-003
tblVehicleEF	LHD1	0.24	0.07
tblVehicleEF	LHD1	0.03	0.03

tblVehicleEF	LHD1	5.0350e-003	1.0000e-003
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tblVehicleEF	LHD1	0.91	0.20
tblVehicleEF	LHD1	0.49	0.08
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tblVehicleEF	LHD1	2.5520e-003	2.5000e-003
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.4380e-003	2.0000e-004
tblVehicleEF	LHD1	0.01	1.8000e-003

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tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	6.5460e-003	1.0000e-003
tblVehicleEF	LHD1	0.28	0.10
tblVehicleEF	LHD1	1.06	0.20
tblVehicleEF	LHD1	0.45	0.07
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tblVehicleEF	LHD1	6.9440e-003	7.6000e-003
tblVehicleEF	LHD1	3.7100e-004	1.0000e-004
tblVehicleEF	LHD1	0.01	1.8000e-003
tblVehicleEF	LHD1	0.42	0.07
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	6.5460e-003	1.0000e-003
tblVehicleEF	LHD1	0.36	0.12
tblVehicleEF	LHD1	1.06	0.20
tblVehicleEF	LHD1	0.49	0.08
tblVehicleEF	LHD2	2.8170e-003	2.9000e-003
tblVehicleEF	LHD2	0.02	6.9000e-003
tblVehicleEF	LHD2	9.8630e-003	7.3000e-003
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tblVehicleEF	LHD2	1.26	0.64
tblVehicleEF	LHD2	1.38	0.55
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tblVehicleEF	LHD2	14.40	7.04
tblVehicleEF	LHD2	0.15	0.11
tblVehicleEF	LHD2	2.92	0.98

tblVehicleEF	LHD2	0.46	0.17
tblVehicleEF	LHD2	1.6300e-003	1.5000e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.03	0.02
tblVehicleEF	LHD2	4.0900e-004	1.0000e-004
tblVehicleEF	LHD2	1.5600e-003	1.4000e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.8050e-003	2.7000e-003
tblVehicleEF	LHD2	0.03	0.02
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tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	5.8600e-004	5.0000e-004
tblVehicleEF	LHD2	0.19	0.12
tblVehicleEF	LHD2	0.16	0.08
tblVehicleEF	LHD2	0.13	0.04
tblVehicleEF	LHD2	1.5300e-004	1.0000e-004
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tblVehicleEF	LHD2	1.2990e-003	8.0000e-004
tblVehicleEF	LHD2	0.05	0.03
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	5.8600e-004	5.0000e-004
tblVehicleEF	LHD2	0.23	0.13
tblVehicleEF	LHD2	0.16	0.08

tblVehicleEF	LHD2	0.15	0.04
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tblVehicleEF	LHD2	0.11	0.13
tblVehicleEF	LHD2	1.28	0.64
tblVehicleEF	LHD2	1.25	0.55
tblVehicleEF	LHD2	15.87	14.31
tblVehicleEF	LHD2	703.60	754.66
tblVehicleEF	LHD2	14.40	7.04
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tblVehicleEF	LHD2	0.42	0.17
tblVehicleEF	LHD2	1.6300e-003	1.5000e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.03	0.02
tblVehicleEF	LHD2	4.0900e-004	1.0000e-004
tblVehicleEF	LHD2	1.5600e-003	1.4000e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.8050e-003	2.7000e-003
tblVehicleEF	LHD2	0.03	0.02
tblVehicleEF	LHD2	3.7600e-004	1.0000e-004
tblVehicleEF	LHD2	2.8400e-003	8.0000e-004
tblVehicleEF	LHD2	0.06	0.03
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	1.2570e-003	5.0000e-004

tblVehicleEF	LHD2	0.19	0.12
tblVehicleEF	LHD2	0.15	0.08
tblVehicleEF	LHD2	0.12	0.04
tblVehicleEF	LHD2	1.5300e-004	1.0000e-004
tblVehicleEF	LHD2	6.8040e-003	7.3000e-003
tblVehicleEF	LHD2	1.6800e-004	1.0000e-004
tblVehicleEF	LHD2	2.8400e-003	8.0000e-004
tblVehicleEF	LHD2	0.06	0.03
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	1.2570e-003	5.0000e-004
tblVehicleEF	LHD2	0.23	0.13
tblVehicleEF	LHD2	0.15	0.08
tblVehicleEF	LHD2	0.14	0.04
tblVehicleEF	LHD2	2.8170e-003	2.9000e-003
tblVehicleEF	LHD2	0.02	6.9000e-003
tblVehicleEF	LHD2	9.2600e-003	7.3000e-003
tblVehicleEF	LHD2	0.11	0.13
tblVehicleEF	LHD2	1.28	0.64
tblVehicleEF	LHD2	1.26	0.55
tblVehicleEF	LHD2	15.87	14.31
tblVehicleEF	LHD2	703.60	754.66
tblVehicleEF	LHD2	14.40	7.04
tblVehicleEF	LHD2	0.15	0.11
tblVehicleEF	LHD2	2.82	0.98
tblVehicleEF	LHD2	0.42	0.17
tblVehicleEF	LHD2	1.6300e-003	1.5000e-003
tblVehicleEF	LHD2	0.09	0.09

tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.03	0.02
tblVehicleEF	LHD2	4.0900e-004	1.0000e-004
tblVehicleEF	LHD2	1.5600e-003	1.4000e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.8050e-003	2.7000e-003
tblVehicleEF	LHD2	0.03	0.02
tblVehicleEF	LHD2	3.7600e-004	1.0000e-004
tblVehicleEF	LHD2	3.0390e-003	8.0000e-004
tblVehicleEF	LHD2	0.09	0.03
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	1.6020e-003	5.0000e-004
tblVehicleEF	LHD2	0.19	0.12
tblVehicleEF	LHD2	0.17	0.08
tblVehicleEF	LHD2	0.12	0.04
tblVehicleEF	LHD2	1.5300e-004	1.0000e-004
tblVehicleEF	LHD2	6.8040e-003	7.3000e-003
tblVehicleEF	LHD2	1.6800e-004	1.0000e-004
tblVehicleEF	LHD2	3.0390e-003	8.0000e-004
tblVehicleEF	LHD2	0.09	0.03
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	1.6020e-003	5.0000e-004
tblVehicleEF	LHD2	0.23	0.13
tblVehicleEF	LHD2	0.17	0.08
tblVehicleEF	LHD2	0.14	0.04
tblVehicleEF	MCY	0.42	0.34
tblVehicleEF	MCY	0.18	0.26

tblVehicleEF	MCY	24.37	20.00
tblVehicleEF	MCY	10.27	9.07
tblVehicleEF	MCY	166.31	213.40
tblVehicleEF	MCY	50.64	61.71
tblVehicleEF	MCY	1.22	1.16
tblVehicleEF	MCY	0.33	0.27
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	2.1510e-003	2.0000e-003
tblVehicleEF	MCY	5.2380e-003	3.0000e-003
tblVehicleEF	MCY	5.0400e-003	5.0000e-003
tblVehicleEF	MCY	2.0280e-003	1.9000e-003
tblVehicleEF	MCY	4.9740e-003	2.8000e-003
tblVehicleEF	MCY	1.43	0.89
tblVehicleEF	MCY	1.26	0.75
tblVehicleEF	MCY	0.77	0.56
tblVehicleEF	MCY	2.63	2.29
tblVehicleEF	MCY	1.37	0.56
tblVehicleEF	MCY	2.50	1.98
tblVehicleEF	MCY	2.1350e-003	2.1000e-003
tblVehicleEF	MCY	7.4900e-004	6.0000e-004
tblVehicleEF	MCY	1.43	0.89
tblVehicleEF	MCY	1.26	0.75
tblVehicleEF	MCY	0.77	0.56
tblVehicleEF	MCY	3.14	2.82
tblVehicleEF	MCY	1.37	0.56
tblVehicleEF	MCY	2.71	2.15
tblVehicleEF	MCY	0.40	0.34

tblVehicleEF	MCY	0.15	0.26
tblVehicleEF	MCY	22.87	20.00
tblVehicleEF	MCY	8.98	9.07
tblVehicleEF	MCY	166.31	213.40
tblVehicleEF	MCY	50.64	61.71
tblVehicleEF	MCY	1.07	1.16
tblVehicleEF	MCY	0.30	0.27
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	2.1510e-003	2.0000e-003
tblVehicleEF	MCY	5.2380e-003	3.0000e-003
tblVehicleEF	MCY	5.0400e-003	5.0000e-003
tblVehicleEF	MCY	2.0280e-003	1.9000e-003
tblVehicleEF	MCY	4.9740e-003	2.8000e-003
tblVehicleEF	MCY	3.36	0.89
tblVehicleEF	MCY	1.57	0.75
tblVehicleEF	MCY	1.93	0.56
tblVehicleEF	MCY	2.47	2.29
tblVehicleEF	MCY	1.28	0.56
tblVehicleEF	MCY	1.99	1.98
tblVehicleEF	MCY	2.1060e-003	2.1000e-003
tblVehicleEF	MCY	7.1200e-004	6.0000e-004
tblVehicleEF	MCY	3.36	0.89
tblVehicleEF	MCY	1.57	0.75
tblVehicleEF	MCY	1.93	0.56
tblVehicleEF	MCY	2.95	2.82
tblVehicleEF	MCY	1.28	0.56
tblVehicleEF	MCY	2.16	2.15

tblVehicleEF	MCY	0.40	0.34
tblVehicleEF	MCY	0.15	0.26
tblVehicleEF	MCY	22.23	20.00
tblVehicleEF	MCY	8.91	9.07
tblVehicleEF	MCY	166.31	213.40
tblVehicleEF	MCY	50.64	61.71
tblVehicleEF	MCY	1.08	1.16
tblVehicleEF	MCY	0.30	0.27
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	2.1510e-003	2.0000e-003
tblVehicleEF	MCY	5.2380e-003	3.0000e-003
tblVehicleEF	MCY	5.0400e-003	5.0000e-003
tblVehicleEF	MCY	2.0280e-003	1.9000e-003
tblVehicleEF	MCY	4.9740e-003	2.8000e-003
tblVehicleEF	MCY	4.27	0.89
tblVehicleEF	MCY	3.25	0.75
tblVehicleEF	MCY	2.70	0.56
tblVehicleEF	MCY	2.46	2.29
tblVehicleEF	MCY	1.58	0.56
tblVehicleEF	MCY	2.02	1.98
tblVehicleEF	MCY	2.0960e-003	2.1000e-003
tblVehicleEF	MCY	7.1200e-004	6.0000e-004
tblVehicleEF	MCY	4.27	0.89
tblVehicleEF	MCY	3.25	0.75
tblVehicleEF	MCY	2.70	0.56
tblVehicleEF	MCY	2.94	2.82
tblVehicleEF	MCY	1.58	0.56

tblVehicleEF	MCY	2.20	2.15
tblVehicleEF	MDV	0.03	3.8000e-003
tblVehicleEF	MDV	0.05	0.08
tblVehicleEF	MDV	2.46	0.82
tblVehicleEF	MDV	8.49	3.10
tblVehicleEF	MDV	512.44	379.50
tblVehicleEF	MDV	114.77	81.06
tblVehicleEF	MDV	0.45	0.08
tblVehicleEF	MDV	0.84	0.32
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	2.4990e-003	1.5000e-003
tblVehicleEF	MDV	3.9470e-003	1.8000e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.3060e-003	1.3000e-003
tblVehicleEF	MDV	3.6310e-003	1.7000e-003
tblVehicleEF	MDV	0.18	0.07
tblVehicleEF	MDV	0.47	0.15
tblVehicleEF	MDV	0.14	0.08
tblVehicleEF	MDV	0.08	0.02
tblVehicleEF	MDV	0.37	0.06
tblVehicleEF	MDV	0.65	0.38
tblVehicleEF	MDV	5.1540e-003	3.8000e-003
tblVehicleEF	MDV	1.3010e-003	8.0000e-004
tblVehicleEF	MDV	0.18	0.07
tblVehicleEF	MDV	0.47	0.15
tblVehicleEF	MDV	0.14	0.08
tblVehicleEF	MDV	0.11	0.02

tblVehicleEF	MDV	0.37	0.06
tblVehicleEF	MDV	0.72	0.42
tblVehicleEF	MDV	0.03	3.8000e-003
tblVehicleEF	MDV	0.04	0.08
tblVehicleEF	MDV	2.80	0.82
tblVehicleEF	MDV	6.51	3.10
tblVehicleEF	MDV	546.20	379.50
tblVehicleEF	MDV	114.77	81.06
tblVehicleEF	MDV	0.40	0.08
tblVehicleEF	MDV	0.74	0.32
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	2.4990e-003	1.5000e-003
tblVehicleEF	MDV	3.9470e-003	1.8000e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.3060e-003	1.3000e-003
tblVehicleEF	MDV	3.6310e-003	1.7000e-003
tblVehicleEF	MDV	0.40	0.07
tblVehicleEF	MDV	0.52	0.15
tblVehicleEF	MDV	0.29	0.08
tblVehicleEF	MDV	0.08	0.02
tblVehicleEF	MDV	0.33	0.06
tblVehicleEF	MDV	0.52	0.38
tblVehicleEF	MDV	5.4960e-003	3.8000e-003
tblVehicleEF	MDV	1.2650e-003	8.0000e-004
tblVehicleEF	MDV	0.40	0.07
tblVehicleEF	MDV	0.52	0.15
tblVehicleEF	MDV	0.29	0.08

tblVehicleEF	MDV	0.12	0.02
tblVehicleEF	MDV	0.33	0.06
tblVehicleEF	MDV	0.57	0.42
tblVehicleEF	MDV	0.03	3.8000e-003
tblVehicleEF	MDV	0.04	0.08
tblVehicleEF	MDV	2.62	0.82
tblVehicleEF	MDV	6.69	3.10
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tblVehicleEF	MDV	0.40	0.08
tblVehicleEF	MDV	0.75	0.32
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	2.4990e-003	1.5000e-003
tblVehicleEF	MDV	3.9470e-003	1.8000e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.3060e-003	1.3000e-003
tblVehicleEF	MDV	3.6310e-003	1.7000e-003
tblVehicleEF	MDV	0.41	0.07
tblVehicleEF	MDV	0.79	0.15
tblVehicleEF	MDV	0.33	0.08
tblVehicleEF	MDV	0.08	0.02
tblVehicleEF	MDV	0.45	0.06
tblVehicleEF	MDV	0.54	0.38
tblVehicleEF	MDV	5.3460e-003	3.8000e-003
tblVehicleEF	MDV	1.2690e-003	8.0000e-004
tblVehicleEF	MDV	0.41	0.07
tblVehicleEF	MDV	0.79	0.15

tblVehicleEF	MDV	0.33	0.08
tblVehicleEF	MDV	0.12	0.02
tblVehicleEF	MDV	0.45	0.06
tblVehicleEF	MDV	0.59	0.42
tblVehicleEF	MH	0.15	9.3000e-003
tblVehicleEF	MH	0.06	0.02
tblVehicleEF	MH	10.88	0.85
tblVehicleEF	MH	14.64	1.96
tblVehicleEF	MH	1,262.50	1,512.95
tblVehicleEF	MH	64.55	17.73
tblVehicleEF	MH	2.90	1.52
tblVehicleEF	MH	1.93	0.24
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.04	0.03
tblVehicleEF	MH	2.2440e-003	2.0000e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1720e-003	3.3000e-003
tblVehicleEF	MH	0.04	0.03
tblVehicleEF	MH	2.0630e-003	2.0000e-004
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tblVehicleEF	MH	0.20	0.05
tblVehicleEF	MH	0.76	0.23
tblVehicleEF	MH	0.41	0.07
tblVehicleEF	MH	0.07	0.01
tblVehicleEF	MH	0.85	0.09
tblVehicleEF	MH	0.01	0.01

tblVehicleEF	MH	9.0200e-004	2.0000e-004
tblVehicleEF	MH	2.48	0.58
tblVehicleEF	MH	0.20	0.05
tblVehicleEF	MH	0.76	0.23
tblVehicleEF	MH	0.59	0.08
tblVehicleEF	MH	0.07	0.01
tblVehicleEF	MH	0.93	0.10
tblVehicleEF	MH	0.16	9.3000e-003
tblVehicleEF	MH	0.06	0.02
tblVehicleEF	MH	11.44	0.85
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tblVehicleEF	MH	1,262.50	1,512.95
tblVehicleEF	MH	64.55	17.73
tblVehicleEF	MH	2.64	1.52
tblVehicleEF	MH	1.79	0.24
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.04	0.03
tblVehicleEF	MH	2.2440e-003	2.0000e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1720e-003	3.3000e-003
tblVehicleEF	MH	0.04	0.03
tblVehicleEF	MH	2.0630e-003	2.0000e-004
tblVehicleEF	MH	5.44	0.58
tblVehicleEF	MH	0.21	0.05
tblVehicleEF	MH	1.63	0.23
tblVehicleEF	MH	0.44	0.07

tblVehicleEF	MH	0.07	0.01
tblVehicleEF	MH	0.77	0.09
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	8.7100e-004	2.0000e-004
tblVehicleEF	MH	5.44	0.58
tblVehicleEF	MH	0.21	0.05
tblVehicleEF	MH	1.63	0.23
tblVehicleEF	MH	0.63	0.08
tblVehicleEF	MH	0.07	0.01
tblVehicleEF	MH	0.85	0.10
tblVehicleEF	MH	0.16	9.3000e-003
tblVehicleEF	MH	0.06	0.02
tblVehicleEF	MH	11.38	0.85
tblVehicleEF	MH	13.04	1.96
tblVehicleEF	MH	1,262.50	1,512.95
tblVehicleEF	MH	64.55	17.73
tblVehicleEF	MH	2.67	1.52
tblVehicleEF	MH	1.79	0.24
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.04	0.03
tblVehicleEF	MH	2.2440e-003	2.0000e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1720e-003	3.3000e-003
tblVehicleEF	MH	0.04	0.03
tblVehicleEF	MH	2.0630e-003	2.0000e-004
tblVehicleEF	MH	6.52	0.58

tblVehicleEF	MH	0.40	0.05
tblVehicleEF	MH	2.43	0.23
tblVehicleEF	MH	0.44	0.07
tblVehicleEF	MH	0.08	0.01
tblVehicleEF	MH	0.78	0.09
tblVehicleEF	MH	0.01	0.01
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tblVehicleEF	MH	6.52	0.58
tblVehicleEF	MH	0.40	0.05
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tblVehicleEF	MH	0.62	0.08
tblVehicleEF	MH	0.08	0.01
tblVehicleEF	MH	0.86	0.10
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tblVehicleEF	MHD	0.57	0.43
tblVehicleEF	MHD	0.85	0.27
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tblVehicleEF	MHD	170.87	84.01
tblVehicleEF	MHD	1,222.93	1,109.33
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tblVehicleEF	MHD	13.84	1.66
tblVehicleEF	MHD	0.01	5.0000e-004
tblVehicleEF	MHD	0.13	0.13

tblVehicleEF	MHD	0.03	7.2000e-003
tblVehicleEF	MHD	1.2670e-003	1.0000e-004
tblVehicleEF	MHD	0.01	5.0000e-004
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	0.03	6.9000e-003
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tblVehicleEF	MHD	2.3230e-003	4.0000e-004
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tblVehicleEF	MHD	0.07	0.02
tblVehicleEF	MHD	1.0380e-003	2.0000e-004
tblVehicleEF	MHD	0.13	0.02
tblVehicleEF	MHD	0.07	0.02
tblVehicleEF	MHD	0.68	0.05
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tblVehicleEF	MHD	6.6600e-004	1.0000e-004
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tblVehicleEF	MHD	0.08	0.03
tblVehicleEF	MHD	1.0380e-003	2.0000e-004
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tblVehicleEF	MHD	0.07	0.02
tblVehicleEF	MHD	0.74	0.06
tblVehicleEF	MHD	0.02	4.0000e-003
tblVehicleEF	MHD	0.01	2.1000e-003
tblVehicleEF	MHD	0.11	0.01
tblVehicleEF	MHD	0.38	0.43

tblVehicleEF	MHD	0.87	0.27
tblVehicleEF	MHD	9.85	1.19
tblVehicleEF	MHD	181.40	84.01
tblVehicleEF	MHD	1,222.93	1,109.33
tblVehicleEF	MHD	47.31	10.07
tblVehicleEF	MHD	1.13	0.52
tblVehicleEF	MHD	2.51	1.47
tblVehicleEF	MHD	13.72	1.66
tblVehicleEF	MHD	0.01	5.0000e-004
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	0.03	7.2000e-003
tblVehicleEF	MHD	1.2670e-003	1.0000e-004
tblVehicleEF	MHD	0.01	5.0000e-004
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	0.03	6.9000e-003
tblVehicleEF	MHD	1.1650e-003	1.0000e-004
tblVehicleEF	MHD	5.1770e-003	4.0000e-004
tblVehicleEF	MHD	0.11	0.02
tblVehicleEF	MHD	0.06	0.02
tblVehicleEF	MHD	2.3060e-003	2.0000e-004
tblVehicleEF	MHD	0.13	0.02
tblVehicleEF	MHD	0.07	0.02
tblVehicleEF	MHD	0.63	0.05
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tblVehicleEF	MHD	6.4800e-004	1.0000e-004
tblVehicleEF	MHD	5.1770e-003	4.0000e-004

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tblVehicleEF	MHD	0.07	0.02
tblVehicleEF	MHD	0.69	0.06
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tblVehicleEF	MHD	0.11	0.01
tblVehicleEF	MHD	0.72	0.43
tblVehicleEF	MHD	0.87	0.27
tblVehicleEF	MHD	9.94	1.19
tblVehicleEF	MHD	157.22	84.01
tblVehicleEF	MHD	1,222.93	1,109.33
tblVehicleEF	MHD	47.31	10.07
tblVehicleEF	MHD	1.04	0.52
tblVehicleEF	MHD	2.53	1.47
tblVehicleEF	MHD	13.73	1.66
tblVehicleEF	MHD	0.02	5.0000e-004
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	0.03	7.2000e-003
tblVehicleEF	MHD	1.2670e-003	1.0000e-004
tblVehicleEF	MHD	0.02	5.0000e-004
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	0.03	6.9000e-003
tblVehicleEF	MHD	1.1650e-003	1.0000e-004
tblVehicleEF	MHD	5.7650e-003	4.0000e-004

tblVehicleEF	MHD	0.18	0.02
tblVehicleEF	MHD	0.07	0.02
tblVehicleEF	MHD	3.1630e-003	2.0000e-004
tblVehicleEF	MHD	0.13	0.02
tblVehicleEF	MHD	0.08	0.02
tblVehicleEF	MHD	0.63	0.05
tblVehicleEF	MHD	1.5110e-003	8.0000e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	6.4900e-004	1.0000e-004
tblVehicleEF	MHD	5.7650e-003	4.0000e-004
tblVehicleEF	MHD	0.18	0.02
tblVehicleEF	MHD	0.09	0.03
tblVehicleEF	MHD	3.1630e-003	2.0000e-004
tblVehicleEF	MHD	0.16	0.02
tblVehicleEF	MHD	0.08	0.02
tblVehicleEF	MHD	0.69	0.06
tblVehicleEF	OBUS	0.02	8.8000e-003
tblVehicleEF	OBUS	0.02	9.0000e-003
tblVehicleEF	OBUS	0.06	0.03
tblVehicleEF	OBUS	0.36	0.50
tblVehicleEF	OBUS	1.47	0.98
tblVehicleEF	OBUS	11.18	2.88
tblVehicleEF	OBUS	198.88	65.66
tblVehicleEF	OBUS	1,431.33	1,496.24
tblVehicleEF	OBUS	67.80	21.75
tblVehicleEF	OBUS	0.98	0.23
tblVehicleEF	OBUS	2.64	1.13

tblVehicleEF	OBUS	3.88	0.68
tblVehicleEF	OBUS	2.2000e-004	1.0000e-004
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	6.1000e-003
tblVehicleEF	OBUS	1.1240e-003	2.0000e-004
tblVehicleEF	OBUS	2.1000e-004	1.0000e-004
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	0.01	5.8000e-003
tblVehicleEF	OBUS	1.0330e-003	2.0000e-004
tblVehicleEF	OBUS	3.3700e-003	1.7000e-003
tblVehicleEF	OBUS	0.04	0.03
tblVehicleEF	OBUS	0.06	0.05
tblVehicleEF	OBUS	1.2460e-003	8.0000e-004
tblVehicleEF	OBUS	0.13	0.05
tblVehicleEF	OBUS	0.14	0.09
tblVehicleEF	OBUS	0.70	0.14
tblVehicleEF	OBUS	1.9100e-003	6.0000e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.7500e-004	2.0000e-004
tblVehicleEF	OBUS	3.3700e-003	1.7000e-003
tblVehicleEF	OBUS	0.04	0.03
tblVehicleEF	OBUS	0.08	0.06
tblVehicleEF	OBUS	1.2460e-003	8.0000e-004
tblVehicleEF	OBUS	0.17	0.07
tblVehicleEF	OBUS	0.14	0.09
tblVehicleEF	OBUS	0.77	0.15
tblVehicleEF	OBUS	0.02	8.8000e-003

tblVehicleEF	OBUS	0.03	9.0000e-003
tblVehicleEF	OBUS	0.05	0.03
tblVehicleEF	OBUS	0.33	0.50
tblVehicleEF	OBUS	1.52	0.98
tblVehicleEF	OBUS	9.96	2.88
tblVehicleEF	OBUS	209.71	65.66
tblVehicleEF	OBUS	1,431.33	1,496.24
tblVehicleEF	OBUS	67.80	21.75
tblVehicleEF	OBUS	1.01	0.23
tblVehicleEF	OBUS	2.51	1.13
tblVehicleEF	OBUS	3.73	0.68
tblVehicleEF	OBUS	1.8500e-004	1.0000e-004
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	6.1000e-003
tblVehicleEF	OBUS	1.1240e-003	2.0000e-004
tblVehicleEF	OBUS	1.7700e-004	1.0000e-004
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	0.01	5.8000e-003
tblVehicleEF	OBUS	1.0330e-003	2.0000e-004
tblVehicleEF	OBUS	7.2920e-003	1.7000e-003
tblVehicleEF	OBUS	0.05	0.03
tblVehicleEF	OBUS	0.06	0.05
tblVehicleEF	OBUS	2.6200e-003	8.0000e-004
tblVehicleEF	OBUS	0.14	0.05
tblVehicleEF	OBUS	0.13	0.09
tblVehicleEF	OBUS	0.65	0.14
tblVehicleEF	OBUS	2.0130e-003	6.0000e-004

tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.5500e-004	2.0000e-004
tblVehicleEF	OBUS	7.2920e-003	1.7000e-003
tblVehicleEF	OBUS	0.05	0.03
tblVehicleEF	OBUS	0.08	0.06
tblVehicleEF	OBUS	2.6200e-003	8.0000e-004
tblVehicleEF	OBUS	0.17	0.07
tblVehicleEF	OBUS	0.13	0.09
tblVehicleEF	OBUS	0.71	0.15
tblVehicleEF	OBUS	0.02	8.8000e-003
tblVehicleEF	OBUS	0.03	9.0000e-003
tblVehicleEF	OBUS	0.05	0.03
tblVehicleEF	OBUS	0.41	0.50
tblVehicleEF	OBUS	1.51	0.98
tblVehicleEF	OBUS	10.10	2.88
tblVehicleEF	OBUS	183.93	65.66
tblVehicleEF	OBUS	1,431.33	1,496.24
tblVehicleEF	OBUS	67.80	21.75
tblVehicleEF	OBUS	0.94	0.23
tblVehicleEF	OBUS	2.53	1.13
tblVehicleEF	OBUS	3.74	0.68
tblVehicleEF	OBUS	2.6700e-004	1.0000e-004
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	6.1000e-003
tblVehicleEF	OBUS	1.1240e-003	2.0000e-004
tblVehicleEF	OBUS	2.5600e-004	1.0000e-004
tblVehicleEF	OBUS	0.06	0.06

tblVehicleEF	OBUS	0.01	5.8000e-003
tblVehicleEF	OBUS	1.0330e-003	2.0000e-004
tblVehicleEF	OBUS	7.5400e-003	1.7000e-003
tblVehicleEF	OBUS	0.07	0.03
tblVehicleEF	OBUS	0.06	0.05
tblVehicleEF	OBUS	3.5720e-003	8.0000e-004
tblVehicleEF	OBUS	0.14	0.05
tblVehicleEF	OBUS	0.15	0.09
tblVehicleEF	OBUS	0.65	0.14
tblVehicleEF	OBUS	1.7670e-003	6.0000e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.5700e-004	2.0000e-004
tblVehicleEF	OBUS	7.5400e-003	1.7000e-003
tblVehicleEF	OBUS	0.07	0.03
tblVehicleEF	OBUS	0.08	0.06
tblVehicleEF	OBUS	3.5720e-003	8.0000e-004
tblVehicleEF	OBUS	0.17	0.07
tblVehicleEF	OBUS	0.15	0.09
tblVehicleEF	OBUS	0.72	0.15
tblVehicleEF	SBUS	1.00	0.02
tblVehicleEF	SBUS	0.01	2.6000e-003
tblVehicleEF	SBUS	0.10	1.3000e-003
tblVehicleEF	SBUS	6.12	1.26
tblVehicleEF	SBUS	0.78	0.22
tblVehicleEF	SBUS	6.63	0.19
tblVehicleEF	SBUS	1,276.27	299.60
tblVehicleEF	SBUS	1,143.42	991.09

tblVehicleEF	SBUS	36.31	1.09
tblVehicleEF	SBUS	12.20	2.23
tblVehicleEF	SBUS	4.99	2.75
tblVehicleEF	SBUS	15.43	1.56
tblVehicleEF	SBUS	0.01	1.5000e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.02
tblVehicleEF	SBUS	3.0400e-004	0.00
tblVehicleEF	SBUS	0.01	1.5000e-003
tblVehicleEF	SBUS	2.7600e-003	2.9000e-003
tblVehicleEF	SBUS	0.03	0.02
tblVehicleEF	SBUS	2.7900e-004	0.00
tblVehicleEF	SBUS	4.0180e-003	1.0000e-004
tblVehicleEF	SBUS	0.04	8.0000e-004
tblVehicleEF	SBUS	0.77	0.09
tblVehicleEF	SBUS	1.6500e-003	0.00
tblVehicleEF	SBUS	0.12	0.04
tblVehicleEF	SBUS	0.02	1.6000e-003
tblVehicleEF	SBUS	0.37	7.3000e-003
tblVehicleEF	SBUS	0.01	2.8000e-003
tblVehicleEF	SBUS	0.01	9.4000e-003
tblVehicleEF	SBUS	4.7900e-004	0.00
tblVehicleEF	SBUS	4.0180e-003	1.0000e-004
tblVehicleEF	SBUS	0.04	8.0000e-004
tblVehicleEF	SBUS	1.10	0.12
tblVehicleEF	SBUS	1.6500e-003	0.00
tblVehicleEF	SBUS	0.14	0.05

tblVehicleEF	SBUS	0.02	1.6000e-003
tblVehicleEF	SBUS	0.40	8.0000e-003
tblVehicleEF	SBUS	1.00	0.02
tblVehicleEF	SBUS	0.01	2.6000e-003
tblVehicleEF	SBUS	0.08	1.3000e-003
tblVehicleEF	SBUS	5.97	1.26
tblVehicleEF	SBUS	0.79	0.22
tblVehicleEF	SBUS	4.61	0.19
tblVehicleEF	SBUS	1,341.45	299.60
tblVehicleEF	SBUS	1,143.42	991.09
tblVehicleEF	SBUS	36.31	1.09
tblVehicleEF	SBUS	12.59	2.23
tblVehicleEF	SBUS	4.78	2.75
tblVehicleEF	SBUS	15.38	1.56
tblVehicleEF	SBUS	0.01	1.5000e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.02
tblVehicleEF	SBUS	3.0400e-004	0.00
tblVehicleEF	SBUS	0.01	1.5000e-003
tblVehicleEF	SBUS	2.7600e-003	2.9000e-003
tblVehicleEF	SBUS	0.03	0.02
tblVehicleEF	SBUS	2.7900e-004	0.00
tblVehicleEF	SBUS	8.5020e-003	1.0000e-004
tblVehicleEF	SBUS	0.04	8.0000e-004
tblVehicleEF	SBUS	0.76	0.09
tblVehicleEF	SBUS	3.3340e-003	0.00
tblVehicleEF	SBUS	0.12	0.04

tblVehicleEF	SBUS	0.02	1.6000e-003
tblVehicleEF	SBUS	0.30	7.3000e-003
tblVehicleEF	SBUS	0.01	2.8000e-003
tblVehicleEF	SBUS	0.01	9.4000e-003
tblVehicleEF	SBUS	4.4500e-004	0.00
tblVehicleEF	SBUS	8.5020e-003	1.0000e-004
tblVehicleEF	SBUS	0.04	8.0000e-004
tblVehicleEF	SBUS	1.09	0.12
tblVehicleEF	SBUS	3.3340e-003	0.00
tblVehicleEF	SBUS	0.15	0.05
tblVehicleEF	SBUS	0.02	1.6000e-003
tblVehicleEF	SBUS	0.33	8.0000e-003
tblVehicleEF	SBUS	1.00	0.02
tblVehicleEF	SBUS	0.01	2.6000e-003
tblVehicleEF	SBUS	0.08	1.3000e-003
tblVehicleEF	SBUS	6.33	1.26
tblVehicleEF	SBUS	0.79	0.22
tblVehicleEF	SBUS	4.89	0.19
tblVehicleEF	SBUS	1,186.25	299.60
tblVehicleEF	SBUS	1,143.42	991.09
tblVehicleEF	SBUS	36.31	1.09
tblVehicleEF	SBUS	11.66	2.23
tblVehicleEF	SBUS	4.80	2.75
tblVehicleEF	SBUS	15.39	1.56
tblVehicleEF	SBUS	0.02	1.5000e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.02

tblVehicleEF	SBUS	3.0400e-004	0.00
tblVehicleEF	SBUS	0.01	1.5000e-003
tblVehicleEF	SBUS	2.7600e-003	2.9000e-003
tblVehicleEF	SBUS	0.03	0.02
tblVehicleEF	SBUS	2.7900e-004	0.00
tblVehicleEF	SBUS	7.6430e-003	1.0000e-004
tblVehicleEF	SBUS	0.05	8.0000e-004
tblVehicleEF	SBUS	0.77	0.09
tblVehicleEF	SBUS	4.1680e-003	0.00
tblVehicleEF	SBUS	0.12	0.04
tblVehicleEF	SBUS	0.03	1.6000e-003
tblVehicleEF	SBUS	0.31	7.3000e-003
tblVehicleEF	SBUS	0.01	2.8000e-003
tblVehicleEF	SBUS	0.01	9.4000e-003
tblVehicleEF	SBUS	4.4900e-004	0.00
tblVehicleEF	SBUS	7.6430e-003	1.0000e-004
tblVehicleEF	SBUS	0.05	8.0000e-004
tblVehicleEF	SBUS	1.10	0.12
tblVehicleEF	SBUS	4.1680e-003	0.00
tblVehicleEF	SBUS	0.15	0.05
tblVehicleEF	SBUS	0.03	1.6000e-003
tblVehicleEF	SBUS	0.34	8.0000e-003
tblVehicleEF	UBUS	0.33	1.10
tblVehicleEF	UBUS	0.13	1.5000e-003
tblVehicleEF	UBUS	8.23	8.13
tblVehicleEF	UBUS	27.24	0.25
tblVehicleEF	UBUS	1,956.69	1,559.20

tblVehicleEF	UBUS	175.16	2.75
tblVehicleEF	UBUS	5.75	0.64
tblVehicleEF	UBUS	12.03	0.03
tblVehicleEF	UBUS	0.44	0.08
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.07	4.9000e-003
tblVehicleEF	UBUS	1.8730e-003	0.00
tblVehicleEF	UBUS	0.19	0.03
tblVehicleEF	UBUS	3.0000e-003	7.2000e-003
tblVehicleEF	UBUS	0.06	4.7000e-003
tblVehicleEF	UBUS	1.7220e-003	0.00
tblVehicleEF	UBUS	0.01	1.0000e-004
tblVehicleEF	UBUS	0.18	8.0000e-004
tblVehicleEF	UBUS	4.6750e-003	1.0000e-004
tblVehicleEF	UBUS	1.03	0.02
tblVehicleEF	UBUS	0.05	1.0000e-004
tblVehicleEF	UBUS	1.78	5.3000e-003
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	2.2350e-003	0.00
tblVehicleEF	UBUS	0.01	1.0000e-004
tblVehicleEF	UBUS	0.18	8.0000e-004
tblVehicleEF	UBUS	4.6750e-003	1.0000e-004
tblVehicleEF	UBUS	1.43	1.12
tblVehicleEF	UBUS	0.05	1.0000e-004
tblVehicleEF	UBUS	1.95	5.8000e-003
tblVehicleEF	UBUS	0.35	1.10
tblVehicleEF	UBUS	0.11	1.5000e-003

tblVehicleEF	UBUS	8.54	8.13
tblVehicleEF	UBUS	20.40	0.25
tblVehicleEF	UBUS	1,956.69	1,559.20
tblVehicleEF	UBUS	175.16	2.75
tblVehicleEF	UBUS	5.42	0.64
tblVehicleEF	UBUS	11.81	0.03
tblVehicleEF	UBUS	0.44	0.08
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.07	4.9000e-003
tblVehicleEF	UBUS	1.8730e-003	0.00
tblVehicleEF	UBUS	0.19	0.03
tblVehicleEF	UBUS	3.0000e-003	7.2000e-003
tblVehicleEF	UBUS	0.06	4.7000e-003
tblVehicleEF	UBUS	1.7220e-003	0.00
tblVehicleEF	UBUS	0.02	1.0000e-004
tblVehicleEF	UBUS	0.21	8.0000e-004
tblVehicleEF	UBUS	9.9340e-003	1.0000e-004
tblVehicleEF	UBUS	1.09	0.02
tblVehicleEF	UBUS	0.04	1.0000e-004
tblVehicleEF	UBUS	1.49	5.3000e-003
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	2.1180e-003	0.00
tblVehicleEF	UBUS	0.02	1.0000e-004
tblVehicleEF	UBUS	0.21	8.0000e-004
tblVehicleEF	UBUS	9.9340e-003	1.0000e-004
tblVehicleEF	UBUS	1.51	1.12
tblVehicleEF	UBUS	0.04	1.0000e-004

tblVehicleEF	UBUS	1.63	5.8000e-003
tblVehicleEF	UBUS	0.35	1.10
tblVehicleEF	UBUS	0.11	1.5000e-003
tblVehicleEF	UBUS	8.49	8.13
tblVehicleEF	UBUS	21.10	0.25
tblVehicleEF	UBUS	1,956.69	1,559.20
tblVehicleEF	UBUS	175.16	2.75
tblVehicleEF	UBUS	5.45	0.64
tblVehicleEF	UBUS	11.83	0.03
tblVehicleEF	UBUS	0.44	0.08
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.07	4.9000e-003
tblVehicleEF	UBUS	1.8730e-003	0.00
tblVehicleEF	UBUS	0.19	0.03
tblVehicleEF	UBUS	3.0000e-003	7.2000e-003
tblVehicleEF	UBUS	0.06	4.7000e-003
tblVehicleEF	UBUS	1.7220e-003	0.00
tblVehicleEF	UBUS	0.02	1.0000e-004
tblVehicleEF	UBUS	0.37	8.0000e-004
tblVehicleEF	UBUS	0.01	1.0000e-004
tblVehicleEF	UBUS	1.08	0.02
tblVehicleEF	UBUS	0.06	1.0000e-004
tblVehicleEF	UBUS	1.52	5.3000e-003
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	2.1300e-003	0.00
tblVehicleEF	UBUS	0.02	1.0000e-004
tblVehicleEF	UBUS	0.37	8.0000e-004

tblVehicleEF	UBUS	0.01	1.0000e-004
tblVehicleEF	UBUS	1.50	1.12
tblVehicleEF	UBUS	0.06	1.0000e-004
tblVehicleEF	UBUS	1.67	5.8000e-003
tblVehicleTrips	CC_TL	6.60	0.00
tblVehicleTrips	CC_TL	6.60	37.50
tblVehicleTrips	CC_TL	6.60	0.00
tblVehicleTrips	CC_TL	6.60	37.50
tblVehicleTrips	CC_TL	6.60	0.00
tblVehicleTrips	CC_TL	6.60	0.00
tblVehicleTrips	CC_TL	6.60	37.50
tblVehicleTrips	CC_TL	6.60	37.50
tblVehicleTrips	CC_TL	6.60	37.50
tblVehicleTrips	CC_TL	6.60	37.50
tblVehicleTrips	CC_TL	6.60	0.00
tblVehicleTrips	CC_TTP	48.00	0.00
tblVehicleTrips	CC_TTP	64.10	0.00
tblVehicleTrips	CC_TTP	51.40	0.00
tblVehicleTrips	CC_TTP	0.00	61.60
tblVehicleTrips	CC_TTP	0.00	28.00
tblVehicleTrips	CNW_TL	6.60	0.00
tblVehicleTrips	CNW_TL	6.60	7.00
tblVehicleTrips	CNW_TL	6.60	0.00
tblVehicleTrips	CNW_TL	6.60	7.00
tblVehicleTrips	CNW_TL	6.60	0.00
tblVehicleTrips	CNW_TL	6.60	0.00
tblVehicleTrips	CNW_TL	6.60	7.00

tblVehicleTrips	CNW_TL	6.60	7.00
tblVehicleTrips	CNW_TL	6.60	7.00
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tblVehicleTrips	CNW_TL	6.60	0.00
tblVehicleTrips	CNW_TTP	19.00	0.00
tblVehicleTrips	CNW_TTP	19.00	0.00
tblVehicleTrips	CNW_TTP	19.00	0.00
tblVehicleTrips	CNW_TTP	0.00	19.00
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tblVehicleTrips	CW_TL	14.70	0.00
tblVehicleTrips	CW_TL	14.70	0.00
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tblVehicleTrips	CW_TL	14.70	0.00
tblVehicleTrips	CW_TL	14.70	0.00
tblVehicleTrips	CW_TL	14.70	0.00
tblVehicleTrips	CW_TL	14.70	0.00
tblVehicleTrips	CW_TL	14.70	0.00
tblVehicleTrips	CW_TL	14.70	0.00
tblVehicleTrips	CW_TL	14.70	0.00
tblVehicleTrips	CW_TTP	33.00	0.00
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tblVehicleTrips	CW_TTP	29.60	0.00
tblVehicleTrips	CW_TTP	0.00	19.40
tblVehicleTrips	CW_TTP	0.00	59.00
tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	DV_TP	19.00	0.00

tblVehicleTrips	DV_TP	39.00	0.00
tblVehicleTrips	DV_TP	39.00	0.00
tblVehicleTrips	DV_TP	38.00	0.00
tblVehicleTrips	DV_TP	30.00	0.00
tblVehicleTrips	DV_TP	18.00	0.00
tblVehicleTrips	DV_TP	35.00	0.00
tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	HO_TL	7.90	7.00
tblVehicleTrips	HO_TL	7.90	0.00
tblVehicleTrips	HO_TTP	38.10	0.00
tblVehicleTrips	HS_TL	7.10	7.00
tblVehicleTrips	HS_TL	7.10	0.00
tblVehicleTrips	HS_TTP	19.60	0.00
tblVehicleTrips	HW_TL	16.80	0.00
tblVehicleTrips	HW_TL	16.80	0.00
tblVehicleTrips	HW_TTP	42.30	0.00
tblVehicleTrips	PB_TP	3.00	0.00
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tblVehicleTrips	PB_TP	9.00	0.00
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tblVehicleTrips	PB_TP	44.00	0.00
tblVehicleTrips	PB_TP	11.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	86.00	100.00
tblVehicleTrips	PR_TP	77.00	0.00

tblVehicleTrips	PR_TP	52.00	100.00
tblVehicleTrips	PR_TP	52.00	0.00
tblVehicleTrips	PR_TP	58.00	100.00
tblVehicleTrips	PR_TP	60.00	0.00
tblVehicleTrips	PR_TP	38.00	100.00
tblVehicleTrips	PR_TP	54.00	100.00
tblVehicleTrips	PR_TP	86.00	0.00
tblVehicleTrips	PR_TP	0.00	100.00
tblVehicleTrips	PR_TP	0.00	100.00
tblVehicleTrips	ST_TR	7.16	4.39
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	ST_TR	40.63	10.33
tblVehicleTrips	ST_TR	20.87	0.00
tblVehicleTrips	ST_TR	8.19	3.14
tblVehicleTrips	ST_TR	8.96	0.00
tblVehicleTrips	ST_TR	94.36	41.92
tblVehicleTrips	ST_TR	49.97	18.88
tblVehicleTrips	ST_TR	9.91	0.00
tblVehicleTrips	ST_TR	0.00	22.98
tblVehicleTrips	ST_TR	0.00	1.69
tblVehicleTrips	SU_TR	6.07	4.39
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	SU_TR	39.53	10.33
tblVehicleTrips	SU_TR	26.73	0.00
tblVehicleTrips	SU_TR	5.95	3.14
tblVehicleTrips	SU_TR	1.55	0.00
tblVehicleTrips	SU_TR	72.16	41.92

tblVehicleTrips	SU_TR	25.24	18.88
tblVehicleTrips	SU_TR	8.62	0.00
tblVehicleTrips	SU_TR	0.00	22.98
tblVehicleTrips	SU_TR	0.00	1.69
tblVehicleTrips	WD_TR	6.59	4.39
tblVehicleTrips	WD_TR	11.03	0.00
tblVehicleTrips	WD_TR	35.74	10.33
tblVehicleTrips	WD_TR	32.93	0.00
tblVehicleTrips	WD_TR	8.17	3.14
tblVehicleTrips	WD_TR	36.13	0.00
tblVehicleTrips	WD_TR	89.95	41.92
tblVehicleTrips	WD_TR	42.70	18.88
tblVehicleTrips	WD_TR	9.52	0.00
tblVehicleTrips	WD_TR	0.00	22.98
tblVehicleTrips	WD_TR	0.00	1.69
tblWater	IndoorWaterUseRate	5,538,092.18	5,748,750.00
tblWater	IndoorWaterUseRate	23,229,800.86	3,825,930.00
tblWater	IndoorWaterUseRate	0.00	390,915.00
tblWater	IndoorWaterUseRate	6,990,719.63	383,250.00
tblWater	IndoorWaterUseRate	8,700,802.11	13,673,813.00
tblWater	IndoorWaterUseRate	1,054,036.52	906,660.00
tblWater	IndoorWaterUseRate	13,780,430.54	39,600.00
tblWater	IndoorWaterUseRate	2,222,175.64	604,440.00
tblWater	IndoorWaterUseRate	9,186,717.61	13,481,640.00
tblWater	IndoorWaterUseRate	0.00	678,840.00
tblWater	IndoorWaterUseRate	0.00	102,368.00
tblWater	IndoorWaterUseRate	0.00	1,002,582.00

tblWater	OutdoorWaterUseRate	3,491,405.94	0.00
tblWater	OutdoorWaterUseRate	14,237,619.88	23,461,272.00
tblWater	OutdoorWaterUseRate	149,721,308.10	46,401,182.40
tblWater	OutdoorWaterUseRate	4,284,634.61	4,040,552.40
tblWater	OutdoorWaterUseRate	966,755.79	33,627,823.20
tblWater	OutdoorWaterUseRate	200,768.86	0.00
tblWater	OutdoorWaterUseRate	879,601.95	1,303,404.00
tblWater	OutdoorWaterUseRate	1,361,978.62	1,303,404.00
tblWater	OutdoorWaterUseRate	5,791,626.32	9,580,019.40
tblWater	OutdoorWaterUseRate	0.00	5,865,318.00
tblWater	OutdoorWaterUseRate	0.00	651,702.00
tblWoodstoves	NumberCatalytic	4.25	0.00
tblWoodstoves	NumberCatalytic	7.05	0.00
tblWoodstoves	NumberNoncatalytic	4.25	0.00
tblWoodstoves	NumberNoncatalytic	7.05	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	10.5102	101.5893	67.9517	0.1284	22.3332	4.7448	27.0780	11.8930	4.4128	16.3057	0.0000	11,276.9455	11,276.9455	2.9510	0.0000	11,350.7206
2021	19.5258	145.4360	107.0125	0.2044	30.5771	6.6665	37.2436	16.2685	6.2080	22.4765	0.0000	17,934.4996	17,934.4996	4.5481	0.0000	18,048.2020
2022	16.4363	70.1320	68.7569	0.1309	9.3961	3.1364	12.5325	4.6505	2.9491	7.5996	0.0000	11,474.3979	11,474.3979	2.5093	0.0000	11,537.1311
2023	12.5575	39.1036	47.4715	0.0891	1.0920	1.7059	2.7979	0.2960	1.6163	1.9123	0.0000	7,797.7130	7,797.7130	1.4539	0.0000	7,834.0607
Maximum	**19.5258**	**145.4360**	**107.0125**	**0.2044**	**30.5771**	**6.6665**	**37.2436**	**16.2685**	**6.2080**	**22.4765**	**0.0000**	**17,934.4996**	**17,934.4996**	**4.5481**	**0.0000**	**18,048.2020**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	3.5284	22.2659	71.4232	0.1284	10.4881	0.1652	10.6533	5.4702	0.1576	5.6278	0.0000	11,276.9335	11,276.9335	2.9510	0.0000	11,350.7086
2021	9.8023	36.2558	113.9540	0.2044	14.5181	0.2526	14.7707	7.5259	0.2399	7.7658	0.0000	17,934.4807	17,934.4807	4.5481	0.0000	18,048.1830
2022	12.2649	27.2629	73.6022	0.1309	4.9380	0.1842	5.1222	2.2846	0.1736	2.4582	0.0000	11,474.3865	11,474.3865	2.5093	0.0000	11,537.1196
2023	10.4827	20.3621	49.7554	0.0891	1.0920	0.1204	1.2124	0.2960	0.1125	0.4085	0.0000	7,797.7057	7,797.7057	1.4539	0.0000	7,834.0533
Maximum	**12.2649**	**36.2558**	**113.9540**	**0.2044**	**14.5181**	**0.2526**	**14.7707**	**7.5259**	**0.2399**	**7.7658**	**0.0000**	**17,934.4807**	**17,934.4807**	**4.5481**	**0.0000**	**18,048.1830**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**38.88**	**70.21**	**-6.02**	**0.00**	**51.05**	**95.56**	**60.13**	**52.95**	**95.50**	**66.33**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	4-1-2020	6-30-2020	26.4849	3.4412
2	7-1-2020	9-30-2020	42.7687	11.1380
3	10-1-2020	12-31-2020	42.8602	11.2295
4	1-1-2021	3-31-2021	39.1514	10.3128
5	4-1-2021	6-30-2021	39.5017	10.3427
6	7-1-2021	9-30-2021	43.1435	12.6905
7	10-1-2021	12-31-2021	43.2422	12.7892
8	1-1-2022	3-31-2022	36.4281	11.6811

9	**4-1-2022**	**6-30-2022**	19.3284	9.5869
10	**7-1-2022**	**9-30-2022**	15.4090	9.1331
11	**10-1-2022**	**12-31-2022**	15.4821	9.2061
12	**1-1-2023**	**3-31-2023**	13.9354	8.3429
13	**4-1-2023**	**6-30-2023**	14.0210	8.3664
14	**7-1-2023**	**9-30-2023**	14.1750	8.4584
		Highest	43.2422	12.7892

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	6.7227	0.0195	1.6882	9.0000e-005		9.3100e-003	9.3100e-003		9.3100e-003	9.3100e-003	0.0000	2.7573	2.7573	2.6900e-003	0.0000	2.8245
Energy	0.2861	2.5932	2.1281	0.0156		0.1977	0.1977		0.1977	0.1977	0.0000	7,519.9001	7,519.9001	0.2663	0.0958	7,555.0966
Mobile	2.0812	8.7687	36.2296	0.1483	14.6501	0.1147	14.7648	3.9315	0.1072	4.0387	0.0000	13,718.3672	13,718.3672	0.3504	0.0000	13,727.1283
Waste						0.0000	0.0000		0.0000	0.0000	283.3713	0.0000	283.3713	16.7468	0.0000	702.0405
Water						0.0000	0.0000		0.0000	0.0000	12.9563	192.8161	205.7724	1.3395	0.0332	249.1598
Total	**9.0900**	**11.3813**	**40.0460**	**0.1640**	**14.6501**	**0.3217**	**14.9718**	**3.9315**	**0.3142**	**4.2457**	**296.3276**	**21,433.8407**	**21,730.1683**	**18.7056**	**0.1290**	**22,236.2497**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	6.7227	0.0195	1.6882	9.0000e-005		9.3100e-003	9.3100e-003		9.3100e-003	9.3100e-003	0.0000	2.7573	2.7573	2.6900e-003	0.0000	2.8245
Energy	0.2115	1.9185	1.5843	0.0115		0.1461	0.1461		0.1461	0.1461	0.0000	2,093.1081	2,093.1081	0.0401	0.0384	2,105.5464
Mobile	2.0812	8.7687	36.2296	0.1483	14.6501	0.1147	14.7648	3.9315	0.1072	4.0387	0.0000	13,718.3672	13,718.3672	0.3504	0.0000	13,727.1283
Waste						0.0000	0.0000		0.0000	0.0000	113.3485	0.0000	113.3485	6.6987	0.0000	280.8162
Water						0.0000	0.0000		0.0000	0.0000	10.3650	167.1060	177.4710	1.0721	0.0267	212.2313
Total	**9.0154**	**10.7067**	**39.5022**	**0.1600**	**14.6501**	**0.2701**	**14.9203**	**3.9315**	**0.2626**	**4.1941**	**123.7135**	**15,981.3386**	**16,105.0522**	**8.1641**	**0.0651**	**16,328.5467**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.82**	**5.93**	**1.36**	**2.48**	**0.00**	**16.02**	**0.34**	**0.00**	**16.41**	**1.21**	**58.25**	**25.44**	**25.89**	**56.35**	**49.56**	**26.57**

2.3 Vegetation

Vegetation

	CO2e
Category	MT
Vegetation Land Change	-45,510.0000
Total	**-45,510.0000**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	4/1/2020	4/29/2020	7	29	
2	Site Preparation	Site Preparation	4/1/2020	4/1/2022	7	731	
3	Grading	Grading	5/1/2020	5/1/2022	7	731	
4	Building Construction	Building Construction	6/1/2020	12/1/2023	7	1279	
5	Paving	Paving	7/1/2020	12/1/2023	7	1249	
6	Architectural Coating	Architectural Coating	7/1/2021	12/1/2023	7	884	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 653.35

Acres of Paving: 2.78

Residential Indoor: 720,698; Residential Outdoor: 240,233; Non-Residential Indoor: 1,840,950; Non-Residential Outdoor: 613,650; Striped Parking Area: 7,266 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	10.00	81	0.73
Demolition	Excavators	3	10.00	158	0.38
Demolition	Rubber Tired Dozers	2	10.00	247	0.40
Site Preparation	Crushing/Proc. Equipment	2	10.00	85	0.78
Site Preparation	Rubber Tired Dozers	16	10.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	5	10.00	97	0.37
Grading	Crushing/Proc. Equipment	2	10.00	85	0.78
Grading	Excavators	20	10.00	158	0.38
Grading	Graders	11	10.00	187	0.41
Grading	Rubber Tired Dozers	5	10.00	247	0.40
Grading	Scrapers	4	10.00	367	0.48
Grading	Tractors/Loaders/Backhoes	4	10.00	97	0.37
Building Construction	Cranes	10	10.00	231	0.29
Building Construction	Crushing/Proc. Equipment	2	10.00	85	0.78
Building Construction	Forklifts	10	10.00	89	0.20
Building Construction	Generator Sets	10	10.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	4	10.00	97	0.37
Building Construction	Welders	8	10.00	46	0.45
Paving	Pavers	11	10.00	130	0.42
Paving	Paving Equipment	11	10.00	132	0.36
Paving	Rollers	11	10.00	80	0.38
Architectural Coating	Air Compressors	8	10.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	5.00	0.00	10.00	7.00	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	23	60.00	0.00	4,706.00	7.00	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	46	180.00	0.00	0.00	7.00	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	44	750.00	238.00	0.00	7.00	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	33	100.00	0.00	0.00	7.00	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	8	150.00	0.00	0.00	7.00	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0167	0.0000	0.0167	2.5200e-003	0.0000	2.5200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0600	0.6018	0.3943	7.0000e-004		0.0301	0.0301		0.0280	0.0280	0.0000	61.6225	61.6225	0.0174	0.0000	62.0574
Total	**0.0600**	**0.6018**	**0.3943**	**7.0000e-004**	**0.0167**	**0.0301**	**0.0467**	**2.5200e-003**	**0.0280**	**0.0305**	**0.0000**	**61.6225**	**61.6225**	**0.0174**	**0.0000**	**62.0574**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0000e-005	1.7000e-003	3.6000e-004	0.0000	8.0000e-005	1.0000e-005	1.0000e-004	2.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.3609	0.3609	1.0000e-005	0.0000	0.3612
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.1000e-004	3.3000e-004	3.1200e-003	0.0000	3.7000e-004	0.0000	3.7000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3485	0.3485	3.0000e-005	0.0000	0.3491
Total	**5.7000e-004**	**2.0300e-003**	**3.4800e-003**	**0.0000**	**4.5000e-004**	**1.0000e-005**	**4.7000e-004**	**1.2000e-004**	**1.0000e-005**	**1.4000e-004**	**0.0000**	**0.7094**	**0.7094**	**4.0000e-005**	**0.0000**	**0.7103**

3.2 Demolition - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.4900e-003	0.0000	7.4900e-003	1.1300e-003	0.0000	1.1300e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.3800e-003	0.0363	0.4220	7.0000e-004		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004	0.0000	61.6224	61.6224	0.0174	0.0000	62.0573
Total	**8.3800e-003**	**0.0363**	**0.4220**	**7.0000e-004**	**7.4900e-003**	**1.7000e-004**	**7.6600e-003**	**1.1300e-003**	**1.7000e-004**	**1.3000e-003**	**0.0000**	**61.6224**	**61.6224**	**0.0174**	**0.0000**	**62.0573**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0000e-005	1.7000e-003	3.6000e-004	0.0000	8.0000e-005	1.0000e-005	1.0000e-004	2.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.3609	0.3609	1.0000e-005	0.0000	0.3612
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.1000e-004	3.3000e-004	3.1200e-003	0.0000	3.7000e-004	0.0000	3.7000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3485	0.3485	3.0000e-005	0.0000	0.3491
Total	**5.7000e-004**	**2.0300e-003**	**3.4800e-003**	**0.0000**	**4.5000e-004**	**1.0000e-005**	**4.7000e-004**	**1.2000e-004**	**1.0000e-005**	**1.4000e-004**	**0.0000**	**0.7094**	**0.7094**	**4.0000e-005**	**0.0000**	**0.7103**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					16.5629	0.0000	16.5629	9.1035	0.0000	9.1035	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.3388	34.2788	14.8171	0.0285		1.7234	1.7234		1.5921	1.5921	0.0000	2,505.7323	2,505.7323	0.7587	0.0000	2,524.6997
Total	**3.3388**	**34.2788**	**14.8171**	**0.0285**	**16.5629**	**1.7234**	**18.2863**	**9.1035**	**1.5921**	**10.6956**	**0.0000**	**2,505.7323**	**2,505.7323**	**0.7587**	**0.0000**	**2,524.6997**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0104	0.3002	0.0630	6.7000e-004	0.0333	2.6400e-003	0.0360	8.6100e-003	2.5300e-003	0.0111	0.0000	63.8951	63.8951	1.7500e-003	0.0000	63.9389
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0580	0.0373	0.3551	4.4000e-004	0.0422	4.3000e-004	0.0426	0.0112	4.0000e-004	0.0116	0.0000	39.6554	39.6554	2.8600e-003	0.0000	39.7268
Total	**0.0684**	**0.3375**	**0.4181**	**1.1100e-003**	**0.0755**	**3.0700e-003**	**0.0786**	**0.0198**	**2.9300e-003**	**0.0228**	**0.0000**	**103.5505**	**103.5505**	**4.6100e-003**	**0.0000**	**103.6657**

3.3 Site Preparation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.4533	0.0000	7.4533	4.0966	0.0000	4.0966	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5103	2.6933	14.0511	0.0285		0.0188	0.0188		0.0188	0.0188	0.0000	2,505.7293	2,505.7293	0.7587	0.0000	2,524.6967
Total	**0.5103**	**2.6933**	**14.0511**	**0.0285**	**7.4533**	**0.0188**	**7.4721**	**4.0966**	**0.0188**	**4.1154**	**0.0000**	**2,505.7293**	**2,505.7293**	**0.7587**	**0.0000**	**2,524.6967**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0104	0.3002	0.0630	6.7000e-004	0.0333	2.6400e-003	0.0360	8.6100e-003	2.5300e-003	0.0111	0.0000	63.8951	63.8951	1.7500e-003	0.0000	63.9389
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0580	0.0373	0.3551	4.4000e-004	0.0422	4.3000e-004	0.0426	0.0112	4.0000e-004	0.0116	0.0000	39.6554	39.6554	2.8600e-003	0.0000	39.7268
Total	**0.0684**	**0.3375**	**0.4181**	**1.1100e-003**	**0.0755**	**3.0700e-003**	**0.0786**	**0.0198**	**2.9300e-003**	**0.0228**	**0.0000**	**103.5505**	**103.5505**	**4.6100e-003**	**0.0000**	**103.6657**

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					21.9827	0.0000	21.9827	12.0827	0.0000	12.0827	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.2665	43.8023	19.2958	0.0379		2.1659	2.1659		2.0002	2.0002	0.0000	3,325.9584	3,325.9584	1.0056	0.0000	3,351.0984
Total	**4.2665**	**43.8023**	**19.2958**	**0.0379**	**21.9827**	**2.1659**	**24.1487**	**12.0827**	**2.0002**	**14.0829**	**0.0000**	**3,325.9584**	**3,325.9584**	**1.0056**	**0.0000**	**3,351.0984**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0128	0.3648	0.0774	8.8000e-004	0.0345	3.0400e-003	0.0376	9.0400e-003	2.9000e-003	0.0119	0.0000	83.9788	83.9788	2.2500e-003	0.0000	84.0350
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0724	0.0442	0.4224	5.7000e-004	0.0560	5.4000e-004	0.0566	0.0149	5.0000e-004	0.0154	0.0000	51.0265	51.0265	3.3500e-003	0.0000	51.1104
Total	**0.0851**	**0.4090**	**0.4999**	**1.4500e-003**	**0.0905**	**3.5800e-003**	**0.0941**	**0.0240**	**3.4000e-003**	**0.0274**	**0.0000**	**135.0054**	**135.0054**	**5.6000e-003**	**0.0000**	**135.1455**

3.3 Site Preparation - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.8922	0.0000	9.8922	5.4372	0.0000	5.4372	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.6586	3.4360	18.6438	0.0379		0.0227	0.0227		0.0227	0.0227	0.0000	3,325.9544	3,325.9544	1.0056	0.0000	3,351.0944
Total	**0.6586**	**3.4360**	**18.6438**	**0.0379**	**9.8922**	**0.0227**	**9.9150**	**5.4372**	**0.0227**	**5.4599**	**0.0000**	**3,325.9544**	**3,325.9544**	**1.0056**	**0.0000**	**3,351.0944**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0128	0.3648	0.0774	8.8000e-004	0.0345	3.0400e-003	0.0376	9.0400e-003	2.9000e-003	0.0119	0.0000	83.9788	83.9788	2.2500e-003	0.0000	84.0350
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0724	0.0442	0.4224	5.7000e-004	0.0560	5.4000e-004	0.0566	0.0149	5.0000e-004	0.0154	0.0000	51.0265	51.0265	3.3500e-003	0.0000	51.1104
Total	**0.0851**	**0.4090**	**0.4999**	**1.4500e-003**	**0.0905**	**3.5800e-003**	**0.0941**	**0.0240**	**3.4000e-003**	**0.0274**	**0.0000**	**135.0054**	**135.0054**	**5.6000e-003**	**0.0000**	**135.1455**

3.3 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.4822	0.0000	5.4822	3.0126	0.0000	3.0126	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.8631	8.8456	4.3887	9.4500e-003		0.4259	0.4259		0.3935	0.3935	0.0000	829.0374	829.0374	0.2504	0.0000	835.2977
Total	**0.8631**	**8.8456**	**4.3887**	**9.4500e-003**	**5.4822**	**0.4259**	**5.9081**	**3.0126**	**0.3935**	**3.4061**	**0.0000**	**829.0374**	**829.0374**	**0.2504**	**0.0000**	**835.2977**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.9500e-003	0.0836	0.0183	2.2000e-004	0.0309	6.6000e-004	0.0315	7.7200e-003	6.3000e-004	8.3500e-003	0.0000	20.7283	20.7283	5.5000e-004	0.0000	20.7419
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0169	9.8100e-003	0.0936	1.4000e-004	0.0140	1.3000e-004	0.0141	3.7200e-003	1.2000e-004	3.8300e-003	0.0000	12.3065	12.3065	7.3000e-004	0.0000	12.3249
Total	**0.0199**	**0.0934**	**0.1120**	**3.6000e-004**	**0.0449**	**7.9000e-004**	**0.0456**	**0.0114**	**7.5000e-004**	**0.0122**	**0.0000**	**33.0348**	**33.0348**	**1.2800e-003**	**0.0000**	**33.0668**

3.3 Site Preparation - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.4670	0.0000	2.4670	1.3557	0.0000	1.3557	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1605	0.8259	4.6473	9.4500e-003		5.1900e-003	5.1900e-003		5.1900e-003	5.1900e-003	0.0000	829.0364	829.0364	0.2504	0.0000	835.2968
Total	**0.1605**	**0.8259**	**4.6473**	**9.4500e-003**	**2.4670**	**5.1900e-003**	**2.4722**	**1.3557**	**5.1900e-003**	**1.3609**	**0.0000**	**829.0364**	**829.0364**	**0.2504**	**0.0000**	**835.2968**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.9500e-003	0.0836	0.0183	2.2000e-004	0.0309	6.6000e-004	0.0315	7.7200e-003	6.3000e-004	8.3500e-003	0.0000	20.7283	20.7283	5.5000e-004	0.0000	20.7419
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0169	9.8100e-003	0.0936	1.4000e-004	0.0140	1.3000e-004	0.0141	3.7200e-003	1.2000e-004	3.8300e-003	0.0000	12.3065	12.3065	7.3000e-004	0.0000	12.3249
Total	**0.0199**	**0.0934**	**0.1120**	**3.6000e-004**	**0.0449**	**7.9000e-004**	**0.0456**	**0.0114**	**7.5000e-004**	**0.0122**	**0.0000**	**33.0348**	**33.0348**	**1.2800e-003**	**0.0000**	**33.0668**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.9571	0.0000	4.9571	2.5718	0.0000	2.5718	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.2841	36.3706	23.5247	0.0469		1.5595	1.5595		1.4406	1.4406	0.0000	4,113.0902	4,113.0902	1.2842	0.0000	4,145.1950
Total	**3.2841**	**36.3706**	**23.5247**	**0.0469**	**4.9571**	**1.5595**	**6.5166**	**2.5718**	**1.4406**	**4.0124**	**0.0000**	**4,113.0902**	**4,113.0902**	**1.2842**	**0.0000**	**4,145.1950**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1550	0.0996	0.9492	1.1800e-003	0.1128	1.1600e-003	0.1140	0.0300	1.0700e-003	0.0311	0.0000	105.9880	105.9880	7.6400e-003	0.0000	106.1789
Total	**0.1550**	**0.0996**	**0.9492**	**1.1800e-003**	**0.1128**	**1.1600e-003**	**0.1140**	**0.0300**	**1.0700e-003**	**0.0311**	**0.0000**	**105.9880**	**105.9880**	**7.6400e-003**	**0.0000**	**106.1789**

3.4 Grading - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.2307	0.0000	2.2307	1.1573	0.0000	1.1573	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.7181	3.5413	26.8988	0.0469		0.0220	0.0220		0.0220	0.0220	0.0000	4,113.0853	4,113.0853	1.2842	0.0000	4,145.1900
Total	**0.7181**	**3.5413**	**26.8988**	**0.0469**	**2.2307**	**0.0220**	**2.2527**	**1.1573**	**0.0220**	**1.1794**	**0.0000**	**4,113.0853**	**4,113.0853**	**1.2842**	**0.0000**	**4,145.1900**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1550	0.0996	0.9492	1.1800e-003	0.1128	1.1600e-003	0.1140	0.0300	1.0700e-003	0.0311	0.0000	105.9880	105.9880	7.6400e-003	0.0000	106.1789
Total	**0.1550**	**0.0996**	**0.9492**	**1.1800e-003**	**0.1128**	**1.1600e-003**	**0.1140**	**0.0300**	**1.0700e-003**	**0.0311**	**0.0000**	**105.9880**	**105.9880**	**7.6400e-003**	**0.0000**	**106.1789**

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.2154	0.0000	7.2154	3.8131	0.0000	3.8131	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.6286	50.2969	34.4019	0.0698		2.1317	2.1317		1.9688	1.9688	0.0000	6,126.4753	6,126.4753	1.9113	0.0000	6,174.2589
Total	**4.6286**	**50.2969**	**34.4019**	**0.0698**	**7.2154**	**2.1317**	**9.3471**	**3.8131**	**1.9688**	**5.7819**	**0.0000**	**6,126.4753**	**6,126.4753**	**1.9113**	**0.0000**	**6,174.2589**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2172	0.1325	1.2673	1.7100e-003	0.1680	1.6300e-003	0.1697	0.0447	1.5000e-003	0.0462	0.0000	153.0796	153.0796	0.0101	0.0000	153.3312
Total	**0.2172**	**0.1325**	**1.2673**	**1.7100e-003**	**0.1680**	**1.6300e-003**	**0.1697**	**0.0447**	**1.5000e-003**	**0.0462**	**0.0000**	**153.0796**	**153.0796**	**0.0101**	**0.0000**	**153.3312**

3.4 Grading - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.2469	0.0000	3.2469	1.7159	0.0000	1.7159	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0512	5.1371	40.0679	0.0698		0.0306	0.0306		0.0306	0.0306	0.0000	6,126.4680	6,126.4680	1.9113	0.0000	6,174.2515
Total	**1.0512**	**5.1371**	**40.0679**	**0.0698**	**3.2469**	**0.0306**	**3.2775**	**1.7159**	**0.0306**	**1.7465**	**0.0000**	**6,126.4680**	**6,126.4680**	**1.9113**	**0.0000**	**6,174.2515**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2172	0.1325	1.2673	1.7100e-003	0.1680	1.6300e-003	0.1697	0.0447	1.5000e-003	0.0462	0.0000	153.0796	153.0796	0.0101	0.0000	153.3312
Total	**0.2172**	**0.1325**	**1.2673**	**1.7100e-003**	**0.1680**	**1.6300e-003**	**0.1697**	**0.0447**	**1.5000e-003**	**0.0462**	**0.0000**	**153.0796**	**153.0796**	**0.0101**	**0.0000**	**153.3312**

3.4 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.6235	0.0000	2.6235	1.2891	0.0000	1.2891	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3381	14.0865	10.9709	0.0231		0.5870	0.5870		0.5422	0.5422	0.0000	2,031.0584	2,031.0584	0.6333	0.0000	2,046.8917
Total	**1.3381**	**14.0865**	**10.9709**	**0.0231**	**2.6235**	**0.5870**	**3.2105**	**1.2891**	**0.5422**	**1.8313**	**0.0000**	**2,031.0584**	**2,031.0584**	**0.6333**	**0.0000**	**2,046.8917**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0674	0.0391	0.3736	5.5000e-004	0.0557	5.1000e-004	0.0562	0.0148	4.7000e-004	0.0153	0.0000	49.0908	49.0908	2.9300e-003	0.0000	49.1640
Total	**0.0674**	**0.0391**	**0.3736**	**5.5000e-004**	**0.0557**	**5.1000e-004**	**0.0562**	**0.0148**	**4.7000e-004**	**0.0153**	**0.0000**	**49.0908**	**49.0908**	**2.9300e-003**	**0.0000**	**49.1640**

3.4 Grading - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.1806	0.0000	1.1806	0.5801	0.0000	0.5801	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3435	1.6621	13.2815	0.0231		9.5100e-003	9.5100e-003		9.5100e-003	9.5100e-003	0.0000	2,031.0560	2,031.0560	0.6333	0.0000	2,046.8893
Total	**0.3435**	**1.6621**	**13.2815**	**0.0231**	**1.1806**	**9.5100e-003**	**1.1901**	**0.5801**	**9.5100e-003**	**0.5896**	**0.0000**	**2,031.0560**	**2,031.0560**	**0.6333**	**0.0000**	**2,046.8893**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0674	0.0391	0.3736	5.5000e-004	0.0557	5.1000e-004	0.0562	0.0148	4.7000e-004	0.0153	0.0000	49.0908	49.0908	2.9300e-003	0.0000	49.1640
Total	**0.0674**	**0.0391**	**0.3736**	**5.5000e-004**	**0.0557**	**5.1000e-004**	**0.0562**	**0.0148**	**4.7000e-004**	**0.0153**	**0.0000**	**49.0908**	**49.0908**	**2.9300e-003**	**0.0000**	**49.1640**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.9588	17.4231	13.6386	0.0248		0.9177	0.9177		0.8779	0.8779	0.0000	2,122.2274	2,122.2274	0.4088	0.0000	2,132.4484
Total	**1.9588**	**17.4231**	**13.6386**	**0.0248**		**0.9177**	**0.9177**		**0.8779**	**0.8779**	**0.0000**	**2,122.2274**	**2,122.2274**	**0.4088**	**0.0000**	**2,132.4484**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1571	3.1758	1.0883	5.9900e-003	0.1503	0.0291	0.1793	0.0434	0.0278	0.0712	0.0000	567.2800	567.2800	0.0289	0.0000	568.0031
Worker	0.5642	0.3623	3.4544	4.3000e-003	0.4105	4.2300e-003	0.4148	0.1093	3.9000e-003	0.1132	0.0000	385.7386	385.7386	0.0278	0.0000	386.4333
Total	**0.7213**	**3.5381**	**4.5427**	**0.0103**	**0.5608**	**0.0333**	**0.5941**	**0.1527**	**0.0317**	**0.1844**	**0.0000**	**953.0186**	**953.0186**	**0.0567**	**0.0000**	**954.4364**

3.5 Building Construction - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4231	3.0799	14.4744	0.0248		0.0147	0.0147		0.0147	0.0147	0.0000	2,122.2248	2,122.2248	0.4088	0.0000	2,132.4458
Total	**0.4231**	**3.0799**	**14.4744**	**0.0248**		**0.0147**	**0.0147**		**0.0147**	**0.0147**	**0.0000**	**2,122.2248**	**2,122.2248**	**0.4088**	**0.0000**	**2,132.4458**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1571	3.1758	1.0883	5.9900e-003	0.1503	0.0291	0.1793	0.0434	0.0278	0.0712	0.0000	567.2800	567.2800	0.0289	0.0000	568.0031
Worker	0.5642	0.3623	3.4544	4.3000e-003	0.4105	4.2300e-003	0.4148	0.1093	3.9000e-003	0.1132	0.0000	385.7386	385.7386	0.0278	0.0000	386.4333
Total	**0.7213**	**3.5381**	**4.5427**	**0.0103**	**0.5608**	**0.0333**	**0.5941**	**0.1527**	**0.0317**	**0.1844**	**0.0000**	**953.0186**	**953.0186**	**0.0567**	**0.0000**	**954.4364**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.0092	27.0536	22.7724	0.0424		1.3549	1.3549		1.2956	1.2956	0.0000	3,619.6905	3,619.6905	0.6830	0.0000	3,636.7659
Total	**3.0092**	**27.0536**	**22.7724**	**0.0424**		**1.3549**	**1.3549**		**1.2956**	**1.2956**	**0.0000**	**3,619.6905**	**3,619.6905**	**0.6830**	**0.0000**	**3,636.7659**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2299	4.9783	1.6438	0.0102	0.2563	0.0346	0.2908	0.0741	0.0331	0.1071	0.0000	961.5871	961.5871	0.0467	0.0000	962.7541
Worker	0.9049	0.5520	5.2803	7.1100e-003	0.7002	6.7800e-003	0.7070	0.1864	6.2500e-003	0.1926	0.0000	637.8317	637.8317	0.0419	0.0000	638.8801
Total	**1.1348**	**5.5303**	**6.9241**	**0.0173**	**0.9564**	**0.0413**	**0.9978**	**0.2604**	**0.0393**	**0.2997**	**0.0000**	**1,599.4188**	**1,599.4188**	**0.0886**	**0.0000**	**1,601.6341**

3.5 Building Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.7030	5.1143	24.6818	0.0424		0.0228	0.0228		0.0228	0.0228	0.0000	3,619.6862	3,619.6862	0.6830	0.0000	3,636.7616
Total	**0.7030**	**5.1143**	**24.6818**	**0.0424**		**0.0228**	**0.0228**		**0.0228**	**0.0228**	**0.0000**	**3,619.6862**	**3,619.6862**	**0.6830**	**0.0000**	**3,636.7616**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2299	4.9783	1.6438	0.0102	0.2563	0.0346	0.2908	0.0741	0.0331	0.1071	0.0000	961.5871	961.5871	0.0467	0.0000	962.7541
Worker	0.9049	0.5520	5.2803	7.1100e-003	0.7002	6.7800e-003	0.7070	0.1864	6.2500e-003	0.1926	0.0000	637.8317	637.8317	0.0419	0.0000	638.8801
Total	**1.1348**	**5.5303**	**6.9241**	**0.0173**	**0.9564**	**0.0413**	**0.9978**	**0.2604**	**0.0393**	**0.2997**	**0.0000**	**1,599.4188**	**1,599.4188**	**0.0886**	**0.0000**	**1,601.6341**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.7369	24.3022	22.4477	0.0424		1.1719	1.1719		1.1208	1.1208	0.0000	3,620.1606	3,620.1606	0.6740	0.0000	3,637.0115
Total	**2.7369**	**24.3022**	**22.4477**	**0.0424**		**1.1719**	**1.1719**		**1.1208**	**1.1208**	**0.0000**	**3,620.1606**	**3,620.1606**	**0.6740**	**0.0000**	**3,637.0115**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2104	4.7240	1.4969	0.0101	0.2562	0.0305	0.2867	0.0741	0.0292	0.1032	0.0000	955.2043	955.2043	0.0451	0.0000	956.3314
Worker	0.8475	0.4917	4.6951	6.8700e-003	0.7002	6.3700e-003	0.7066	0.1864	5.8700e-003	0.1922	0.0000	617.0155	617.0155	0.0368	0.0000	617.9362
Total	**1.0579**	**5.2158**	**6.1920**	**0.0170**	**0.9564**	**0.0369**	**0.9933**	**0.2604**	**0.0350**	**0.2955**	**0.0000**	**1,572.2199**	**1,572.2199**	**0.0819**	**0.0000**	**1,574.2676**

3.5 Building Construction - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.6881	4.9911	24.6781	0.0424		0.0209	0.0209		0.0209	0.0209	0.0000	3,620.1563	3,620.1563	0.6740	0.0000	3,637.0072
Total	**0.6881**	**4.9911**	**24.6781**	**0.0424**		**0.0209**	**0.0209**		**0.0209**	**0.0209**	**0.0000**	**3,620.1563**	**3,620.1563**	**0.6740**	**0.0000**	**3,637.0072**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2104	4.7240	1.4969	0.0101	0.2562	0.0305	0.2867	0.0741	0.0292	0.1032	0.0000	955.2043	955.2043	0.0451	0.0000	956.3314
Worker	0.8475	0.4917	4.6951	6.8700e-003	0.7002	6.3700e-003	0.7066	0.1864	5.8700e-003	0.1922	0.0000	617.0155	617.0155	0.0368	0.0000	617.9362
Total	**1.0579**	**5.2158**	**6.1920**	**0.0170**	**0.9564**	**0.0369**	**0.9933**	**0.2604**	**0.0350**	**0.2955**	**0.0000**	**1,572.2199**	**1,572.2199**	**0.0819**	**0.0000**	**1,574.2676**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.3324	20.5990	20.4115	0.0389		0.9468	0.9468		0.9051	0.9051	0.0000	3,322.8485	3,322.8485	0.6099	0.0000	3,338.0957
Total	**2.3324**	**20.5990**	**20.4115**	**0.0389**		**0.9468**	**0.9468**		**0.9051**	**0.9051**	**0.0000**	**3,322.8485**	**3,322.8485**	**0.6099**	**0.0000**	**3,338.0957**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1226	3.3231	1.1218	9.1700e-003	0.2351	6.0200e-003	0.2412	0.0680	5.7500e-003	0.0737	0.0000	869.5279	869.5279	0.0246	0.0000	870.1432
Worker	0.7269	0.4014	3.8241	6.0800e-003	0.6426	5.5100e-003	0.6482	0.1710	5.0800e-003	0.1761	0.0000	546.6684	546.6684	0.0296	0.0000	547.4073
Total	**0.8495**	**3.7245**	**4.9459**	**0.0153**	**0.8778**	**0.0115**	**0.8893**	**0.2390**	**0.0108**	**0.2498**	**0.0000**	**1,416.1962**	**1,416.1962**	**0.0542**	**0.0000**	**1,417.5506**

3.5 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.6193	4.4800	22.6478	0.0389		0.0176	0.0176		0.0176	0.0176	0.0000	3,322.8445	3,322.8445	0.6099	0.0000	3,338.0917
Total	**0.6193**	**4.4800**	**22.6478**	**0.0389**		**0.0176**	**0.0176**		**0.0176**	**0.0176**	**0.0000**	**3,322.8445**	**3,322.8445**	**0.6099**	**0.0000**	**3,338.0917**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1226	3.3231	1.1218	9.1700e-003	0.2351	6.0200e-003	0.2412	0.0680	5.7500e-003	0.0737	0.0000	869.5279	869.5279	0.0246	0.0000	870.1432
Worker	0.7269	0.4014	3.8241	6.0800e-003	0.6426	5.5100e-003	0.6482	0.1710	5.0800e-003	0.1761	0.0000	546.6684	546.6684	0.0296	0.0000	547.4073
Total	**0.8495**	**3.7245**	**4.9459**	**0.0153**	**0.8778**	**0.0115**	**0.8893**	**0.2390**	**0.0108**	**0.2498**	**0.0000**	**1,416.1962**	**1,416.1962**	**0.0542**	**0.0000**	**1,417.5506**

3.6 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.8580	8.8965	9.2674	0.0144		0.4761	0.4761		0.4381	0.4381	0.0000	1,266.7850	1,266.7850	0.4097	0.0000	1,277.0276
Paving	5.4000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.8586**	**8.8965**	**9.2674**	**0.0144**		**0.4761**	**0.4761**		**0.4381**	**0.4381**	**0.0000**	**1,266.7850**	**1,266.7850**	**0.4097**	**0.0000**	**1,277.0276**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0647	0.0415	0.3960	4.9000e-004	0.0471	4.8000e-004	0.0476	0.0125	4.5000e-004	0.0130	0.0000	44.2217	44.2217	3.1900e-003	0.0000	44.3014
Total	**0.0647**	**0.0415**	**0.3960**	**4.9000e-004**	**0.0471**	**4.8000e-004**	**0.0476**	**0.0125**	**4.5000e-004**	**0.0130**	**0.0000**	**44.2217**	**44.2217**	**3.1900e-003**	**0.0000**	**44.3014**

3.6 Paving - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.8580	8.8965	9.2674	0.0144		0.0714	0.0714		0.0657	0.0657	0.0000	1,266.7835	1,266.7835	0.4097	0.0000	1,277.0261
Paving	5.4000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.8586**	**8.8965**	**9.2674**	**0.0144**		**0.0714**	**0.0714**		**0.0657**	**0.0657**	**0.0000**	**1,266.7835**	**1,266.7835**	**0.4097**	**0.0000**	**1,277.0261**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0647	0.0415	0.3960	4.9000e-004	0.0471	4.8000e-004	0.0476	0.0125	4.5000e-004	0.0130	0.0000	44.2217	44.2217	3.1900e-003	0.0000	44.3014
Total	**0.0647**	**0.0415**	**0.3960**	**4.9000e-004**	**0.0471**	**4.8000e-004**	**0.0476**	**0.0125**	**4.5000e-004**	**0.0130**	**0.0000**	**44.2217**	**44.2217**	**3.1900e-003**	**0.0000**	**44.3014**

3.6 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.5753	16.2094	18.3852	0.0286		0.8503	0.8503		0.7823	0.7823	0.0000	2,512.3210	2,512.3210	0.8125	0.0000	2,532.6344
Paving	1.0600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.5764**	**16.2094**	**18.3852**	**0.0286**		**0.8503**	**0.8503**		**0.7823**	**0.7823**	**0.0000**	**2,512.3210**	**2,512.3210**	**0.8125**	**0.0000**	**2,532.6344**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1207	0.0736	0.7040	9.5000e-004	0.0934	9.0000e-004	0.0943	0.0249	8.3000e-004	0.0257	0.0000	85.0442	85.0442	5.5900e-003	0.0000	85.1840
Total	**0.1207**	**0.0736**	**0.7040**	**9.5000e-004**	**0.0934**	**9.0000e-004**	**0.0943**	**0.0249**	**8.3000e-004**	**0.0257**	**0.0000**	**85.0442**	**85.0442**	**5.5900e-003**	**0.0000**	**85.1840**

3.6 Paving - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.5753	16.2094	18.3852	0.0286		0.1276	0.1276		0.1174	0.1174	0.0000	2,512.3180	2,512.3180	0.8125	0.0000	2,532.6314
Paving	1.0600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.5764**	**16.2094**	**18.3852**	**0.0286**		**0.1276**	**0.1276**		**0.1174**	**0.1174**	**0.0000**	**2,512.3180**	**2,512.3180**	**0.8125**	**0.0000**	**2,532.6314**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1207	0.0736	0.7040	9.5000e-004	0.0934	9.0000e-004	0.0943	0.0249	8.3000e-004	0.0257	0.0000	85.0442	85.0442	5.5900e-003	0.0000	85.1840
Total	**0.1207**	**0.0736**	**0.7040**	**9.5000e-004**	**0.0934**	**9.0000e-004**	**0.0943**	**0.0249**	**8.3000e-004**	**0.0257**	**0.0000**	**85.0442**	**85.0442**	**5.5900e-003**	**0.0000**	**85.1840**

3.6 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.3837	13.9583	18.2940	0.0286		0.7125	0.7125		0.6555	0.6555	0.0000	2,512.8326	2,512.8326	0.8127	0.0000	2,533.1501
Paving	1.0600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.3848**	**13.9583**	**18.2940**	**0.0286**		**0.7125**	**0.7125**		**0.6555**	**0.6555**	**0.0000**	**2,512.8326**	**2,512.8326**	**0.8127**	**0.0000**	**2,533.1501**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1130	0.0656	0.6260	9.2000e-004	0.0934	8.5000e-004	0.0942	0.0249	7.8000e-004	0.0256	0.0000	82.2687	82.2687	4.9100e-003	0.0000	82.3915
Total	**0.1130**	**0.0656**	**0.6260**	**9.2000e-004**	**0.0934**	**8.5000e-004**	**0.0942**	**0.0249**	**7.8000e-004**	**0.0256**	**0.0000**	**82.2687**	**82.2687**	**4.9100e-003**	**0.0000**	**82.3915**

3.6 Paving - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.3837	13.9582	18.2939	0.0286		0.1069	0.1069		0.0983	0.0983	0.0000	2,512.8296	2,512.8296	0.8127	0.0000	2,533.1471
Paving	1.0600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.3848**	**13.9582**	**18.2939**	**0.0286**		**0.1069**	**0.1069**		**0.0983**	**0.0983**	**0.0000**	**2,512.8296**	**2,512.8296**	**0.8127**	**0.0000**	**2,533.1471**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1130	0.0656	0.6260	9.2000e-004	0.0934	8.5000e-004	0.0942	0.0249	7.8000e-004	0.0256	0.0000	82.2687	82.2687	4.9100e-003	0.0000	82.3915
Total	**0.1130**	**0.0656**	**0.6260**	**9.2000e-004**	**0.0934**	**8.5000e-004**	**0.0942**	**0.0249**	**7.8000e-004**	**0.0256**	**0.0000**	**82.2687**	**82.2687**	**4.9100e-003**	**0.0000**	**82.3915**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.1893	11.7363	16.7946	0.0263		0.5875	0.5875		0.5405	0.5405	0.0000	2,306.2188	2,306.2188	0.7459	0.0000	2,324.8658
Paving	9.8000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.1902**	**11.7363**	**16.7946**	**0.0263**		**0.5875**	**0.5875**		**0.5405**	**0.5405**	**0.0000**	**2,306.2188**	**2,306.2188**	**0.7459**	**0.0000**	**2,324.8658**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0969	0.0535	0.5099	8.1000e-004	0.0857	7.4000e-004	0.0864	0.0228	6.8000e-004	0.0235	0.0000	72.8891	72.8891	3.9400e-003	0.0000	72.9876
Total	**0.0969**	**0.0535**	**0.5099**	**8.1000e-004**	**0.0857**	**7.4000e-004**	**0.0864**	**0.0228**	**6.8000e-004**	**0.0235**	**0.0000**	**72.8891**	**72.8891**	**3.9400e-003**	**0.0000**	**72.9876**

3.6 Paving - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.1893	11.7363	16.7946	0.0263		0.0881	0.0881		0.0811	0.0811	0.0000	2,306.2161	2,306.2161	0.7459	0.0000	2,324.8630
Paving	9.8000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.1902**	**11.7363**	**16.7946**	**0.0263**		**0.0881**	**0.0881**		**0.0811**	**0.0811**	**0.0000**	**2,306.2161**	**2,306.2161**	**0.7459**	**0.0000**	**2,324.8630**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0969	0.0535	0.5099	8.1000e-004	0.0857	7.4000e-004	0.0864	0.0228	6.8000e-004	0.0235	0.0000	72.8891	72.8891	3.9400e-003	0.0000	72.9876
Total	**0.0969**	**0.0535**	**0.5099**	**8.1000e-004**	**0.0857**	**7.4000e-004**	**0.0864**	**0.0228**	**6.8000e-004**	**0.0235**	**0.0000**	**72.8891**	**72.8891**	**3.9400e-003**	**0.0000**	**72.9876**

3.7 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	4.1277					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2685	1.8729	2.2295	3.6500e-003		0.1154	0.1154		0.1154	0.1154	0.0000	313.1991	313.1991	0.0215	0.0000	313.7365
Total	**4.3962**	**1.8729**	**2.2295**	**3.6500e-003**		**0.1154**	**0.1154**		**0.1154**	**0.1154**	**0.0000**	**313.1991**	**313.1991**	**0.0215**	**0.0000**	**313.7365**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0912	0.0557	0.5324	7.2000e-004	0.0706	6.8000e-004	0.0713	0.0188	6.3000e-004	0.0194	0.0000	64.3074	64.3074	4.2300e-003	0.0000	64.4131
Total	**0.0912**	**0.0557**	**0.5324**	**7.2000e-004**	**0.0706**	**6.8000e-004**	**0.0713**	**0.0188**	**6.3000e-004**	**0.0194**	**0.0000**	**64.3074**	**64.3074**	**4.2300e-003**	**0.0000**	**64.4131**

3.7 Architectural Coating - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	4.1277					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0365	0.1580	2.2478	3.6500e-003		7.3000e-004	7.3000e-004		7.3000e-004	7.3000e-004	0.0000	313.1988	313.1988	0.0215	0.0000	313.7361
Total	**4.1641**	**0.1580**	**2.2478**	**3.6500e-003**		**7.3000e-004**	**7.3000e-004**		**7.3000e-004**	**7.3000e-004**	**0.0000**	**313.1988**	**313.1988**	**0.0215**	**0.0000**	**313.7361**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0912	0.0557	0.5324	7.2000e-004	0.0706	6.8000e-004	0.0713	0.0188	6.3000e-004	0.0194	0.0000	64.3074	64.3074	4.2300e-003	0.0000	64.4131
Total	**0.0912**	**0.0557**	**0.5324**	**7.2000e-004**	**0.0706**	**6.8000e-004**	**0.0713**	**0.0188**	**6.3000e-004**	**0.0194**	**0.0000**	**64.3074**	**64.3074**	**4.2300e-003**	**0.0000**	**64.4131**

3.7 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	8.1881					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4977	3.4273	4.4131	7.2300e-003		0.1988	0.1988		0.1988	0.1988	0.0000	621.2918	621.2918	0.0405	0.0000	622.3030
Total	**8.6858**	**3.4273**	**4.4131**	**7.2300e-003**		**0.1988**	**0.1988**		**0.1988**	**0.1988**	**0.0000**	**621.2918**	**621.2918**	**0.0405**	**0.0000**	**622.3030**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1695	0.0984	0.9390	1.3700e-003	0.1400	1.2700e-003	0.1413	0.0373	1.1700e-003	0.0384	0.0000	123.4031	123.4031	7.3600e-003	0.0000	123.5872
Total	**0.1695**	**0.0984**	**0.9390**	**1.3700e-003**	**0.1400**	**1.2700e-003**	**0.1413**	**0.0373**	**1.1700e-003**	**0.0384**	**0.0000**	**123.4031**	**123.4031**	**7.3600e-003**	**0.0000**	**123.5872**

3.7 Architectural Coating - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	8.1881					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0723	0.3133	4.4589	7.2300e-003		1.4500e-003	1.4500e-003		1.4500e-003	1.4500e-003	0.0000	621.2910	621.2910	0.0405	0.0000	622.3023
Total	**8.2604**	**0.3133**	**4.4589**	**7.2300e-003**		**1.4500e-003**	**1.4500e-003**		**1.4500e-003**	**1.4500e-003**	**0.0000**	**621.2910**	**621.2910**	**0.0405**	**0.0000**	**622.3023**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1695	0.0984	0.9390	1.3700e-003	0.1400	1.2700e-003	0.1413	0.0373	1.1700e-003	0.0384	0.0000	123.4031	123.4031	7.3600e-003	0.0000	123.5872
Total	**0.1695**	**0.0984**	**0.9390**	**1.3700e-003**	**0.1400**	**1.2700e-003**	**0.1413**	**0.0373**	**1.1700e-003**	**0.0384**	**0.0000**	**123.4031**	**123.4031**	**7.3600e-003**	**0.0000**	**123.5872**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	7.5151					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4280	2.9100	4.0448	6.6400e-003		0.1582	0.1582		0.1582	0.1582	0.0000	570.2267	570.2267	0.0341	0.0000	571.0796
Total	**7.9431**	**2.9100**	**4.0448**	**6.6400e-003**		**0.1582**	**0.1582**		**0.1582**	**0.1582**	**0.0000**	**570.2267**	**570.2267**	**0.0341**	**0.0000**	**571.0796**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1454	0.0803	0.7648	1.2200e-003	0.1285	1.1000e-003	0.1296	0.0342	1.0200e-003	0.0352	0.0000	109.3337	109.3337	5.9100e-003	0.0000	109.4815
Total	**0.1454**	**0.0803**	**0.7648**	**1.2200e-003**	**0.1285**	**1.1000e-003**	**0.1296**	**0.0342**	**1.0200e-003**	**0.0352**	**0.0000**	**109.3337**	**109.3337**	**5.9100e-003**	**0.0000**	**109.4815**

3.7 Architectural Coating - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	7.5151					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0664	0.2876	4.0924	6.6400e-003		1.3300e-003	1.3300e-003		1.3300e-003	1.3300e-003	0.0000	570.2260	570.2260	0.0341	0.0000	571.0789
Total	**7.5814**	**0.2876**	**4.0924**	**6.6400e-003**		**1.3300e-003**	**1.3300e-003**		**1.3300e-003**	**1.3300e-003**	**0.0000**	**570.2260**	**570.2260**	**0.0341**	**0.0000**	**571.0789**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1454	0.0803	0.7648	1.2200e-003	0.1285	1.1000e-003	0.1296	0.0342	1.0200e-003	0.0352	0.0000	109.3337	109.3337	5.9100e-003	0.0000	109.4815
Total	**0.1454**	**0.0803**	**0.7648**	**1.2200e-003**	**0.1285**	**1.1000e-003**	**0.1296**	**0.0342**	**1.0200e-003**	**0.0352**	**0.0000**	**109.3337**	**109.3337**	**5.9100e-003**	**0.0000**	**109.4815**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.0812	8.7687	36.2296	0.1483	14.6501	0.1147	14.7648	3.9315	0.1072	4.0387	0.0000	13,718.3672	13,718.3672	0.3504	0.0000	13,727.1283
Unmitigated	2.0812	8.7687	36.2296	0.1483	14.6501	0.1147	14.7648	3.9315	0.1072	4.0387	0.0000	13,718.3672	13,718.3672	0.3504	0.0000	13,727.1283

4.2 Trip Summary Information

Guenoc Valley Mixed Use Planned Development Project - Phase 1A - Lake County, Annual

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	153.65	153.65	153.65	225,896	225,896
Apartments Low Rise	219.50	219.50	219.50	322,708	322,708
General Office Building	0.00	0.00	0.00		
General Office Building	0.00	0.00	0.00		
General Office Building	0.00	0.00	0.00		
Golf Course	185.94	185.94	185.94	1,308,296	1,308,296
Health Club	0.00	0.00	0.00		
Hotel	285.74	285.74	285.74	2,540,949	2,540,949
Hotel	191.54	191.54	191.54	1,703,273	1,703,273
Hotel	40.82	40.82	40.82	362,993	362,993
Hotel	254.34	254.34	254.34	2,261,724	2,261,724
Hotel	84.78	84.78	84.78	753,908	753,908
Hotel	62.80	62.80	62.80	558,450	558,450
Hotel	157.00	157.00	157.00	1,396,126	1,396,126
Medical Office Building	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Quality Restaurant	494.66	494.66	494.66	4,898,390	4,898,390
Quality Restaurant	964.16	964.16	964.16	9,547,710	9,547,710
Quality Restaurant	444.35	444.35	444.35	4,400,249	4,400,249
Regional Shopping Center	566.40	566.40	566.40	5,276,395	5,276,395
Single Family Housing	0.00	0.00	0.00		
Single Family Housing	0.00	0.00	0.00		
Single Family Housing	0.00	0.00	0.00		
Single Family Housing	0.00	0.00	0.00		
Single Family Housing	0.00	0.00	0.00		
User Defined Commercial	298.74	298.74	298.74	2,656,551	2,656,551
User Defined Commercial	114.90	114.90	114.90	1,021,751	1,021,751
User Defined Industrial	59.15	59.15	59.15	245,664	245,664
User Defined Recreational	0.00	0.00	0.00		
User Defined Recreational	0.00	0.00	0.00		
User Defined Recreational	0.00	0.00	0.00		
User Defined Recreational	0.00	0.00	0.00		
User Defined Recreational	0.00	0.00	0.00		
Total	4,578.47	4,578.47	4,578.47	39,481,033	39,481,033

4.3 Trip Type Information

Guenoc Valley Mixed Use Planned Development Project - Phase 1A - Lake County, Annual

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	0.00	7.00	7.00	42.30	19.60	38.10	100	0	0
Apartments Low Rise	0.00	7.00	7.00	42.30	19.60	38.10	100	0	0
General Office Building	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
General Office Building	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
General Office Building	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Golf Course	0.00	37.50	7.00	33.00	48.00	19.00	100	0	0
Health Club	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Hotel	0.00	37.50	7.00	19.40	61.60	19.00	100	0	0
Hotel	0.00	37.50	7.00	19.40	61.60	19.00	100	0	0
Hotel	0.00	37.50	7.00	19.40	61.60	19.00	100	0	0
Hotel	0.00	37.50	7.00	19.40	61.60	19.00	100	0	0
Hotel	0.00	37.50	7.00	19.40	61.60	19.00	100	0	0
Hotel	0.00	37.50	7.00	19.40	61.60	19.00	100	0	0
Hotel	0.00	37.50	7.00	19.40	61.60	19.00	100	0	0
Medical Office Building	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Quality Restaurant	0.00	37.50	7.00	12.00	69.00	19.00	100	0	0
Quality Restaurant	0.00	37.50	7.00	12.00	69.00	19.00	100	0	0
Quality Restaurant	0.00	37.50	7.00	12.00	69.00	19.00	100	0	0
Regional Shopping Center	0.00	37.50	7.00	16.30	64.70	19.00	100	0	0
Single Family Housing	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Single Family Housing	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Single Family Housing	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Single Family Housing	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Single Family Housing	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
User Defined Commercial	0.00	37.50	7.00	19.40	61.60	19.00	100	0	0
User Defined Commercial	0.00	37.50	7.00	19.40	61.60	19.00	100	0	0
User Defined Industrial	0.00	37.50	7.00	59.00	28.00	13.00	100	0	0
User Defined Recreational	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Recreational	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
User Defined Recreational	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
User Defined Recreational	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
User Defined Recreational	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.523944	0.040967	0.216482	0.125887	0.034961	0.005575	0.018558	0.023512	0.001235	0.001018	0.005348	0.001113	0.001401
General Office Building	0.523944	0.040967	0.216482	0.125887	0.034961	0.005575	0.018558	0.023512	0.001235	0.001018	0.005348	0.001113	0.001401
Golf Course	0.523944	0.040967	0.216482	0.125887	0.034961	0.005575	0.018558	0.023512	0.001235	0.001018	0.005348	0.001113	0.001401
Health Club	0.523944	0.040967	0.216482	0.125887	0.034961	0.005575	0.018558	0.023512	0.001235	0.001018	0.005348	0.001113	0.001401
Hotel	0.523944	0.040967	0.216482	0.125887	0.034961	0.005575	0.018558	0.023512	0.001235	0.001018	0.005348	0.001113	0.001401
Medical Office Building	0.523944	0.040967	0.216482	0.125887	0.034961	0.005575	0.018558	0.023512	0.001235	0.001018	0.005348	0.001113	0.001401
Parking Lot	0.523944	0.040967	0.216482	0.125887	0.034961	0.005575	0.018558	0.023512	0.001235	0.001018	0.005348	0.001113	0.001401
Quality Restaurant	0.523944	0.040967	0.216482	0.125887	0.034961	0.005575	0.018558	0.023512	0.001235	0.001018	0.005348	0.001113	0.001401
Regional Shopping Center	0.523944	0.040967	0.216482	0.125887	0.034961	0.005575	0.018558	0.023512	0.001235	0.001018	0.005348	0.001113	0.001401
Single Family Housing	0.523944	0.040967	0.216482	0.125887	0.034961	0.005575	0.018558	0.023512	0.001235	0.001018	0.005348	0.001113	0.001401
User Defined Commercial	0.523944	0.040967	0.216482	0.125887	0.034961	0.005575	0.018558	0.023512	0.001235	0.001018	0.005348	0.001113	0.001401
User Defined Industrial	0.523944	0.040967	0.216482	0.125887	0.034961	0.005575	0.018558	0.023512	0.001235	0.001018	0.005348	0.001113	0.001401
User Defined Recreational	0.523944	0.040967	0.216482	0.125887	0.034961	0.005575	0.018558	0.023512	0.001235	0.001018	0.005348	0.001113	0.001401

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Percent of Electricity Use Generated with Renewable Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	4,688.4988	4,688.4988	0.2120	0.0439	4,706.8698
NaturalGas Mitigated	0.2115	1.9185	1.5843	0.0115		0.1461	0.1461		0.1461	0.1461	0.0000	2,093.1081	2,093.1081	0.0401	0.0384	2,105.5464
NaturalGas Unmitigated	0.2861	2.5932	2.1281	0.0156		0.1977	0.1977		0.1977	0.1977	0.0000	2,831.4012	2,831.4012	0.0543	0.0519	2,848.2268

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	377985	2.0400e-003	0.0174	7.4100e-003	1.1000e-004		1.4100e-003	1.4100e-003		1.4100e-003	1.4100e-003	0.0000	20.1707	20.1707	3.9000e-004	3.7000e-004	20.2906
Apartments Low Rise	539979	2.9100e-003	0.0249	0.0106	1.6000e-004		2.0100e-003	2.0100e-003		2.0100e-003	2.0100e-003	0.0000	28.8153	28.8153	5.5000e-004	5.3000e-004	28.9866
General Office Building	2.28032e+006	0.0123	0.1118	0.0939	6.7000e-004		8.5000e-003	8.5000e-003		8.5000e-003	8.5000e-003	0.0000	121.6865	121.6865	2.3300e-003	2.2300e-003	122.4096

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	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Office Building	246204	1.3300e-003	0.0121	0.0101	7.0000e-005		9.2000e-004	9.2000e-004		9.2000e-004	9.2000e-004	0.0000	13.1384	13.1384	2.5000e-004	2.4000e-004	13.2165
General Office Building	27356	1.5000e-004	1.3400e-003	1.1300e-003	1.0000e-005		1.0000e-004	1.0000e-004		1.0000e-004	1.0000e-004	0.0000	1.4598	1.4598	3.0000e-005	3.0000e-005	1.4685
Golf Course	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Health Club	414882	2.2400e-003	0.0203	0.0171	1.2000e-004		1.5500e-003	1.5500e-003		1.5500e-003	1.5500e-003	0.0000	22.1397	22.1397	4.2000e-004	4.1000e-004	22.2713
Hotel	1.22899e+006	6.6300e-003	0.0602	0.0506	3.6000e-004		4.5800e-003	4.5800e-003		4.5800e-003	4.5800e-003	0.0000	65.5837	65.5837	1.2600e-003	1.2000e-003	65.9734
Hotel	1.87878e+006	0.0101	0.0921	0.0774	5.5000e-004		7.0000e-003	7.0000e-003		7.0000e-003	7.0000e-003	0.0000	100.2589	100.2589	1.9200e-003	1.8400e-003	100.8546
Hotel	2.73617e+006	0.0148	0.1341	0.1127	8.0000e-004		0.0102	0.0102		0.0102	0.0102	0.0000	146.0123	146.0123	2.8000e-003	2.6800e-003	146.8800
Hotel	228360	1.2300e-003	0.0112	9.4000e-003	7.0000e-005		8.5000e-004	8.5000e-004		8.5000e-004	8.5000e-004	0.0000	12.1862	12.1862	2.3000e-004	2.2000e-004	12.2586
Hotel	3.94232e+006	0.0213	0.1933	0.1623	1.1600e-003		0.0147	0.0147		0.0147	0.0147	0.0000	210.3774	210.3774	4.0300e-003	3.8600e-003	211.6276
Hotel	566748	3.0600e-003	0.0278	0.0233	1.7000e-004		2.1100e-003	2.1100e-003		2.1100e-003	2.1100e-003	0.0000	30.2438	30.2438	5.8000e-004	5.5000e-004	30.4236
Hotel	593736	3.2000e-003	0.0291	0.0245	1.7000e-004		2.2100e-003	2.2100e-003		2.2100e-003	2.2100e-003	0.0000	31.6840	31.6840	6.1000e-004	5.8000e-004	31.8723
Medical Office Building	164136	8.9000e-004	8.0500e-003	6.7600e-003	5.0000e-005		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004	0.0000	8.7589	8.7589	1.7000e-004	1.6000e-004	8.8110
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Quality Restaurant	1.23172e+006	6.6400e-003	0.0604	0.0507	3.6000e-004		4.5900e-003	4.5900e-003		4.5900e-003	4.5900e-003	0.0000	65.7293	65.7293	1.2600e-003	1.2100e-003	66.1199
Quality Restaurant	1.37116e+006	7.3900e-003	0.0672	0.0565	4.0000e-004		5.1100e-003	5.1100e-003		5.1100e-003	5.1100e-003	0.0000	73.1703	73.1703	1.4000e-003	1.3400e-003	73.6051
Quality Restaurant	2.6726e+006	0.0144	0.1310	0.1101	7.9000e-004		9.9600e-003	9.9600e-003		9.9600e-003	9.9600e-003	0.0000	142.6201	142.6201	2.7300e-003	2.6100e-003	143.4676
Regional Shopping Center	216300	1.1700e-003	0.0106	8.9100e-003	6.0000e-005		8.1000e-004	8.1000e-004		8.1000e-004	8.1000e-004	0.0000	11.5426	11.5426	2.2000e-004	2.1000e-004	11.6112
Single Family Housing	157515	1.7000e-003	0.0145	6.1800e-003	9.0000e-005		1.1700e-003	1.1700e-003		1.1700e-003	1.1700e-003	0.0000	16.8112	16.8112	3.2000e-004	3.1000e-004	16.9111

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	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	363495	1.9600e-003	0.0168	7.1300e-003	1.1000e-004		1.3500e-003	1.3500e-003		1.3500e-003	1.3500e-003	0.0000	19.3975	19.3975	3.7000e-004	3.6000e-004	19.5128
Single Family Housing	484660	2.6100e-003	0.0223	9.5000e-003	1.4000e-004		1.8100e-003	1.8100e-003		1.8100e-003	1.8100e-003	0.0000	25.8633	25.8633	5.0000e-004	4.7000e-004	26.0170
Single Family Housing	545243	2.9400e-003	0.0251	0.0107	1.6000e-004		2.0300e-003	2.0300e-003		2.0300e-003	2.0300e-003	0.0000	29.0962	29.0962	5.6000e-004	5.3000e-004	29.2691
User Defined Commercial	2.4402e+006	0.0132	0.1196	0.1005	7.2000e-004		9.0900e-003	9.0900e-003		9.0900e-003	9.0900e-003	0.0000	130.2184	130.2184	2.5000e-003	2.3900e-003	130.9922
User Defined Commercial	8.97064e+006	0.0484	0.4397	0.3694	2.6400e-003		0.0334	0.0334		0.0334	0.0334	0.0000	478.7075	478.7075	9.1800e-003	8.7800e-003	481.5522
User Defined Industrial	1.09424e+006	5.9000e-003	0.0536	0.0451	3.2000e-004		4.0800e-003	4.0800e-003		4.0800e-003	4.0800e-003	0.0000	58.3928	58.3928	1.1200e-003	1.0700e-003	58.7398
User Defined Recreational	2.85852e+006	0.0154	0.1401	0.1177	8.4000e-004		0.0107	0.0107		0.0107	0.0107	0.0000	152.5415	152.5415	2.9200e-003	2.8000e-003	153.4480
User Defined Recreational	3.0212e+006	0.0163	0.1481	0.1244	8.9000e-004		0.0113	0.0113		0.0113	0.0113	0.0000	161.2227	161.2227	3.0900e-003	2.9600e-003	162.1808
User Defined Recreational	3.1374e+006	0.0169	0.1538	0.1292	9.2000e-004		0.0117	0.0117		0.0117	0.0117	0.0000	167.4236	167.4236	3.2100e-003	3.0700e-003	168.4185
User Defined Recreational	755300	4.0700e-003	0.0370	0.0311	2.2000e-004		2.8100e-003	2.8100e-003		2.8100e-003	2.8100e-003	0.0000	40.3057	40.3057	7.7000e-004	7.4000e-004	40.5452
User Defined Recreational	8.35478e+006	0.0451	0.4096	0.3440	2.4600e-003		0.0311	0.0311		0.0311	0.0311	0.0000	445.8429	445.8429	8.5500e-003	8.1700e-003	448.4923
Total		**0.2861**	**2.5932**	**2.1281**	**0.0156**		**0.1977**	**0.1977**		**0.1977**	**0.1977**	**0.0000**	**2,831.4012**	**2,831.4012**	**0.0543**	**0.0519**	**2,848.2268**

5.2 Energy by Land Use - NaturalGas

Mitigated

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	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	207315	1.1200e-003	9.5500e-003	4.0600e-003	6.0000e-005		7.7000e-004	7.7000e-004		7.7000e-004	7.7000e-004	0.0000	11.0631	11.0631	2.1000e-004	2.0000e-004	11.1288
Apartments Low Rise	296164	1.6000e-003	0.0137	5.8100e-003	9.0000e-005		1.1000e-003	1.1000e-003		1.1000e-003	1.1000e-003	0.0000	15.8044	15.8044	3.0000e-004	2.9000e-004	15.8983
General Office Building	1.07175e+006	5.7800e-003	0.0525	0.0441	3.2000e-004		3.9900e-003	3.9900e-003		3.9900e-003	3.9900e-003	0.0000	57.1926	57.1926	1.1000e-003	1.0500e-003	57.5325
General Office Building	115716	6.2000e-004	5.6700e-003	4.7600e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004	0.0000	6.1750	6.1750	1.2000e-004	1.1000e-004	6.2117
General Office Building	12857.3	7.0000e-005	6.3000e-004	5.3000e-004	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.6861	0.6861	1.0000e-005	1.0000e-005	0.6902
Golf Course	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Health Club	214415	1.1600e-003	0.0105	8.8300e-003	6.0000e-005		8.0000e-004	8.0000e-004		8.0000e-004	8.0000e-004	0.0000	11.4420	11.4420	2.2000e-004	2.1000e-004	11.5100
Hotel	1.28949e+006	6.9500e-003	0.0632	0.0531	3.8000e-004		4.8000e-003	4.8000e-003		4.8000e-003	4.8000e-003	0.0000	68.8122	68.8122	1.3200e-003	1.2600e-003	69.2211
Hotel	1.85792e+006	0.0100	0.0911	0.0765	5.5000e-004		6.9200e-003	6.9200e-003		6.9200e-003	6.9200e-003	0.0000	99.1459	99.1459	1.9000e-003	1.8200e-003	99.7351
Hotel	107621	5.8000e-004	5.2800e-003	4.4300e-003	3.0000e-005		4.0000e-004	4.0000e-004		4.0000e-004	4.0000e-004	0.0000	5.7431	5.7431	1.1000e-004	1.1000e-004	5.7772
Hotel	267095	1.4400e-003	0.0131	0.0110	8.0000e-005		1.0000e-003	1.0000e-003		1.0000e-003	1.0000e-003	0.0000	14.2532	14.2532	2.7000e-004	2.6000e-004	14.3379
Hotel	279814	1.5100e-003	0.0137	0.0115	8.0000e-005		1.0400e-003	1.0400e-003		1.0400e-003	1.0400e-003	0.0000	14.9319	14.9319	2.9000e-004	2.7000e-004	15.0207
Hotel	579195	3.1200e-003	0.0284	0.0239	1.7000e-004		2.1600e-003	2.1600e-003		2.1600e-003	2.1600e-003	0.0000	30.9081	30.9081	5.9000e-004	5.7000e-004	31.0917
Hotel	885425	4.7700e-003	0.0434	0.0365	2.6000e-004		3.3000e-003	3.3000e-003		3.3000e-003	3.3000e-003	0.0000	47.2496	47.2496	9.1000e-004	8.7000e-004	47.5304
Medical Office Building	77143.9	4.2000e-004	3.7800e-003	3.1800e-003	2.0000e-005		2.9000e-004	2.9000e-004		2.9000e-004	2.9000e-004	0.0000	4.1167	4.1167	8.0000e-005	8.0000e-005	4.1412
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Quality Restaurant	1.07638e+006	5.8000e-003	0.0528	0.0443	3.2000e-004		4.0100e-003	4.0100e-003		4.0100e-003	4.0100e-003	0.0000	57.4399	57.4399	1.1000e-003	1.0500e-003	57.7812
Quality Restaurant	1.19824e+006	6.4600e-003	0.0587	0.0493	3.5000e-004		4.4600e-003	4.4600e-003		4.4600e-003	4.4600e-003	0.0000	63.9425	63.9425	1.2300e-003	1.1700e-003	64.3225

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	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Quality Restaurant	2.33555e+006	0.0126	0.1145	0.0962	6.9000e-004		8.7000e-003	8.7000e-003		8.7000e-003	8.7000e-003	0.0000	124.6337	124.6337	2.3900e-003	2.2800e-003	125.3743
Regional Shopping Center	101661	5.5000e-004	4.9800e-003	4.1900e-003	3.0000e-005		3.8000e-004	3.8000e-004		3.8000e-004	3.8000e-004	0.0000	5.4250	5.4250	1.0000e-004	1.0000e-004	5.4573
Single Family Housing	196267	1.0600e-003	9.0400e-003	3.8500e-003	6.0000e-005		7.3000e-004	7.3000e-004		7.3000e-004	7.3000e-004	0.0000	10.4735	10.4735	2.0000e-004	1.9000e-004	10.5358
Single Family Housing	261689	1.4100e-003	0.0121	5.1300e-003	8.0000e-005		9.7000e-004	9.7000e-004		9.7000e-004	9.7000e-004	0.0000	13.9647	13.9647	2.7000e-004	2.6000e-004	14.0477
Single Family Housing	294400	1.5900e-003	0.0136	5.7700e-003	9.0000e-005		1.1000e-003	1.1000e-003		1.1000e-003	1.1000e-003	0.0000	15.7103	15.7103	3.0000e-004	2.9000e-004	15.8037
Single Family Housing	85048.9	9.2000e-004	7.8400e-003	3.3400e-003	5.0000e-005		6.3000e-004	6.3000e-004		6.3000e-004	6.3000e-004	0.0000	9.0771	9.0771	1.7000e-004	1.7000e-004	9.1310
User Defined Commercial	2.13246e+006	0.0115	0.1045	0.0878	6.3000e-004		7.9400e-003	7.9400e-003		7.9400e-003	7.9400e-003	0.0000	113.7960	113.7960	2.1800e-003	2.0900e-003	114.4722
User Defined Commercial	7.83931e+006	0.0423	0.3843	0.3228	2.3100e-003		0.0292	0.0292		0.0292	0.0292	0.0000	418.3356	418.3356	8.0200e-003	7.6700e-003	420.8215
User Defined Industrial	514293	2.7700e-003	0.0252	0.0212	1.5000e-004		1.9200e-003	1.9200e-003		1.9200e-003	1.9200e-003	0.0000	27.4446	27.4446	5.3000e-004	5.0000e-004	27.6077
User Defined Recreational	2.49802e+006	0.0135	0.1225	0.1029	7.3000e-004		9.3100e-003	9.3100e-003		9.3100e-003	9.3100e-003	0.0000	133.3038	133.3038	2.5500e-003	2.4400e-003	134.0960
User Defined Recreational	2.64018e+006	0.0142	0.1294	0.1087	7.8000e-004		9.8400e-003	9.8400e-003		9.8400e-003	9.8400e-003	0.0000	140.8902	140.8902	2.7000e-003	2.5800e-003	141.7275
User Defined Recreational	2.74173e+006	0.0148	0.1344	0.1129	8.1000e-004		0.0102	0.0102		0.0102	0.0102	0.0000	146.3091	146.3091	2.8000e-003	2.6800e-003	147.1785
User Defined Recreational	660046	3.5600e-003	0.0324	0.0272	1.9000e-004		2.4600e-003	2.4600e-003		2.4600e-003	2.4600e-003	0.0000	35.2226	35.2226	6.8000e-004	6.5000e-004	35.4319
User Defined Recreational	7.30112e+006	0.0394	0.3579	0.3006	2.1500e-003		0.0272	0.0272		0.0272	0.0272	0.0000	389.6156	389.6156	7.4700e-003	7.1400e-003	391.9309
Total		**0.2115**	**1.9185**	**1.5843**	**0.0116**		**0.1461**	**0.1461**		**0.1461**	**0.1461**	**0.0000**	**2,093.1081**	**2,093.1081**	**0.0401**	**0.0384**	**2,105.5464**

5.3 Energy by Land Use - Electricity

Unmitigated

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	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	166567	48.4562	2.1900e-003	4.5000e-004	48.6460
Apartments Low Rise	237953	69.2231	3.1300e-003	6.5000e-004	69.4944
General Office Building	1.2907e+006	375.4800	0.0170	3.5100e-003	376.9513
General Office Building	139356	40.5403	1.8300e-003	3.8000e-004	40.6991
General Office Building	15484	4.5045	2.0000e-004	4.0000e-005	4.5221
Golf Course	0	0.0000	0.0000	0.0000	0.0000
Health Club	505896	147.1710	6.6500e-003	1.3800e-003	147.7476
Hotel	1.41665e+006	412.1209	0.0186	3.8600e-003	413.7357
Hotel	203658	59.2465	2.6800e-003	5.5000e-004	59.4786
Hotel	213356	62.0677	2.8100e-003	5.8000e-004	62.3109
Hotel	441632	128.4758	5.8100e-003	1.2000e-003	128.9792
Hotel	675130	196.4031	8.8800e-003	1.8400e-003	197.1726
Hotel	82060	23.8722	1.0800e-003	2.2000e-004	23.9657
Hotel	983228	286.0323	0.0129	2.6800e-003	287.1531
Medical Office Building	92904	27.0268	1.2200e-003	2.5000e-004	27.1327
Parking Lot	42383.9	12.3300	5.6000e-004	1.2000e-004	12.3783
Quality Restaurant	260442	75.7656	3.4300e-003	7.1000e-004	76.0624
Quality Restaurant	289926	84.3428	3.8100e-003	7.9000e-004	84.6733

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	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Quality Restaurant	565110	164.3970	7.4300e-003	1.5400e-003	165.0411
Regional Shopping Center	405600	117.9937	5.3400e-003	1.1000e-003	118.4560
Single Family Housing	112804	65.6319	2.9700e-003	6.1000e-004	65.8890
Single Family Housing	260317	75.7291	3.4200e-003	7.1000e-004	76.0258
Single Family Housing	347089	100.9721	4.5700e-003	9.4000e-004	101.3678
Single Family Housing	390475	113.5936	5.1400e-003	1.0600e-003	114.0387
User Defined Commercial	1.8968e+006	551.8020	0.0250	5.1600e-003	553.9642
User Defined Commercial	515970	150.1016	6.7900e-003	1.4000e-003	150.6897
User Defined Industrial	619360	180.1789	8.1500e-003	1.6900e-003	180.8849
User Defined Recreational	1.76658e+006	513.9193	0.0232	4.8100e-003	515.9329
User Defined Recreational	159705	46.4600	2.1000e-003	4.3000e-004	46.6421
User Defined Recreational	604422	175.8333	7.9500e-003	1.6400e-003	176.5223
User Defined Recreational	638820	185.8401	8.4000e-003	1.7400e-003	186.5682
User Defined Recreational	663390	192.9878	8.7300e-003	1.8100e-003	193.7439
Total		**4,688.4988**	**0.2120**	**0.0439**	**4,706.8698**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	0	0.0000	0.0000	0.0000	0.0000
General Office Building	0	0.0000	0.0000	0.0000	0.0000
Golf Course	0	0.0000	0.0000	0.0000	0.0000
Health Club	0	0.0000	0.0000	0.0000	0.0000
Hotel	0	0.0000	0.0000	0.0000	0.0000
Medical Office Building	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Quality Restaurant	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	0	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	6.7227	0.0195	1.6882	9.0000e-005		9.3100e-003	9.3100e-003		9.3100e-003	9.3100e-003	0.0000	2.7573	2.7573	2.6900e-003	0.0000	2.8245
Unmitigated	6.7227	0.0195	1.6882	9.0000e-005		9.3100e-003	9.3100e-003		9.3100e-003	9.3100e-003	0.0000	2.7573	2.7573	2.6900e-003	0.0000	2.8245

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.9831					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.6881					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0515	0.0195	1.6882	9.0000e-005		9.3100e-003	9.3100e-003		9.3100e-003	9.3100e-003	0.0000	2.7573	2.7573	2.6900e-003	0.0000	2.8245
Total	**6.7227**	**0.0195**	**1.6882**	**9.0000e-005**		**9.3100e-003**	**9.3100e-003**		**9.3100e-003**	**9.3100e-003**	**0.0000**	**2.7573**	**2.7573**	**2.6900e-003**	**0.0000**	**2.8245**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.9831					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.6881					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0515	0.0195	1.6882	9.0000e-005		9.3100e-003	9.3100e-003		9.3100e-003	9.3100e-003	0.0000	2.7573	2.7573	2.6900e-003	0.0000	2.8245
Total	**6.7227**	**0.0195**	**1.6882**	**9.0000e-005**		**9.3100e-003**	**9.3100e-003**		**9.3100e-003**	**9.3100e-003**	**0.0000**	**2.7573**	**2.7573**	**2.6900e-003**	**0.0000**	**2.8245**

7.0 Water Detail

7.1 Mitigation Measures Water

Use Reclaimed Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	177.4710	1.0721	0.0267	212.2313
Unmitigated	205.7724	1.3395	0.0332	249.1598

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	5.74875 / 0	10.8731	0.1877	4.5100e-003	16.9097
General Office Building	3.82593 / 23.4613	31.1243	0.1260	3.2200e-003	35.2354
Golf Course	0.390915 / 46.4012	47.9846	0.0149	7.5000e-004	48.5802
Health Club	0.38325 / 4.04055	4.8389	0.0127	3.4000e-004	5.2575
Hotel	13.6738 / 33.6278	60.1018	0.4481	0.0110	74.5945
Medical Office Building	0.90666 / 0	1.7148	0.0296	7.1000e-004	2.6669
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Quality Restaurant	0.0396 / 1.3034	1.4020	1.3500e-003	4.0000e-005	1.4488
Regional Shopping Center	0.60444 / 1.3034	2.4703	0.0198	4.9000e-004	3.1102
Single Family Housing	13.4816 / 9.58002	35.2531	0.4407	0.0107	49.4481
User Defined Commercial	0.67884 / 0	1.2839	0.0222	5.3000e-004	1.9968
User Defined Industrial	0.102368 / 5.86532	6.1656	3.6100e-003	1.4000e-004	6.2965
User Defined Recreational	1.00258 / 0.651702	2.5598	0.0328	7.9000e-004	3.6152
Total		**205.7724**	**1.3394**	**0.0332**	**249.1598**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	4.599 / 0	8.6984	0.1502	3.6100e-003	13.5277
General Office Building	3.06074 / 21.1151	27.2883	0.1009	2.6000e-003	30.5865
Golf Course	0.312732 / 41.7611	43.1122	0.0121	6.4000e-004	43.6072
Health Club	0.3066 / 3.6365	4.2825	0.0102	2.8000e-004	4.6190
Hotel	10.9391 / 30.265	51.5054	0.3586	8.8700e-003	63.1130
Medical Office Building	0.725328 / 0	1.3719	0.0237	5.7000e-004	2.1335
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Quality Restaurant	0.03168 / 1.17306	1.2543	1.0900e-003	4.0000e-005	1.2923
Regional Shopping Center	0.483552 / 1.17306	2.1090	0.0158	3.9000e-004	2.6214
Single Family Housing	10.7853 / 8.62202	29.1779	0.3526	8.5400e-003	40.5377
User Defined Commercial	0.543072 / 0	1.0272	0.0177	4.3000e-004	1.5974
User Defined Industrial	0.0818944 / 5.27879	5.5297	2.9200e-003	1.1000e-004	5.6368
User Defined Recreational	0.802066 / 0.586532	2.1142	0.0262	6.3000e-004	2.9588
Total		**177.4710**	**1.0721**	**0.0267**	**212.2313**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	113.3485	6.6987	0.0000	280.8162
Unmitigated	283.3713	16.7468	0.0000	702.0405

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	39.1	7.9370	0.4691	0.0000	19.6635
General Office Building	121.55	24.6736	1.4582	0.0000	61.1277
Golf Course	2.4	0.4872	0.0288	0.0000	1.2070
Health Club	673.74	136.7631	8.0825	0.0000	338.8249
Hotel	185.06	37.5655	2.2201	0.0000	93.0670
Medical Office Building	90.72	18.4153	1.0883	0.0000	45.6232
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Quality Restaurant	41.43	8.4099	0.4970	0.0000	20.8352
Regional Shopping Center	31.5	6.3942	0.3779	0.0000	15.8414
Single Family Housing	145.08	29.4499	1.7404	0.0000	72.9610
User Defined Commercial	31.5	6.3942	0.3779	0.0000	15.8414
User Defined Industrial	2.4	0.4872	0.0288	0.0000	1.2070
User Defined Recreational	31.5	6.3942	0.3779	0.0000	15.8414
Total		**283.3714**	**16.7468**	**0.0000**	**702.0405**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	15.64	3.1748	0.1876	0.0000	7.8654
General Office Building	48.62	9.8694	0.5833	0.0000	24.4511
Golf Course	0.96	0.1949	0.0115	0.0000	0.4828
Health Club	269.496	54.7053	3.2330	0.0000	135.5300
Hotel	74.024	15.0262	0.8880	0.0000	37.2268
Medical Office Building	36.288	7.3661	0.4353	0.0000	18.2493
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Quality Restaurant	16.572	3.3640	0.1988	0.0000	8.3341
Regional Shopping Center	12.6	2.5577	0.1512	0.0000	6.3366
Single Family Housing	58.032	11.7800	0.6962	0.0000	29.1844
User Defined Commercial	12.6	2.5577	0.1512	0.0000	6.3366
User Defined Industrial	0.96	0.1949	0.0115	0.0000	0.4828
User Defined Recreational	12.6	2.5577	0.1512	0.0000	6.3366
Total		**113.3485**	**6.6987**	**0.0000**	**280.8162**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

	Total CO2	CH4	N2O	CO2e
Category	MT			
Unmitigated	-45,510.0000	0.0000	0.0000	-45,510.0000

11.1 Vegetation Land Change

Vegetation Type

	Initial/Final	Total CO2	CH4	N2O	CO2e
	Acres	MT			
Trees	410 / 0	-45,510.0000	0.0000	0.0000	-45,510.0000
Total		**-45,510.0000**	**0.0000**	**0.0000**	**-45,510.0000**

Guenoc Valley Mixed Use Planned Development Project - Phase 1B and 1C

Lake County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	146.00	Dwelling Unit	635.32	262,800.00	418
Single Family Housing	87.00	Dwelling Unit	259.75	156,600.00	249
Single Family Housing	89.00	Dwelling Unit	724.95	160,200.00	255
Single Family Housing	39.00	Dwelling Unit	201.18	70,200.00	112
Single Family Housing	29.00	Dwelling Unit	150.81	52,200.00	83
Single Family Housing	11.00	Dwelling Unit	81.96	19,800.00	31

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	67
Climate Zone	1			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Guenoc Valley Mixed Use Planned Development Project - Phase 1B and 1C - Lake County, Annual

Project Characteristics -

Land Use - Notes

Construction Phase - Notes

Off-road Equipment - Notes

Off-road Equipment - Notes

Off-road Equipment - Notes

Off-road Equipment - Notes

Off-road Equipment - Notes

Off-road Equipment - Notes

Vehicle Trips - Notes

Woodstoves - Notes

Construction Off-road Equipment Mitigation - Notes

Area Mitigation -

Energy Mitigation -

Water Mitigation -

Table Name	Column Name	Default Value	New Value
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tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
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tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3

tblConstEquipMitigation	DPF	No Change	Level 3
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tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
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tblConstEquipMitigation	Tier	No Change	Tier 4 Final
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Guenoc Valley Mixed Use Planned Development Project - Phase 1B and 1C - Lake County, Annual

tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
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tblConstructionPhase	NumDays	15,500.00	201.00
tblConstructionPhase	NumDays	11,000.00	141.00
tblConstructionPhase	NumDays	6,000.00	77.00
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tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConsumerProducts	ROG_EF	2.14E-05	1.62E-05
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tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	NumberGas	220.55	0.00
tblFireplaces	NumberNoFireplace	40.10	0.00
tblFireplaces	NumberWood	140.35	0.00
tblFleetMix	HHD	0.02	0.02
tblFleetMix	LDA	0.52	0.56
tblFleetMix	LDT1	0.04	0.03
tblFleetMix	LDT2	0.21	0.23
tblFleetMix	LHD1	0.04	0.02

tblFleetMix	LHD2	6.0900e-003	3.3860e-003
tblFleetMix	MCY	5.5630e-003	4.2790e-003
tblFleetMix	MDV	0.13	0.11
tblFleetMix	MH	1.5840e-003	6.6400e-004
tblFleetMix	MHD	0.02	0.02
tblFleetMix	OBUS	1.2570e-003	1.0710e-003
tblFleetMix	SBUS	1.1340e-003	9.9300e-004
tblFleetMix	UBUS	1.0530e-003	8.0600e-004
tblGrading	AcresOfGrading	2,386.88	38,750.00
tblLandUse	LotAcreage	3.57	81.96
tblLandUse	LotAcreage	47.40	635.32
tblLandUse	LotAcreage	9.42	150.81
tblLandUse	LotAcreage	12.66	201.18
tblLandUse	LotAcreage	28.25	259.75
tblLandUse	LotAcreage	28.90	724.95
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tblVehicleEF	HHD	5.2100e-004	0.00
tblVehicleEF	HHD	0.17	0.03
tblVehicleEF	HHD	3.9880e-003	0.00
tblVehicleEF	HHD	0.17	0.00
tblVehicleEF	HHD	0.02	9.7000e-003
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	1.7000e-004	0.00
tblVehicleEF	HHD	8.0000e-004	0.00

tblVehicleEF	HHD	0.02	1.0000e-004
tblVehicleEF	HHD	1.01	0.49
tblVehicleEF	HHD	5.2100e-004	0.00
tblVehicleEF	HHD	0.20	0.07
tblVehicleEF	HHD	3.9880e-003	0.00
tblVehicleEF	HHD	0.19	0.00
tblVehicleEF	LDA	8.2420e-003	1.8000e-003
tblVehicleEF	LDA	0.01	0.05
tblVehicleEF	LDA	0.86	0.52
tblVehicleEF	LDA	2.62	2.15
tblVehicleEF	LDA	262.90	239.59
tblVehicleEF	LDA	60.09	50.81
tblVehicleEF	LDA	0.09	0.03
tblVehicleEF	LDA	0.18	0.17
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	2.0100e-003	1.3000e-003
tblVehicleEF	LDA	2.7270e-003	1.7000e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	1.8550e-003	1.2000e-003
tblVehicleEF	LDA	2.5080e-003	1.6000e-003
tblVehicleEF	LDA	0.08	0.04
tblVehicleEF	LDA	0.21	0.09
tblVehicleEF	LDA	0.06	0.04
tblVehicleEF	LDA	0.02	6.6000e-003
tblVehicleEF	LDA	0.06	0.03
tblVehicleEF	LDA	0.18	0.21
tblVehicleEF	LDA	2.6370e-003	2.4000e-003

tblVehicleEF	LDA	6.4700e-004	5.0000e-004
tblVehicleEF	LDA	0.08	0.04
tblVehicleEF	LDA	0.21	0.09
tblVehicleEF	LDA	0.06	0.04
tblVehicleEF	LDA	0.03	9.6000e-003
tblVehicleEF	LDA	0.06	0.03
tblVehicleEF	LDA	0.20	0.23
tblVehicleEF	LDA	9.0920e-003	1.8000e-003
tblVehicleEF	LDA	0.01	0.05
tblVehicleEF	LDA	1.00	0.52
tblVehicleEF	LDA	2.01	2.15
tblVehicleEF	LDA	281.29	239.59
tblVehicleEF	LDA	60.09	50.81
tblVehicleEF	LDA	0.08	0.03
tblVehicleEF	LDA	0.16	0.17
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	2.0100e-003	1.3000e-003
tblVehicleEF	LDA	2.7270e-003	1.7000e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	1.8550e-003	1.2000e-003
tblVehicleEF	LDA	2.5080e-003	1.6000e-003
tblVehicleEF	LDA	0.17	0.04
tblVehicleEF	LDA	0.24	0.09
tblVehicleEF	LDA	0.12	0.04
tblVehicleEF	LDA	0.02	6.6000e-003
tblVehicleEF	LDA	0.05	0.03
tblVehicleEF	LDA	0.14	0.21

tblVehicleEF	LDA	2.8230e-003	2.4000e-003
tblVehicleEF	LDA	6.3600e-004	5.0000e-004
tblVehicleEF	LDA	0.17	0.04
tblVehicleEF	LDA	0.24	0.09
tblVehicleEF	LDA	0.12	0.04
tblVehicleEF	LDA	0.03	9.6000e-003
tblVehicleEF	LDA	0.05	0.03
tblVehicleEF	LDA	0.16	0.23
tblVehicleEF	LDA	8.6950e-003	1.8000e-003
tblVehicleEF	LDA	0.01	0.05
tblVehicleEF	LDA	0.93	0.52
tblVehicleEF	LDA	2.07	2.15
tblVehicleEF	LDA	273.25	239.59
tblVehicleEF	LDA	60.09	50.81
tblVehicleEF	LDA	0.08	0.03
tblVehicleEF	LDA	0.16	0.17
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	2.0100e-003	1.3000e-003
tblVehicleEF	LDA	2.7270e-003	1.7000e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	1.8550e-003	1.2000e-003
tblVehicleEF	LDA	2.5080e-003	1.6000e-003
tblVehicleEF	LDA	0.18	0.04
tblVehicleEF	LDA	0.36	0.09
tblVehicleEF	LDA	0.13	0.04
tblVehicleEF	LDA	0.02	6.6000e-003
tblVehicleEF	LDA	0.07	0.03

tblVehicleEF	LDA	0.15	0.21
tblVehicleEF	LDA	2.7420e-003	2.4000e-003
tblVehicleEF	LDA	6.3700e-004	5.0000e-004
tblVehicleEF	LDA	0.18	0.04
tblVehicleEF	LDA	0.36	0.09
tblVehicleEF	LDA	0.13	0.04
tblVehicleEF	LDA	0.03	9.6000e-003
tblVehicleEF	LDA	0.07	0.03
tblVehicleEF	LDA	0.16	0.23
tblVehicleEF	LDT1	0.03	3.8000e-003
tblVehicleEF	LDT1	0.05	0.07
tblVehicleEF	LDT1	3.00	0.87
tblVehicleEF	LDT1	10.46	2.34
tblVehicleEF	LDT1	333.98	287.73
tblVehicleEF	LDT1	76.88	61.75
tblVehicleEF	LDT1	0.37	0.07
tblVehicleEF	LDT1	0.56	0.24
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	3.8430e-003	1.7000e-003
tblVehicleEF	LDT1	6.5140e-003	2.2000e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	3.5410e-003	1.5000e-003
tblVehicleEF	LDT1	5.9940e-003	2.0000e-003
tblVehicleEF	LDT1	0.35	0.09
tblVehicleEF	LDT1	0.80	0.18
tblVehicleEF	LDT1	0.23	0.08
tblVehicleEF	LDT1	0.08	0.02

tblVehicleEF	LDT1	0.59	0.08
tblVehicleEF	LDT1	0.74	0.32
tblVehicleEF	LDT1	3.3840e-003	2.8000e-003
tblVehicleEF	LDT1	9.5600e-004	6.0000e-004
tblVehicleEF	LDT1	0.35	0.09
tblVehicleEF	LDT1	0.80	0.18
tblVehicleEF	LDT1	0.23	0.08
tblVehicleEF	LDT1	0.12	0.02
tblVehicleEF	LDT1	0.59	0.08
tblVehicleEF	LDT1	0.81	0.35
tblVehicleEF	LDT1	0.04	3.8000e-003
tblVehicleEF	LDT1	0.04	0.07
tblVehicleEF	LDT1	3.38	0.87
tblVehicleEF	LDT1	7.91	2.34
tblVehicleEF	LDT1	355.82	287.73
tblVehicleEF	LDT1	76.88	61.75
tblVehicleEF	LDT1	0.33	0.07
tblVehicleEF	LDT1	0.50	0.24
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	3.8430e-003	1.7000e-003
tblVehicleEF	LDT1	6.5140e-003	2.2000e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	3.5410e-003	1.5000e-003
tblVehicleEF	LDT1	5.9940e-003	2.0000e-003
tblVehicleEF	LDT1	0.78	0.09
tblVehicleEF	LDT1	0.91	0.18
tblVehicleEF	LDT1	0.50	0.08

tblVehicleEF	LDT1	0.09	0.02
tblVehicleEF	LDT1	0.54	0.08
tblVehicleEF	LDT1	0.58	0.32
tblVehicleEF	LDT1	3.6080e-003	2.8000e-003
tblVehicleEF	LDT1	9.1100e-004	6.0000e-004
tblVehicleEF	LDT1	0.78	0.09
tblVehicleEF	LDT1	0.91	0.18
tblVehicleEF	LDT1	0.50	0.08
tblVehicleEF	LDT1	0.13	0.02
tblVehicleEF	LDT1	0.54	0.08
tblVehicleEF	LDT1	0.64	0.35
tblVehicleEF	LDT1	0.03	3.8000e-003
tblVehicleEF	LDT1	0.04	0.07
tblVehicleEF	LDT1	3.17	0.87
tblVehicleEF	LDT1	8.14	2.34
tblVehicleEF	LDT1	346.27	287.73
tblVehicleEF	LDT1	76.88	61.75
tblVehicleEF	LDT1	0.32	0.07
tblVehicleEF	LDT1	0.50	0.24
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	3.8430e-003	1.7000e-003
tblVehicleEF	LDT1	6.5140e-003	2.2000e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	3.5410e-003	1.5000e-003
tblVehicleEF	LDT1	5.9940e-003	2.0000e-003
tblVehicleEF	LDT1	0.87	0.09
tblVehicleEF	LDT1	1.54	0.18

tblVehicleEF	LDT1	0.59	0.08
tblVehicleEF	LDT1	0.09	0.02
tblVehicleEF	LDT1	0.73	0.08
tblVehicleEF	LDT1	0.60	0.32
tblVehicleEF	LDT1	3.5090e-003	2.8000e-003
tblVehicleEF	LDT1	9.1500e-004	6.0000e-004
tblVehicleEF	LDT1	0.87	0.09
tblVehicleEF	LDT1	1.54	0.18
tblVehicleEF	LDT1	0.59	0.08
tblVehicleEF	LDT1	0.12	0.02
tblVehicleEF	LDT1	0.73	0.08
tblVehicleEF	LDT1	0.66	0.35
tblVehicleEF	LDT2	0.01	2.9000e-003
tblVehicleEF	LDT2	0.02	0.06
tblVehicleEF	LDT2	1.23	0.70
tblVehicleEF	LDT2	4.25	2.74
tblVehicleEF	LDT2	370.21	307.00
tblVehicleEF	LDT2	85.69	66.18
tblVehicleEF	LDT2	0.18	0.06
tblVehicleEF	LDT2	0.42	0.26
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	1.9280e-003	1.3000e-003
tblVehicleEF	LDT2	2.9010e-003	1.7000e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	1.7730e-003	1.2000e-003
tblVehicleEF	LDT2	2.6680e-003	1.6000e-003
tblVehicleEF	LDT2	0.12	0.06

tblVehicleEF	LDT2	0.30	0.12
tblVehicleEF	LDT2	0.09	0.06
tblVehicleEF	LDT2	0.03	0.01
tblVehicleEF	LDT2	0.17	0.05
tblVehicleEF	LDT2	0.29	0.29
tblVehicleEF	LDT2	3.7160e-003	3.0000e-003
tblVehicleEF	LDT2	9.3200e-004	7.0000e-004
tblVehicleEF	LDT2	0.12	0.06
tblVehicleEF	LDT2	0.30	0.12
tblVehicleEF	LDT2	0.09	0.06
tblVehicleEF	LDT2	0.04	0.02
tblVehicleEF	LDT2	0.17	0.05
tblVehicleEF	LDT2	0.32	0.32
tblVehicleEF	LDT2	0.01	2.9000e-003
tblVehicleEF	LDT2	0.02	0.06
tblVehicleEF	LDT2	1.41	0.70
tblVehicleEF	LDT2	3.27	2.74
tblVehicleEF	LDT2	395.47	307.00
tblVehicleEF	LDT2	85.69	66.18
tblVehicleEF	LDT2	0.16	0.06
tblVehicleEF	LDT2	0.37	0.26
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	1.9280e-003	1.3000e-003
tblVehicleEF	LDT2	2.9010e-003	1.7000e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	1.7730e-003	1.2000e-003
tblVehicleEF	LDT2	2.6680e-003	1.6000e-003

tblVehicleEF	LDT2	0.26	0.06
tblVehicleEF	LDT2	0.33	0.12
tblVehicleEF	LDT2	0.19	0.06
tblVehicleEF	LDT2	0.03	0.01
tblVehicleEF	LDT2	0.15	0.05
tblVehicleEF	LDT2	0.23	0.29
tblVehicleEF	LDT2	3.9710e-003	3.0000e-003
tblVehicleEF	LDT2	9.1400e-004	7.0000e-004
tblVehicleEF	LDT2	0.26	0.06
tblVehicleEF	LDT2	0.33	0.12
tblVehicleEF	LDT2	0.19	0.06
tblVehicleEF	LDT2	0.05	0.02
tblVehicleEF	LDT2	0.15	0.05
tblVehicleEF	LDT2	0.26	0.32
tblVehicleEF	LDT2	0.01	2.9000e-003
tblVehicleEF	LDT2	0.02	0.06
tblVehicleEF	LDT2	1.31	0.70
tblVehicleEF	LDT2	3.36	2.74
tblVehicleEF	LDT2	384.43	307.00
tblVehicleEF	LDT2	85.69	66.18
tblVehicleEF	LDT2	0.15	0.06
tblVehicleEF	LDT2	0.37	0.26
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	1.9280e-003	1.3000e-003
tblVehicleEF	LDT2	2.9010e-003	1.7000e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	1.7730e-003	1.2000e-003

tblVehicleEF	LDT2	2.6680e-003	1.6000e-003
tblVehicleEF	LDT2	0.26	0.06
tblVehicleEF	LDT2	0.50	0.12
tblVehicleEF	LDT2	0.21	0.06
tblVehicleEF	LDT2	0.03	0.01
tblVehicleEF	LDT2	0.21	0.05
tblVehicleEF	LDT2	0.24	0.29
tblVehicleEF	LDT2	3.8590e-003	3.0000e-003
tblVehicleEF	LDT2	9.1600e-004	7.0000e-004
tblVehicleEF	LDT2	0.26	0.06
tblVehicleEF	LDT2	0.50	0.12
tblVehicleEF	LDT2	0.21	0.06
tblVehicleEF	LDT2	0.05	0.02
tblVehicleEF	LDT2	0.21	0.05
tblVehicleEF	LDT2	0.27	0.32
tblVehicleEF	LHD1	6.2510e-003	4.8000e-003
tblVehicleEF	LHD1	0.06	8.4000e-003
tblVehicleEF	LHD1	0.04	0.01
tblVehicleEF	LHD1	0.16	0.18
tblVehicleEF	LHD1	3.01	0.77
tblVehicleEF	LHD1	5.01	0.99
tblVehicleEF	LHD1	9.43	9.11
tblVehicleEF	LHD1	705.41	776.98
tblVehicleEF	LHD1	28.48	10.85
tblVehicleEF	LHD1	0.10	0.07
tblVehicleEF	LHD1	3.25	0.94
tblVehicleEF	LHD1	1.36	0.30

tblVehicleEF	LHD1	1.1360e-003	9.0000e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	0.01	9.9000e-003
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.5640e-003	2.0000e-004
tblVehicleEF	LHD1	1.0870e-003	9.0000e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.5520e-003	2.5000e-003
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.4380e-003	2.0000e-004
tblVehicleEF	LHD1	5.5100e-003	1.8000e-003
tblVehicleEF	LHD1	0.22	0.07
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	2.3250e-003	1.0000e-003
tblVehicleEF	LHD1	0.27	0.10
tblVehicleEF	LHD1	0.94	0.20
tblVehicleEF	LHD1	0.48	0.07
tblVehicleEF	LHD1	9.4000e-005	1.0000e-004
tblVehicleEF	LHD1	6.9420e-003	7.6000e-003
tblVehicleEF	LHD1	3.7900e-004	1.0000e-004
tblVehicleEF	LHD1	5.5100e-003	1.8000e-003
tblVehicleEF	LHD1	0.22	0.07
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.3250e-003	1.0000e-003
tblVehicleEF	LHD1	0.35	0.12
tblVehicleEF	LHD1	0.94	0.20
tblVehicleEF	LHD1	0.53	0.08

tblVehicleEF	LHD1	6.2510e-003	4.8000e-003
tblVehicleEF	LHD1	0.06	8.4000e-003
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.16	0.18
tblVehicleEF	LHD1	3.10	0.77
tblVehicleEF	LHD1	4.54	0.99
tblVehicleEF	LHD1	9.43	9.11
tblVehicleEF	LHD1	705.41	776.98
tblVehicleEF	LHD1	28.48	10.85
tblVehicleEF	LHD1	0.10	0.07
tblVehicleEF	LHD1	3.10	0.94
tblVehicleEF	LHD1	1.26	0.30
tblVehicleEF	LHD1	1.1360e-003	9.0000e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	0.01	9.9000e-003
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.5640e-003	2.0000e-004
tblVehicleEF	LHD1	1.0870e-003	9.0000e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.5520e-003	2.5000e-003
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.4380e-003	2.0000e-004
tblVehicleEF	LHD1	0.01	1.8000e-003
tblVehicleEF	LHD1	0.24	0.07
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	5.0350e-003	1.0000e-003
tblVehicleEF	LHD1	0.28	0.10

tblVehicleEF	LHD1	0.91	0.20
tblVehicleEF	LHD1	0.45	0.07
tblVehicleEF	LHD1	9.4000e-005	1.0000e-004
tblVehicleEF	LHD1	6.9440e-003	7.6000e-003
tblVehicleEF	LHD1	3.7000e-004	1.0000e-004
tblVehicleEF	LHD1	0.01	1.8000e-003
tblVehicleEF	LHD1	0.24	0.07
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	5.0350e-003	1.0000e-003
tblVehicleEF	LHD1	0.36	0.12
tblVehicleEF	LHD1	0.91	0.20
tblVehicleEF	LHD1	0.49	0.08
tblVehicleEF	LHD1	6.2510e-003	4.8000e-003
tblVehicleEF	LHD1	0.06	8.4000e-003
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.16	0.18
tblVehicleEF	LHD1	3.09	0.77
tblVehicleEF	LHD1	4.58	0.99
tblVehicleEF	LHD1	9.43	9.11
tblVehicleEF	LHD1	705.41	776.98
tblVehicleEF	LHD1	28.48	10.85
tblVehicleEF	LHD1	0.10	0.07
tblVehicleEF	LHD1	3.12	0.94
tblVehicleEF	LHD1	1.27	0.30
tblVehicleEF	LHD1	1.1360e-003	9.0000e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	0.01	9.9000e-003

tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.5640e-003	2.0000e-004
tblVehicleEF	LHD1	1.0870e-003	9.0000e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.5520e-003	2.5000e-003
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.4380e-003	2.0000e-004
tblVehicleEF	LHD1	0.01	1.8000e-003
tblVehicleEF	LHD1	0.42	0.07
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	6.5460e-003	1.0000e-003
tblVehicleEF	LHD1	0.28	0.10
tblVehicleEF	LHD1	1.06	0.20
tblVehicleEF	LHD1	0.45	0.07
tblVehicleEF	LHD1	9.4000e-005	1.0000e-004
tblVehicleEF	LHD1	6.9440e-003	7.6000e-003
tblVehicleEF	LHD1	3.7100e-004	1.0000e-004
tblVehicleEF	LHD1	0.01	1.8000e-003
tblVehicleEF	LHD1	0.42	0.07
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	6.5460e-003	1.0000e-003
tblVehicleEF	LHD1	0.36	0.12
tblVehicleEF	LHD1	1.06	0.20
tblVehicleEF	LHD1	0.49	0.08
tblVehicleEF	LHD2	2.8170e-003	2.9000e-003
tblVehicleEF	LHD2	0.02	6.9000e-003
tblVehicleEF	LHD2	9.8630e-003	7.3000e-003

tblVehicleEF	LHD2	0.11	0.13
tblVehicleEF	LHD2	1.26	0.64
tblVehicleEF	LHD2	1.38	0.55
tblVehicleEF	LHD2	15.87	14.31
tblVehicleEF	LHD2	703.60	754.66
tblVehicleEF	LHD2	14.40	7.04
tblVehicleEF	LHD2	0.15	0.11
tblVehicleEF	LHD2	2.92	0.98
tblVehicleEF	LHD2	0.46	0.17
tblVehicleEF	LHD2	1.6300e-003	1.5000e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.03	0.02
tblVehicleEF	LHD2	4.0900e-004	1.0000e-004
tblVehicleEF	LHD2	1.5600e-003	1.4000e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.8050e-003	2.7000e-003
tblVehicleEF	LHD2	0.03	0.02
tblVehicleEF	LHD2	3.7600e-004	1.0000e-004
tblVehicleEF	LHD2	1.2990e-003	8.0000e-004
tblVehicleEF	LHD2	0.05	0.03
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	5.8600e-004	5.0000e-004
tblVehicleEF	LHD2	0.19	0.12
tblVehicleEF	LHD2	0.16	0.08
tblVehicleEF	LHD2	0.13	0.04
tblVehicleEF	LHD2	1.5300e-004	1.0000e-004

tblVehicleEF	LHD2	6.8040e-003	7.3000e-003
tblVehicleEF	LHD2	1.7000e-004	1.0000e-004
tblVehicleEF	LHD2	1.2990e-003	8.0000e-004
tblVehicleEF	LHD2	0.05	0.03
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	5.8600e-004	5.0000e-004
tblVehicleEF	LHD2	0.23	0.13
tblVehicleEF	LHD2	0.16	0.08
tblVehicleEF	LHD2	0.15	0.04
tblVehicleEF	LHD2	2.8170e-003	2.9000e-003
tblVehicleEF	LHD2	0.02	6.9000e-003
tblVehicleEF	LHD2	9.2060e-003	7.3000e-003
tblVehicleEF	LHD2	0.11	0.13
tblVehicleEF	LHD2	1.28	0.64
tblVehicleEF	LHD2	1.25	0.55
tblVehicleEF	LHD2	15.87	14.31
tblVehicleEF	LHD2	703.60	754.66
tblVehicleEF	LHD2	14.40	7.04
tblVehicleEF	LHD2	0.15	0.11
tblVehicleEF	LHD2	2.81	0.98
tblVehicleEF	LHD2	0.42	0.17
tblVehicleEF	LHD2	1.6300e-003	1.5000e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.03	0.02
tblVehicleEF	LHD2	4.0900e-004	1.0000e-004
tblVehicleEF	LHD2	1.5600e-003	1.4000e-003

tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.8050e-003	2.7000e-003
tblVehicleEF	LHD2	0.03	0.02
tblVehicleEF	LHD2	3.7600e-004	1.0000e-004
tblVehicleEF	LHD2	2.8400e-003	8.0000e-004
tblVehicleEF	LHD2	0.06	0.03
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	1.2570e-003	5.0000e-004
tblVehicleEF	LHD2	0.19	0.12
tblVehicleEF	LHD2	0.15	0.08
tblVehicleEF	LHD2	0.12	0.04
tblVehicleEF	LHD2	1.5300e-004	1.0000e-004
tblVehicleEF	LHD2	6.8040e-003	7.3000e-003
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tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	1.2570e-003	5.0000e-004
tblVehicleEF	LHD2	0.23	0.13
tblVehicleEF	LHD2	0.15	0.08
tblVehicleEF	LHD2	0.14	0.04
tblVehicleEF	LHD2	2.8170e-003	2.9000e-003
tblVehicleEF	LHD2	0.02	6.9000e-003
tblVehicleEF	LHD2	9.2600e-003	7.3000e-003
tblVehicleEF	LHD2	0.11	0.13
tblVehicleEF	LHD2	1.28	0.64
tblVehicleEF	LHD2	1.26	0.55

tblVehicleEF	LHD2	15.87	14.31
tblVehicleEF	LHD2	703.60	754.66
tblVehicleEF	LHD2	14.40	7.04
tblVehicleEF	LHD2	0.15	0.11
tblVehicleEF	LHD2	2.82	0.98
tblVehicleEF	LHD2	0.42	0.17
tblVehicleEF	LHD2	1.6300e-003	1.5000e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.03	0.02
tblVehicleEF	LHD2	4.0900e-004	1.0000e-004
tblVehicleEF	LHD2	1.5600e-003	1.4000e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.8050e-003	2.7000e-003
tblVehicleEF	LHD2	0.03	0.02
tblVehicleEF	LHD2	3.7600e-004	1.0000e-004
tblVehicleEF	LHD2	3.0390e-003	8.0000e-004
tblVehicleEF	LHD2	0.09	0.03
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	1.6020e-003	5.0000e-004
tblVehicleEF	LHD2	0.19	0.12
tblVehicleEF	LHD2	0.17	0.08
tblVehicleEF	LHD2	0.12	0.04
tblVehicleEF	LHD2	1.5300e-004	1.0000e-004
tblVehicleEF	LHD2	6.8040e-003	7.3000e-003
tblVehicleEF	LHD2	1.6800e-004	1.0000e-004
tblVehicleEF	LHD2	3.0390e-003	8.0000e-004

tblVehicleEF	LHD2	0.09	0.03
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	1.6020e-003	5.0000e-004
tblVehicleEF	LHD2	0.23	0.13
tblVehicleEF	LHD2	0.17	0.08
tblVehicleEF	LHD2	0.14	0.04
tblVehicleEF	MCY	0.42	0.34
tblVehicleEF	MCY	0.18	0.26
tblVehicleEF	MCY	24.37	20.00
tblVehicleEF	MCY	10.27	9.07
tblVehicleEF	MCY	166.31	213.40
tblVehicleEF	MCY	50.64	61.71
tblVehicleEF	MCY	1.22	1.16
tblVehicleEF	MCY	0.33	0.27
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	2.1510e-003	2.0000e-003
tblVehicleEF	MCY	5.2380e-003	3.0000e-003
tblVehicleEF	MCY	5.0400e-003	5.0000e-003
tblVehicleEF	MCY	2.0280e-003	1.9000e-003
tblVehicleEF	MCY	4.9740e-003	2.8000e-003
tblVehicleEF	MCY	1.43	0.89
tblVehicleEF	MCY	1.26	0.75
tblVehicleEF	MCY	0.77	0.56
tblVehicleEF	MCY	2.63	2.29
tblVehicleEF	MCY	1.37	0.56
tblVehicleEF	MCY	2.50	1.98
tblVehicleEF	MCY	2.1350e-003	2.1000e-003

tblVehicleEF	MCY	7.4900e-004	6.0000e-004
tblVehicleEF	MCY	1.43	0.89
tblVehicleEF	MCY	1.26	0.75
tblVehicleEF	MCY	0.77	0.56
tblVehicleEF	MCY	3.14	2.82
tblVehicleEF	MCY	1.37	0.56
tblVehicleEF	MCY	2.71	2.15
tblVehicleEF	MCY	0.40	0.34
tblVehicleEF	MCY	0.15	0.26
tblVehicleEF	MCY	22.87	20.00
tblVehicleEF	MCY	8.98	9.07
tblVehicleEF	MCY	166.31	213.40
tblVehicleEF	MCY	50.64	61.71
tblVehicleEF	MCY	1.07	1.16
tblVehicleEF	MCY	0.30	0.27
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	2.1510e-003	2.0000e-003
tblVehicleEF	MCY	5.2380e-003	3.0000e-003
tblVehicleEF	MCY	5.0400e-003	5.0000e-003
tblVehicleEF	MCY	2.0280e-003	1.9000e-003
tblVehicleEF	MCY	4.9740e-003	2.8000e-003
tblVehicleEF	MCY	3.36	0.89
tblVehicleEF	MCY	1.57	0.75
tblVehicleEF	MCY	1.93	0.56
tblVehicleEF	MCY	2.47	2.29
tblVehicleEF	MCY	1.28	0.56
tblVehicleEF	MCY	1.99	1.98

tblVehicleEF	MCY	2.1060e-003	2.1000e-003
tblVehicleEF	MCY	7.1200e-004	6.0000e-004
tblVehicleEF	MCY	3.36	0.89
tblVehicleEF	MCY	1.57	0.75
tblVehicleEF	MCY	1.93	0.56
tblVehicleEF	MCY	2.95	2.82
tblVehicleEF	MCY	1.28	0.56
tblVehicleEF	MCY	2.16	2.15
tblVehicleEF	MCY	0.40	0.34
tblVehicleEF	MCY	0.15	0.26
tblVehicleEF	MCY	22.23	20.00
tblVehicleEF	MCY	8.91	9.07
tblVehicleEF	MCY	166.31	213.40
tblVehicleEF	MCY	50.64	61.71
tblVehicleEF	MCY	1.08	1.16
tblVehicleEF	MCY	0.30	0.27
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	2.1510e-003	2.0000e-003
tblVehicleEF	MCY	5.2380e-003	3.0000e-003
tblVehicleEF	MCY	5.0400e-003	5.0000e-003
tblVehicleEF	MCY	2.0280e-003	1.9000e-003
tblVehicleEF	MCY	4.9740e-003	2.8000e-003
tblVehicleEF	MCY	4.27	0.89
tblVehicleEF	MCY	3.25	0.75
tblVehicleEF	MCY	2.70	0.56
tblVehicleEF	MCY	2.46	2.29
tblVehicleEF	MCY	1.58	0.56

tblVehicleEF	MCY	2.02	1.98
tblVehicleEF	MCY	2.0960e-003	2.1000e-003
tblVehicleEF	MCY	7.1200e-004	6.0000e-004
tblVehicleEF	MCY	4.27	0.89
tblVehicleEF	MCY	3.25	0.75
tblVehicleEF	MCY	2.70	0.56
tblVehicleEF	MCY	2.94	2.82
tblVehicleEF	MCY	1.58	0.56
tblVehicleEF	MCY	2.20	2.15
tblVehicleEF	MDV	0.03	3.8000e-003
tblVehicleEF	MDV	0.05	0.08
tblVehicleEF	MDV	2.46	0.82
tblVehicleEF	MDV	8.49	3.10
tblVehicleEF	MDV	512.44	379.50
tblVehicleEF	MDV	114.77	81.06
tblVehicleEF	MDV	0.45	0.08
tblVehicleEF	MDV	0.84	0.32
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	2.4990e-003	1.5000e-003
tblVehicleEF	MDV	3.9470e-003	1.8000e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.3060e-003	1.3000e-003
tblVehicleEF	MDV	3.6310e-003	1.7000e-003
tblVehicleEF	MDV	0.18	0.07
tblVehicleEF	MDV	0.47	0.15
tblVehicleEF	MDV	0.14	0.08
tblVehicleEF	MDV	0.08	0.02

tblVehicleEF	MDV	0.37	0.06
tblVehicleEF	MDV	0.65	0.38
tblVehicleEF	MDV	5.1540e-003	3.8000e-003
tblVehicleEF	MDV	1.3010e-003	8.0000e-004
tblVehicleEF	MDV	0.18	0.07
tblVehicleEF	MDV	0.47	0.15
tblVehicleEF	MDV	0.14	0.08
tblVehicleEF	MDV	0.11	0.02
tblVehicleEF	MDV	0.37	0.06
tblVehicleEF	MDV	0.72	0.42
tblVehicleEF	MDV	0.03	3.8000e-003
tblVehicleEF	MDV	0.04	0.08
tblVehicleEF	MDV	2.80	0.82
tblVehicleEF	MDV	6.51	3.10
tblVehicleEF	MDV	546.20	379.50
tblVehicleEF	MDV	114.77	81.06
tblVehicleEF	MDV	0.40	0.08
tblVehicleEF	MDV	0.74	0.32
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	2.4990e-003	1.5000e-003
tblVehicleEF	MDV	3.9470e-003	1.8000e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.3060e-003	1.3000e-003
tblVehicleEF	MDV	3.6310e-003	1.7000e-003
tblVehicleEF	MDV	0.40	0.07
tblVehicleEF	MDV	0.52	0.15
tblVehicleEF	MDV	0.29	0.08

tblVehicleEF	MDV	0.08	0.02
tblVehicleEF	MDV	0.33	0.06
tblVehicleEF	MDV	0.52	0.38
tblVehicleEF	MDV	5.4960e-003	3.8000e-003
tblVehicleEF	MDV	1.2650e-003	8.0000e-004
tblVehicleEF	MDV	0.40	0.07
tblVehicleEF	MDV	0.52	0.15
tblVehicleEF	MDV	0.29	0.08
tblVehicleEF	MDV	0.12	0.02
tblVehicleEF	MDV	0.33	0.06
tblVehicleEF	MDV	0.57	0.42
tblVehicleEF	MDV	0.03	3.8000e-003
tblVehicleEF	MDV	0.04	0.08
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tblVehicleEF	MDV	114.77	81.06
tblVehicleEF	MDV	0.40	0.08
tblVehicleEF	MDV	0.75	0.32
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	2.4990e-003	1.5000e-003
tblVehicleEF	MDV	3.9470e-003	1.8000e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.3060e-003	1.3000e-003
tblVehicleEF	MDV	3.6310e-003	1.7000e-003
tblVehicleEF	MDV	0.41	0.07
tblVehicleEF	MDV	0.79	0.15

tblVehicleEF	MDV	0.33	0.08
tblVehicleEF	MDV	0.08	0.02
tblVehicleEF	MDV	0.45	0.06
tblVehicleEF	MDV	0.54	0.38
tblVehicleEF	MDV	5.3460e-003	3.8000e-003
tblVehicleEF	MDV	1.2690e-003	8.0000e-004
tblVehicleEF	MDV	0.41	0.07
tblVehicleEF	MDV	0.79	0.15
tblVehicleEF	MDV	0.33	0.08
tblVehicleEF	MDV	0.12	0.02
tblVehicleEF	MDV	0.45	0.06
tblVehicleEF	MDV	0.59	0.42
tblVehicleEF	MH	0.15	9.3000e-003
tblVehicleEF	MH	0.06	0.02
tblVehicleEF	MH	10.88	0.85
tblVehicleEF	MH	14.64	1.96
tblVehicleEF	MH	1,262.50	1,512.95
tblVehicleEF	MH	64.55	17.73
tblVehicleEF	MH	2.90	1.52
tblVehicleEF	MH	1.93	0.24
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.04	0.03
tblVehicleEF	MH	2.2440e-003	2.0000e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1720e-003	3.3000e-003
tblVehicleEF	MH	0.04	0.03

tblVehicleEF	MH	2.0630e-003	2.0000e-004
tblVehicleEF	MH	2.48	0.58
tblVehicleEF	MH	0.20	0.05
tblVehicleEF	MH	0.76	0.23
tblVehicleEF	MH	0.41	0.07
tblVehicleEF	MH	0.07	0.01
tblVehicleEF	MH	0.85	0.09
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	9.0200e-004	2.0000e-004
tblVehicleEF	MH	2.48	0.58
tblVehicleEF	MH	0.20	0.05
tblVehicleEF	MH	0.76	0.23
tblVehicleEF	MH	0.59	0.08
tblVehicleEF	MH	0.07	0.01
tblVehicleEF	MH	0.93	0.10
tblVehicleEF	MH	0.16	9.3000e-003
tblVehicleEF	MH	0.06	0.02
tblVehicleEF	MH	11.44	0.85
tblVehicleEF	MH	12.84	1.96
tblVehicleEF	MH	1,262.50	1,512.95
tblVehicleEF	MH	64.55	17.73
tblVehicleEF	MH	2.64	1.52
tblVehicleEF	MH	1.79	0.24
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.04	0.03
tblVehicleEF	MH	2.2440e-003	2.0000e-004

tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1720e-003	3.3000e-003
tblVehicleEF	MH	0.04	0.03
tblVehicleEF	MH	2.0630e-003	2.0000e-004
tblVehicleEF	MH	5.44	0.58
tblVehicleEF	MH	0.21	0.05
tblVehicleEF	MH	1.63	0.23
tblVehicleEF	MH	0.44	0.07
tblVehicleEF	MH	0.07	0.01
tblVehicleEF	MH	0.77	0.09
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	8.7100e-004	2.0000e-004
tblVehicleEF	MH	5.44	0.58
tblVehicleEF	MH	0.21	0.05
tblVehicleEF	MH	1.63	0.23
tblVehicleEF	MH	0.63	0.08
tblVehicleEF	MH	0.07	0.01
tblVehicleEF	MH	0.85	0.10
tblVehicleEF	MH	0.16	9.3000e-003
tblVehicleEF	MH	0.06	0.02
tblVehicleEF	MH	11.38	0.85
tblVehicleEF	MH	13.04	1.96
tblVehicleEF	MH	1,262.50	1,512.95
tblVehicleEF	MH	64.55	17.73
tblVehicleEF	MH	2.67	1.52
tblVehicleEF	MH	1.79	0.24
tblVehicleEF	MH	0.13	0.13

tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.04	0.03
tblVehicleEF	MH	2.2440e-003	2.0000e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1720e-003	3.3000e-003
tblVehicleEF	MH	0.04	0.03
tblVehicleEF	MH	2.0630e-003	2.0000e-004
tblVehicleEF	MH	6.52	0.58
tblVehicleEF	MH	0.40	0.05
tblVehicleEF	MH	2.43	0.23
tblVehicleEF	MH	0.44	0.07
tblVehicleEF	MH	0.08	0.01
tblVehicleEF	MH	0.78	0.09
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	8.7500e-004	2.0000e-004
tblVehicleEF	MH	6.52	0.58
tblVehicleEF	MH	0.40	0.05
tblVehicleEF	MH	2.43	0.23
tblVehicleEF	MH	0.62	0.08
tblVehicleEF	MH	0.08	0.01
tblVehicleEF	MH	0.86	0.10
tblVehicleEF	MHD	0.02	4.0000e-003
tblVehicleEF	MHD	0.01	2.1000e-003
tblVehicleEF	MHD	0.12	0.01
tblVehicleEF	MHD	0.57	0.43
tblVehicleEF	MHD	0.85	0.27
tblVehicleEF	MHD	10.90	1.19

tblVehicleEF	MHD	170.87	84.01
tblVehicleEF	MHD	1,222.93	1,109.33
tblVehicleEF	MHD	47.31	10.07
tblVehicleEF	MHD	1.09	0.52
tblVehicleEF	MHD	2.62	1.47
tblVehicleEF	MHD	13.84	1.66
tblVehicleEF	MHD	0.01	5.0000e-004
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	0.03	7.2000e-003
tblVehicleEF	MHD	1.2670e-003	1.0000e-004
tblVehicleEF	MHD	0.01	5.0000e-004
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	0.03	6.9000e-003
tblVehicleEF	MHD	1.1650e-003	1.0000e-004
tblVehicleEF	MHD	2.3230e-003	4.0000e-004
tblVehicleEF	MHD	0.10	0.02
tblVehicleEF	MHD	0.07	0.02
tblVehicleEF	MHD	1.0380e-003	2.0000e-004
tblVehicleEF	MHD	0.13	0.02
tblVehicleEF	MHD	0.07	0.02
tblVehicleEF	MHD	0.68	0.05
tblVehicleEF	MHD	1.6410e-003	8.0000e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	6.6600e-004	1.0000e-004
tblVehicleEF	MHD	2.3230e-003	4.0000e-004
tblVehicleEF	MHD	0.10	0.02
tblVehicleEF	MHD	0.08	0.03

tblVehicleEF	MHD	1.0380e-003	2.0000e-004
tblVehicleEF	MHD	0.15	0.02
tblVehicleEF	MHD	0.07	0.02
tblVehicleEF	MHD	0.74	0.06
tblVehicleEF	MHD	0.02	4.0000e-003
tblVehicleEF	MHD	0.01	2.1000e-003
tblVehicleEF	MHD	0.11	0.01
tblVehicleEF	MHD	0.38	0.43
tblVehicleEF	MHD	0.87	0.27
tblVehicleEF	MHD	9.85	1.19
tblVehicleEF	MHD	181.40	84.01
tblVehicleEF	MHD	1,222.93	1,109.33
tblVehicleEF	MHD	47.31	10.07
tblVehicleEF	MHD	1.13	0.52
tblVehicleEF	MHD	2.51	1.47
tblVehicleEF	MHD	13.72	1.66
tblVehicleEF	MHD	0.01	5.0000e-004
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	0.03	7.2000e-003
tblVehicleEF	MHD	1.2670e-003	1.0000e-004
tblVehicleEF	MHD	0.01	5.0000e-004
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	0.03	6.9000e-003
tblVehicleEF	MHD	1.1650e-003	1.0000e-004
tblVehicleEF	MHD	5.1770e-003	4.0000e-004
tblVehicleEF	MHD	0.11	0.02
tblVehicleEF	MHD	0.06	0.02

tblVehicleEF	MHD	2.3060e-003	2.0000e-004
tblVehicleEF	MHD	0.13	0.02
tblVehicleEF	MHD	0.07	0.02
tblVehicleEF	MHD	0.63	0.05
tblVehicleEF	MHD	1.7400e-003	8.0000e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	6.4800e-004	1.0000e-004
tblVehicleEF	MHD	5.1770e-003	4.0000e-004
tblVehicleEF	MHD	0.11	0.02
tblVehicleEF	MHD	0.08	0.03
tblVehicleEF	MHD	2.3060e-003	2.0000e-004
tblVehicleEF	MHD	0.16	0.02
tblVehicleEF	MHD	0.07	0.02
tblVehicleEF	MHD	0.69	0.06
tblVehicleEF	MHD	0.03	4.0000e-003
tblVehicleEF	MHD	0.01	2.1000e-003
tblVehicleEF	MHD	0.11	0.01
tblVehicleEF	MHD	0.72	0.43
tblVehicleEF	MHD	0.87	0.27
tblVehicleEF	MHD	9.94	1.19
tblVehicleEF	MHD	157.22	84.01
tblVehicleEF	MHD	1,222.93	1,109.33
tblVehicleEF	MHD	47.31	10.07
tblVehicleEF	MHD	1.04	0.52
tblVehicleEF	MHD	2.53	1.47
tblVehicleEF	MHD	13.73	1.66
tblVehicleEF	MHD	0.02	5.0000e-004

tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	0.03	7.2000e-003
tblVehicleEF	MHD	1.2670e-003	1.0000e-004
tblVehicleEF	MHD	0.02	5.0000e-004
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	0.03	6.9000e-003
tblVehicleEF	MHD	1.1650e-003	1.0000e-004
tblVehicleEF	MHD	5.7650e-003	4.0000e-004
tblVehicleEF	MHD	0.18	0.02
tblVehicleEF	MHD	0.07	0.02
tblVehicleEF	MHD	3.1630e-003	2.0000e-004
tblVehicleEF	MHD	0.13	0.02
tblVehicleEF	MHD	0.08	0.02
tblVehicleEF	MHD	0.63	0.05
tblVehicleEF	MHD	1.5110e-003	8.0000e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	6.4900e-004	1.0000e-004
tblVehicleEF	MHD	5.7650e-003	4.0000e-004
tblVehicleEF	MHD	0.18	0.02
tblVehicleEF	MHD	0.09	0.03
tblVehicleEF	MHD	3.1630e-003	2.0000e-004
tblVehicleEF	MHD	0.16	0.02
tblVehicleEF	MHD	0.08	0.02
tblVehicleEF	MHD	0.69	0.06
tblVehicleEF	OBUS	0.02	8.8000e-003
tblVehicleEF	OBUS	0.02	9.0000e-003
tblVehicleEF	OBUS	0.06	0.03

tblVehicleEF	OBUS	0.36	0.50
tblVehicleEF	OBUS	1.47	0.98
tblVehicleEF	OBUS	11.18	2.88
tblVehicleEF	OBUS	198.88	65.66
tblVehicleEF	OBUS	1,431.33	1,496.24
tblVehicleEF	OBUS	67.80	21.75
tblVehicleEF	OBUS	0.98	0.23
tblVehicleEF	OBUS	2.64	1.13
tblVehicleEF	OBUS	3.88	0.68
tblVehicleEF	OBUS	2.2000e-004	1.0000e-004
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	6.1000e-003
tblVehicleEF	OBUS	1.1240e-003	2.0000e-004
tblVehicleEF	OBUS	2.1000e-004	1.0000e-004
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	0.01	5.8000e-003
tblVehicleEF	OBUS	1.0330e-003	2.0000e-004
tblVehicleEF	OBUS	3.3700e-003	1.7000e-003
tblVehicleEF	OBUS	0.04	0.03
tblVehicleEF	OBUS	0.06	0.05
tblVehicleEF	OBUS	1.2460e-003	8.0000e-004
tblVehicleEF	OBUS	0.13	0.05
tblVehicleEF	OBUS	0.14	0.09
tblVehicleEF	OBUS	0.70	0.14
tblVehicleEF	OBUS	1.9100e-003	6.0000e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.7500e-004	2.0000e-004

tblVehicleEF	OBUS	3.3700e-003	1.7000e-003
tblVehicleEF	OBUS	0.04	0.03
tblVehicleEF	OBUS	0.08	0.06
tblVehicleEF	OBUS	1.2460e-003	8.0000e-004
tblVehicleEF	OBUS	0.17	0.07
tblVehicleEF	OBUS	0.14	0.09
tblVehicleEF	OBUS	0.77	0.15
tblVehicleEF	OBUS	0.02	8.8000e-003
tblVehicleEF	OBUS	0.03	9.0000e-003
tblVehicleEF	OBUS	0.05	0.03
tblVehicleEF	OBUS	0.33	0.50
tblVehicleEF	OBUS	1.52	0.98
tblVehicleEF	OBUS	9.96	2.88
tblVehicleEF	OBUS	209.71	65.66
tblVehicleEF	OBUS	1,431.33	1,496.24
tblVehicleEF	OBUS	67.80	21.75
tblVehicleEF	OBUS	1.01	0.23
tblVehicleEF	OBUS	2.51	1.13
tblVehicleEF	OBUS	3.73	0.68
tblVehicleEF	OBUS	1.8500e-004	1.0000e-004
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	6.1000e-003
tblVehicleEF	OBUS	1.1240e-003	2.0000e-004
tblVehicleEF	OBUS	1.7700e-004	1.0000e-004
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	0.01	5.8000e-003
tblVehicleEF	OBUS	1.0330e-003	2.0000e-004

tblVehicleEF	OBUS	7.2920e-003	1.7000e-003
tblVehicleEF	OBUS	0.05	0.03
tblVehicleEF	OBUS	0.06	0.05
tblVehicleEF	OBUS	2.6200e-003	8.0000e-004
tblVehicleEF	OBUS	0.14	0.05
tblVehicleEF	OBUS	0.13	0.09
tblVehicleEF	OBUS	0.65	0.14
tblVehicleEF	OBUS	2.0130e-003	6.0000e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.5500e-004	2.0000e-004
tblVehicleEF	OBUS	7.2920e-003	1.7000e-003
tblVehicleEF	OBUS	0.05	0.03
tblVehicleEF	OBUS	0.08	0.06
tblVehicleEF	OBUS	2.6200e-003	8.0000e-004
tblVehicleEF	OBUS	0.17	0.07
tblVehicleEF	OBUS	0.13	0.09
tblVehicleEF	OBUS	0.71	0.15
tblVehicleEF	OBUS	0.02	8.8000e-003
tblVehicleEF	OBUS	0.03	9.0000e-003
tblVehicleEF	OBUS	0.05	0.03
tblVehicleEF	OBUS	0.41	0.50
tblVehicleEF	OBUS	1.51	0.98
tblVehicleEF	OBUS	10.10	2.88
tblVehicleEF	OBUS	183.93	65.66
tblVehicleEF	OBUS	1,431.33	1,496.24
tblVehicleEF	OBUS	67.80	21.75
tblVehicleEF	OBUS	0.94	0.23

tblVehicleEF	OBUS	2.53	1.13
tblVehicleEF	OBUS	3.74	0.68
tblVehicleEF	OBUS	2.6700e-004	1.0000e-004
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	6.1000e-003
tblVehicleEF	OBUS	1.1240e-003	2.0000e-004
tblVehicleEF	OBUS	2.5600e-004	1.0000e-004
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	0.01	5.8000e-003
tblVehicleEF	OBUS	1.0330e-003	2.0000e-004
tblVehicleEF	OBUS	7.5400e-003	1.7000e-003
tblVehicleEF	OBUS	0.07	0.03
tblVehicleEF	OBUS	0.06	0.05
tblVehicleEF	OBUS	3.5720e-003	8.0000e-004
tblVehicleEF	OBUS	0.14	0.05
tblVehicleEF	OBUS	0.15	0.09
tblVehicleEF	OBUS	0.65	0.14
tblVehicleEF	OBUS	1.7670e-003	6.0000e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.5700e-004	2.0000e-004
tblVehicleEF	OBUS	7.5400e-003	1.7000e-003
tblVehicleEF	OBUS	0.07	0.03
tblVehicleEF	OBUS	0.08	0.06
tblVehicleEF	OBUS	3.5720e-003	8.0000e-004
tblVehicleEF	OBUS	0.17	0.07
tblVehicleEF	OBUS	0.15	0.09
tblVehicleEF	OBUS	0.72	0.15

tblVehicleEF	SBUS	1.00	0.02
tblVehicleEF	SBUS	0.01	2.6000e-003
tblVehicleEF	SBUS	0.10	1.3000e-003
tblVehicleEF	SBUS	6.12	1.26
tblVehicleEF	SBUS	0.78	0.22
tblVehicleEF	SBUS	6.63	0.19
tblVehicleEF	SBUS	1,276.27	299.60
tblVehicleEF	SBUS	1,143.42	991.09
tblVehicleEF	SBUS	36.31	1.09
tblVehicleEF	SBUS	12.20	2.23
tblVehicleEF	SBUS	4.99	2.75
tblVehicleEF	SBUS	15.43	1.56
tblVehicleEF	SBUS	0.01	1.5000e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.02
tblVehicleEF	SBUS	3.0400e-004	0.00
tblVehicleEF	SBUS	0.01	1.5000e-003
tblVehicleEF	SBUS	2.7600e-003	2.9000e-003
tblVehicleEF	SBUS	0.03	0.02
tblVehicleEF	SBUS	2.7900e-004	0.00
tblVehicleEF	SBUS	4.0180e-003	1.0000e-004
tblVehicleEF	SBUS	0.04	8.0000e-004
tblVehicleEF	SBUS	0.77	0.09
tblVehicleEF	SBUS	1.6500e-003	0.00
tblVehicleEF	SBUS	0.12	0.04
tblVehicleEF	SBUS	0.02	1.6000e-003
tblVehicleEF	SBUS	0.37	7.3000e-003

tblVehicleEF	SBUS	0.01	2.8000e-003
tblVehicleEF	SBUS	0.01	9.4000e-003
tblVehicleEF	SBUS	4.7900e-004	0.00
tblVehicleEF	SBUS	4.0180e-003	1.0000e-004
tblVehicleEF	SBUS	0.04	8.0000e-004
tblVehicleEF	SBUS	1.10	0.12
tblVehicleEF	SBUS	1.6500e-003	0.00
tblVehicleEF	SBUS	0.14	0.05
tblVehicleEF	SBUS	0.02	1.6000e-003
tblVehicleEF	SBUS	0.40	8.0000e-003
tblVehicleEF	SBUS	1.00	0.02
tblVehicleEF	SBUS	0.01	2.6000e-003
tblVehicleEF	SBUS	0.08	1.3000e-003
tblVehicleEF	SBUS	5.97	1.26
tblVehicleEF	SBUS	0.79	0.22
tblVehicleEF	SBUS	4.61	0.19
tblVehicleEF	SBUS	1,341.45	299.60
tblVehicleEF	SBUS	1,143.42	991.09
tblVehicleEF	SBUS	36.31	1.09
tblVehicleEF	SBUS	12.59	2.23
tblVehicleEF	SBUS	4.78	2.75
tblVehicleEF	SBUS	15.38	1.56
tblVehicleEF	SBUS	0.01	1.5000e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.02
tblVehicleEF	SBUS	3.0400e-004	0.00
tblVehicleEF	SBUS	0.01	1.5000e-003

tblVehicleEF	SBUS	2.7600e-003	2.9000e-003
tblVehicleEF	SBUS	0.03	0.02
tblVehicleEF	SBUS	2.7900e-004	0.00
tblVehicleEF	SBUS	8.5020e-003	1.0000e-004
tblVehicleEF	SBUS	0.04	8.0000e-004
tblVehicleEF	SBUS	0.76	0.09
tblVehicleEF	SBUS	3.3340e-003	0.00
tblVehicleEF	SBUS	0.12	0.04
tblVehicleEF	SBUS	0.02	1.6000e-003
tblVehicleEF	SBUS	0.30	7.3000e-003
tblVehicleEF	SBUS	0.01	2.8000e-003
tblVehicleEF	SBUS	0.01	9.4000e-003
tblVehicleEF	SBUS	4.4500e-004	0.00
tblVehicleEF	SBUS	8.5020e-003	1.0000e-004
tblVehicleEF	SBUS	0.04	8.0000e-004
tblVehicleEF	SBUS	1.09	0.12
tblVehicleEF	SBUS	3.3340e-003	0.00
tblVehicleEF	SBUS	0.15	0.05
tblVehicleEF	SBUS	0.02	1.6000e-003
tblVehicleEF	SBUS	0.33	8.0000e-003
tblVehicleEF	SBUS	1.00	0.02
tblVehicleEF	SBUS	0.01	2.6000e-003
tblVehicleEF	SBUS	0.08	1.3000e-003
tblVehicleEF	SBUS	6.33	1.26
tblVehicleEF	SBUS	0.79	0.22
tblVehicleEF	SBUS	4.89	0.19
tblVehicleEF	SBUS	1,186.25	299.60

tblVehicleEF	SBUS	1,143.42	991.09
tblVehicleEF	SBUS	36.31	1.09
tblVehicleEF	SBUS	11.66	2.23
tblVehicleEF	SBUS	4.80	2.75
tblVehicleEF	SBUS	15.39	1.56
tblVehicleEF	SBUS	0.02	1.5000e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.02
tblVehicleEF	SBUS	3.0400e-004	0.00
tblVehicleEF	SBUS	0.01	1.5000e-003
tblVehicleEF	SBUS	2.7600e-003	2.9000e-003
tblVehicleEF	SBUS	0.03	0.02
tblVehicleEF	SBUS	2.7900e-004	0.00
tblVehicleEF	SBUS	7.6430e-003	1.0000e-004
tblVehicleEF	SBUS	0.05	8.0000e-004
tblVehicleEF	SBUS	0.77	0.09
tblVehicleEF	SBUS	4.1680e-003	0.00
tblVehicleEF	SBUS	0.12	0.04
tblVehicleEF	SBUS	0.03	1.6000e-003
tblVehicleEF	SBUS	0.31	7.3000e-003
tblVehicleEF	SBUS	0.01	2.8000e-003
tblVehicleEF	SBUS	0.01	9.4000e-003
tblVehicleEF	SBUS	4.4900e-004	0.00
tblVehicleEF	SBUS	7.6430e-003	1.0000e-004
tblVehicleEF	SBUS	0.05	8.0000e-004
tblVehicleEF	SBUS	1.10	0.12
tblVehicleEF	SBUS	4.1680e-003	0.00

tblVehicleEF	SBUS	0.15	0.05
tblVehicleEF	SBUS	0.03	1.6000e-003
tblVehicleEF	SBUS	0.34	8.0000e-003
tblVehicleEF	UBUS	0.33	1.10
tblVehicleEF	UBUS	0.13	1.5000e-003
tblVehicleEF	UBUS	8.23	8.13
tblVehicleEF	UBUS	27.24	0.25
tblVehicleEF	UBUS	1,956.69	1,559.20
tblVehicleEF	UBUS	175.16	2.75
tblVehicleEF	UBUS	5.75	0.64
tblVehicleEF	UBUS	12.03	0.03
tblVehicleEF	UBUS	0.44	0.08
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.07	4.9000e-003
tblVehicleEF	UBUS	1.8730e-003	0.00
tblVehicleEF	UBUS	0.19	0.03
tblVehicleEF	UBUS	3.0000e-003	7.2000e-003
tblVehicleEF	UBUS	0.06	4.7000e-003
tblVehicleEF	UBUS	1.7220e-003	0.00
tblVehicleEF	UBUS	0.01	1.0000e-004
tblVehicleEF	UBUS	0.18	8.0000e-004
tblVehicleEF	UBUS	4.6750e-003	1.0000e-004
tblVehicleEF	UBUS	1.03	0.02
tblVehicleEF	UBUS	0.05	1.0000e-004
tblVehicleEF	UBUS	1.78	5.3000e-003
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	2.2350e-003	0.00

tblVehicleEF	UBUS	0.01	1.0000e-004
tblVehicleEF	UBUS	0.18	8.0000e-004
tblVehicleEF	UBUS	4.6750e-003	1.0000e-004
tblVehicleEF	UBUS	1.43	1.12
tblVehicleEF	UBUS	0.05	1.0000e-004
tblVehicleEF	UBUS	1.95	5.8000e-003
tblVehicleEF	UBUS	0.35	1.10
tblVehicleEF	UBUS	0.11	1.5000e-003
tblVehicleEF	UBUS	8.54	8.13
tblVehicleEF	UBUS	20.40	0.25
tblVehicleEF	UBUS	1,956.69	1,559.20
tblVehicleEF	UBUS	175.16	2.75
tblVehicleEF	UBUS	5.42	0.64
tblVehicleEF	UBUS	11.81	0.03
tblVehicleEF	UBUS	0.44	0.08
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.07	4.9000e-003
tblVehicleEF	UBUS	1.8730e-003	0.00
tblVehicleEF	UBUS	0.19	0.03
tblVehicleEF	UBUS	3.0000e-003	7.2000e-003
tblVehicleEF	UBUS	0.06	4.7000e-003
tblVehicleEF	UBUS	1.7220e-003	0.00
tblVehicleEF	UBUS	0.02	1.0000e-004
tblVehicleEF	UBUS	0.21	8.0000e-004
tblVehicleEF	UBUS	9.9340e-003	1.0000e-004
tblVehicleEF	UBUS	1.09	0.02
tblVehicleEF	UBUS	0.04	1.0000e-004

tblVehicleEF	UBUS	1.49	5.3000e-003
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	2.1180e-003	0.00
tblVehicleEF	UBUS	0.02	1.0000e-004
tblVehicleEF	UBUS	0.21	8.0000e-004
tblVehicleEF	UBUS	9.9340e-003	1.0000e-004
tblVehicleEF	UBUS	1.51	1.12
tblVehicleEF	UBUS	0.04	1.0000e-004
tblVehicleEF	UBUS	1.63	5.8000e-003
tblVehicleEF	UBUS	0.35	1.10
tblVehicleEF	UBUS	0.11	1.5000e-003
tblVehicleEF	UBUS	8.49	8.13
tblVehicleEF	UBUS	21.10	0.25
tblVehicleEF	UBUS	1,956.69	1,559.20
tblVehicleEF	UBUS	175.16	2.75
tblVehicleEF	UBUS	5.45	0.64
tblVehicleEF	UBUS	11.83	0.03
tblVehicleEF	UBUS	0.44	0.08
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.07	4.9000e-003
tblVehicleEF	UBUS	1.8730e-003	0.00
tblVehicleEF	UBUS	0.19	0.03
tblVehicleEF	UBUS	3.0000e-003	7.2000e-003
tblVehicleEF	UBUS	0.06	4.7000e-003
tblVehicleEF	UBUS	1.7220e-003	0.00
tblVehicleEF	UBUS	0.02	1.0000e-004
tblVehicleEF	UBUS	0.37	8.0000e-004

tblVehicleEF	UBUS	0.01	1.0000e-004
tblVehicleEF	UBUS	1.08	0.02
tblVehicleEF	UBUS	0.06	1.0000e-004
tblVehicleEF	UBUS	1.52	5.3000e-003
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	2.1300e-003	0.00
tblVehicleEF	UBUS	0.02	1.0000e-004
tblVehicleEF	UBUS	0.37	8.0000e-004
tblVehicleEF	UBUS	0.01	1.0000e-004
tblVehicleEF	UBUS	1.50	1.12
tblVehicleEF	UBUS	0.06	1.0000e-004
tblVehicleEF	UBUS	1.67	5.8000e-003
tblVehicleTrips	ST_TR	9.91	5.89
tblVehicleTrips	SU_TR	8.62	5.89
tblVehicleTrips	WD_TR	9.52	5.89
tblWoodstoves	NumberCatalytic	20.05	0.00
tblWoodstoves	NumberNoncatalytic	20.05	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.2360	2.3637	1.2275	3.0400e-003	1.8769	0.1069	1.9838	1.0289	0.0984	1.1272	0.0000	267.4320	267.4320	0.0842	0.0000	269.5370
2024	3.1210	28.6781	26.1727	0.0569	27.3727	1.1887	28.5614	5.8935	1.1026	6.9961	0.0000	4,977.1993	4,977.1993	1.3895	0.0000	5,011.9356
2025	2.3131	18.9894	21.3863	0.0437	0.3686	0.7520	1.1205	0.0991	0.7152	0.8143	0.0000	3,762.5998	3,762.5998	0.6488	0.0000	3,778.8194
2026	2.2958	18.9660	21.2652	0.0436	0.3686	0.7518	1.1204	0.0991	0.7151	0.8142	0.0000	3,752.9650	3,752.9650	0.6475	0.0000	3,769.1532
2027	2.2781	18.9435	21.1547	0.0435	0.3685	0.7517	1.1202	0.0991	0.7149	0.8140	0.0000	3,744.0273	3,744.0273	0.6464	0.0000	3,760.1867
2028	2.2685	18.9745	21.1176	0.0435	0.3695	0.7535	1.1231	0.0994	0.7167	0.8161	0.0000	3,746.1962	3,746.1962	0.6471	0.0000	3,762.3748
2029	2.2440	18.9041	20.9677	0.0433	0.3685	0.7513	1.1198	0.0991	0.7146	0.8137	0.0000	3,728.6903	3,728.6903	0.6444	0.0000	3,744.8006
2030	12.3901	5.7595	12.3125	0.0235	0.1463	0.2086	0.3549	0.0391	0.2086	0.2476	0.0000	2,017.1049	2,017.1049	0.0859	0.0000	2,019.2531
Maximum	**12.3901**	**28.6781**	**26.1727**	**0.0569**	**27.3727**	**1.1887**	**28.5614**	**5.8935**	**1.1026**	**6.9961**	**0.0000**	**4,977.1993**	**4,977.1993**	**1.3895**	**0.0000**	**5,011.9356**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0451	0.1619	1.4637	3.0400e-003	0.8502	8.0000e-004	0.8510	0.4645	7.9000e-004	0.4653	0.0000	267.4317	267.4317	0.0842	0.0000	269.5367
2024	0.8823	3.6856	31.7732	0.0569	12.4677	0.0151	12.4828	2.6922	0.0150	2.7071	0.0000	4,977.1937	4,977.1937	1.3895	0.0000	5,011.9300
2025	0.7412	4.2827	24.1435	0.0437	0.3686	0.0118	0.3804	0.0991	0.0116	0.1107	0.0000	3,762.5958	3,762.5958	0.6488	0.0000	3,778.8154
2026	0.7239	4.2593	24.0224	0.0436	0.3686	0.0117	0.3802	0.0991	0.0115	0.1106	0.0000	3,752.9611	3,752.9611	0.6475	0.0000	3,769.1492
2027	0.7062	4.2369	23.9119	0.0435	0.3685	0.0115	0.3801	0.0991	0.0113	0.1104	0.0000	3,744.0233	3,744.0233	0.6464	0.0000	3,760.1827
2028	0.6923	4.2276	23.8823	0.0435	0.3695	0.0114	0.3809	0.0994	0.0112	0.1105	0.0000	3,746.1922	3,746.1922	0.6471	0.0000	3,762.3708
2029	0.6721	4.1975	23.7249	0.0433	0.3685	0.0112	0.3797	0.0991	0.0110	0.1101	0.0000	3,728.6864	3,728.6864	0.6444	0.0000	3,744.7966
2030	12.1288	4.1570	12.8195	0.0235	0.1463	0.0266	0.1729	0.0391	0.0265	0.0656	0.0000	2,017.1027	2,017.1027	0.0859	0.0000	2,019.2509
Maximum	**12.1288**	**4.2827**	**31.7732**	**0.0569**	**12.4677**	**0.0266**	**12.4828**	**2.6922**	**0.0265**	**2.7071**	**0.0000**	**4,977.1937**	**4,977.1937**	**1.3895**	**0.0000**	**5,011.9300**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**38.88**	**77.80**	**-13.83**	**0.00**	**51.00**	**98.10**	**57.79**	**50.50**	**98.02**	**69.54**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**12-1-2023**	**2-29-2024**	7.9719	0.7113
2	**3-1-2024**	**5-31-2024**	9.3168	1.1824

3	**6-1-2024**	**8-31-2024**	9.3120	1.1775
4	**9-1-2024**	**11-30-2024**	5.8608	1.2824
5	**12-1-2024**	**2-28-2025**	5.4012	1.2538
6	**3-1-2025**	**5-31-2025**	5.3691	1.2660
7	**6-1-2025**	**8-31-2025**	5.3635	1.2604
8	**9-1-2025**	**11-30-2025**	5.3162	1.2578
9	**12-1-2025**	**2-28-2026**	5.2563	1.2424
10	**3-1-2026**	**5-31-2026**	5.3590	1.2559
11	**6-1-2026**	**8-31-2026**	5.3537	1.2507
12	**9-1-2026**	**11-30-2026**	5.3059	1.2475
13	**12-1-2026**	**2-28-2027**	5.2458	1.2319
14	**3-1-2027**	**5-31-2027**	5.3490	1.2460
15	**6-1-2027**	**8-31-2027**	5.3441	1.2410
16	**9-1-2027**	**11-30-2027**	5.2957	1.2372
17	**12-1-2027**	**2-29-2028**	5.2940	1.2356
18	**3-1-2028**	**5-31-2028**	5.3399	1.2368
19	**6-1-2028**	**8-31-2028**	5.3353	1.2322
20	**9-1-2028**	**11-30-2028**	5.2863	1.2278
21	**12-1-2028**	**2-28-2029**	5.2261	1.2123
22	**3-1-2029**	**5-31-2029**	5.3306	1.2275
23	**6-1-2029**	**8-31-2029**	5.3264	1.2233
24	**9-1-2029**	**11-30-2029**	5.2767	1.2183
25	**12-1-2029**	**2-28-2030**	3.8635	1.3961
26	**3-1-2030**	**5-31-2030**	2.7268	2.7268
27	**6-1-2030**	**8-31-2030**	5.8988	5.5950
28	**9-1-2030**	**9-30-2030**	2.6038	2.4380
		Highest	9.3168	5.5950

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.3532	0.0344	2.9807	1.6000e-004		0.0165	0.0165		0.0165	0.0165	0.0000	4.8637	4.8637	4.6900e-003	0.0000	4.9810
Energy	0.0262	0.2239	0.0953	1.4300e-003		0.0181	0.0181		0.0181	0.0181	0.0000	1,271.5250	1,271.5250	0.0507	0.0142	1,277.0321
Mobile	0.6882	1.9357	9.0860	0.0320	3.2473	0.0238	3.2711	0.8696	0.0222	0.8919	0.0000	2,952.9127	2,952.9127	0.0976	0.0000	2,955.3525
Waste						0.0000	0.0000		0.0000	0.0000	83.8921	0.0000	83.8921	4.9579	0.0000	207.8391
Water						0.0000	0.0000		0.0000	0.0000	8.2888	57.8976	66.1864	0.8540	0.0206	93.6872
Total	**4.0676**	**2.1940**	**12.1619**	**0.0336**	**3.2473**	**0.0584**	**3.3057**	**0.8696**	**0.0568**	**0.9264**	**92.1809**	**4,287.1990**	**4,379.3799**	**5.9649**	**0.0349**	**4,538.8918**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.3532	0.0344	2.9807	1.6000e-004		0.0165	0.0165		0.0165	0.0165	0.0000	4.8637	4.8637	4.6900e-003	0.0000	4.9810
Energy	0.0142	0.1209	0.0514	7.7000e-004		9.7700e-003	9.7700e-003		9.7700e-003	9.7700e-003	0.0000	139.9963	139.9963	2.6800e-003	2.5700e-003	140.8283
Mobile	0.6882	1.9357	9.0860	0.0320	3.2473	0.0238	3.2711	0.8696	0.0222	0.8919	0.0000	2,952.9127	2,952.9127	0.0976	0.0000	2,955.3525
Waste						0.0000	0.0000		0.0000	0.0000	83.8921	0.0000	83.8921	4.9579	0.0000	207.8391
Water						0.0000	0.0000		0.0000	0.0000	6.6311	47.9951	54.6262	0.6832	0.0165	76.6334
Total	**4.0555**	**2.0910**	**12.1181**	**0.0329**	**3.2473**	**0.0501**	**3.2974**	**0.8696**	**0.0485**	**0.9181**	**90.5232**	**3,145.7678**	**3,236.2910**	**5.7461**	**0.0191**	**3,385.6342**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.30**	**4.69**	**0.36**	**1.97**	**0.00**	**14.27**	**0.25**	**0.00**	**14.67**	**0.90**	**1.80**	**26.62**	**26.10**	**3.67**	**45.21**	**25.41**

3.0 Construction Detail

Construction Phase

Guenoc Valley Mixed Use Planned Development Project - Phase 1B and 1C - Lake County, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	12/1/2023	11/30/2023	7	0	
2	Site Preparation	Site Preparation	12/1/2023	2/15/2024	7	77	
3	Grading	Grading	2/15/2024	9/2/2024	7	201	
4	Building Construction	Building Construction	9/2/2024	2/18/2030	7	1996	
5	Paving	Paving	2/18/2030	7/8/2030	7	141	
6	Architectural Coating	Architectural Coating	7/8/2030	11/25/2030	7	141	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 38750

Acres of Paving: 0

Residential Indoor: 1,461,645; Residential Outdoor: 487,215; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Guenoc Valley Mixed Use Planned Development Project - Phase 1B and 1C - Lake County, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Demolition	Excavators	0	8.00	158	0.38
Demolition	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	16	10.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	5	10.00	97	0.37
Grading	Excavators	20	10.00	158	0.38
Grading	Graders	11	10.00	187	0.41
Grading	Rubber Tired Dozers	5	10.00	247	0.40
Grading	Scrapers	4	10.00	367	0.48
Grading	Tractors/Loaders/Backhoes	4	10.00	97	0.37
Building Construction	Cranes	10	10.00	231	0.29
Building Construction	Forklifts	10	10.00	89	0.20
Building Construction	Generator Sets	10	10.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	4	10.00	97	0.37
Building Construction	Welders	8	10.00	46	0.45
Paving	Pavers	11	10.00	130	0.42
Paving	Paving Equipment	11	10.00	132	0.36
Paving	Rollers	11	10.00	80	0.38
Architectural Coating	Air Compressors	8	10.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	0	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	21	53.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	44	110.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	42	144.00	43.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	33	83.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	8	29.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Demolition - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Demolition - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.8669	0.0000	1.8669	1.0262	0.0000	1.0262	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2269	2.3582	1.1791	2.9500e-003		0.1068	0.1068		0.0983	0.0983	0.0000	259.0788	259.0788	0.0838	0.0000	261.1735
Total	**0.2269**	**2.3582**	**1.1791**	**2.9500e-003**	**1.8669**	**0.1068**	**1.9737**	**1.0262**	**0.0983**	**1.1245**	**0.0000**	**259.0788**	**259.0788**	**0.0838**	**0.0000**	**261.1735**

3.3 Site Preparation - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0400e-003	5.4900e-003	0.0484	9.0000e-005	0.0101	8.0000e-005	0.0102	2.6800e-003	7.0000e-005	2.7500e-003	0.0000	8.3532	8.3532	4.1000e-004	0.0000	8.3634
Total	**9.0400e-003**	**5.4900e-003**	**0.0484**	**9.0000e-005**	**0.0101**	**8.0000e-005**	**0.0102**	**2.6800e-003**	**7.0000e-005**	**2.7500e-003**	**0.0000**	**8.3532**	**8.3532**	**4.1000e-004**	**0.0000**	**8.3634**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.8401	0.0000	0.8401	0.4618	0.0000	0.4618	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0361	0.1564	1.4153	2.9500e-003		7.2000e-004	7.2000e-004		7.2000e-004	7.2000e-004	0.0000	259.0785	259.0785	0.0838	0.0000	261.1732
Total	**0.0361**	**0.1564**	**1.4153**	**2.9500e-003**	**0.8401**	**7.2000e-004**	**0.8408**	**0.4618**	**7.2000e-004**	**0.4625**	**0.0000**	**259.0785**	**259.0785**	**0.0838**	**0.0000**	**261.1732**

3.3 Site Preparation - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0400e-003	5.4900e-003	0.0484	9.0000e-005	0.0101	8.0000e-005	0.0102	2.6800e-003	7.0000e-005	2.7500e-003	0.0000	8.3532	8.3532	4.1000e-004	0.0000	8.3634
Total	**9.0400e-003**	**5.4900e-003**	**0.0484**	**9.0000e-005**	**0.0101**	**8.0000e-005**	**0.0102**	**2.6800e-003**	**7.0000e-005**	**2.7500e-003**	**0.0000**	**8.3532**	**8.3532**	**4.1000e-004**	**0.0000**	**8.3634**

3.3 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.7702	0.0000	2.7702	1.5227	0.0000	1.5227	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3404	3.4869	1.7617	4.3700e-003		0.1573	0.1573		0.1447	0.1447	0.0000	384.4560	384.4560	0.1243	0.0000	387.5646
Total	**0.3404**	**3.4869**	**1.7617**	**4.3700e-003**	**2.7702**	**0.1573**	**2.9275**	**1.5227**	**0.1447**	**1.6674**	**0.0000**	**384.4560**	**384.4560**	**0.1243**	**0.0000**	**387.5646**

3.3 Site Preparation - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0125	7.2200e-003	0.0643	1.3000e-004	0.0150	1.1000e-004	0.0151	3.9800e-003	1.0000e-004	4.0800e-003	0.0000	11.9424	11.9424	5.3000e-004	0.0000	11.9556
Total	**0.0125**	**7.2200e-003**	**0.0643**	**1.3000e-004**	**0.0150**	**1.1000e-004**	**0.0151**	**3.9800e-003**	**1.0000e-004**	**4.0800e-003**	**0.0000**	**11.9424**	**11.9424**	**5.3000e-004**	**0.0000**	**11.9556**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2466	0.0000	1.2466	0.6852	0.0000	0.6852	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0536	0.2321	2.1001	4.3700e-003		1.0700e-003	1.0700e-003		1.0700e-003	1.0700e-003	0.0000	384.4556	384.4556	0.1243	0.0000	387.5641
Total	**0.0536**	**0.2321**	**2.1001**	**4.3700e-003**	**1.2466**	**1.0700e-003**	**1.2476**	**0.6852**	**1.0700e-003**	**0.6863**	**0.0000**	**384.4556**	**384.4556**	**0.1243**	**0.0000**	**387.5641**

3.3 Site Preparation - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0125	7.2200e-003	0.0643	1.3000e-004	0.0150	1.1000e-004	0.0151	3.9800e-003	1.0000e-004	4.0800e-003	0.0000	11.9424	11.9424	5.3000e-004	0.0000	11.9556
Total	**0.0125**	**7.2200e-003**	**0.0643**	**1.3000e-004**	**0.0150**	**1.1000e-004**	**0.0151**	**3.9800e-003**	**1.0000e-004**	**4.0800e-003**	**0.0000**	**11.9424**	**11.9424**	**5.3000e-004**	**0.0000**	**11.9556**

3.4 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					24.3298	0.0000	24.3298	4.2979	0.0000	4.2979	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.8337	18.3392	16.5809	0.0367		0.7478	0.7478		0.6880	0.6880	0.0000	3,221.7078	3,221.7078	1.0420	0.0000	3,247.7570
Total	**1.8337**	**18.3392**	**16.5809**	**0.0367**	**24.3298**	**0.7478**	**25.0776**	**4.2979**	**0.6880**	**4.9858**	**0.0000**	**3,221.7078**	**3,221.7078**	**1.0420**	**0.0000**	**3,247.7570**

3.4 Grading - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1136	0.0655	0.5827	1.2000e-003	0.1356	9.8000e-004	0.1366	0.0361	9.0000e-004	0.0370	0.0000	108.3047	108.3047	4.7700e-003	0.0000	108.4240
Total	**0.1136**	**0.0655**	**0.5827**	**1.2000e-003**	**0.1356**	**9.8000e-004**	**0.1366**	**0.0361**	**9.0000e-004**	**0.0370**	**0.0000**	**108.3047**	**108.3047**	**4.7700e-003**	**0.0000**	**108.4240**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					10.9484	0.0000	10.9484	1.9340	0.0000	1.9340	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4502	1.9508	20.9745	0.0367		9.0000e-003	9.0000e-003		9.0000e-003	9.0000e-003	0.0000	3,221.7040	3,221.7040	1.0420	0.0000	3,247.7531
Total	**0.4502**	**1.9508**	**20.9745**	**0.0367**	**10.9484**	**9.0000e-003**	**10.9574**	**1.9340**	**9.0000e-003**	**1.9430**	**0.0000**	**3,221.7040**	**3,221.7040**	**1.0420**	**0.0000**	**3,247.7531**

3.4 Grading - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1136	0.0655	0.5827	1.2000e-003	0.1356	9.8000e-004	0.1366	0.0361	9.0000e-004	0.0370	0.0000	108.3047	108.3047	4.7700e-003	0.0000	108.4240
Total	**0.1136**	**0.0655**	**0.5827**	**1.2000e-003**	**0.1356**	**9.8000e-004**	**0.1366**	**0.0361**	**9.0000e-004**	**0.0370**	**0.0000**	**108.3047**	**108.3047**	**4.7700e-003**	**0.0000**	**108.4240**

3.5 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.7239	6.5161	6.6573	0.0130		0.2814	0.2814		0.2679	0.2679	0.0000	1,109.0558	1,109.0558	0.2125	0.0000	1,114.3693
Total	**0.7239**	**6.5161**	**6.6573**	**0.0130**		**0.2814**	**0.2814**		**0.2679**	**0.2679**	**0.0000**	**1,109.0558**	**1,109.0558**	**0.2125**	**0.0000**	**1,114.3693**

3.5 Building Construction - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.4200e-003	0.2116	0.0665	5.9000e-004	0.0153	3.6000e-004	0.0157	4.4400e-003	3.4000e-004	4.7800e-003	0.0000	56.3821	56.3821	1.5500e-003	0.0000	56.4207
Worker	0.0895	0.0516	0.4592	9.5000e-004	0.1068	7.7000e-004	0.1076	0.0284	7.1000e-004	0.0291	0.0000	85.3505	85.3505	3.7600e-003	0.0000	85.4446
Total	**0.0969**	**0.2632**	**0.5257**	**1.5400e-003**	**0.1222**	**1.1300e-003**	**0.1233**	**0.0329**	**1.0500e-003**	**0.0339**	**0.0000**	**141.7326**	**141.7326**	**5.3100e-003**	**0.0000**	**141.8653**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1556	1.1668	7.5259	0.0130		2.8500e-003	2.8500e-003		2.8500e-003	2.8500e-003	0.0000	1,109.0545	1,109.0545	0.2125	0.0000	1,114.3680
Total	**0.1556**	**1.1668**	**7.5259**	**0.0130**		**2.8500e-003**	**2.8500e-003**		**2.8500e-003**	**2.8500e-003**	**0.0000**	**1,109.0545**	**1,109.0545**	**0.2125**	**0.0000**	**1,114.3680**

3.5 Building Construction - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.4200e-003	0.2116	0.0665	5.9000e-004	0.0153	3.6000e-004	0.0157	4.4400e-003	3.4000e-004	4.7800e-003	0.0000	56.3821	56.3821	1.5500e-003	0.0000	56.4207
Worker	0.0895	0.0516	0.4592	9.5000e-004	0.1068	7.7000e-004	0.1076	0.0284	7.1000e-004	0.0291	0.0000	85.3505	85.3505	3.7600e-003	0.0000	85.4446
Total	**0.0969**	**0.2632**	**0.5257**	**1.5400e-003**	**0.1222**	**1.1300e-003**	**0.1233**	**0.0329**	**1.0500e-003**	**0.0339**	**0.0000**	**141.7326**	**141.7326**	**5.3100e-003**	**0.0000**	**141.8653**

3.5 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.0412	18.2263	19.9447	0.0392		0.7487	0.7487		0.7122	0.7122	0.0000	3,345.7773	3,345.7773	0.6343	0.0000	3,361.6340
Total	**2.0412**	**18.2263**	**19.9447**	**0.0392**		**0.7487**	**0.7487**		**0.7122**	**0.7122**	**0.0000**	**3,345.7773**	**3,345.7773**	**0.6343**	**0.0000**	**3,361.6340**

3.5 Building Construction - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0210	0.6239	0.1851	1.7800e-003	0.0463	1.0000e-003	0.0473	0.0134	9.5000e-004	0.0143	0.0000	169.0916	169.0916	4.4900e-003	0.0000	169.2038
Worker	0.2509	0.1392	1.2565	2.7500e-003	0.3223	2.2300e-003	0.3245	0.0857	2.0600e-003	0.0878	0.0000	247.7309	247.7309	0.0100	0.0000	247.9816
Total	**0.2719**	**0.7631**	**1.4416**	**4.5300e-003**	**0.3686**	**3.2300e-003**	**0.3718**	**0.0991**	**3.0100e-003**	**0.1021**	**0.0000**	**416.8225**	**416.8225**	**0.0145**	**0.0000**	**417.1854**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4694	3.5197	22.7019	0.0392		8.5900e-003	8.5900e-003		8.5900e-003	8.5900e-003	0.0000	3,345.7733	3,345.7733	0.6343	0.0000	3,361.6300
Total	**0.4694**	**3.5197**	**22.7019**	**0.0392**		**8.5900e-003**	**8.5900e-003**		**8.5900e-003**	**8.5900e-003**	**0.0000**	**3,345.7733**	**3,345.7733**	**0.6343**	**0.0000**	**3,361.6300**

3.5 Building Construction - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0210	0.6239	0.1851	1.7800e-003	0.0463	1.0000e-003	0.0473	0.0134	9.5000e-004	0.0143	0.0000	169.0916	169.0916	4.4900e-003	0.0000	169.2038
Worker	0.2509	0.1392	1.2565	2.7500e-003	0.3223	2.2300e-003	0.3245	0.0857	2.0600e-003	0.0878	0.0000	247.7309	247.7309	0.0100	0.0000	247.9816
Total	**0.2719**	**0.7631**	**1.4416**	**4.5300e-003**	**0.3686**	**3.2300e-003**	**0.3718**	**0.0991**	**3.0100e-003**	**0.1021**	**0.0000**	**416.8225**	**416.8225**	**0.0145**	**0.0000**	**417.1854**

3.5 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.0412	18.2263	19.9447	0.0392		0.7487	0.7487		0.7122	0.7122	0.0000	3,345.7773	3,345.7773	0.6343	0.0000	3,361.6340
Total	**2.0412**	**18.2263**	**19.9447**	**0.0392**		**0.7487**	**0.7487**		**0.7122**	**0.7122**	**0.0000**	**3,345.7773**	**3,345.7773**	**0.6343**	**0.0000**	**3,361.6340**

3.5 Building Construction - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0201	0.6148	0.1740	1.7800e-003	0.0463	9.5000e-004	0.0472	0.0134	9.1000e-004	0.0143	0.0000	168.3622	168.3622	4.3400e-003	0.0000	168.4708
Worker	0.2345	0.1249	1.1465	2.6500e-003	0.3223	2.1400e-003	0.3244	0.0857	1.9700e-003	0.0877	0.0000	238.8256	238.8256	8.9100e-003	0.0000	239.0485
Total	**0.2546**	**0.7397**	**1.3205**	**4.4300e-003**	**0.3686**	**3.0900e-003**	**0.3716**	**0.0991**	**2.8800e-003**	**0.1020**	**0.0000**	**407.1878**	**407.1878**	**0.0133**	**0.0000**	**407.5192**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4694	3.5197	22.7019	0.0392		8.5900e-003	8.5900e-003		8.5900e-003	8.5900e-003	0.0000	3,345.7733	3,345.7733	0.6343	0.0000	3,361.6300
Total	**0.4694**	**3.5197**	**22.7019**	**0.0392**		**8.5900e-003**	**8.5900e-003**		**8.5900e-003**	**8.5900e-003**	**0.0000**	**3,345.7733**	**3,345.7733**	**0.6343**	**0.0000**	**3,361.6300**

3.5 Building Construction - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0201	0.6148	0.1740	1.7800e-003	0.0463	9.5000e-004	0.0472	0.0134	9.1000e-004	0.0143	0.0000	168.3622	168.3622	4.3400e-003	0.0000	168.4708
Worker	0.2345	0.1249	1.1465	2.6500e-003	0.3223	2.1400e-003	0.3244	0.0857	1.9700e-003	0.0877	0.0000	238.8256	238.8256	8.9100e-003	0.0000	239.0485
Total	**0.2546**	**0.7397**	**1.3205**	**4.4300e-003**	**0.3686**	**3.0900e-003**	**0.3716**	**0.0991**	**2.8800e-003**	**0.1020**	**0.0000**	**407.1878**	**407.1878**	**0.0133**	**0.0000**	**407.5192**

3.5 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.0412	18.2263	19.9447	0.0392		0.7487	0.7487		0.7122	0.7122	0.0000	3,345.7773	3,345.7773	0.6343	0.0000	3,361.6340
Total	**2.0412**	**18.2263**	**19.9447**	**0.0392**		**0.7487**	**0.7487**		**0.7122**	**0.7122**	**0.0000**	**3,345.7773**	**3,345.7773**	**0.6343**	**0.0000**	**3,361.6340**

3.5 Building Construction - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0193	0.6055	0.1651	1.7700e-003	0.0463	9.1000e-004	0.0472	0.0134	8.7000e-004	0.0142	0.0000	167.6236	167.6236	4.2100e-003	0.0000	167.7289
Worker	0.2176	0.1118	1.0449	2.5500e-003	0.3223	2.0100e-003	0.3243	0.0857	1.8500e-003	0.0876	0.0000	230.6264	230.6264	7.9000e-003	0.0000	230.8238
Total	**0.2369**	**0.7173**	**1.2100**	**4.3200e-003**	**0.3685**	**2.9200e-003**	**0.3715**	**0.0991**	**2.7200e-003**	**0.1018**	**0.0000**	**398.2501**	**398.2501**	**0.0121**	**0.0000**	**398.5527**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4694	3.5197	22.7019	0.0392		8.5900e-003	8.5900e-003		8.5900e-003	8.5900e-003	0.0000	3,345.7733	3,345.7733	0.6343	0.0000	3,361.6300
Total	**0.4694**	**3.5197**	**22.7019**	**0.0392**		**8.5900e-003**	**8.5900e-003**		**8.5900e-003**	**8.5900e-003**	**0.0000**	**3,345.7733**	**3,345.7733**	**0.6343**	**0.0000**	**3,361.6300**

3.5 Building Construction - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0193	0.6055	0.1651	1.7700e-003	0.0463	9.1000e-004	0.0472	0.0134	8.7000e-004	0.0142	0.0000	167.6236	167.6236	4.2100e-003	0.0000	167.7289
Worker	0.2176	0.1118	1.0449	2.5500e-003	0.3223	2.0100e-003	0.3243	0.0857	1.8500e-003	0.0876	0.0000	230.6264	230.6264	7.9000e-003	0.0000	230.8238
Total	**0.2369**	**0.7173**	**1.2100**	**4.3200e-003**	**0.3685**	**2.9200e-003**	**0.3715**	**0.0991**	**2.7200e-003**	**0.1018**	**0.0000**	**398.2501**	**398.2501**	**0.0121**	**0.0000**	**398.5527**

3.5 Building Construction - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.0468	18.2762	19.9994	0.0393		0.7508	0.7508		0.7142	0.7142	0.0000	3,354.9438	3,354.9438	0.6360	0.0000	3,370.8440
Total	**2.0468**	**18.2762**	**19.9994**	**0.0393**		**0.7508**	**0.7508**		**0.7142**	**0.7142**	**0.0000**	**3,354.9438**	**3,354.9438**	**0.6360**	**0.0000**	**3,370.8440**

3.5 Building Construction - 2028

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0186	0.5981	0.1576	1.7700e-003	0.0464	8.6000e-004	0.0472	0.0134	8.3000e-004	0.0142	0.0000	167.4554	167.4554	4.0700e-003	0.0000	167.5572
Worker	0.2030	0.1002	0.9606	2.4800e-003	0.3232	1.8800e-003	0.3250	0.0860	1.7300e-003	0.0877	0.0000	223.7971	223.7971	7.0600e-003	0.0000	223.9737
Total	**0.2216**	**0.6983**	**1.1182**	**4.2500e-003**	**0.3695**	**2.7400e-003**	**0.3723**	**0.0994**	**2.5600e-003**	**0.1019**	**0.0000**	**391.2525**	**391.2525**	**0.0111**	**0.0000**	**391.5309**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4706	3.5293	22.7641	0.0393		8.6100e-003	8.6100e-003		8.6100e-003	8.6100e-003	0.0000	3,354.9398	3,354.9398	0.6360	0.0000	3,370.8400
Total	**0.4706**	**3.5293**	**22.7641**	**0.0393**		**8.6100e-003**	**8.6100e-003**		**8.6100e-003**	**8.6100e-003**	**0.0000**	**3,354.9398**	**3,354.9398**	**0.6360**	**0.0000**	**3,370.8400**

3.5 Building Construction - 2028

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0186	0.5981	0.1576	1.7700e-003	0.0464	8.6000e-004	0.0472	0.0134	8.3000e-004	0.0142	0.0000	167.4554	167.4554	4.0700e-003	0.0000	167.5572
Worker	0.2030	0.1002	0.9606	2.4800e-003	0.3232	1.8800e-003	0.3250	0.0860	1.7300e-003	0.0877	0.0000	223.7971	223.7971	7.0600e-003	0.0000	223.9737
Total	**0.2216**	**0.6983**	**1.1182**	**4.2500e-003**	**0.3695**	**2.7400e-003**	**0.3723**	**0.0994**	**2.5600e-003**	**0.1019**	**0.0000**	**391.2525**	**391.2525**	**0.0111**	**0.0000**	**391.5309**

3.5 Building Construction - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.0412	18.2263	19.9447	0.0392		0.7487	0.7487		0.7122	0.7122	0.0000	3,345.7773	3,345.7773	0.6343	0.0000	3,361.6340
Total	**2.0412**	**18.2263**	**19.9447**	**0.0392**		**0.7487**	**0.7487**		**0.7122**	**0.7122**	**0.0000**	**3,345.7773**	**3,345.7773**	**0.6343**	**0.0000**	**3,361.6340**

3.5 Building Construction - 2029

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0180	0.5890	0.1503	1.7600e-003	0.0462	8.2000e-004	0.0471	0.0134	7.8000e-004	0.0141	0.0000	166.4781	166.4781	3.9300e-003	0.0000	166.5763
Worker	0.1848	0.0888	0.8727	2.4000e-003	0.3223	1.7400e-003	0.3240	0.0857	1.6000e-003	0.0873	0.0000	216.4349	216.4349	6.2100e-003	0.0000	216.5903
Total	**0.2028**	**0.6779**	**1.0230**	**4.1600e-003**	**0.3685**	**2.5600e-003**	**0.3711**	**0.0991**	**2.3800e-003**	**0.1015**	**0.0000**	**382.9131**	**382.9131**	**0.0101**	**0.0000**	**383.1666**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4694	3.5197	22.7019	0.0392		8.5900e-003	8.5900e-003		8.5900e-003	8.5900e-003	0.0000	3,345.7733	3,345.7733	0.6343	0.0000	3,361.6300
Total	**0.4694**	**3.5197**	**22.7019**	**0.0392**		**8.5900e-003**	**8.5900e-003**		**8.5900e-003**	**8.5900e-003**	**0.0000**	**3,345.7733**	**3,345.7733**	**0.6343**	**0.0000**	**3,361.6300**

3.5 Building Construction - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0180	0.5890	0.1503	1.7600e-003	0.0462	8.2000e-004	0.0471	0.0134	7.8000e-004	0.0141	0.0000	166.4781	166.4781	3.9300e-003	0.0000	166.5763
Worker	0.1848	0.0888	0.8727	2.4000e-003	0.3223	1.7400e-003	0.3240	0.0857	1.6000e-003	0.0873	0.0000	216.4349	216.4349	6.2100e-003	0.0000	216.5903
Total	**0.2028**	**0.6779**	**1.0230**	**4.1600e-003**	**0.3685**	**2.5600e-003**	**0.3711**	**0.0991**	**2.3800e-003**	**0.1015**	**0.0000**	**382.9131**	**382.9131**	**0.0101**	**0.0000**	**383.1666**

3.5 Building Construction - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2293	1.3911	2.5733	5.8500e-003		0.0285	0.0285		0.0285	0.0285	0.0000	495.2972	495.2972	0.0186	0.0000	495.7611
Total	**0.2293**	**1.3911**	**2.5733**	**5.8500e-003**		**0.0285**	**0.0285**		**0.0285**	**0.0285**	**0.0000**	**495.2972**	**495.2972**	**0.0186**	**0.0000**	**495.7611**

3.5 Building Construction - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3400e-003	0.0780	0.0194	2.4000e-004	6.2000e-003	1.0000e-004	6.3100e-003	1.7900e-003	1.0000e-004	1.8900e-003	0.0000	22.2866	22.2866	5.1000e-004	0.0000	22.2993
Worker	0.0226	0.0106	0.1074	3.1000e-004	0.0433	2.2000e-004	0.0435	0.0115	2.0000e-004	0.0117	0.0000	28.2394	28.2394	7.4000e-004	0.0000	28.2579
Total	**0.0250**	**0.0886**	**0.1269**	**5.5000e-004**	**0.0495**	**3.2000e-004**	**0.0498**	**0.0133**	**3.0000e-004**	**0.0136**	**0.0000**	**50.5260**	**50.5260**	**1.2500e-003**	**0.0000**	**50.5572**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0630	0.4725	3.0477	5.8500e-003		1.1500e-003	1.1500e-003		1.1500e-003	1.1500e-003	0.0000	495.2967	495.2967	0.0186	0.0000	495.7605
Total	**0.0630**	**0.4725**	**3.0477**	**5.8500e-003**		**1.1500e-003**	**1.1500e-003**		**1.1500e-003**	**1.1500e-003**	**0.0000**	**495.2967**	**495.2967**	**0.0186**	**0.0000**	**495.7605**

3.5 Building Construction - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3400e-003	0.0780	0.0194	2.4000e-004	6.2000e-003	1.0000e-004	6.3100e-003	1.7900e-003	1.0000e-004	1.8900e-003	0.0000	22.2866	22.2866	5.1000e-004	0.0000	22.2993
Worker	0.0226	0.0106	0.1074	3.1000e-004	0.0433	2.2000e-004	0.0435	0.0115	2.0000e-004	0.0117	0.0000	28.2394	28.2394	7.4000e-004	0.0000	28.2579
Total	**0.0250**	**0.0886**	**0.1269**	**5.5000e-004**	**0.0495**	**3.2000e-004**	**0.0498**	**0.0133**	**3.0000e-004**	**0.0136**	**0.0000**	**50.5260**	**50.5260**	**1.2500e-003**	**0.0000**	**50.5572**

3.6 Paving - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.6711	3.4511	7.6821	0.0136		0.1603	0.1603		0.1603	0.1603	0.0000	1,168.0734	1,168.0734	0.0548	0.0000	1,169.4423
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.6711**	**3.4511**	**7.6821**	**0.0136**		**0.1603**	**0.1603**		**0.1603**	**0.1603**	**0.0000**	**1,168.0734**	**1,168.0734**	**0.0548**	**0.0000**	**1,169.4423**

3.6 Paving - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0375	0.0176	0.1782	5.2000e-004	0.0718	3.6000e-004	0.0721	0.0191	3.3000e-004	0.0194	0.0000	46.8375	46.8375	1.2300e-003	0.0000	46.8682
Total	**0.0375**	**0.0176**	**0.1782**	**5.2000e-004**	**0.0718**	**3.6000e-004**	**0.0721**	**0.0191**	**3.3000e-004**	**0.0194**	**0.0000**	**46.8375**	**46.8375**	**1.2300e-003**	**0.0000**	**46.8682**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.6711	3.4511	7.6821	0.0136		0.0240	0.0240		0.0240	0.0240	0.0000	1,168.0720	1,168.0720	0.0548	0.0000	1,169.4409
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.6711**	**3.4511**	**7.6821**	**0.0136**		**0.0240**	**0.0240**		**0.0240**	**0.0240**	**0.0000**	**1,168.0720**	**1,168.0720**	**0.0548**	**0.0000**	**1,169.4409**

3.6 Paving - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0375	0.0176	0.1782	5.2000e-004	0.0718	3.6000e-004	0.0721	0.0191	3.3000e-004	0.0194	0.0000	46.8375	46.8375	1.2300e-003	0.0000	46.8682
Total	**0.0375**	**0.0176**	**0.1782**	**5.2000e-004**	**0.0718**	**3.6000e-004**	**0.0721**	**0.0191**	**3.3000e-004**	**0.0194**	**0.0000**	**46.8375**	**46.8375**	**1.2300e-003**	**0.0000**	**46.8682**

3.7 Architectural Coating - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	11.2912					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1229	0.8049	1.6899	2.7900e-003		0.0191	0.0191		0.0191	0.0191	0.0000	240.0059	240.0059	9.7100e-003	0.0000	240.2487
Total	**11.4141**	**0.8049**	**1.6899**	**2.7900e-003**		**0.0191**	**0.0191**		**0.0191**	**0.0191**	**0.0000**	**240.0059**	**240.0059**	**9.7100e-003**	**0.0000**	**240.2487**

3.7 Architectural Coating - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0131	6.1400e-003	0.0623	1.8000e-004	0.0251	1.3000e-004	0.0252	6.6700e-003	1.2000e-004	6.7900e-003	0.0000	16.3649	16.3649	4.3000e-004	0.0000	16.3757
Total	**0.0131**	**6.1400e-003**	**0.0623**	**1.8000e-004**	**0.0251**	**1.3000e-004**	**0.0252**	**6.6700e-003**	**1.2000e-004**	**6.7900e-003**	**0.0000**	**16.3649**	**16.3649**	**4.3000e-004**	**0.0000**	**16.3757**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	11.2912					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0279	0.1210	1.7225	2.7900e-003		5.6000e-004	5.6000e-004		5.6000e-004	5.6000e-004	0.0000	240.0056	240.0056	9.7100e-003	0.0000	240.2484
Total	**11.3191**	**0.1210**	**1.7225**	**2.7900e-003**		**5.6000e-004**	**5.6000e-004**		**5.6000e-004**	**5.6000e-004**	**0.0000**	**240.0056**	**240.0056**	**9.7100e-003**	**0.0000**	**240.2484**

3.7 Architectural Coating - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0131	6.1400e-003	0.0623	1.8000e-004	0.0251	1.3000e-004	0.0252	6.6700e-003	1.2000e-004	6.7900e-003	0.0000	16.3649	16.3649	4.3000e-004	0.0000	16.3757
Total	**0.0131**	**6.1400e-003**	**0.0623**	**1.8000e-004**	**0.0251**	**1.3000e-004**	**0.0252**	**6.6700e-003**	**1.2000e-004**	**6.7900e-003**	**0.0000**	**16.3649**	**16.3649**	**4.3000e-004**	**0.0000**	**16.3757**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.6882	1.9357	9.0860	0.0320	3.2473	0.0238	3.2711	0.8696	0.0222	0.8919	0.0000	2,952.9127	2,952.9127	0.0976	0.0000	2,955.3525
Unmitigated	0.6882	1.9357	9.0860	0.0320	3.2473	0.0238	3.2711	0.8696	0.0222	0.8919	0.0000	2,952.9127	2,952.9127	0.0976	0.0000	2,955.3525

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	859.94	859.94	859.94	3,197,875	3,197,875
Single Family Housing	512.43	512.43	512.43	1,905,583	1,905,583
Single Family Housing	524.21	524.21	524.21	1,949,390	1,949,390
Single Family Housing	229.71	229.71	229.71	854,227	854,227
Single Family Housing	170.81	170.81	170.81	635,194	635,194
Single Family Housing	64.79	64.79	64.79	240,936	240,936
Total	2,361.89	2,361.89	2,361.89	8,783,205	8,783,205

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	16.80	7.10	7.90	42.30	19.60	38.10	86	11	3
Single Family Housing	16.80	7.10	7.90	42.30	19.60	38.10	86	11	3
Single Family Housing	16.80	7.10	7.90	42.30	19.60	38.10	86	11	3
Single Family Housing	16.80	7.10	7.90	42.30	19.60	38.10	86	11	3
Single Family Housing	16.80	7.10	7.90	42.30	19.60	38.10	86	11	3
Single Family Housing	16.80	7.10	7.90	42.30	19.60	38.10	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.562691	0.032307	0.225633	0.110304	0.018549	0.003386	0.015829	0.023488	0.001071	0.000806	0.004279	0.000993	0.000664

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Percent of Electricity Use Generated with Renewable Energy

Guenoc Valley Mixed Use Planned Development Project - Phase 1B and 1C - Lake County, Annual

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1,012.2454	1,012.2454	0.0458	9.4700e-003	1,016.2117
NaturalGas Mitigated	0.0142	0.1209	0.0514	7.7000e-004		9.7700e-003	9.7700e-003		9.7700e-003	9.7700e-003	0.0000	139.9963	139.9963	2.6800e-003	2.5700e-003	140.8283
NaturalGas Unmitigated	0.0262	0.2239	0.0953	1.4300e-003		0.0181	0.0181		0.0181	0.0181	0.0000	259.2796	259.2796	4.9700e-003	4.7500e-003	260.8204

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	1.05414e+006	5.6800e-003	0.0486	0.0207	3.1000e-004		3.9300e-003	3.9300e-003		3.9300e-003	3.9300e-003	0.0000	56.2527	56.2527	1.0800e-003	1.0300e-003	56.5870
Single Family Housing	1.07837e+006	5.8100e-003	0.0497	0.0211	3.2000e-004		4.0200e-003	4.0200e-003		4.0200e-003	4.0200e-003	0.0000	57.5459	57.5459	1.1000e-003	1.0600e-003	57.8878
Single Family Housing	1.76901e+006	9.5400e-003	0.0815	0.0347	5.2000e-004		6.5900e-003	6.5900e-003		6.5900e-003	6.5900e-003	0.0000	94.4011	94.4011	1.8100e-003	1.7300e-003	94.9620
Single Family Housing	133282	7.2000e-004	6.1400e-003	2.6100e-003	4.0000e-005		5.0000e-004	5.0000e-004		5.0000e-004	5.0000e-004	0.0000	7.1124	7.1124	1.4000e-004	1.3000e-004	7.1547
Single Family Housing	351379	1.8900e-003	0.0162	6.8900e-003	1.0000e-004		1.3100e-003	1.3100e-003		1.3100e-003	1.3100e-003	0.0000	18.7509	18.7509	3.6000e-004	3.4000e-004	18.8623
Single Family Housing	472544	2.5500e-003	0.0218	9.2700e-003	1.4000e-004		1.7600e-003	1.7600e-003		1.7600e-003	1.7600e-003	0.0000	25.2167	25.2167	4.8000e-004	4.6000e-004	25.3666
Total		**0.0262**	**0.2239**	**0.0953**	**1.4300e-003**		**0.0181**	**0.0181**		**0.0181**	**0.0181**	**0.0000**	**259.2796**	**259.2796**	**4.9700e-003**	**4.7500e-003**	**260.8204**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	189725	1.0200e-003	8.7400e-003	3.7200e-003	6.0000e-005		7.1000e-004	7.1000e-004		7.1000e-004	7.1000e-004	0.0000	10.1244	10.1244	1.9000e-004	1.9000e-004	10.1846
Single Family Housing	255147	1.3800e-003	0.0118	5.0000e-003	8.0000e-005		9.5000e-004	9.5000e-004		9.5000e-004	9.5000e-004	0.0000	13.6156	13.6156	2.6000e-004	2.5000e-004	13.6965
Single Family Housing	569174	3.0700e-003	0.0262	0.0112	1.7000e-004		2.1200e-003	2.1200e-003		2.1200e-003	2.1200e-003	0.0000	30.3733	30.3733	5.8000e-004	5.6000e-004	30.5538
Single Family Housing	582258	3.1400e-003	0.0268	0.0114	1.7000e-004		2.1700e-003	2.1700e-003		2.1700e-003	2.1700e-003	0.0000	31.0715	31.0715	6.0000e-004	5.7000e-004	31.2562
Single Family Housing	71964.5	3.9000e-004	3.3200e-003	1.4100e-003	2.0000e-005		2.7000e-004	2.7000e-004		2.7000e-004	2.7000e-004	0.0000	3.8403	3.8403	7.0000e-005	7.0000e-005	3.8631
Single Family Housing	955165	5.1500e-003	0.0440	0.0187	2.8000e-004		3.5600e-003	3.5600e-003		3.5600e-003	3.5600e-003	0.0000	50.9712	50.9712	9.8000e-004	9.3000e-004	51.2741
Total		**0.0142**	**0.1209**	**0.0514**	**7.8000e-004**		**9.7800e-003**	**9.7800e-003**		**9.7800e-003**	**9.7800e-003**	**0.0000**	**139.9963**	**139.9963**	**2.6800e-003**	**2.5700e-003**	**140.8283**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	1.26687e+006	368.5482	0.0167	3.4500e-003	369.9923
Single Family Housing	251639	73.2048	3.3100e-003	6.8000e-004	73.4916
Single Family Housing	338412	98.4478	4.4500e-003	9.2000e-004	98.8336
Single Family Housing	754918	219.6143	9.9300e-003	2.0500e-003	220.4749
Single Family Housing	772273	224.6630	0.0102	2.1000e-003	225.5433
Single Family Housing	95449.4	27.7673	1.2600e-003	2.6000e-004	27.8761
Total		**1,012.2454**	**0.0458**	**9.4600e-003**	**1,016.2117**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.3532	0.0344	2.9807	1.6000e-004		0.0165	0.0165		0.0165	0.0165	0.0000	4.8637	4.8637	4.6900e-003	0.0000	4.9810
Unmitigated	3.3532	0.0344	2.9807	1.6000e-004		0.0165	0.0165		0.0165	0.0165	0.0000	4.8637	4.8637	4.6900e-003	0.0000	4.9810

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.1291					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.1340					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0900	0.0344	2.9807	1.6000e-004		0.0165	0.0165		0.0165	0.0165	0.0000	4.8637	4.8637	4.6900e-003	0.0000	4.9810
Total	**3.3532**	**0.0344**	**2.9807**	**1.6000e-004**		**0.0165**	**0.0165**		**0.0165**	**0.0165**	**0.0000**	**4.8637**	**4.8637**	**4.6900e-003**	**0.0000**	**4.9810**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.1291					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.1340					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0900	0.0344	2.9807	1.6000e-004		0.0165	0.0165		0.0165	0.0165	0.0000	4.8637	4.8637	4.6900e-003	0.0000	4.9810
Total	**3.3532**	**0.0344**	**2.9807**	**1.6000e-004**		**0.0165**	**0.0165**		**0.0165**	**0.0165**	**0.0000**	**4.8637**	**4.8637**	**4.6900e-003**	**0.0000**	**4.9810**

7.0 Water Detail

7.1 Mitigation Measures Water

Use Reclaimed Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	54.6262	0.6832	0.0165	76.6334
Unmitigated	66.1864	0.8540	0.0206	93.6872

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	26.1268 / 16.4712	66.1864	0.8540	0.0206	93.6872
Total		**66.1864**	**0.8540**	**0.0206**	**93.6872**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	20.9014 / 14.8241	54.6262	0.6832	0.0165	76.6334
Total		**54.6262**	**0.6832**	**0.0165**	**76.6334**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	83.8921	4.9579	0.0000	207.8391
Unmitigated	83.8921	4.9579	0.0000	207.8391

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	413.28	83.8921	4.9579	0.0000	207.8391
Total		**83.8921**	**4.9579**	**0.0000**	**207.8391**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	413.28	83.8921	4.9579	0.0000	207.8391
Total		**83.8921**	**4.9579**	**0.0000**	**207.8391**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Guenoc Valley Mixed Use Planned Development Project - Future Phases

Lake County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Commercial	5.00	User Defined Unit	16.00	5,000.00	0
User Defined Industrial	25.00	User Defined Unit	16.00	25,000.00	0
Golf Course	18.00	Hole	125.66	0.00	0
Hotel	565.00	Room	18.83	820,380.00	0
Quality Restaurant	14.00	1000sqft	0.32	14,000.00	0
Apartments Low Rise	200.00	Dwelling Unit	12.50	200,000.00	572
Single Family Housing	1,000.00	Dwelling Unit	324.68	1,800,000.00	2860
Regional Shopping Center	16.00	1000sqft	0.37	16,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	67
Climate Zone	1			**Operational Year**	2030
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Notes

Construction Phase - Notes

Off-road Equipment - Notes

Off-road Equipment - Notes

Off-road Equipment - Notes

Off-road Equipment - Notes

Off-road Equipment - Notes

Off-road Equipment - Notes

Vehicle Trips - Notes

Vehicle Emission Factors - EMFAC 2017

Vehicle Emission Factors - EMFAC 2017

Vehicle Emission Factors - EMFAC 2017

Woodstoves - Notes

Consumer Products - Statewide consumer product emission factors for 2017. 2017 value calculated using the growth in California population and the 2008 total building square footage.

Energy Use - Notes

Water And Wastewater - Notes

Solid Waste - Notes

Land Use Change -

Construction Off-road Equipment Mitigation - Notes

Area Mitigation -

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True

Guenoc Valley Mixed Use Planned Development Project - Future Phases - Lake County, Annual

tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	20.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	21.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	13.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	660.00	146.00
tblConstructionPhase	NumDays	9,300.00	2,060.00
tblConstructionPhase	NumDays	600.00	0.00
tblConstructionPhase	NumDays	930.00	207.00
tblConstructionPhase	NumDays	660.00	146.00
tblConstructionPhase	NumDays	360.00	80.00
tblConsumerProducts	ROG_EF	2.14E-05	1.62E-05
tblEnergyUse	LightingElect	0.00	4.74
tblEnergyUse	LightingElect	0.00	3.45
tblEnergyUse	NT24E	0.00	15.83
tblEnergyUse	NT24E	0.00	3.98
tblEnergyUse	NT24NG	0.00	88.55
tblEnergyUse	T24E	0.00	4.00
tblEnergyUse	T24E	0.00	3.63
tblEnergyUse	T24NG	0.00	27.65

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tblEnergyUse	T24NG	0.00	19.54
tblFireplaces	FireplaceDayYear	82.00	0.00
tblFireplaces	FireplaceDayYear	82.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	NumberGas	110.00	0.00
tblFireplaces	NumberGas	550.00	0.00
tblFireplaces	NumberNoFireplace	20.00	0.00
tblFireplaces	NumberNoFireplace	100.00	0.00
tblFireplaces	NumberWood	70.00	0.00
tblFireplaces	NumberWood	350.00	0.00
tblGrading	AcresOfGrading	2,458.13	2,325.00
tblLandUse	LandUseSquareFeet	0.00	5,000.00
tblLandUse	LandUseSquareFeet	0.00	25,000.00
tblLandUse	LotAcreage	0.00	16.00
tblLandUse	LotAcreage	0.00	16.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	10.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	20.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	10.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	10.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	11.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	11.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	11.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	11.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	16.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	8.00
tblOffRoadEquipment	UsageHours	6.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	7.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	7.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00

tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblSolidWaste	SolidWasteGenerationRate	0.00	31.50
tblSolidWaste	SolidWasteGenerationRate	0.00	2.40
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	53.00	18.00
tblTripsAndVMT	WorkerTripNumber	110.00	20.00
tblTripsAndVMT	WorkerTripNumber	83.00	15.00
tblVehicleEF	HHD	0.24	0.02
tblVehicleEF	HHD	5.4240e-003	0.05
tblVehicleEF	HHD	0.09	0.00
tblVehicleEF	HHD	0.96	6.28
tblVehicleEF	HHD	0.79	0.40
tblVehicleEF	HHD	2.60	5.3000e-003
tblVehicleEF	HHD	2,724.34	1,039.23
tblVehicleEF	HHD	1,527.40	1,409.20
tblVehicleEF	HHD	6.67	0.04
tblVehicleEF	HHD	8.52	5.34
tblVehicleEF	HHD	2.06	2.66
tblVehicleEF	HHD	20.08	2.36
tblVehicleEF	HHD	4.5140e-003	2.6000e-003
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.03	0.04
tblVehicleEF	HHD	7.5870e-003	0.02
tblVehicleEF	HHD	5.7000e-005	0.00
tblVehicleEF	HHD	4.3190e-003	2.5000e-003

tblVehicleEF	HHD	0.02	0.03
tblVehicleEF	HHD	8.4070e-003	8.9000e-003
tblVehicleEF	HHD	7.2580e-003	0.02
tblVehicleEF	HHD	5.2000e-005	0.00
tblVehicleEF	HHD	1.1600e-004	0.00
tblVehicleEF	HHD	4.8960e-003	1.0000e-004
tblVehicleEF	HHD	0.26	0.42
tblVehicleEF	HHD	6.6000e-005	0.00
tblVehicleEF	HHD	0.09	0.03
tblVehicleEF	HHD	1.4070e-003	0.00
tblVehicleEF	HHD	0.06	0.00
tblVehicleEF	HHD	0.03	9.7000e-003
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	1.0900e-004	0.00
tblVehicleEF	HHD	1.1600e-004	0.00
tblVehicleEF	HHD	4.8960e-003	1.0000e-004
tblVehicleEF	HHD	0.29	0.49
tblVehicleEF	HHD	6.6000e-005	0.00
tblVehicleEF	HHD	0.10	0.07
tblVehicleEF	HHD	1.4070e-003	0.00
tblVehicleEF	HHD	0.07	0.00
tblVehicleEF	HHD	0.23	0.02
tblVehicleEF	HHD	5.4750e-003	0.05
tblVehicleEF	HHD	0.08	0.00
tblVehicleEF	HHD	0.70	6.28
tblVehicleEF	HHD	0.80	0.40
tblVehicleEF	HHD	2.35	5.3000e-003

tblVehicleEF	HHD	2,886.04	1,039.23
tblVehicleEF	HHD	1,527.40	1,409.20
tblVehicleEF	HHD	6.67	0.04
tblVehicleEF	HHD	8.80	5.34
tblVehicleEF	HHD	1.99	2.66
tblVehicleEF	HHD	20.06	2.36
tblVehicleEF	HHD	3.8290e-003	2.6000e-003
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.03	0.04
tblVehicleEF	HHD	7.5870e-003	0.02
tblVehicleEF	HHD	5.7000e-005	0.00
tblVehicleEF	HHD	3.6630e-003	2.5000e-003
tblVehicleEF	HHD	0.02	0.03
tblVehicleEF	HHD	8.4070e-003	8.9000e-003
tblVehicleEF	HHD	7.2580e-003	0.02
tblVehicleEF	HHD	5.2000e-005	0.00
tblVehicleEF	HHD	2.4900e-004	0.00
tblVehicleEF	HHD	5.2770e-003	1.0000e-004
tblVehicleEF	HHD	0.24	0.42
tblVehicleEF	HHD	1.3600e-004	0.00
tblVehicleEF	HHD	0.09	0.03
tblVehicleEF	HHD	1.3350e-003	0.00
tblVehicleEF	HHD	0.06	0.00
tblVehicleEF	HHD	0.03	9.7000e-003
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	1.0500e-004	0.00
tblVehicleEF	HHD	2.4900e-004	0.00

tblVehicleEF	HHD	5.2770e-003	1.0000e-004
tblVehicleEF	HHD	0.28	0.49
tblVehicleEF	HHD	1.3600e-004	0.00
tblVehicleEF	HHD	0.10	0.07
tblVehicleEF	HHD	1.3350e-003	0.00
tblVehicleEF	HHD	0.06	0.00
tblVehicleEF	HHD	0.26	0.02
tblVehicleEF	HHD	5.4710e-003	0.05
tblVehicleEF	HHD	0.08	0.00
tblVehicleEF	HHD	1.32	6.28
tblVehicleEF	HHD	0.80	0.40
tblVehicleEF	HHD	2.37	5.3000e-003
tblVehicleEF	HHD	2,501.03	1,039.23
tblVehicleEF	HHD	1,527.40	1,409.20
tblVehicleEF	HHD	6.67	0.04
tblVehicleEF	HHD	8.14	5.34
tblVehicleEF	HHD	1.99	2.66
tblVehicleEF	HHD	20.06	2.36
tblVehicleEF	HHD	5.4610e-003	2.6000e-003
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.03	0.04
tblVehicleEF	HHD	7.5870e-003	0.02
tblVehicleEF	HHD	5.7000e-005	0.00
tblVehicleEF	HHD	5.2240e-003	2.5000e-003
tblVehicleEF	HHD	0.02	0.03
tblVehicleEF	HHD	8.4070e-003	8.9000e-003
tblVehicleEF	HHD	7.2580e-003	0.02

tblVehicleEF	HHD	5.2000e-005	0.00
tblVehicleEF	HHD	2.2000e-004	0.00
tblVehicleEF	HHD	6.9200e-003	1.0000e-004
tblVehicleEF	HHD	0.28	0.42
tblVehicleEF	HHD	1.6400e-004	0.00
tblVehicleEF	HHD	0.09	0.03
tblVehicleEF	HHD	1.6200e-003	0.00
tblVehicleEF	HHD	0.06	0.00
tblVehicleEF	HHD	0.02	9.7000e-003
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	1.0600e-004	0.00
tblVehicleEF	HHD	2.2000e-004	0.00
tblVehicleEF	HHD	6.9200e-003	1.0000e-004
tblVehicleEF	HHD	0.32	0.49
tblVehicleEF	HHD	1.6400e-004	0.00
tblVehicleEF	HHD	0.10	0.07
tblVehicleEF	HHD	1.6200e-003	0.00
tblVehicleEF	HHD	0.06	0.00
tblVehicleEF	LDA	3.5310e-003	1.8000e-003
tblVehicleEF	LDA	4.7440e-003	0.05
tblVehicleEF	LDA	0.48	0.52
tblVehicleEF	LDA	1.20	2.15
tblVehicleEF	LDA	197.00	239.59
tblVehicleEF	LDA	45.65	50.81
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	0.07	0.17
tblVehicleEF	LDA	0.04	0.04

tblVehicleEF	LDA	1.3500e-003	1.3000e-003
tblVehicleEF	LDA	2.0480e-003	1.7000e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	1.2420e-003	1.2000e-003
tblVehicleEF	LDA	1.8830e-003	1.6000e-003
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	0.12	0.09
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	8.8310e-003	6.6000e-003
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	0.06	0.21
tblVehicleEF	LDA	1.9730e-003	2.4000e-003
tblVehicleEF	LDA	4.7700e-004	5.0000e-004
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	0.12	0.09
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.01	9.6000e-003
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	0.07	0.23
tblVehicleEF	LDA	3.9140e-003	1.8000e-003
tblVehicleEF	LDA	3.8480e-003	0.05
tblVehicleEF	LDA	0.56	0.52
tblVehicleEF	LDA	0.93	2.15
tblVehicleEF	LDA	210.73	239.59
tblVehicleEF	LDA	45.65	50.81
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	0.06	0.17

tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	1.3500e-003	1.3000e-003
tblVehicleEF	LDA	2.0480e-003	1.7000e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	1.2420e-003	1.2000e-003
tblVehicleEF	LDA	1.8830e-003	1.6000e-003
tblVehicleEF	LDA	0.09	0.04
tblVehicleEF	LDA	0.13	0.09
tblVehicleEF	LDA	0.07	0.04
tblVehicleEF	LDA	9.7790e-003	6.6000e-003
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	0.05	0.21
tblVehicleEF	LDA	2.1120e-003	2.4000e-003
tblVehicleEF	LDA	4.7200e-004	5.0000e-004
tblVehicleEF	LDA	0.09	0.04
tblVehicleEF	LDA	0.13	0.09
tblVehicleEF	LDA	0.07	0.04
tblVehicleEF	LDA	0.01	9.6000e-003
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	0.06	0.23
tblVehicleEF	LDA	3.7550e-003	1.8000e-003
tblVehicleEF	LDA	3.9910e-003	0.05
tblVehicleEF	LDA	0.52	0.52
tblVehicleEF	LDA	0.96	2.15
tblVehicleEF	LDA	204.73	239.59
tblVehicleEF	LDA	45.65	50.81
tblVehicleEF	LDA	0.04	0.03

tblVehicleEF	LDA	0.06	0.17
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	1.3500e-003	1.3000e-003
tblVehicleEF	LDA	2.0480e-003	1.7000e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	1.2420e-003	1.2000e-003
tblVehicleEF	LDA	1.8830e-003	1.6000e-003
tblVehicleEF	LDA	0.09	0.04
tblVehicleEF	LDA	0.18	0.09
tblVehicleEF	LDA	0.07	0.04
tblVehicleEF	LDA	9.3860e-003	6.6000e-003
tblVehicleEF	LDA	0.05	0.03
tblVehicleEF	LDA	0.05	0.21
tblVehicleEF	LDA	2.0510e-003	2.4000e-003
tblVehicleEF	LDA	4.7200e-004	5.0000e-004
tblVehicleEF	LDA	0.09	0.04
tblVehicleEF	LDA	0.18	0.09
tblVehicleEF	LDA	0.07	0.04
tblVehicleEF	LDA	0.01	9.6000e-003
tblVehicleEF	LDA	0.05	0.03
tblVehicleEF	LDA	0.06	0.23
tblVehicleEF	LDT1	9.9740e-003	3.8000e-003
tblVehicleEF	LDT1	0.02	0.07
tblVehicleEF	LDT1	1.05	0.87
tblVehicleEF	LDT1	4.73	2.34
tblVehicleEF	LDT1	252.64	287.73
tblVehicleEF	LDT1	62.23	61.75

tblVehicleEF	LDT1	0.12	0.07
tblVehicleEF	LDT1	0.29	0.24
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	1.8620e-003	1.7000e-003
tblVehicleEF	LDT1	3.4460e-003	2.2000e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	1.7120e-003	1.5000e-003
tblVehicleEF	LDT1	3.1690e-003	2.0000e-003
tblVehicleEF	LDT1	0.21	0.09
tblVehicleEF	LDT1	0.48	0.18
tblVehicleEF	LDT1	0.14	0.08
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	0.31	0.08
tblVehicleEF	LDT1	0.32	0.32
tblVehicleEF	LDT1	2.5390e-003	2.8000e-003
tblVehicleEF	LDT1	7.0600e-004	6.0000e-004
tblVehicleEF	LDT1	0.21	0.09
tblVehicleEF	LDT1	0.48	0.18
tblVehicleEF	LDT1	0.14	0.08
tblVehicleEF	LDT1	0.04	0.02
tblVehicleEF	LDT1	0.31	0.08
tblVehicleEF	LDT1	0.35	0.35
tblVehicleEF	LDT1	0.01	3.8000e-003
tblVehicleEF	LDT1	0.02	0.07
tblVehicleEF	LDT1	1.20	0.87
tblVehicleEF	LDT1	3.64	2.34
tblVehicleEF	LDT1	269.78	287.73

tblVehicleEF	LDT1	62.23	61.75
tblVehicleEF	LDT1	0.11	0.07
tblVehicleEF	LDT1	0.26	0.24
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	1.8620e-003	1.7000e-003
tblVehicleEF	LDT1	3.4460e-003	2.2000e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	1.7120e-003	1.5000e-003
tblVehicleEF	LDT1	3.1690e-003	2.0000e-003
tblVehicleEF	LDT1	0.48	0.09
tblVehicleEF	LDT1	0.54	0.18
tblVehicleEF	LDT1	0.31	0.08
tblVehicleEF	LDT1	0.03	0.02
tblVehicleEF	LDT1	0.28	0.08
tblVehicleEF	LDT1	0.26	0.32
tblVehicleEF	LDT1	2.7130e-003	2.8000e-003
tblVehicleEF	LDT1	6.8700e-004	6.0000e-004
tblVehicleEF	LDT1	0.48	0.09
tblVehicleEF	LDT1	0.54	0.18
tblVehicleEF	LDT1	0.31	0.08
tblVehicleEF	LDT1	0.04	0.02
tblVehicleEF	LDT1	0.28	0.08
tblVehicleEF	LDT1	0.28	0.35
tblVehicleEF	LDT1	0.01	3.8000e-003
tblVehicleEF	LDT1	0.02	0.07
tblVehicleEF	LDT1	1.12	0.87
tblVehicleEF	LDT1	3.75	2.34

tblVehicleEF	LDT1	262.28	287.73
tblVehicleEF	LDT1	62.23	61.75
tblVehicleEF	LDT1	0.11	0.07
tblVehicleEF	LDT1	0.26	0.24
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	1.8620e-003	1.7000e-003
tblVehicleEF	LDT1	3.4460e-003	2.2000e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	1.7120e-003	1.5000e-003
tblVehicleEF	LDT1	3.1690e-003	2.0000e-003
tblVehicleEF	LDT1	0.51	0.09
tblVehicleEF	LDT1	0.86	0.18
tblVehicleEF	LDT1	0.34	0.08
tblVehicleEF	LDT1	0.03	0.02
tblVehicleEF	LDT1	0.38	0.08
tblVehicleEF	LDT1	0.27	0.32
tblVehicleEF	LDT1	2.6370e-003	2.8000e-003
tblVehicleEF	LDT1	6.8900e-004	6.0000e-004
tblVehicleEF	LDT1	0.51	0.09
tblVehicleEF	LDT1	0.86	0.18
tblVehicleEF	LDT1	0.34	0.08
tblVehicleEF	LDT1	0.04	0.02
tblVehicleEF	LDT1	0.38	0.08
tblVehicleEF	LDT1	0.29	0.35
tblVehicleEF	LDT2	5.3280e-003	2.9000e-003
tblVehicleEF	LDT2	8.5660e-003	0.06
tblVehicleEF	LDT2	0.71	0.70

tblVehicleEF	LDT2	2.05	2.74
tblVehicleEF	LDT2	287.51	307.00
tblVehicleEF	LDT2	68.29	66.18
tblVehicleEF	LDT2	0.08	0.06
tblVehicleEF	LDT2	0.18	0.26
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	1.4740e-003	1.3000e-003
tblVehicleEF	LDT2	2.2560e-003	1.7000e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	1.3550e-003	1.2000e-003
tblVehicleEF	LDT2	2.0740e-003	1.6000e-003
tblVehicleEF	LDT2	0.08	0.06
tblVehicleEF	LDT2	0.19	0.12
tblVehicleEF	LDT2	0.06	0.06
tblVehicleEF	LDT2	0.01	0.01
tblVehicleEF	LDT2	0.12	0.05
tblVehicleEF	LDT2	0.12	0.29
tblVehicleEF	LDT2	2.8810e-003	3.0000e-003
tblVehicleEF	LDT2	7.1800e-004	7.0000e-004
tblVehicleEF	LDT2	0.08	0.06
tblVehicleEF	LDT2	0.19	0.12
tblVehicleEF	LDT2	0.06	0.06
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.12	0.05
tblVehicleEF	LDT2	0.13	0.32
tblVehicleEF	LDT2	5.8960e-003	2.9000e-003
tblVehicleEF	LDT2	6.9570e-003	0.06

tblVehicleEF	LDT2	0.82	0.70
tblVehicleEF	LDT2	1.60	2.74
tblVehicleEF	LDT2	307.13	307.00
tblVehicleEF	LDT2	68.29	66.18
tblVehicleEF	LDT2	0.07	0.06
tblVehicleEF	LDT2	0.16	0.26
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	1.4740e-003	1.3000e-003
tblVehicleEF	LDT2	2.2560e-003	1.7000e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	1.3550e-003	1.2000e-003
tblVehicleEF	LDT2	2.0740e-003	1.6000e-003
tblVehicleEF	LDT2	0.17	0.06
tblVehicleEF	LDT2	0.21	0.12
tblVehicleEF	LDT2	0.14	0.06
tblVehicleEF	LDT2	0.01	0.01
tblVehicleEF	LDT2	0.11	0.05
tblVehicleEF	LDT2	0.09	0.29
tblVehicleEF	LDT2	3.0790e-003	3.0000e-003
tblVehicleEF	LDT2	7.1000e-004	7.0000e-004
tblVehicleEF	LDT2	0.17	0.06
tblVehicleEF	LDT2	0.21	0.12
tblVehicleEF	LDT2	0.14	0.06
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.11	0.05
tblVehicleEF	LDT2	0.10	0.32
tblVehicleEF	LDT2	5.6600e-003	2.9000e-003

tblVehicleEF	LDT2	7.2110e-003	0.06
tblVehicleEF	LDT2	0.76	0.70
tblVehicleEF	LDT2	1.64	2.74
tblVehicleEF	LDT2	298.55	307.00
tblVehicleEF	LDT2	68.29	66.18
tblVehicleEF	LDT2	0.07	0.06
tblVehicleEF	LDT2	0.16	0.26
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	1.4740e-003	1.3000e-003
tblVehicleEF	LDT2	2.2560e-003	1.7000e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	1.3550e-003	1.2000e-003
tblVehicleEF	LDT2	2.0740e-003	1.6000e-003
tblVehicleEF	LDT2	0.16	0.06
tblVehicleEF	LDT2	0.29	0.12
tblVehicleEF	LDT2	0.14	0.06
tblVehicleEF	LDT2	0.01	0.01
tblVehicleEF	LDT2	0.15	0.05
tblVehicleEF	LDT2	0.10	0.29
tblVehicleEF	LDT2	2.9920e-003	3.0000e-003
tblVehicleEF	LDT2	7.1100e-004	7.0000e-004
tblVehicleEF	LDT2	0.16	0.06
tblVehicleEF	LDT2	0.29	0.12
tblVehicleEF	LDT2	0.14	0.06
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.15	0.05
tblVehicleEF	LDT2	0.11	0.32

tblVehicleEF	LHD1	6.3380e-003	4.8000e-003
tblVehicleEF	LHD1	0.03	8.4000e-003
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.16	0.18
tblVehicleEF	LHD1	1.73	0.77
tblVehicleEF	LHD1	3.65	0.99
tblVehicleEF	LHD1	9.22	9.11
tblVehicleEF	LHD1	697.20	776.98
tblVehicleEF	LHD1	30.22	10.85
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	2.27	0.94
tblVehicleEF	LHD1	1.35	0.30
tblVehicleEF	LHD1	9.3700e-004	9.0000e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	0.01	9.9000e-003
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tblVehicleEF	LHD1	8.9700e-004	9.0000e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.5240e-003	2.5000e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	1.1170e-003	2.0000e-004
tblVehicleEF	LHD1	5.3360e-003	1.8000e-003
tblVehicleEF	LHD1	0.23	0.07
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	2.4870e-003	1.0000e-003
tblVehicleEF	LHD1	0.18	0.10

tblVehicleEF	LHD1	1.14	0.20
tblVehicleEF	LHD1	0.39	0.07
tblVehicleEF	LHD1	9.2000e-005	1.0000e-004
tblVehicleEF	LHD1	6.8500e-003	7.6000e-003
tblVehicleEF	LHD1	3.7200e-004	1.0000e-004
tblVehicleEF	LHD1	5.3360e-003	1.8000e-003
tblVehicleEF	LHD1	0.23	0.07
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4870e-003	1.0000e-003
tblVehicleEF	LHD1	0.23	0.12
tblVehicleEF	LHD1	1.14	0.20
tblVehicleEF	LHD1	0.43	0.08
tblVehicleEF	LHD1	6.3380e-003	4.8000e-003
tblVehicleEF	LHD1	0.03	8.4000e-003
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.16	0.18
tblVehicleEF	LHD1	1.77	0.77
tblVehicleEF	LHD1	3.33	0.99
tblVehicleEF	LHD1	9.22	9.11
tblVehicleEF	LHD1	697.20	776.98
tblVehicleEF	LHD1	30.22	10.85
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	2.17	0.94
tblVehicleEF	LHD1	1.25	0.30
tblVehicleEF	LHD1	9.3700e-004	9.0000e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	0.01	9.9000e-003

tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	1.2150e-003	2.0000e-004
tblVehicleEF	LHD1	8.9700e-004	9.0000e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.5240e-003	2.5000e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	1.1170e-003	2.0000e-004
tblVehicleEF	LHD1	0.01	1.8000e-003
tblVehicleEF	LHD1	0.26	0.07
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	5.2070e-003	1.0000e-003
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tblVehicleEF	LHD1	1.10	0.20
tblVehicleEF	LHD1	0.37	0.07
tblVehicleEF	LHD1	9.2000e-005	1.0000e-004
tblVehicleEF	LHD1	6.8510e-003	7.6000e-003
tblVehicleEF	LHD1	3.6600e-004	1.0000e-004
tblVehicleEF	LHD1	0.01	1.8000e-003
tblVehicleEF	LHD1	0.26	0.07
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	5.2070e-003	1.0000e-003
tblVehicleEF	LHD1	0.23	0.12
tblVehicleEF	LHD1	1.10	0.20
tblVehicleEF	LHD1	0.40	0.08
tblVehicleEF	LHD1	6.3380e-003	4.8000e-003
tblVehicleEF	LHD1	0.03	8.4000e-003
tblVehicleEF	LHD1	0.03	0.01

tblVehicleEF	LHD1	0.16	0.18
tblVehicleEF	LHD1	1.77	0.77
tblVehicleEF	LHD1	3.35	0.99
tblVehicleEF	LHD1	9.22	9.11
tblVehicleEF	LHD1	697.20	776.98
tblVehicleEF	LHD1	30.22	10.85
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	2.18	0.94
tblVehicleEF	LHD1	1.25	0.30
tblVehicleEF	LHD1	9.3700e-004	9.0000e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	0.01	9.9000e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	1.2150e-003	2.0000e-004
tblVehicleEF	LHD1	8.9700e-004	9.0000e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.5240e-003	2.5000e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	1.1170e-003	2.0000e-004
tblVehicleEF	LHD1	0.01	1.8000e-003
tblVehicleEF	LHD1	0.41	0.07
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	6.2580e-003	1.0000e-003
tblVehicleEF	LHD1	0.18	0.10
tblVehicleEF	LHD1	1.29	0.20
tblVehicleEF	LHD1	0.37	0.07
tblVehicleEF	LHD1	9.2000e-005	1.0000e-004

tblVehicleEF	LHD1	6.8510e-003	7.6000e-003
tblVehicleEF	LHD1	3.6700e-004	1.0000e-004
tblVehicleEF	LHD1	0.01	1.8000e-003
tblVehicleEF	LHD1	0.41	0.07
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	6.2580e-003	1.0000e-003
tblVehicleEF	LHD1	0.23	0.12
tblVehicleEF	LHD1	1.29	0.20
tblVehicleEF	LHD1	0.41	0.08
tblVehicleEF	LHD2	2.6390e-003	2.9000e-003
tblVehicleEF	LHD2	8.3910e-003	6.9000e-003
tblVehicleEF	LHD2	5.2210e-003	7.3000e-003
tblVehicleEF	LHD2	0.12	0.13
tblVehicleEF	LHD2	0.71	0.64
tblVehicleEF	LHD2	0.99	0.55
tblVehicleEF	LHD2	14.78	14.31
tblVehicleEF	LHD2	678.64	754.66
tblVehicleEF	LHD2	17.07	7.04
tblVehicleEF	LHD2	0.11	0.11
tblVehicleEF	LHD2	1.05	0.98
tblVehicleEF	LHD2	0.32	0.17
tblVehicleEF	LHD2	1.3260e-003	1.5000e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	3.3800e-004	1.0000e-004
tblVehicleEF	LHD2	1.2690e-003	1.4000e-003

tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.7540e-003	2.7000e-003
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	3.1100e-004	1.0000e-004
tblVehicleEF	LHD2	8.4400e-004	8.0000e-004
tblVehicleEF	LHD2	0.03	0.03
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	4.3200e-004	5.0000e-004
tblVehicleEF	LHD2	0.12	0.12
tblVehicleEF	LHD2	0.11	0.08
tblVehicleEF	LHD2	0.07	0.04
tblVehicleEF	LHD2	1.4300e-004	1.0000e-004
tblVehicleEF	LHD2	6.5770e-003	7.3000e-003
tblVehicleEF	LHD2	1.8800e-004	1.0000e-004
tblVehicleEF	LHD2	8.4400e-004	8.0000e-004
tblVehicleEF	LHD2	0.03	0.03
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	4.3200e-004	5.0000e-004
tblVehicleEF	LHD2	0.14	0.13
tblVehicleEF	LHD2	0.11	0.08
tblVehicleEF	LHD2	0.08	0.04
tblVehicleEF	LHD2	2.6390e-003	2.9000e-003
tblVehicleEF	LHD2	8.4940e-003	6.9000e-003
tblVehicleEF	LHD2	4.9420e-003	7.3000e-003
tblVehicleEF	LHD2	0.12	0.13
tblVehicleEF	LHD2	0.71	0.64
tblVehicleEF	LHD2	0.91	0.55

tblVehicleEF	LHD2	14.78	14.31
tblVehicleEF	LHD2	678.64	754.66
tblVehicleEF	LHD2	17.07	7.04
tblVehicleEF	LHD2	0.11	0.11
tblVehicleEF	LHD2	1.01	0.98
tblVehicleEF	LHD2	0.30	0.17
tblVehicleEF	LHD2	1.3260e-003	1.5000e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	3.3800e-004	1.0000e-004
tblVehicleEF	LHD2	1.2690e-003	1.4000e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.7540e-003	2.7000e-003
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	3.1100e-004	1.0000e-004
tblVehicleEF	LHD2	1.8090e-003	8.0000e-004
tblVehicleEF	LHD2	0.04	0.03
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tblVehicleEF	LHD2	8.9700e-004	5.0000e-004
tblVehicleEF	LHD2	0.12	0.12
tblVehicleEF	LHD2	0.10	0.08
tblVehicleEF	LHD2	0.07	0.04
tblVehicleEF	LHD2	1.4300e-004	1.0000e-004
tblVehicleEF	LHD2	6.5770e-003	7.3000e-003
tblVehicleEF	LHD2	1.8700e-004	1.0000e-004
tblVehicleEF	LHD2	1.8090e-003	8.0000e-004

tblVehicleEF	LHD2	0.04	0.03
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	8.9700e-004	5.0000e-004
tblVehicleEF	LHD2	0.14	0.13
tblVehicleEF	LHD2	0.10	0.08
tblVehicleEF	LHD2	0.07	0.04
tblVehicleEF	LHD2	2.6390e-003	2.9000e-003
tblVehicleEF	LHD2	8.4860e-003	6.9000e-003
tblVehicleEF	LHD2	4.9660e-003	7.3000e-003
tblVehicleEF	LHD2	0.12	0.13
tblVehicleEF	LHD2	0.71	0.64
tblVehicleEF	LHD2	0.92	0.55
tblVehicleEF	LHD2	14.78	14.31
tblVehicleEF	LHD2	678.64	754.66
tblVehicleEF	LHD2	17.07	7.04
tblVehicleEF	LHD2	0.11	0.11
tblVehicleEF	LHD2	1.01	0.98
tblVehicleEF	LHD2	0.30	0.17
tblVehicleEF	LHD2	1.3260e-003	1.5000e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	3.3800e-004	1.0000e-004
tblVehicleEF	LHD2	1.2690e-003	1.4000e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.7540e-003	2.7000e-003
tblVehicleEF	LHD2	0.02	0.02

tblVehicleEF	LHD2	3.1100e-004	1.0000e-004
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tblVehicleEF	LHD2	0.01	0.02
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tblVehicleEF	LHD2	0.12	0.12
tblVehicleEF	LHD2	0.12	0.08
tblVehicleEF	LHD2	0.07	0.04
tblVehicleEF	LHD2	1.4300e-004	1.0000e-004
tblVehicleEF	LHD2	6.5770e-003	7.3000e-003
tblVehicleEF	LHD2	1.8700e-004	1.0000e-004
tblVehicleEF	LHD2	1.7220e-003	8.0000e-004
tblVehicleEF	LHD2	0.05	0.03
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	1.0720e-003	5.0000e-004
tblVehicleEF	LHD2	0.14	0.13
tblVehicleEF	LHD2	0.12	0.08
tblVehicleEF	LHD2	0.07	0.04
tblVehicleEF	MCY	0.45	0.34
tblVehicleEF	MCY	0.17	0.26
tblVehicleEF	MCY	20.88	20.00
tblVehicleEF	MCY	10.49	9.07
tblVehicleEF	MCY	170.83	213.40
tblVehicleEF	MCY	47.71	61.71
tblVehicleEF	MCY	1.19	1.16
tblVehicleEF	MCY	0.32	0.27
tblVehicleEF	MCY	0.01	0.01

tblVehicleEF	MCY	2.0290e-003	2.0000e-003
tblVehicleEF	MCY	3.0800e-003	3.0000e-003
tblVehicleEF	MCY	5.0400e-003	5.0000e-003
tblVehicleEF	MCY	1.8980e-003	1.9000e-003
tblVehicleEF	MCY	2.9010e-003	2.8000e-003
tblVehicleEF	MCY	1.39	0.89
tblVehicleEF	MCY	1.09	0.75
tblVehicleEF	MCY	0.70	0.56
tblVehicleEF	MCY	2.41	2.29
tblVehicleEF	MCY	0.88	0.56
tblVehicleEF	MCY	2.34	1.98
tblVehicleEF	MCY	2.1190e-003	2.1000e-003
tblVehicleEF	MCY	7.1800e-004	6.0000e-004
tblVehicleEF	MCY	1.39	0.89
tblVehicleEF	MCY	1.09	0.75
tblVehicleEF	MCY	0.70	0.56
tblVehicleEF	MCY	2.95	2.82
tblVehicleEF	MCY	0.88	0.56
tblVehicleEF	MCY	2.54	2.15
tblVehicleEF	MCY	0.44	0.34
tblVehicleEF	MCY	0.14	0.26
tblVehicleEF	MCY	19.77	20.00
tblVehicleEF	MCY	9.01	9.07
tblVehicleEF	MCY	170.83	213.40
tblVehicleEF	MCY	47.71	61.71
tblVehicleEF	MCY	1.04	1.16
tblVehicleEF	MCY	0.29	0.27

tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	2.0290e-003	2.0000e-003
tblVehicleEF	MCY	3.0800e-003	3.0000e-003
tblVehicleEF	MCY	5.0400e-003	5.0000e-003
tblVehicleEF	MCY	1.8980e-003	1.9000e-003
tblVehicleEF	MCY	2.9010e-003	2.8000e-003
tblVehicleEF	MCY	3.26	0.89
tblVehicleEF	MCY	1.45	0.75
tblVehicleEF	MCY	1.73	0.56
tblVehicleEF	MCY	2.30	2.29
tblVehicleEF	MCY	0.82	0.56
tblVehicleEF	MCY	1.88	1.98
tblVehicleEF	MCY	2.0980e-003	2.1000e-003
tblVehicleEF	MCY	6.7900e-004	6.0000e-004
tblVehicleEF	MCY	3.26	0.89
tblVehicleEF	MCY	1.45	0.75
tblVehicleEF	MCY	1.73	0.56
tblVehicleEF	MCY	2.82	2.82
tblVehicleEF	MCY	0.82	0.56
tblVehicleEF	MCY	2.05	2.15
tblVehicleEF	MCY	0.44	0.34
tblVehicleEF	MCY	0.14	0.26
tblVehicleEF	MCY	19.26	20.00
tblVehicleEF	MCY	8.99	9.07
tblVehicleEF	MCY	170.83	213.40
tblVehicleEF	MCY	47.71	61.71
tblVehicleEF	MCY	1.06	1.16

tblVehicleEF	MCY	0.30	0.27
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	2.0290e-003	2.0000e-003
tblVehicleEF	MCY	3.0800e-003	3.0000e-003
tblVehicleEF	MCY	5.0400e-003	5.0000e-003
tblVehicleEF	MCY	1.8980e-003	1.9000e-003
tblVehicleEF	MCY	2.9010e-003	2.8000e-003
tblVehicleEF	MCY	4.14	0.89
tblVehicleEF	MCY	3.05	0.75
tblVehicleEF	MCY	2.31	0.56
tblVehicleEF	MCY	2.29	2.29
tblVehicleEF	MCY	1.05	0.56
tblVehicleEF	MCY	1.91	1.98
tblVehicleEF	MCY	2.0900e-003	2.1000e-003
tblVehicleEF	MCY	6.8000e-004	6.0000e-004
tblVehicleEF	MCY	4.14	0.89
tblVehicleEF	MCY	3.05	0.75
tblVehicleEF	MCY	2.31	0.56
tblVehicleEF	MCY	2.81	2.82
tblVehicleEF	MCY	1.05	0.56
tblVehicleEF	MCY	2.08	2.15
tblVehicleEF	MDV	0.02	3.8000e-003
tblVehicleEF	MDV	0.03	0.08
tblVehicleEF	MDV	1.38	0.82
tblVehicleEF	MDV	5.32	3.10
tblVehicleEF	MDV	412.91	379.50
tblVehicleEF	MDV	97.64	81.06

tblVehicleEF	MDV	0.24	0.08
tblVehicleEF	MDV	0.53	0.32
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	1.7840e-003	1.5000e-003
tblVehicleEF	MDV	2.9620e-003	1.8000e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	1.6430e-003	1.3000e-003
tblVehicleEF	MDV	2.7240e-003	1.7000e-003
tblVehicleEF	MDV	0.18	0.07
tblVehicleEF	MDV	0.43	0.15
tblVehicleEF	MDV	0.15	0.08
tblVehicleEF	MDV	0.04	0.02
tblVehicleEF	MDV	0.36	0.06
tblVehicleEF	MDV	0.39	0.38
tblVehicleEF	MDV	4.1410e-003	3.8000e-003
tblVehicleEF	MDV	1.0710e-003	8.0000e-004
tblVehicleEF	MDV	0.18	0.07
tblVehicleEF	MDV	0.43	0.15
tblVehicleEF	MDV	0.15	0.08
tblVehicleEF	MDV	0.06	0.02
tblVehicleEF	MDV	0.36	0.06
tblVehicleEF	MDV	0.42	0.42
tblVehicleEF	MDV	0.02	3.8000e-003
tblVehicleEF	MDV	0.02	0.08
tblVehicleEF	MDV	1.59	0.82
tblVehicleEF	MDV	4.12	3.10
tblVehicleEF	MDV	440.18	379.50

tblVehicleEF	MDV	97.64	81.06
tblVehicleEF	MDV	0.21	0.08
tblVehicleEF	MDV	0.47	0.32
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	1.7840e-003	1.5000e-003
tblVehicleEF	MDV	2.9620e-003	1.8000e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	1.6430e-003	1.3000e-003
tblVehicleEF	MDV	2.7240e-003	1.7000e-003
tblVehicleEF	MDV	0.40	0.07
tblVehicleEF	MDV	0.48	0.15
tblVehicleEF	MDV	0.31	0.08
tblVehicleEF	MDV	0.04	0.02
tblVehicleEF	MDV	0.32	0.06
tblVehicleEF	MDV	0.31	0.38
tblVehicleEF	MDV	4.4170e-003	3.8000e-003
tblVehicleEF	MDV	1.0500e-003	8.0000e-004
tblVehicleEF	MDV	0.40	0.07
tblVehicleEF	MDV	0.48	0.15
tblVehicleEF	MDV	0.31	0.08
tblVehicleEF	MDV	0.06	0.02
tblVehicleEF	MDV	0.32	0.06
tblVehicleEF	MDV	0.34	0.42
tblVehicleEF	MDV	0.02	3.8000e-003
tblVehicleEF	MDV	0.02	0.08
tblVehicleEF	MDV	1.49	0.82
tblVehicleEF	MDV	4.24	3.10

tblVehicleEF	MDV	428.26	379.50
tblVehicleEF	MDV	97.64	81.06
tblVehicleEF	MDV	0.21	0.08
tblVehicleEF	MDV	0.47	0.32
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	1.7840e-003	1.5000e-003
tblVehicleEF	MDV	2.9620e-003	1.8000e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	1.6430e-003	1.3000e-003
tblVehicleEF	MDV	2.7240e-003	1.7000e-003
tblVehicleEF	MDV	0.38	0.07
tblVehicleEF	MDV	0.68	0.15
tblVehicleEF	MDV	0.32	0.08
tblVehicleEF	MDV	0.04	0.02
tblVehicleEF	MDV	0.44	0.06
tblVehicleEF	MDV	0.32	0.38
tblVehicleEF	MDV	4.2960e-003	3.8000e-003
tblVehicleEF	MDV	1.0520e-003	8.0000e-004
tblVehicleEF	MDV	0.38	0.07
tblVehicleEF	MDV	0.68	0.15
tblVehicleEF	MDV	0.32	0.08
tblVehicleEF	MDV	0.06	0.02
tblVehicleEF	MDV	0.44	0.06
tblVehicleEF	MDV	0.35	0.42
tblVehicleEF	MH	0.04	9.3000e-003
tblVehicleEF	MH	0.04	0.02
tblVehicleEF	MH	2.16	0.85

tblVehicleEF	MH	7.76	1.96
tblVehicleEF	MH	1,228.21	1,512.95
tblVehicleEF	MH	61.00	17.73
tblVehicleEF	MH	1.81	1.52
tblVehicleEF	MH	1.49	0.24
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	1.1640e-003	2.0000e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.2010e-003	3.3000e-003
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	1.0700e-003	2.0000e-004
tblVehicleEF	MH	1.72	0.58
tblVehicleEF	MH	0.14	0.05
tblVehicleEF	MH	0.56	0.23
tblVehicleEF	MH	0.12	0.07
tblVehicleEF	MH	0.06	0.01
tblVehicleEF	MH	0.50	0.09
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	7.4700e-004	2.0000e-004
tblVehicleEF	MH	1.72	0.58
tblVehicleEF	MH	0.14	0.05
tblVehicleEF	MH	0.56	0.23
tblVehicleEF	MH	0.17	0.08
tblVehicleEF	MH	0.06	0.01
tblVehicleEF	MH	0.55	0.10

tblVehicleEF	MH	0.04	9.3000e-003
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.23	0.85
tblVehicleEF	MH	6.94	1.96
tblVehicleEF	MH	1,228.21	1,512.95
tblVehicleEF	MH	61.00	17.73
tblVehicleEF	MH	1.68	1.52
tblVehicleEF	MH	1.38	0.24
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	1.1640e-003	2.0000e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.2010e-003	3.3000e-003
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	1.0700e-003	2.0000e-004
tblVehicleEF	MH	3.72	0.58
tblVehicleEF	MH	0.15	0.05
tblVehicleEF	MH	1.16	0.23
tblVehicleEF	MH	0.13	0.07
tblVehicleEF	MH	0.05	0.01
tblVehicleEF	MH	0.47	0.09
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	7.3300e-004	2.0000e-004
tblVehicleEF	MH	3.72	0.58
tblVehicleEF	MH	0.15	0.05
tblVehicleEF	MH	1.16	0.23

tblVehicleEF	MH	0.17	0.08
tblVehicleEF	MH	0.05	0.01
tblVehicleEF	MH	0.51	0.10
tblVehicleEF	MH	0.04	9.3000e-003
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.23	0.85
tblVehicleEF	MH	7.04	1.96
tblVehicleEF	MH	1,228.21	1,512.95
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tblVehicleEF	MH	1.70	1.52
tblVehicleEF	MH	1.39	0.24
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	1.1640e-003	2.0000e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.2010e-003	3.3000e-003
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	1.0700e-003	2.0000e-004
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tblVehicleEF	MH	0.27	0.05
tblVehicleEF	MH	1.57	0.23
tblVehicleEF	MH	0.13	0.07
tblVehicleEF	MH	0.06	0.01
tblVehicleEF	MH	0.47	0.09
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	7.3500e-004	2.0000e-004

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tblVehicleEF	MH	0.27	0.05
tblVehicleEF	MH	1.57	0.23
tblVehicleEF	MH	0.17	0.08
tblVehicleEF	MH	0.06	0.01
tblVehicleEF	MH	0.51	0.10
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tblVehicleEF	MHD	0.33	0.43
tblVehicleEF	MHD	0.36	0.27
tblVehicleEF	MHD	5.13	1.19
tblVehicleEF	MHD	176.89	84.01
tblVehicleEF	MHD	1,189.88	1,109.33
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tblVehicleEF	MHD	13.96	1.66
tblVehicleEF	MHD	1.8300e-004	5.0000e-004
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	4.8310e-003	7.2000e-003
tblVehicleEF	MHD	6.2500e-004	1.0000e-004
tblVehicleEF	MHD	1.7500e-004	5.0000e-004
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	4.6180e-003	6.9000e-003
tblVehicleEF	MHD	5.7500e-004	1.0000e-004
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tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	5.8100e-004	2.0000e-004
tblVehicleEF	MHD	0.05	0.02
tblVehicleEF	MHD	0.04	0.02
tblVehicleEF	MHD	0.33	0.05
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tblVehicleEF	MHD	5.0200e-004	1.0000e-004
tblVehicleEF	MHD	1.1010e-003	4.0000e-004
tblVehicleEF	MHD	0.06	0.02
tblVehicleEF	MHD	0.03	0.03
tblVehicleEF	MHD	5.8100e-004	2.0000e-004
tblVehicleEF	MHD	0.06	0.02
tblVehicleEF	MHD	0.04	0.02
tblVehicleEF	MHD	0.36	0.06
tblVehicleEF	MHD	0.02	4.0000e-003
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tblVehicleEF	MHD	0.06	0.01
tblVehicleEF	MHD	0.21	0.43
tblVehicleEF	MHD	0.37	0.27
tblVehicleEF	MHD	4.65	1.19
tblVehicleEF	MHD	187.72	84.01
tblVehicleEF	MHD	1,189.88	1,109.33
tblVehicleEF	MHD	41.18	10.07
tblVehicleEF	MHD	0.57	0.52
tblVehicleEF	MHD	1.47	1.47

tblVehicleEF	MHD	13.90	1.66
tblVehicleEF	MHD	1.5400e-004	5.0000e-004
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tblVehicleEF	MHD	4.8310e-003	7.2000e-003
tblVehicleEF	MHD	6.2500e-004	1.0000e-004
tblVehicleEF	MHD	1.4800e-004	5.0000e-004
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	4.6180e-003	6.9000e-003
tblVehicleEF	MHD	5.7500e-004	1.0000e-004
tblVehicleEF	MHD	2.3650e-003	4.0000e-004
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tblVehicleEF	MHD	0.03	0.03
tblVehicleEF	MHD	1.2070e-003	2.0000e-004
tblVehicleEF	MHD	0.06	0.02
tblVehicleEF	MHD	0.04	0.02
tblVehicleEF	MHD	0.34	0.06
tblVehicleEF	MHD	0.02	4.0000e-003

tblVehicleEF	MHD	4.5560e-003	2.1000e-003
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tblVehicleEF	MHD	0.37	0.27
tblVehicleEF	MHD	4.69	1.19
tblVehicleEF	MHD	162.70	84.01
tblVehicleEF	MHD	1,189.88	1,109.33
tblVehicleEF	MHD	41.18	10.07
tblVehicleEF	MHD	0.53	0.52
tblVehicleEF	MHD	1.48	1.47
tblVehicleEF	MHD	13.90	1.66
tblVehicleEF	MHD	2.2300e-004	5.0000e-004
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	4.8310e-003	7.2000e-003
tblVehicleEF	MHD	6.2500e-004	1.0000e-004
tblVehicleEF	MHD	2.1300e-004	5.0000e-004
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	4.6180e-003	6.9000e-003
tblVehicleEF	MHD	5.7500e-004	1.0000e-004
tblVehicleEF	MHD	2.1890e-003	4.0000e-004
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tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	1.4350e-003	2.0000e-004
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tblVehicleEF	MHD	0.05	0.02
tblVehicleEF	MHD	0.31	0.05
tblVehicleEF	MHD	1.5620e-003	8.0000e-004

tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	4.9500e-004	1.0000e-004
tblVehicleEF	MHD	2.1890e-003	4.0000e-004
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tblVehicleEF	MHD	0.05	0.02
tblVehicleEF	MHD	0.34	0.06
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tblVehicleEF	OBUS	0.32	0.50
tblVehicleEF	OBUS	0.62	0.98
tblVehicleEF	OBUS	7.03	2.88
tblVehicleEF	OBUS	240.74	65.66
tblVehicleEF	OBUS	1,421.04	1,496.24
tblVehicleEF	OBUS	66.25	21.75
tblVehicleEF	OBUS	0.57	0.23
tblVehicleEF	OBUS	1.12	1.13
tblVehicleEF	OBUS	3.07	0.68
tblVehicleEF	OBUS	5.4000e-005	1.0000e-004
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	3.5030e-003	6.1000e-003
tblVehicleEF	OBUS	1.0480e-003	2.0000e-004
tblVehicleEF	OBUS	5.2000e-005	1.0000e-004
tblVehicleEF	OBUS	0.06	0.06

tblVehicleEF	OBUS	3.3280e-003	5.8000e-003
tblVehicleEF	OBUS	9.6300e-004	2.0000e-004
tblVehicleEF	OBUS	2.4880e-003	1.7000e-003
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.05	0.05
tblVehicleEF	OBUS	9.9800e-004	8.0000e-004
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tblVehicleEF	OBUS	0.46	0.14
tblVehicleEF	OBUS	2.3090e-003	6.0000e-004
tblVehicleEF	OBUS	0.01	0.01
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tblVehicleEF	OBUS	2.4880e-003	1.7000e-003
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tblVehicleEF	OBUS	0.63	0.98
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tblVehicleEF	OBUS	254.08	65.66
tblVehicleEF	OBUS	1,421.04	1,496.24

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tblVehicleEF	OBUS	2.98	0.68
tblVehicleEF	OBUS	4.6000e-005	1.0000e-004
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tblVehicleEF	OBUS	3.5030e-003	6.1000e-003
tblVehicleEF	OBUS	1.0480e-003	2.0000e-004
tblVehicleEF	OBUS	4.4000e-005	1.0000e-004
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.3280e-003	5.8000e-003
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tblVehicleEF	OBUS	0.10	0.09
tblVehicleEF	OBUS	0.43	0.14
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tblVehicleEF	OBUS	0.34	0.50
tblVehicleEF	OBUS	0.63	0.98
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tblVehicleEF	OBUS	222.32	65.66
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tblVehicleEF	OBUS	2.99	0.68
tblVehicleEF	OBUS	6.6000e-005	1.0000e-004
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tblVehicleEF	OBUS	6.3000e-005	1.0000e-004
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tblVehicleEF	OBUS	4.9750e-003	1.7000e-003
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tblVehicleEF	OBUS	0.05	0.05
tblVehicleEF	OBUS	2.6350e-003	8.0000e-004
tblVehicleEF	OBUS	0.06	0.05

tblVehicleEF	OBUS	0.12	0.09
tblVehicleEF	OBUS	0.43	0.14
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tblVehicleEF	OBUS	0.08	0.07
tblVehicleEF	OBUS	0.12	0.09
tblVehicleEF	OBUS	0.47	0.15
tblVehicleEF	SBUS	1.00	0.02
tblVehicleEF	SBUS	5.4740e-003	2.6000e-003
tblVehicleEF	SBUS	0.07	1.3000e-003
tblVehicleEF	SBUS	5.68	1.26
tblVehicleEF	SBUS	0.38	0.22
tblVehicleEF	SBUS	4.48	0.19
tblVehicleEF	SBUS	1,238.19	299.60
tblVehicleEF	SBUS	1,132.15	991.09
tblVehicleEF	SBUS	34.10	1.09
tblVehicleEF	SBUS	6.77	2.23
tblVehicleEF	SBUS	2.35	2.75
tblVehicleEF	SBUS	15.51	1.56
tblVehicleEF	SBUS	3.5790e-003	1.5000e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.01	0.02

tblVehicleEF	SBUS	3.4400e-004	0.00
tblVehicleEF	SBUS	3.4240e-003	1.5000e-003
tblVehicleEF	SBUS	2.7780e-003	2.9000e-003
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	3.1700e-004	0.00
tblVehicleEF	SBUS	4.3980e-003	1.0000e-004
tblVehicleEF	SBUS	0.04	8.0000e-004
tblVehicleEF	SBUS	0.72	0.09
tblVehicleEF	SBUS	1.9850e-003	0.00
tblVehicleEF	SBUS	0.08	0.04
tblVehicleEF	SBUS	0.03	1.6000e-003
tblVehicleEF	SBUS	0.28	7.3000e-003
tblVehicleEF	SBUS	0.01	2.8000e-003
tblVehicleEF	SBUS	0.01	9.4000e-003
tblVehicleEF	SBUS	4.2000e-004	0.00
tblVehicleEF	SBUS	4.3980e-003	1.0000e-004
tblVehicleEF	SBUS	0.04	8.0000e-004
tblVehicleEF	SBUS	1.03	0.12
tblVehicleEF	SBUS	1.9850e-003	0.00
tblVehicleEF	SBUS	0.09	0.05
tblVehicleEF	SBUS	0.03	1.6000e-003
tblVehicleEF	SBUS	0.30	8.0000e-003
tblVehicleEF	SBUS	1.00	0.02
tblVehicleEF	SBUS	5.5530e-003	2.6000e-003
tblVehicleEF	SBUS	0.06	1.3000e-003
tblVehicleEF	SBUS	5.59	1.26
tblVehicleEF	SBUS	0.38	0.22

tblVehicleEF	SBUS	3.12	0.19
tblVehicleEF	SBUS	1,301.76	299.60
tblVehicleEF	SBUS	1,132.15	991.09
tblVehicleEF	SBUS	34.10	1.09
tblVehicleEF	SBUS	6.99	2.23
tblVehicleEF	SBUS	2.26	2.75
tblVehicleEF	SBUS	15.48	1.56
tblVehicleEF	SBUS	3.0170e-003	1.5000e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	3.4400e-004	0.00
tblVehicleEF	SBUS	2.8870e-003	1.5000e-003
tblVehicleEF	SBUS	2.7780e-003	2.9000e-003
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	3.1700e-004	0.00
tblVehicleEF	SBUS	9.0980e-003	1.0000e-004
tblVehicleEF	SBUS	0.04	8.0000e-004
tblVehicleEF	SBUS	0.71	0.09
tblVehicleEF	SBUS	3.8800e-003	0.00
tblVehicleEF	SBUS	0.08	0.04
tblVehicleEF	SBUS	0.02	1.6000e-003
tblVehicleEF	SBUS	0.23	7.3000e-003
tblVehicleEF	SBUS	0.01	2.8000e-003
tblVehicleEF	SBUS	0.01	9.4000e-003
tblVehicleEF	SBUS	3.9700e-004	0.00
tblVehicleEF	SBUS	9.0980e-003	1.0000e-004
tblVehicleEF	SBUS	0.04	8.0000e-004

tblVehicleEF	SBUS	1.03	0.12
tblVehicleEF	SBUS	3.8800e-003	0.00
tblVehicleEF	SBUS	0.09	0.05
tblVehicleEF	SBUS	0.02	1.6000e-003
tblVehicleEF	SBUS	0.25	8.0000e-003
tblVehicleEF	SBUS	1.00	0.02
tblVehicleEF	SBUS	5.5450e-003	2.6000e-003
tblVehicleEF	SBUS	0.06	1.3000e-003
tblVehicleEF	SBUS	5.82	1.26
tblVehicleEF	SBUS	0.38	0.22
tblVehicleEF	SBUS	3.30	0.19
tblVehicleEF	SBUS	1,150.40	299.60
tblVehicleEF	SBUS	1,132.15	991.09
tblVehicleEF	SBUS	34.10	1.09
tblVehicleEF	SBUS	6.47	2.23
tblVehicleEF	SBUS	2.26	2.75
tblVehicleEF	SBUS	15.49	1.56
tblVehicleEF	SBUS	4.3550e-003	1.5000e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	3.4400e-004	0.00
tblVehicleEF	SBUS	4.1670e-003	1.5000e-003
tblVehicleEF	SBUS	2.7780e-003	2.9000e-003
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	3.1700e-004	0.00
tblVehicleEF	SBUS	7.0520e-003	1.0000e-004
tblVehicleEF	SBUS	0.04	8.0000e-004

tblVehicleEF	SBUS	0.72	0.09
tblVehicleEF	SBUS	4.5570e-003	0.00
tblVehicleEF	SBUS	0.08	0.04
tblVehicleEF	SBUS	0.03	1.6000e-003
tblVehicleEF	SBUS	0.23	7.3000e-003
tblVehicleEF	SBUS	0.01	2.8000e-003
tblVehicleEF	SBUS	0.01	9.4000e-003
tblVehicleEF	SBUS	4.0000e-004	0.00
tblVehicleEF	SBUS	7.0520e-003	1.0000e-004
tblVehicleEF	SBUS	0.04	8.0000e-004
tblVehicleEF	SBUS	1.03	0.12
tblVehicleEF	SBUS	4.5570e-003	0.00
tblVehicleEF	SBUS	0.09	0.05
tblVehicleEF	SBUS	0.03	1.6000e-003
tblVehicleEF	SBUS	0.26	8.0000e-003
tblVehicleEF	UBUS	0.06	1.10
tblVehicleEF	UBUS	0.09	1.5000e-003
tblVehicleEF	UBUS	3.55	8.13
tblVehicleEF	UBUS	15.70	0.25
tblVehicleEF	UBUS	1,917.57	1,559.20
tblVehicleEF	UBUS	160.55	2.75
tblVehicleEF	UBUS	3.47	0.64
tblVehicleEF	UBUS	12.02	0.03
tblVehicleEF	UBUS	0.46	0.08
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.04	4.9000e-003
tblVehicleEF	UBUS	1.4080e-003	0.00

tblVehicleEF	UBUS	0.20	0.03
tblVehicleEF	UBUS	3.0000e-003	7.2000e-003
tblVehicleEF	UBUS	0.04	4.7000e-003
tblVehicleEF	UBUS	1.2950e-003	0.00
tblVehicleEF	UBUS	6.5340e-003	1.0000e-004
tblVehicleEF	UBUS	0.09	8.0000e-004
tblVehicleEF	UBUS	3.4140e-003	1.0000e-004
tblVehicleEF	UBUS	0.25	0.02
tblVehicleEF	UBUS	0.02	1.0000e-004
tblVehicleEF	UBUS	1.23	5.3000e-003
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	1.8900e-003	0.00
tblVehicleEF	UBUS	6.5340e-003	1.0000e-004
tblVehicleEF	UBUS	0.09	8.0000e-004
tblVehicleEF	UBUS	3.4140e-003	1.0000e-004
tblVehicleEF	UBUS	0.33	1.12
tblVehicleEF	UBUS	0.02	1.0000e-004
tblVehicleEF	UBUS	1.35	5.8000e-003
tblVehicleEF	UBUS	0.06	1.10
tblVehicleEF	UBUS	0.08	1.5000e-003
tblVehicleEF	UBUS	3.62	8.13
tblVehicleEF	UBUS	12.28	0.25
tblVehicleEF	UBUS	1,917.57	1,559.20
tblVehicleEF	UBUS	160.55	2.75
tblVehicleEF	UBUS	3.29	0.64
tblVehicleEF	UBUS	11.85	0.03
tblVehicleEF	UBUS	0.46	0.08

tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.04	4.9000e-003
tblVehicleEF	UBUS	1.4080e-003	0.00
tblVehicleEF	UBUS	0.20	0.03
tblVehicleEF	UBUS	3.0000e-003	7.2000e-003
tblVehicleEF	UBUS	0.04	4.7000e-003
tblVehicleEF	UBUS	1.2950e-003	0.00
tblVehicleEF	UBUS	0.01	1.0000e-004
tblVehicleEF	UBUS	0.11	8.0000e-004
tblVehicleEF	UBUS	6.9810e-003	1.0000e-004
tblVehicleEF	UBUS	0.26	0.02
tblVehicleEF	UBUS	0.02	1.0000e-004
tblVehicleEF	UBUS	1.07	5.3000e-003
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	1.8310e-003	0.00
tblVehicleEF	UBUS	0.01	1.0000e-004
tblVehicleEF	UBUS	0.11	8.0000e-004
tblVehicleEF	UBUS	6.9810e-003	1.0000e-004
tblVehicleEF	UBUS	0.33	1.12
tblVehicleEF	UBUS	0.02	1.0000e-004
tblVehicleEF	UBUS	1.17	5.8000e-003
tblVehicleEF	UBUS	0.06	1.10
tblVehicleEF	UBUS	0.08	1.5000e-003
tblVehicleEF	UBUS	3.61	8.13
tblVehicleEF	UBUS	12.66	0.25
tblVehicleEF	UBUS	1,917.57	1,559.20
tblVehicleEF	UBUS	160.55	2.75

tblVehicleEF	UBUS	3.31	0.64
tblVehicleEF	UBUS	11.87	0.03
tblVehicleEF	UBUS	0.46	0.08
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.04	4.9000e-003
tblVehicleEF	UBUS	1.4080e-003	0.00
tblVehicleEF	UBUS	0.20	0.03
tblVehicleEF	UBUS	3.0000e-003	7.2000e-003
tblVehicleEF	UBUS	0.04	4.7000e-003
tblVehicleEF	UBUS	1.2950e-003	0.00
tblVehicleEF	UBUS	0.01	1.0000e-004
tblVehicleEF	UBUS	0.17	8.0000e-004
tblVehicleEF	UBUS	9.0370e-003	1.0000e-004
tblVehicleEF	UBUS	0.26	0.02
tblVehicleEF	UBUS	0.03	1.0000e-004
tblVehicleEF	UBUS	1.09	5.3000e-003
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	1.8370e-003	0.00
tblVehicleEF	UBUS	0.01	1.0000e-004
tblVehicleEF	UBUS	0.17	8.0000e-004
tblVehicleEF	UBUS	9.0370e-003	1.0000e-004
tblVehicleEF	UBUS	0.33	1.12
tblVehicleEF	UBUS	0.03	1.0000e-004
tblVehicleEF	UBUS	1.19	5.8000e-003
tblVehicleTrips	ST_TR	7.16	2.49
tblVehicleTrips	ST_TR	40.63	10.33
tblVehicleTrips	ST_TR	8.19	2.54

tblVehicleTrips	ST_TR	94.36	41.92
tblVehicleTrips	ST_TR	49.97	18.88
tblVehicleTrips	ST_TR	9.91	5.89
tblVehicleTrips	ST_TR	0.00	22.98
tblVehicleTrips	ST_TR	0.00	1.69
tblVehicleTrips	SU_TR	6.07	2.49
tblVehicleTrips	SU_TR	39.53	10.33
tblVehicleTrips	SU_TR	5.95	2.54
tblVehicleTrips	SU_TR	72.16	41.92
tblVehicleTrips	SU_TR	25.24	18.88
tblVehicleTrips	SU_TR	8.62	5.89
tblVehicleTrips	SU_TR	0.00	22.98
tblVehicleTrips	SU_TR	0.00	1.69
tblVehicleTrips	WD_TR	6.59	2.49
tblVehicleTrips	WD_TR	35.74	10.33
tblVehicleTrips	WD_TR	8.17	2.54
tblVehicleTrips	WD_TR	89.95	41.92
tblVehicleTrips	WD_TR	42.70	18.88
tblVehicleTrips	WD_TR	9.52	5.89
tblVehicleTrips	WD_TR	0.00	22.98
tblVehicleTrips	WD_TR	0.00	1.69
tblWater	IndoorWaterUseRate	0.00	678,840.00
tblWater	IndoorWaterUseRate	0.00	102,368.00
tblWater	OutdoorWaterUseRate	0.00	5,865,318.00
tblWoodstoves	NumberCatalytic	10.00	0.00
tblWoodstoves	NumberCatalytic	50.00	0.00
tblWoodstoves	NumberNoncatalytic	10.00	0.00

tblWoodstoves	NumberNoncatalytic	50.00	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2030	0.1673	0.9124	0.7966	3.0500e-003	1.5686	0.0328	1.6014	0.8614	0.0328	0.8942	0.0000	261.9636	261.9636	0.0135	0.0000	262.3011
2031	2.2564	9.0261	17.8735	0.0516	8.4239	0.3306	8.7546	4.0736	0.3306	4.4042	0.0000	4,576.5408	4,576.5408	0.1812	0.0000	4,581.0711
2032	1.8883	10.2891	17.2870	0.0488	1.6115	0.1614	1.7729	0.4335	0.1608	0.5943	0.0000	4,270.0361	4,270.0361	0.1343	0.0000	4,273.3940
2033	1.8155	10.1483	16.9197	0.0482	1.5992	0.1596	1.7588	0.4302	0.1591	0.5892	0.0000	4,216.9934	4,216.9934	0.1309	0.0000	4,220.2658
2034	1.7678	10.0947	16.7041	0.0480	1.5992	0.1591	1.7583	0.4302	0.1586	0.5888	0.0000	4,198.7485	4,198.7485	0.1288	0.0000	4,201.9678
2035	1.6230	9.0724	16.5396	0.0481	1.6053	0.0940	1.6994	0.4318	0.0935	0.5254	0.0000	4,199.0575	4,199.0575	0.1181	0.0000	4,202.0106
2036	1.6292	9.1072	16.6030	0.0482	1.6115	0.0944	1.7059	0.4335	0.0939	0.5274	0.0000	4,215.1458	4,215.1458	0.1186	0.0000	4,218.1103
2037	1.6230	9.0724	16.5396	0.0481	1.6053	0.0940	1.6994	0.4318	0.0935	0.5254	0.0000	4,199.0575	4,199.0575	0.1181	0.0000	4,202.0106
2038	1.6230	9.0724	16.5396	0.0481	1.6053	0.0940	1.6994	0.4318	0.0935	0.5254	0.0000	4,199.0575	4,199.0575	0.1181	0.0000	4,202.0106
2039	1.5550	8.5328	16.2746	0.0454	1.4236	0.1026	1.5261	0.3829	0.1021	0.4850	0.0000	3,966.5481	3,966.5481	0.1141	0.0000	3,969.4015
2040	42.0378	2.1827	8.2667	0.0151	0.1664	0.0541	0.2205	0.0443	0.0541	0.0983	0.0000	1,301.2879	1,301.2879	0.0421	0.0000	1,302.3397
Maximum	**42.0378**	**10.2891**	**17.8735**	**0.0516**	**8.4239**	**0.3306**	**8.7546**	**4.0736**	**0.3306**	**4.4042**	**0.0000**	**4,576.5408**	**4,576.5408**	**0.1812**	**0.0000**	**4,581.0711**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2030	0.0318	0.1319	1.1942	3.0500e-003	0.7075	6.2000e-004	0.7081	0.3881	6.2000e-004	0.3887	0.0000	261.9633	261.9633	0.0135	0.0000	262.3008
2031	0.5494	2.3298	24.2906	0.0516	3.8148	0.0108	3.8256	1.8395	0.0108	1.8503	0.0000	4,576.5354	4,576.5354	0.1812	0.0000	4,581.0656
2032	0.9993	5.3772	19.8234	0.0488	1.6115	0.0154	1.6269	0.4335	0.0148	0.4483	0.0000	4,270.0329	4,270.0329	0.1343	0.0000	4,273.3908
2033	0.9332	5.2739	19.4367	0.0482	1.5992	0.0147	1.6139	0.4302	0.0141	0.4443	0.0000	4,216.9903	4,216.9903	0.1309	0.0000	4,220.2627
2034	0.8855	5.2203	19.2211	0.0480	1.5992	0.0142	1.6134	0.4302	0.0136	0.4438	0.0000	4,198.7454	4,198.7454	0.1288	0.0000	4,201.9647
2035	0.8476	5.1963	19.1098	0.0481	1.6053	0.0138	1.6191	0.4318	0.0133	0.4451	0.0000	4,199.0544	4,199.0544	0.1181	0.0000	4,202.0075
2036	0.8508	5.2162	19.1830	0.0482	1.6115	0.0138	1.6253	0.4335	0.0133	0.4468	0.0000	4,215.1427	4,215.1427	0.1186	0.0000	4,218.1071
2037	0.8476	5.1963	19.1098	0.0481	1.6053	0.0138	1.6191	0.4318	0.0133	0.4451	0.0000	4,199.0544	4,199.0544	0.1181	0.0000	4,202.0075
2038	0.8476	5.1963	19.1098	0.0481	1.6053	0.0138	1.6191	0.4318	0.0133	0.4451	0.0000	4,199.0544	4,199.0544	0.1181	0.0000	4,202.0075
2039	0.8687	5.1022	18.5493	0.0454	1.4236	0.0151	1.4387	0.3829	0.0147	0.3976	0.0000	3,966.5450	3,966.5450	0.1141	0.0000	3,969.3984
2040	41.9549	1.6004	8.3057	0.0151	0.1664	7.9900e-003	0.1744	0.0443	7.9500e-003	0.0522	0.0000	1,301.2864	1,301.2864	0.0421	0.0000	1,302.3383
Maximum	**41.9549**	**5.3772**	**24.2906**	**0.0516**	**3.8148**	**0.0154**	**3.8256**	**1.8395**	**0.0148**	**1.8503**	**0.0000**	**4,576.5354**	**4,576.5354**	**0.1812**	**0.0000**	**4,581.0656**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**14.43**	**47.62**	**-16.83**	**0.00**	**23.97**	**90.27**	**27.74**	**32.29**	**90.56**	**40.48**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Guenoc Valley Mixed Use Planned Development Project - Future Phases - Lake County, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	11-26-2030	2-25-2031	2.7294	0.4141
2	2-26-2031	5-25-2031	2.7543	0.6915
3	5-26-2031	8-25-2031	2.8400	0.7903
4	8-26-2031	11-25-2031	2.8407	0.7910
5	11-26-2031	2-25-2032	3.0225	1.3255
6	2-26-2032	5-25-2032	2.9890	1.5657
7	5-26-2032	8-25-2032	3.0407	1.5858
8	8-26-2032	11-25-2032	3.0638	1.6088
9	11-26-2032	2-25-2033	3.0581	1.6031
10	2-26-2033	5-25-2033	2.9255	1.5180
11	5-26-2033	8-25-2033	3.0113	1.5563
12	8-26-2033	11-25-2033	3.0318	1.5768
13	11-26-2033	2-25-2034	3.0275	1.5726
14	2-26-2034	5-25-2034	2.9001	1.4926
15	5-26-2034	8-25-2034	2.9865	1.5315
16	8-26-2034	11-25-2034	3.0047	1.5497
17	11-26-2034	2-25-2035	2.8289	1.5467
18	2-26-2035	5-25-2035	2.6041	1.4711
19	5-26-2035	8-25-2035	2.6817	1.5105
20	8-26-2035	11-25-2035	2.6980	1.5268
21	11-26-2035	2-25-2036	2.7084	1.5372
22	2-26-2036	5-25-2036	2.6336	1.4879
23	5-26-2036	8-25-2036	2.6817	1.5105
24	8-26-2036	11-25-2036	2.6980	1.5268
25	11-26-2036	2-25-2037	2.7084	1.5372
26	2-26-2037	5-25-2037	2.6041	1.4711

27	**5-26-2037**	**8-25-2037**	2.6817	1.5105
28	**8-26-2037**	**11-25-2037**	2.6980	1.5268
29	**11-26-2037**	**2-25-2038**	2.7084	1.5372
30	**2-26-2038**	**5-25-2038**	2.6041	1.4711
31	**5-26-2038**	**8-25-2038**	2.6817	1.5105
32	**8-26-2038**	**11-25-2038**	2.6980	1.5268
33	**11-26-2038**	**2-25-2039**	2.7084	1.5372
34	**2-26-2039**	**5-25-2039**	2.6041	1.4711
35	**5-26-2039**	**8-25-2039**	2.6817	1.5105
36	**8-26-2039**	**11-25-2039**	2.6542	1.5340
37	**11-26-2039**	**2-25-2040**	1.1762	1.1762
38	**2-26-2040**	**5-25-2040**	1.0334	1.0334
39	**5-26-2040**	**8-25-2040**	15.9433	15.6959
40	**8-26-2040**	**9-30-2040**	7.4596	7.3425
		Highest	15.9433	15.6959

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	12.9310	0.1025	8.8925	4.7000e-004		0.0494	0.0494		0.0494	0.0494	0.0000	14.5660	14.5660	0.0139	0.0000	14.9135
Energy	0.1840	1.6305	1.0970	0.0100		0.1271	0.1271		0.1271	0.1271	0.0000	6,681.4853	6,681.4853	0.2547	0.0789	6,711.3509
Mobile	2.4781	6.4531	30.5361	0.1033	10.4524	0.0776	10.5299	2.7992	0.0724	2.8716	0.0000	9,543.1682	9,543.1682	0.3395	0.0000	9,551.6548
Waste						0.0000	0.0000		0.0000	0.0000	303.8409	0.0000	303.8409	17.9565	0.0000	752.7531
Water						0.0000	0.0000		0.0000	0.0000	31.3234	366.6586	397.9820	3.2338	0.0794	502.4867
Total	**15.5930**	**8.1861**	**40.5256**	**0.1138**	**10.4524**	**0.2541**	**10.7065**	**2.7992**	**0.2489**	**3.0481**	**335.1643**	**16,605.8782**	**16,941.0425**	**21.7983**	**0.1583**	**17,533.1589**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	12.9310	0.1025	8.8925	4.7000e-004		0.0494	0.0494		0.0494	0.0494	0.0000	14.5660	14.5660	0.0139	0.0000	14.9135
Energy	0.0969	0.8580	0.5731	5.2800e-003		0.0669	0.0669		0.0669	0.0669	0.0000	958.7561	958.7561	0.0184	0.0176	964.4535
Mobile	2.4781	6.4531	30.5361	0.1033	10.4524	0.0776	10.5299	2.7992	0.0724	2.8716	0.0000	9,543.1682	9,543.1682	0.3395	0.0000	9,551.6548
Waste						0.0000	0.0000		0.0000	0.0000	236.9959	0.0000	236.9959	14.0061	0.0000	587.1474
Water						0.0000	0.0000		0.0000	0.0000	25.0587	314.4510	339.5097	2.5880	0.0637	423.1962
Total	**15.5059**	**7.4136**	**40.0017**	**0.1090**	**10.4524**	**0.1939**	**10.6463**	**2.7992**	**0.1888**	**2.9879**	**262.0546**	**10,830.9414**	**11,092.9960**	**16.9658**	**0.0813**	**11,541.3654**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.56**	**9.44**	**1.29**	**4.18**	**0.00**	**23.68**	**0.56**	**0.00**	**24.18**	**1.97**	**21.81**	**34.78**	**34.52**	**22.17**	**48.63**	**34.17**

2.3 Vegetation

Vegetation

	CO2e
Category	MT
Vegetation Land Change	-45,510.0000
Total	**-45,510.0000**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	11/25/2030	11/24/2030	5	0	
2	Site Preparation	Site Preparation	11/26/2030	3/17/2031	5	80	
3	Grading	Grading	3/17/2031	12/30/2031	5	207	
4	Building Construction	Building Construction	12/30/2031	11/21/2039	5	2060	
5	Paving	Paving	11/21/2039	6/11/2040	5	146	
6	Architectural Coating	Architectural Coating	6/11/2040	12/31/2040	5	146	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 2325

Acres of Paving: 0

Residential Indoor: 4,050,000; Residential Outdoor: 1,350,000; Non-Residential Indoor: 1,320,570; Non-Residential Outdoor: 440,190; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	0	10.00	81	0.73
Demolition	Excavators	0	10.00	158	0.38
Demolition	Rubber Tired Dozers	0	10.00	247	0.40
Site Preparation	Rubber Tired Dozers	16	10.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	5	10.00	97	0.37
Grading	Excavators	20	10.00	158	0.38
Grading	Graders	11	10.00	187	0.41
Grading	Rubber Tired Dozers	5	10.00	247	0.40
Grading	Scrapers	4	10.00	367	0.48
Grading	Tractors/Loaders/Backhoes	4	10.00	97	0.37
Building Construction	Cranes	10	10.00	231	0.29
Building Construction	Forklifts	10	10.00	89	0.20
Building Construction	Generator Sets	10	10.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	4	10.00	97	0.37
Building Construction	Welders	8	10.00	46	0.45
Paving	Pavers	11	10.00	130	0.42
Paving	Paving Equipment	11	10.00	132	0.36
Paving	Rollers	11	10.00	80	0.38
Architectural Coating	Air Compressors	8	10.00	78	0.48

Trips and VMT

Guenoc Valley Mixed Use Planned Development Project - Future Phases - Lake County, Annual

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	0	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	21	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	44	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	42	872.00	273.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	33	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	8	174.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Demolition - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Demolition - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Site Preparation - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.5657	0.0000	1.5657	0.8607	0.0000	0.8607	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1658	0.9117	0.7895	3.0300e-003		0.0328	0.0328		0.0328	0.0328	0.0000	260.0906	260.0906	0.0135	0.0000	260.4268
Total	**0.1658**	**0.9117**	**0.7895**	**3.0300e-003**	**1.5657**	**0.0328**	**1.5985**	**0.8607**	**0.0328**	**0.8935**	**0.0000**	**260.0906**	**260.0906**	**0.0135**	**0.0000**	**260.4268**

3.3 Site Preparation - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-003	7.0000e-004	7.1300e-003	2.0000e-005	2.8700e-003	1.0000e-005	2.8800e-003	7.6000e-004	1.0000e-005	7.8000e-004	0.0000	1.8730	1.8730	5.0000e-005	0.0000	1.8743
Total	**1.5000e-003**	**7.0000e-004**	**7.1300e-003**	**2.0000e-005**	**2.8700e-003**	**1.0000e-005**	**2.8800e-003**	**7.6000e-004**	**1.0000e-005**	**7.8000e-004**	**0.0000**	**1.8730**	**1.8730**	**5.0000e-005**	**0.0000**	**1.8743**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.7046	0.0000	0.7046	0.3873	0.0000	0.3873	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0303	0.1312	1.1870	3.0300e-003		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004	0.0000	260.0903	260.0903	0.0135	0.0000	260.4265
Total	**0.0303**	**0.1312**	**1.1870**	**3.0300e-003**	**0.7046**	**6.1000e-004**	**0.7052**	**0.3873**	**6.1000e-004**	**0.3879**	**0.0000**	**260.0903**	**260.0903**	**0.0135**	**0.0000**	**260.4265**

3.3 Site Preparation - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-003	7.0000e-004	7.1300e-003	2.0000e-005	2.8700e-003	1.0000e-005	2.8800e-003	7.6000e-004	1.0000e-005	7.8000e-004	0.0000	1.8730	1.8730	5.0000e-005	0.0000	1.8743
Total	**1.5000e-003**	**7.0000e-004**	**7.1300e-003**	**2.0000e-005**	**2.8700e-003**	**1.0000e-005**	**2.8800e-003**	**7.6000e-004**	**1.0000e-005**	**7.8000e-004**	**0.0000**	**1.8730**	**1.8730**	**5.0000e-005**	**0.0000**	**1.8743**

3.3 Site Preparation - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.2519	0.0000	3.2519	1.7875	0.0000	1.7875	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3443	1.8936	1.6397	6.2900e-003		0.0681	0.0681		0.0681	0.0681	0.0000	540.1881	540.1881	0.0279	0.0000	540.8865
Total	**0.3443**	**1.8936**	**1.6397**	**6.2900e-003**	**3.2519**	**0.0681**	**3.3201**	**1.7875**	**0.0681**	**1.8557**	**0.0000**	**540.1881**	**540.1881**	**0.0279**	**0.0000**	**540.8865**

3.3 Site Preparation - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8000e-003	1.2900e-003	0.0135	4.0000e-005	5.9600e-003	3.0000e-005	5.9900e-003	1.5900e-003	3.0000e-005	1.6100e-003	0.0000	3.7889	3.7889	9.0000e-005	0.0000	3.7912
Total	**2.8000e-003**	**1.2900e-003**	**0.0135**	**4.0000e-005**	**5.9600e-003**	**3.0000e-005**	**5.9900e-003**	**1.5900e-003**	**3.0000e-005**	**1.6100e-003**	**0.0000**	**3.7889**	**3.7889**	**9.0000e-005**	**0.0000**	**3.7912**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.4634	0.0000	1.4634	0.8044	0.0000	0.8044	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0629	0.2724	2.4654	6.2900e-003		1.2600e-003	1.2600e-003		1.2600e-003	1.2600e-003	0.0000	540.1875	540.1875	0.0279	0.0000	540.8858
Total	**0.0629**	**0.2724**	**2.4654**	**6.2900e-003**	**1.4634**	**1.2600e-003**	**1.4646**	**0.8044**	**1.2600e-003**	**0.8057**	**0.0000**	**540.1875**	**540.1875**	**0.0279**	**0.0000**	**540.8858**

3.3 Site Preparation - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8000e-003	1.2900e-003	0.0135	4.0000e-005	5.9600e-003	3.0000e-005	5.9900e-003	1.5900e-003	3.0000e-005	1.6100e-003	0.0000	3.7889	3.7889	9.0000e-005	0.0000	3.7912
Total	**2.8000e-003**	**1.2900e-003**	**0.0135**	**4.0000e-005**	**5.9600e-003**	**3.0000e-005**	**5.9900e-003**	**1.5900e-003**	**3.0000e-005**	**1.6100e-003**	**0.0000**	**3.7889**	**3.7889**	**9.0000e-005**	**0.0000**	**3.7912**

3.4 Grading - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.1284	0.0000	5.1284	2.2744	0.0000	2.2744	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.8824	7.0468	16.0285	0.0448		0.2611	0.2611		0.2611	0.2611	0.0000	3,983.6543	3,983.6543	0.1518	0.0000	3,987.4482
Total	**1.8824**	**7.0468**	**16.0285**	**0.0448**	**5.1284**	**0.2611**	**5.3895**	**2.2744**	**0.2611**	**2.5355**	**0.0000**	**3,983.6543**	**3,983.6543**	**0.1518**	**0.0000**	**3,987.4482**

3.4 Grading - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0119	5.5000e-003	0.0576	1.8000e-004	0.0254	1.2000e-004	0.0255	6.7500e-003	1.1000e-004	6.8600e-003	0.0000	16.1380	16.1380	3.8000e-004	0.0000	16.1475
Total	**0.0119**	**5.5000e-003**	**0.0576**	**1.8000e-004**	**0.0254**	**1.2000e-004**	**0.0255**	**6.7500e-003**	**1.1000e-004**	**6.8600e-003**	**0.0000**	**16.1380**	**16.1380**	**3.8000e-004**	**0.0000**	**16.1475**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.3078	0.0000	2.3078	1.0235	0.0000	1.0235	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4636	2.0090	21.6006	0.0448		9.2700e-003	9.2700e-003		9.2700e-003	9.2700e-003	0.0000	3,983.6496	3,983.6496	0.1518	0.0000	3,987.4434
Total	**0.4636**	**2.0090**	**21.6006**	**0.0448**	**2.3078**	**9.2700e-003**	**2.3170**	**1.0235**	**9.2700e-003**	**1.0328**	**0.0000**	**3,983.6496**	**3,983.6496**	**0.1518**	**0.0000**	**3,987.4434**

3.4 Grading - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0119	5.5000e-003	0.0576	1.8000e-004	0.0254	1.2000e-004	0.0255	6.7500e-003	1.1000e-004	6.8600e-003	0.0000	16.1380	16.1380	3.8000e-004	0.0000	16.1475
Total	**0.0119**	**5.5000e-003**	**0.0576**	**1.8000e-004**	**0.0254**	**1.2000e-004**	**0.0255**	**6.7500e-003**	**1.1000e-004**	**6.8600e-003**	**0.0000**	**16.1380**	**16.1380**	**3.8000e-004**	**0.0000**	**16.1475**

3.5 Building Construction - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.3600e-003	0.0568	0.1050	2.4000e-004		1.1600e-003	1.1600e-003		1.1600e-003	1.1600e-003	0.0000	20.2162	20.2162	7.6000e-004	0.0000	20.2352
Total	**9.3600e-003**	**0.0568**	**0.1050**	**2.4000e-004**		**1.1600e-003**	**1.1600e-003**		**1.1600e-003**	**1.1600e-003**	**0.0000**	**20.2162**	**20.2162**	**7.6000e-004**	**0.0000**	**20.2352**

3.5 Building Construction - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.8000e-004	0.0199	4.8100e-003	6.0000e-005	1.6100e-003	3.0000e-005	1.6300e-003	4.6000e-004	2.0000e-005	4.9000e-004	0.0000	5.7571	5.7571	1.3000e-004	0.0000	5.7603
Worker	5.0200e-003	2.3200e-003	0.0243	8.0000e-005	0.0107	5.0000e-005	0.0107	2.8400e-003	5.0000e-005	2.8900e-003	0.0000	6.7982	6.7982	1.6000e-004	0.0000	6.8023
Total	**5.6000e-003**	**0.0223**	**0.0291**	**1.4000e-004**	**0.0123**	**8.0000e-005**	**0.0124**	**3.3000e-003**	**7.0000e-005**	**3.3800e-003**	**0.0000**	**12.5553**	**12.5553**	**2.9000e-004**	**0.0000**	**12.5626**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.5700e-003	0.0193	0.1244	2.4000e-004		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	20.2162	20.2162	7.6000e-004	0.0000	20.2351
Total	**2.5700e-003**	**0.0193**	**0.1244**	**2.4000e-004**		**5.0000e-005**	**5.0000e-005**		**5.0000e-005**	**5.0000e-005**	**0.0000**	**20.2162**	**20.2162**	**7.6000e-004**	**0.0000**	**20.2351**

3.5 Building Construction - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.8000e-004	0.0199	4.8100e-003	6.0000e-005	1.6100e-003	3.0000e-005	1.6300e-003	4.6000e-004	2.0000e-005	4.9000e-004	0.0000	5.7571	5.7571	1.3000e-004	0.0000	5.7603
Worker	5.0200e-003	2.3200e-003	0.0243	8.0000e-005	0.0107	5.0000e-005	0.0107	2.8400e-003	5.0000e-005	2.8900e-003	0.0000	6.7982	6.7982	1.6000e-004	0.0000	6.8023
Total	**5.6000e-003**	**0.0223**	**0.0291**	**1.4000e-004**	**0.0123**	**8.0000e-005**	**0.0124**	**3.3000e-003**	**7.0000e-005**	**3.3800e-003**	**0.0000**	**12.5553**	**12.5553**	**2.9000e-004**	**0.0000**	**12.5626**

3.5 Building Construction - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.2259	7.4384	13.7593	0.0313		0.1522	0.1522		0.1522	0.1522	0.0000	2,648.3240	2,648.3240	0.0992	0.0000	2,650.8041
Total	**1.2259**	**7.4384**	**13.7593**	**0.0313**		**0.1522**	**0.1522**		**0.1522**	**0.1522**	**0.0000**	**2,648.3240**	**2,648.3240**	**0.0992**	**0.0000**	**2,650.8041**

3.5 Building Construction - 2032

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0741	2.5819	0.6079	7.9300e-003	0.2106	3.1400e-003	0.2138	0.0609	3.0000e-003	0.0639	0.0000	752.3222	752.3222	0.0164	0.0000	752.7333
Worker	0.5883	0.2688	2.9199	9.6100e-003	1.4009	6.0700e-003	1.4070	0.3727	5.5900e-003	0.3782	0.0000	869.3899	869.3899	0.0187	0.0000	869.8567
Total	**0.6624**	**2.8507**	**3.5278**	**0.0175**	**1.6115**	**9.2100e-003**	**1.6207**	**0.4335**	**8.5900e-003**	**0.4421**	**0.0000**	**1,621.7120**	**1,621.7120**	**0.0351**	**0.0000**	**1,622.5899**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3369	2.5265	16.2956	0.0313		6.1600e-003	6.1600e-003		6.1600e-003	6.1600e-003	0.0000	2,648.3209	2,648.3209	0.0992	0.0000	2,650.8009
Total	**0.3369**	**2.5265**	**16.2956**	**0.0313**		**6.1600e-003**	**6.1600e-003**		**6.1600e-003**	**6.1600e-003**	**0.0000**	**2,648.3209**	**2,648.3209**	**0.0992**	**0.0000**	**2,650.8009**

3.5 Building Construction - 2032

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0741	2.5819	0.6079	7.9300e-003	0.2106	3.1400e-003	0.2138	0.0609	3.0000e-003	0.0639	0.0000	752.3222	752.3222	0.0164	0.0000	752.7333
Worker	0.5883	0.2688	2.9199	9.6100e-003	1.4009	6.0700e-003	1.4070	0.3727	5.5900e-003	0.3782	0.0000	869.3899	869.3899	0.0187	0.0000	869.8567
Total	**0.6624**	**2.8507**	**3.5278**	**0.0175**	**1.6115**	**9.2100e-003**	**1.6207**	**0.4335**	**8.5900e-003**	**0.4421**	**0.0000**	**1,621.7120**	**1,621.7120**	**0.0351**	**0.0000**	**1,622.5899**

3.5 Building Construction - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.2166	7.3816	13.6542	0.0311		0.1511	0.1511		0.1511	0.1511	0.0000	2,628.1078	2,628.1078	0.0984	0.0000	2,630.5689
Total	**1.2166**	**7.3816**	**13.6542**	**0.0311**		**0.1511**	**0.1511**		**0.1511**	**0.1511**	**0.0000**	**2,628.1078**	**2,628.1078**	**0.0984**	**0.0000**	**2,630.5689**

3.5 Building Construction - 2033

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0716	2.5282	0.5855	7.8500e-003	0.2090	2.9500e-003	0.2120	0.0604	2.8200e-003	0.0632	0.0000	744.6870	744.6870	0.0160	0.0000	745.0859
Worker	0.5273	0.2385	2.6800	9.3300e-003	1.3902	5.6200e-003	1.3958	0.3698	5.1700e-003	0.3750	0.0000	844.1985	844.1985	0.0165	0.0000	844.6110
Total	**0.5989**	**2.7667**	**3.2655**	**0.0172**	**1.5992**	**8.5700e-003**	**1.6078**	**0.4302**	**7.9900e-003**	**0.4382**	**0.0000**	**1,588.8856**	**1,588.8856**	**0.0325**	**0.0000**	**1,589.6969**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3343	2.5072	16.1712	0.0311		6.1200e-003	6.1200e-003		6.1200e-003	6.1200e-003	0.0000	2,628.1047	2,628.1047	0.0984	0.0000	2,630.5658
Total	**0.3343**	**2.5072**	**16.1712**	**0.0311**		**6.1200e-003**	**6.1200e-003**		**6.1200e-003**	**6.1200e-003**	**0.0000**	**2,628.1047**	**2,628.1047**	**0.0984**	**0.0000**	**2,630.5658**

3.5 Building Construction - 2033

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0716	2.5282	0.5855	7.8500e-003	0.2090	2.9500e-003	0.2120	0.0604	2.8200e-003	0.0632	0.0000	744.6870	744.6870	0.0160	0.0000	745.0859
Worker	0.5273	0.2385	2.6800	9.3300e-003	1.3902	5.6200e-003	1.3958	0.3698	5.1700e-003	0.3750	0.0000	844.1985	844.1985	0.0165	0.0000	844.6110
Total	**0.5989**	**2.7667**	**3.2655**	**0.0172**	**1.5992**	**8.5700e-003**	**1.6078**	**0.4302**	**7.9900e-003**	**0.4382**	**0.0000**	**1,588.8856**	**1,588.8856**	**0.0325**	**0.0000**	**1,589.6969**

3.5 Building Construction - 2034

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.2166	7.3816	13.6542	0.0311		0.1511	0.1511		0.1511	0.1511	0.0000	2,628.1078	2,628.1078	0.0984	0.0000	2,630.5689
Total	**1.2166**	**7.3816**	**13.6542**	**0.0311**		**0.1511**	**0.1511**		**0.1511**	**0.1511**	**0.0000**	**2,628.1078**	**2,628.1078**	**0.0984**	**0.0000**	**2,630.5689**

3.5 Building Construction - 2034

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0698	2.4978	0.5706	7.8300e-003	0.2090	2.8300e-003	0.2118	0.0604	2.7000e-003	0.0631	0.0000	742.8508	742.8508	0.0157	0.0000	743.2427
Worker	0.4814	0.2154	2.4793	9.1500e-003	1.3902	5.2300e-003	1.3954	0.3698	4.8100e-003	0.3746	0.0000	827.7898	827.7898	0.0147	0.0000	828.1562
Total	**0.5512**	**2.7132**	**3.0498**	**0.0170**	**1.5992**	**8.0600e-003**	**1.6072**	**0.4302**	**7.5100e-003**	**0.4377**	**0.0000**	**1,570.6407**	**1,570.6407**	**0.0303**	**0.0000**	**1,571.3989**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3343	2.5072	16.1712	0.0311		6.1200e-003	6.1200e-003		6.1200e-003	6.1200e-003	0.0000	2,628.1047	2,628.1047	0.0984	0.0000	2,630.5658
Total	**0.3343**	**2.5072**	**16.1712**	**0.0311**		**6.1200e-003**	**6.1200e-003**		**6.1200e-003**	**6.1200e-003**	**0.0000**	**2,628.1047**	**2,628.1047**	**0.0984**	**0.0000**	**2,630.5658**

3.5 Building Construction - 2034

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0698	2.4978	0.5706	7.8300e-003	0.2090	2.8300e-003	0.2118	0.0604	2.7000e-003	0.0631	0.0000	742.8508	742.8508	0.0157	0.0000	743.2427
Worker	0.4814	0.2154	2.4793	9.1500e-003	1.3902	5.2300e-003	1.3954	0.3698	4.8100e-003	0.3746	0.0000	827.7898	827.7898	0.0147	0.0000	828.1562
Total	**0.5512**	**2.7132**	**3.0498**	**0.0170**	**1.5992**	**8.0600e-003**	**1.6072**	**0.4302**	**7.5100e-003**	**0.4377**	**0.0000**	**1,570.6407**	**1,570.6407**	**0.0303**	**0.0000**	**1,571.3989**

3.5 Building Construction - 2035

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.1111	6.3930	13.6632	0.0312		0.0864	0.0864		0.0864	0.0864	0.0000	2,638.2159	2,638.2159	0.0895	0.0000	2,640.4537
Total	**1.1111**	**6.3930**	**13.6632**	**0.0312**		**0.0864**	**0.0864**		**0.0864**	**0.0864**	**0.0000**	**2,638.2159**	**2,638.2159**	**0.0895**	**0.0000**	**2,640.4537**

3.5 Building Construction - 2035

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0686	2.4813	0.5585	7.8500e-003	0.2098	2.7300e-003	0.2125	0.0606	2.6100e-003	0.0632	0.0000	744.2456	744.2456	0.0155	0.0000	744.6320
Worker	0.4433	0.1982	2.3179	9.0200e-003	1.3955	4.9100e-003	1.4004	0.3712	4.5100e-003	0.3757	0.0000	816.5959	816.5959	0.0132	0.0000	816.9249
Total	**0.5120**	**2.6794**	**2.8764**	**0.0169**	**1.6053**	**7.6400e-003**	**1.6130**	**0.4318**	**7.1200e-003**	**0.4390**	**0.0000**	**1,560.8416**	**1,560.8416**	**0.0286**	**0.0000**	**1,561.5569**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3356	2.5168	16.2334	0.0312		6.1400e-003	6.1400e-003		6.1400e-003	6.1400e-003	0.0000	2,638.2128	2,638.2128	0.0895	0.0000	2,640.4506
Total	**0.3356**	**2.5168**	**16.2334**	**0.0312**		**6.1400e-003**	**6.1400e-003**		**6.1400e-003**	**6.1400e-003**	**0.0000**	**2,638.2128**	**2,638.2128**	**0.0895**	**0.0000**	**2,640.4506**

3.5 Building Construction - 2035

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0686	2.4813	0.5585	7.8500e-003	0.2098	2.7300e-003	0.2125	0.0606	2.6100e-003	0.0632	0.0000	744.2456	744.2456	0.0155	0.0000	744.6320
Worker	0.4433	0.1982	2.3179	9.0200e-003	1.3955	4.9100e-003	1.4004	0.3712	4.5100e-003	0.3757	0.0000	816.5959	816.5959	0.0132	0.0000	816.9249
Total	**0.5120**	**2.6794**	**2.8764**	**0.0169**	**1.6053**	**7.6400e-003**	**1.6130**	**0.4318**	**7.1200e-003**	**0.4390**	**0.0000**	**1,560.8416**	**1,560.8416**	**0.0286**	**0.0000**	**1,561.5569**

3.5 Building Construction - 2036

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.1153	6.4175	13.7156	0.0313		0.0867	0.0867		0.0867	0.0867	0.0000	2,648.3240	2,648.3240	0.0899	0.0000	2,650.5704
Total	**1.1153**	**6.4175**	**13.7156**	**0.0313**		**0.0867**	**0.0867**		**0.0867**	**0.0867**	**0.0000**	**2,648.3240**	**2,648.3240**	**0.0899**	**0.0000**	**2,650.5704**

3.5 Building Construction - 2036

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0689	2.4908	0.5606	7.8800e-003	0.2106	2.7400e-003	0.2134	0.0609	2.6200e-003	0.0635	0.0000	747.0972	747.0972	0.0155	0.0000	747.4850
Worker	0.4450	0.1990	2.3268	9.0600e-003	1.4009	4.9300e-003	1.4058	0.3727	4.5300e-003	0.3772	0.0000	819.7247	819.7247	0.0132	0.0000	820.0549
Total	**0.5139**	**2.6897**	**2.8874**	**0.0169**	**1.6115**	**7.6700e-003**	**1.6192**	**0.4335**	**7.1500e-003**	**0.4407**	**0.0000**	**1,566.8218**	**1,566.8218**	**0.0287**	**0.0000**	**1,567.5399**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3369	2.5265	16.2956	0.0313		6.1600e-003	6.1600e-003		6.1600e-003	6.1600e-003	0.0000	2,648.3209	2,648.3209	0.0899	0.0000	2,650.5673
Total	**0.3369**	**2.5265**	**16.2956**	**0.0313**		**6.1600e-003**	**6.1600e-003**		**6.1600e-003**	**6.1600e-003**	**0.0000**	**2,648.3209**	**2,648.3209**	**0.0899**	**0.0000**	**2,650.5673**

3.5 Building Construction - 2036

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0689	2.4908	0.5606	7.8800e-003	0.2106	2.7400e-003	0.2134	0.0609	2.6200e-003	0.0635	0.0000	747.0972	747.0972	0.0155	0.0000	747.4850
Worker	0.4450	0.1990	2.3268	9.0600e-003	1.4009	4.9300e-003	1.4058	0.3727	4.5300e-003	0.3772	0.0000	819.7247	819.7247	0.0132	0.0000	820.0549
Total	**0.5139**	**2.6897**	**2.8874**	**0.0169**	**1.6115**	**7.6700e-003**	**1.6192**	**0.4335**	**7.1500e-003**	**0.4407**	**0.0000**	**1,566.8218**	**1,566.8218**	**0.0287**	**0.0000**	**1,567.5399**

3.5 Building Construction - 2037

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.1111	6.3930	13.6632	0.0312		0.0864	0.0864		0.0864	0.0864	0.0000	2,638.2159	2,638.2159	0.0895	0.0000	2,640.4537
Total	**1.1111**	**6.3930**	**13.6632**	**0.0312**		**0.0864**	**0.0864**		**0.0864**	**0.0864**	**0.0000**	**2,638.2159**	**2,638.2159**	**0.0895**	**0.0000**	**2,640.4537**

3.5 Building Construction - 2037

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0686	2.4813	0.5585	7.8500e-003	0.2098	2.7300e-003	0.2125	0.0606	2.6100e-003	0.0632	0.0000	744.2456	744.2456	0.0155	0.0000	744.6320
Worker	0.4433	0.1982	2.3179	9.0200e-003	1.3955	4.9100e-003	1.4004	0.3712	4.5100e-003	0.3757	0.0000	816.5959	816.5959	0.0132	0.0000	816.9249
Total	**0.5120**	**2.6794**	**2.8764**	**0.0169**	**1.6053**	**7.6400e-003**	**1.6130**	**0.4318**	**7.1200e-003**	**0.4390**	**0.0000**	**1,560.8416**	**1,560.8416**	**0.0286**	**0.0000**	**1,561.5569**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3356	2.5168	16.2334	0.0312		6.1400e-003	6.1400e-003		6.1400e-003	6.1400e-003	0.0000	2,638.2128	2,638.2128	0.0895	0.0000	2,640.4506
Total	**0.3356**	**2.5168**	**16.2334**	**0.0312**		**6.1400e-003**	**6.1400e-003**		**6.1400e-003**	**6.1400e-003**	**0.0000**	**2,638.2128**	**2,638.2128**	**0.0895**	**0.0000**	**2,640.4506**

3.5 Building Construction - 2037

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0686	2.4813	0.5585	7.8500e-003	0.2098	2.7300e-003	0.2125	0.0606	2.6100e-003	0.0632	0.0000	744.2456	744.2456	0.0155	0.0000	744.6320
Worker	0.4433	0.1982	2.3179	9.0200e-003	1.3955	4.9100e-003	1.4004	0.3712	4.5100e-003	0.3757	0.0000	816.5959	816.5959	0.0132	0.0000	816.9249
Total	**0.5120**	**2.6794**	**2.8764**	**0.0169**	**1.6053**	**7.6400e-003**	**1.6130**	**0.4318**	**7.1200e-003**	**0.4390**	**0.0000**	**1,560.8416**	**1,560.8416**	**0.0286**	**0.0000**	**1,561.5569**

3.5 Building Construction - 2038

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.1111	6.3930	13.6632	0.0312		0.0864	0.0864		0.0864	0.0864	0.0000	2,638.2159	2,638.2159	0.0895	0.0000	2,640.4537
Total	**1.1111**	**6.3930**	**13.6632**	**0.0312**		**0.0864**	**0.0864**		**0.0864**	**0.0864**	**0.0000**	**2,638.2159**	**2,638.2159**	**0.0895**	**0.0000**	**2,640.4537**

3.5 Building Construction - 2038

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0686	2.4813	0.5585	7.8500e-003	0.2098	2.7300e-003	0.2125	0.0606	2.6100e-003	0.0632	0.0000	744.2456	744.2456	0.0155	0.0000	744.6320
Worker	0.4433	0.1982	2.3179	9.0200e-003	1.3955	4.9100e-003	1.4004	0.3712	4.5100e-003	0.3757	0.0000	816.5959	816.5959	0.0132	0.0000	816.9249
Total	**0.5120**	**2.6794**	**2.8764**	**0.0169**	**1.6053**	**7.6400e-003**	**1.6130**	**0.4318**	**7.1200e-003**	**0.4390**	**0.0000**	**1,560.8416**	**1,560.8416**	**0.0286**	**0.0000**	**1,561.5569**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3356	2.5168	16.2334	0.0312		6.1400e-003	6.1400e-003		6.1400e-003	6.1400e-003	0.0000	2,638.2128	2,638.2128	0.0895	0.0000	2,640.4506
Total	**0.3356**	**2.5168**	**16.2334**	**0.0312**		**6.1400e-003**	**6.1400e-003**		**6.1400e-003**	**6.1400e-003**	**0.0000**	**2,638.2128**	**2,638.2128**	**0.0895**	**0.0000**	**2,640.4506**

3.5 Building Construction - 2038

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0686	2.4813	0.5585	7.8500e-003	0.2098	2.7300e-003	0.2125	0.0606	2.6100e-003	0.0632	0.0000	744.2456	744.2456	0.0155	0.0000	744.6320
Worker	0.4433	0.1982	2.3179	9.0200e-003	1.3955	4.9100e-003	1.4004	0.3712	4.5100e-003	0.3757	0.0000	816.5959	816.5959	0.0132	0.0000	816.9249
Total	**0.5120**	**2.6794**	**2.8764**	**0.0169**	**1.6053**	**7.6400e-003**	**1.6130**	**0.4318**	**7.1200e-003**	**0.4390**	**0.0000**	**1,560.8416**	**1,560.8416**	**0.0286**	**0.0000**	**1,561.5569**

3.5 Building Construction - 2039

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.9834	5.6581	12.0928	0.0276		0.0765	0.0765		0.0765	0.0765	0.0000	2,334.9727	2,334.9727	0.0792	0.0000	2,336.9533
Total	**0.9834**	**5.6581**	**12.0928**	**0.0276**		**0.0765**	**0.0765**		**0.0765**	**0.0765**	**0.0000**	**2,334.9727**	**2,334.9727**	**0.0792**	**0.0000**	**2,336.9533**

3.5 Building Construction - 2039

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0607	2.1961	0.4943	6.9400e-003	0.1857	2.4100e-003	0.1881	0.0537	2.3100e-003	0.0560	0.0000	658.7002	658.7002	0.0137	0.0000	659.0421
Worker	0.3924	0.1754	2.0515	7.9800e-003	1.2351	4.3400e-003	1.2395	0.3286	3.9900e-003	0.3326	0.0000	722.7343	722.7343	0.0117	0.0000	723.0255
Total	**0.4531**	**2.3715**	**2.5458**	**0.0149**	**1.4208**	**6.7500e-003**	**1.4276**	**0.3822**	**6.3000e-003**	**0.3885**	**0.0000**	**1,381.4345**	**1,381.4345**	**0.0253**	**0.0000**	**1,382.0676**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2970	2.2275	14.3675	0.0276		5.4300e-003	5.4300e-003		5.4300e-003	5.4300e-003	0.0000	2,334.9699	2,334.9699	0.0792	0.0000	2,336.9505
Total	**0.2970**	**2.2275**	**14.3675**	**0.0276**		**5.4300e-003**	**5.4300e-003**		**5.4300e-003**	**5.4300e-003**	**0.0000**	**2,334.9699**	**2,334.9699**	**0.0792**	**0.0000**	**2,336.9505**

3.5 Building Construction - 2039

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0607	2.1961	0.4943	6.9400e-003	0.1857	2.4100e-003	0.1881	0.0537	2.3100e-003	0.0560	0.0000	658.7002	658.7002	0.0137	0.0000	659.0421
Worker	0.3924	0.1754	2.0515	7.9800e-003	1.2351	4.3400e-003	1.2395	0.3286	3.9900e-003	0.3326	0.0000	722.7343	722.7343	0.0117	0.0000	723.0255
Total	**0.4531**	**2.3715**	**2.5458**	**0.0149**	**1.4208**	**6.7500e-003**	**1.4276**	**0.3822**	**6.3000e-003**	**0.3885**	**0.0000**	**1,381.4345**	**1,381.4345**	**0.0253**	**0.0000**	**1,382.0676**

3.6 Paving - 2039

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1176	0.5029	1.6315	2.8900e-003		0.0193	0.0193		0.0193	0.0193	0.0000	248.5263	248.5263	9.5600e-003	0.0000	248.7654
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1176**	**0.5029**	**1.6315**	**2.8900e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**248.5263**	**248.5263**	**9.5600e-003**	**0.0000**	**248.7654**

3.6 Paving - 2039

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.8000e-004	3.9000e-004	4.5800e-003	2.0000e-005	2.7600e-003	1.0000e-005	2.7700e-003	7.3000e-004	1.0000e-005	7.4000e-004	0.0000	1.6146	1.6146	3.0000e-005	0.0000	1.6152
Total	**8.8000e-004**	**3.9000e-004**	**4.5800e-003**	**2.0000e-005**	**2.7600e-003**	**1.0000e-005**	**2.7700e-003**	**7.3000e-004**	**1.0000e-005**	**7.4000e-004**	**0.0000**	**1.6146**	**1.6146**	**3.0000e-005**	**0.0000**	**1.6152**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1176	0.5029	1.6315	2.8900e-003		2.9000e-003	2.9000e-003		2.9000e-003	2.9000e-003	0.0000	248.5260	248.5260	9.5600e-003	0.0000	248.7651
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1176**	**0.5029**	**1.6315**	**2.8900e-003**		**2.9000e-003**	**2.9000e-003**		**2.9000e-003**	**2.9000e-003**	**0.0000**	**248.5260**	**248.5260**	**9.5600e-003**	**0.0000**	**248.7651**

3.6 Paving - 2039

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.8000e-004	3.9000e-004	4.5800e-003	2.0000e-005	2.7600e-003	1.0000e-005	2.7700e-003	7.3000e-004	1.0000e-005	7.4000e-004	0.0000	1.6146	1.6146	3.0000e-005	0.0000	1.6152
Total	**8.8000e-004**	**3.9000e-004**	**4.5800e-003**	**2.0000e-005**	**2.7600e-003**	**1.0000e-005**	**2.7700e-003**	**7.3000e-004**	**1.0000e-005**	**7.4000e-004**	**0.0000**	**1.6146**	**1.6146**	**3.0000e-005**	**0.0000**	**1.6152**

3.6 Paving - 2040

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4032	1.4581	6.3073	0.0112		0.0464	0.0464		0.0464	0.0464	0.0000	960.9682	960.9682	0.0323	0.0000	961.7756
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.4032**	**1.4581**	**6.3073**	**0.0112**		**0.0464**	**0.0464**		**0.0464**	**0.0464**	**0.0000**	**960.9682**	**960.9682**	**0.0323**	**0.0000**	**961.7756**

3.6 Paving - 2040

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2500e-003	1.0900e-003	0.0138	6.0000e-005	0.0107	3.0000e-005	0.0107	2.8400e-003	3.0000e-005	2.8600e-003	0.0000	5.8848	5.8848	7.0000e-005	0.0000	5.8865
Total	**2.2500e-003**	**1.0900e-003**	**0.0138**	**6.0000e-005**	**0.0107**	**3.0000e-005**	**0.0107**	**2.8400e-003**	**3.0000e-005**	**2.8600e-003**	**0.0000**	**5.8848**	**5.8848**	**7.0000e-005**	**0.0000**	**5.8865**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4032	1.4581	6.3073	0.0112		6.9600e-003	6.9600e-003		6.9600e-003	6.9600e-003	0.0000	960.9670	960.9670	0.0323	0.0000	961.7745
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.4032**	**1.4581**	**6.3073**	**0.0112**		**6.9600e-003**	**6.9600e-003**		**6.9600e-003**	**6.9600e-003**	**0.0000**	**960.9670**	**960.9670**	**0.0323**	**0.0000**	**961.7745**

3.6 Paving - 2040

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2500e-003	1.0900e-003	0.0138	6.0000e-005	0.0107	3.0000e-005	0.0107	2.8400e-003	3.0000e-005	2.8600e-003	0.0000	5.8848	5.8848	7.0000e-005	0.0000	5.8865
Total	**2.2500e-003**	**1.0900e-003**	**0.0138**	**6.0000e-005**	**0.0107**	**3.0000e-005**	**0.0107**	**2.8400e-003**	**3.0000e-005**	**2.8600e-003**	**0.0000**	**5.8848**	**5.8848**	**7.0000e-005**	**0.0000**	**5.8865**

3.7 Architectural Coating - 2040

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	41.4877					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1118	0.7076	1.7445	2.8900e-003		7.2300e-003	7.2300e-003		7.2300e-003	7.2300e-003	0.0000	248.5167	248.5167	8.7500e-003	0.0000	248.7354
Total	**41.5995**	**0.7076**	**1.7445**	**2.8900e-003**		**7.2300e-003**	**7.2300e-003**		**7.2300e-003**	**7.2300e-003**	**0.0000**	**248.5167**	**248.5167**	**8.7500e-003**	**0.0000**	**248.7354**

3.7 Architectural Coating - 2040

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0328	0.0159	0.2011	9.5000e-004	0.1558	4.1000e-004	0.1562	0.0414	3.8000e-004	0.0418	0.0000	85.9182	85.9182	9.7000e-004	0.0000	85.9423
Total	**0.0328**	**0.0159**	**0.2011**	**9.5000e-004**	**0.1558**	**4.1000e-004**	**0.1562**	**0.0414**	**3.8000e-004**	**0.0418**	**0.0000**	**85.9182**	**85.9182**	**9.7000e-004**	**0.0000**	**85.9423**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	41.4877					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0289	0.1253	1.7836	2.8900e-003		5.8000e-004	5.8000e-004		5.8000e-004	5.8000e-004	0.0000	248.5164	248.5164	8.7500e-003	0.0000	248.7351
Total	**41.5166**	**0.1253**	**1.7836**	**2.8900e-003**		**5.8000e-004**	**5.8000e-004**		**5.8000e-004**	**5.8000e-004**	**0.0000**	**248.5164**	**248.5164**	**8.7500e-003**	**0.0000**	**248.7351**

3.7 Architectural Coating - 2040

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0328	0.0159	0.2011	9.5000e-004	0.1558	4.1000e-004	0.1562	0.0414	3.8000e-004	0.0418	0.0000	85.9182	85.9182	9.7000e-004	0.0000	85.9423
Total	**0.0328**	**0.0159**	**0.2011**	**9.5000e-004**	**0.1558**	**4.1000e-004**	**0.1562**	**0.0414**	**3.8000e-004**	**0.0418**	**0.0000**	**85.9182**	**85.9182**	**9.7000e-004**	**0.0000**	**85.9423**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.4781	6.4531	30.5361	0.1033	10.4524	0.0776	10.5299	2.7992	0.0724	2.8716	0.0000	9,543.1682	9,543.1682	0.3395	0.0000	9,551.6548
Unmitigated	2.4781	6.4531	30.5361	0.1033	10.4524	0.0776	10.5299	2.7992	0.0724	2.8716	0.0000	9,543.1682	9,543.1682	0.3395	0.0000	9,551.6548

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	498.00	498.00	498.00	1,851,922	1,851,922
Golf Course	185.94	185.94	185.94	388,162	388,162
Hotel	1,435.10	1,435.10	1435.10	2,883,358	2,883,358
Quality Restaurant	586.88	586.88	586.88	696,864	696,864
Regional Shopping Center	302.08	302.08	302.08	547,695	547,695
Single Family Housing	5,890.00	5,890.00	5890.00	21,903,255	21,903,255
User Defined Commercial	0.00	0.00	0.00		
User Defined Industrial	0.00	0.00	0.00		
Total	8,898.00	8,898.00	8,898.00	28,271,257	28,271,257

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	16.80	7.10	7.90	42.30	19.60	38.10	86	11	3
Golf Course	14.70	6.60	6.60	33.00	48.00	19.00	52	39	9
Hotel	14.70	6.60	6.60	19.40	61.60	19.00	58	38	4
Quality Restaurant	14.70	6.60	6.60	12.00	69.00	19.00	38	18	44
Regional Shopping Center	14.70	6.60	6.60	16.30	64.70	19.00	54	35	11
Single Family Housing	16.80	7.10	7.90	42.30	19.60	38.10	86	11	3
User Defined Commercial	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0
User Defined Industrial	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.562691	0.032307	0.225633	0.110304	0.018549	0.003386	0.015829	0.023488	0.001071	0.000806	0.004279	0.000993	0.000664
Golf Course	0.562691	0.032307	0.225633	0.110304	0.018549	0.003386	0.015829	0.023488	0.001071	0.000806	0.004279	0.000993	0.000664
Hotel	0.562691	0.032307	0.225633	0.110304	0.018549	0.003386	0.015829	0.023488	0.001071	0.000806	0.004279	0.000993	0.000664
Quality Restaurant	0.562691	0.032307	0.225633	0.110304	0.018549	0.003386	0.015829	0.023488	0.001071	0.000806	0.004279	0.000993	0.000664
Regional Shopping Center	0.562691	0.032307	0.225633	0.110304	0.018549	0.003386	0.015829	0.023488	0.001071	0.000806	0.004279	0.000993	0.000664
Single Family Housing	0.562691	0.032307	0.225633	0.110304	0.018549	0.003386	0.015829	0.023488	0.001071	0.000806	0.004279	0.000993	0.000664
User Defined Commercial	0.562691	0.032307	0.225633	0.110304	0.018549	0.003386	0.015829	0.023488	0.001071	0.000806	0.004279	0.000993	0.000664
User Defined Industrial	0.562691	0.032307	0.225633	0.110304	0.018549	0.003386	0.015829	0.023488	0.001071	0.000806	0.004279	0.000993	0.000664

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Percent of Electricity Use Generated with Renewable Energy

Guenoc Valley Mixed Use Planned Development Project - Future Phases - Lake County, Annual

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	4,860.7567	4,860.7567	0.2198	0.0455	4,879.8026
NaturalGas Mitigated	0.0969	0.8580	0.5731	5.2800e-003		0.0669	0.0669		0.0669	0.0669	0.0000	958.7561	958.7561	0.0184	0.0176	964.4535
NaturalGas Unmitigated	0.1840	1.6305	1.0970	0.0100		0.1271	0.1271		0.1271	0.1271	0.0000	1,820.7286	1,820.7286	0.0349	0.0334	1,831.5483

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.15992e+006	0.0117	0.0995	0.0424	6.4000e-004		8.0500e-003	8.0500e-003		8.0500e-003	8.0500e-003	0.0000	115.2613	115.2613	2.2100e-003	2.1100e-003	115.9463
Golf Course	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hotel	1.70311e+007	0.0918	0.8349	0.7013	5.0100e-003		0.0635	0.0635		0.0635	0.0635	0.0000	908.8438	908.8438	0.0174	0.0167	914.2446
Quality Restaurant	1.6268e+006	8.7700e-003	0.0798	0.0670	4.8000e-004		6.0600e-003	6.0600e-003		6.0600e-003	6.0600e-003	0.0000	86.8122	86.8122	1.6600e-003	1.5900e-003	87.3281
Regional Shopping Center	115360	6.2000e-004	5.6500e-003	4.7500e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004	0.0000	6.1561	6.1561	1.2000e-004	1.1000e-004	6.1926
Single Family Housing	1.21165e+007	0.0653	0.5583	0.2376	3.5600e-003		0.0451	0.0451		0.0451	0.0451	0.0000	646.5826	646.5826	0.0124	0.0119	650.4249
User Defined Commercial	581000	3.1300e-003	0.0285	0.0239	1.7000e-004		2.1600e-003	2.1600e-003		2.1600e-003	2.1600e-003	0.0000	31.0044	31.0044	5.9000e-004	5.7000e-004	31.1886
User Defined Industrial	488500	2.6300e-003	0.0240	0.0201	1.4000e-004		1.8200e-003	1.8200e-003		1.8200e-003	1.8200e-003	0.0000	26.0682	26.0682	5.0000e-004	4.8000e-004	26.2231
Total		**0.1840**	**1.6305**	**1.0970**	**0.0100**		**0.1271**	**0.1271**		**0.1271**	**0.1271**	**0.0000**	**1,820.7286**	**1,820.7286**	**0.0349**	**0.0334**	**1,831.5482**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	1.18465e+006	6.3900e-003	0.0546	0.0232	3.5000e-004		4.4100e-003	4.4100e-003		4.4100e-003	4.4100e-003	0.0000	63.2177	63.2177	1.2100e-003	1.1600e-003	63.5934
Golf Course	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hotel	8.02635e+006	0.0433	0.3935	0.3305	2.3600e-003		0.0299	0.0299		0.0299	0.0299	0.0000	428.3167	428.3167	8.2100e-003	7.8500e-003	430.8620
Quality Restaurant	1.42164e+006	7.6700e-003	0.0697	0.0585	4.2000e-004		5.3000e-003	5.3000e-003		5.3000e-003	5.3000e-003	0.0000	75.8640	75.8640	1.4500e-003	1.3900e-003	76.3148
Regional Shopping Center	54219.2	2.9000e-004	2.6600e-003	2.2300e-003	2.0000e-005		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004	0.0000	2.8933	2.8933	6.0000e-005	5.0000e-005	2.9105
Single Family Housing	6.54222e+006	0.0353	0.3015	0.1283	1.9200e-003		0.0244	0.0244		0.0244	0.0244	0.0000	349.1180	349.1180	6.6900e-003	6.4000e-003	351.1927
User Defined Commercial	507727	2.7400e-003	0.0249	0.0209	1.5000e-004		1.8900e-003	1.8900e-003		1.8900e-003	1.8900e-003	0.0000	27.0943	27.0943	5.2000e-004	5.0000e-004	27.2553
User Defined Industrial	229595	1.2400e-003	0.0113	9.4500e-003	7.0000e-005		8.6000e-004	8.6000e-004		8.6000e-004	8.6000e-004	0.0000	12.2521	12.2521	2.3000e-004	2.2000e-004	12.3249
Total		**0.0969**	**0.8580**	**0.5731**	**5.2900e-003**		**0.0669**	**0.0669**		**0.0669**	**0.0669**	**0.0000**	**958.7561**	**958.7561**	**0.0184**	**0.0176**	**964.4535**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	951810	276.8924	0.0125	2.5900e-003	277.9774
Golf Course	0	0.0000	0.0000	0.0000	0.0000
Hotel	6.12003e+006	1,780.3883	0.0805	0.0167	1,787.3644
Quality Restaurant	343980	100.0677	4.5200e-003	9.4000e-004	100.4598
Regional Shopping Center	216320	62.9300	2.8500e-003	5.9000e-004	63.1766
Single Family Housing	8.67722e+006	2,524.3028	0.1141	0.0236	2,534.1938
User Defined Commercial	122850	35.7385	1.6200e-003	3.3000e-004	35.8785
User Defined Industrial	276500	80.4370	3.6400e-003	7.5000e-004	80.7522
Total		**4,860.7567**	**0.2198**	**0.0455**	**4,879.8026**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	0	0.0000	0.0000	0.0000	0.0000
Golf Course	0	0.0000	0.0000	0.0000	0.0000
Hotel	0	0.0000	0.0000	0.0000	0.0000
Quality Restaurant	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	0	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

Guenoc Valley Mixed Use Planned Development Project - Future Phases - Lake County, Annual

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	12.9310	0.1025	8.8925	4.7000e-004		0.0494	0.0494		0.0494	0.0494	0.0000	14.5660	14.5660	0.0139	0.0000	14.9135
Unmitigated	12.9310	0.1025	8.8925	4.7000e-004		0.0494	0.0494		0.0494	0.0494	0.0000	14.5660	14.5660	0.0139	0.0000	14.9135

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	4.1488					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	8.5158					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.2663	0.1025	8.8925	4.7000e-004		0.0494	0.0494		0.0494	0.0494	0.0000	14.5660	14.5660	0.0139	0.0000	14.9135
Total	**12.9310**	**0.1025**	**8.8925**	**4.7000e-004**		**0.0494**	**0.0494**		**0.0494**	**0.0494**	**0.0000**	**14.5660**	**14.5660**	**0.0139**	**0.0000**	**14.9135**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	4.1488					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	8.5158					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.2663	0.1025	8.8925	4.7000e-004		0.0494	0.0494		0.0494	0.0494	0.0000	14.5660	14.5660	0.0139	0.0000	14.9135
Total	**12.9310**	**0.1025**	**8.8925**	**4.7000e-004**		**0.0494**	**0.0494**		**0.0494**	**0.0494**	**0.0000**	**14.5660**	**14.5660**	**0.0139**	**0.0000**	**14.9135**

7.0 Water Detail

7.1 Mitigation Measures Water

Use Reclaimed Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	339.5097	2.5880	0.0637	423.1962
Unmitigated	397.9820	3.2338	0.0794	502.4867

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	13.0308 / 8.21507	33.0107	0.4259	0.0103	46.7268
Golf Course	0 / 149.721	152.4448	6.8900e-003	1.4300e-003	153.0421
Hotel	14.3322 / 1.59247	28.7291	0.4681	0.0113	43.7853
Quality Restaurant	4.24947 / 0.271243	8.3135	0.1388	3.3300e-003	12.7769
Regional Shopping Center	1.18516 / 0.726389	2.9812	0.0387	9.4000e-004	4.2286
Single Family Housing	65.154 / 41.0754	165.0533	2.1296	0.0515	233.6338
User Defined Commercial	0.67884 / 0	1.2839	0.0222	5.3000e-004	1.9968
User Defined Industrial	0.102368 / 5.86532	6.1656	3.6100e-003	1.4000e-004	6.2965
Total		**397.9821**	**3.2338**	**0.0794**	**502.4867**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	10.4246 / 7.39357	27.2450	0.3408	8.2400e-003	38.2211
Golf Course	0 / 134.749	137.2003	6.2000e-003	1.2800e-003	137.7379
Hotel	11.4658 / 1.43322	23.1454	0.3745	9.0000e-003	35.1910
Quality Restaurant	3.39958 / 0.244119	6.6784	0.1110	2.6700e-003	10.2492
Regional Shopping Center	0.948128 / 0.65375	2.4589	0.0310	7.5000e-004	3.4571
Single Family Housing	52.1232 / 36.9678	136.2249	1.7039	0.0412	191.1057
User Defined Commercial	0.543072 / 0	1.0272	0.0177	4.3000e-004	1.5974
User Defined Industrial	0.0818944 / 5.27879	5.5297	2.9200e-003	1.1000e-004	5.6368
Total		**339.5097**	**2.5880**	**0.0637**	**423.1962**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	236.9959	14.0061	0.0000	587.1474
Unmitigated	303.8409	17.9565	0.0000	752.7531

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	92	18.6752	1.1037	0.0000	46.2669
Golf Course	2.4	0.4872	0.0288	0.0000	1.2070
Hotel	309.34	62.7932	3.7110	0.0000	155.5676
Quality Restaurant	12.78	2.5942	0.1533	0.0000	6.4271
Regional Shopping Center	16.8	3.4103	0.2015	0.0000	8.4488
Single Family Housing	1029.6	208.9995	12.3515	0.0000	517.7874
User Defined Commercial	31.5	6.3942	0.3779	0.0000	15.8414
User Defined Industrial	2.4	0.4872	0.0288	0.0000	1.2070
Total		**303.8409**	**17.9565**	**0.0000**	**752.7531**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	71.76	14.5666	0.8609	0.0000	36.0882
Golf Course	1.872	0.3800	0.0225	0.0000	0.9414
Hotel	241.285	48.9787	2.8946	0.0000	121.3427
Quality Restaurant	9.9684	2.0235	0.1196	0.0000	5.0131
Regional Shopping Center	13.104	2.6600	0.1572	0.0000	6.5900
Single Family Housing	803.088	163.0196	9.6342	0.0000	403.8742
User Defined Commercial	24.57	4.9875	0.2948	0.0000	12.3563
User Defined Industrial	1.872	0.3800	0.0225	0.0000	0.9414
Total		**236.9959**	**14.0061**	**0.0000**	**587.1474**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

	Total CO2	CH4	N2O	CO2e
Category	MT			
Unmitigated	-45,510.0000	0.0000	0.0000	-45,510.0000

11.1 Vegetation Land Change

Vegetation Type

	Initial/Final	Total CO2	CH4	N2O	CO2e
	Acres	MT			
Trees	410 / 0	-45,510.0000	0.0000	0.0000	-45,510.0000
Total		**-45,510.0000**	**0.0000**	**0.0000**	**-45,510.0000**

Guenoc Valley Mixed Use Planned Development Project - Phase 1A 2030

Lake County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	116.70	1000sqft	54.53	116,700.00	0
General Office Building	1.40	1000sqft	2.85	1,400.00	0
General Office Building	12.60	1000sqft	0.00	12,600.00	0
Medical Office Building	8.40	1000sqft	17.63	8,400.00	0
User Defined Commercial	13.00	User Defined Unit	21.87	21,000.00	0
User Defined Commercial	5.00	User Defined Unit	18.49	77,200.00	0
User Defined Industrial	35.00	User Defined Unit	38.37	56,000.00	0
Parking Lot	2.78	Acre	2.78	121,096.80	0
Golf Course	18.00	Hole	475.53	0.00	0
Health Club	118.20	1000sqft	26.80	118,200.00	0
Hotel	91.00	Room	59.00	59,200.00	0
Hotel	61.00	Room	45.17	90,500.00	0
Hotel	13.00	Room	16.09	11,000.00	0
Hotel	81.00	Room	31.97	189,900.00	0
Hotel	27.00	Room	148.03	131,800.00	0
Hotel	20.00	Room	28.15	27,300.00	0
Hotel	50.00	Room	0.00	28,600.00	0
Quality Restaurant	11.80	1000sqft	0.00	11,800.00	0
Quality Restaurant	23.00	1000sqft	47.22	23,000.00	0
Quality Restaurant	10.60	1000sqft	93.03	10,600.00	0

User Defined Recreational	6.50	User Defined Unit	0.00	6,500.00	0
User Defined Recreational	26.00	User Defined Unit	0.00	26,000.00	0
User Defined Recreational	27.00	User Defined Unit	0.00	27,000.00	0
User Defined Recreational	24.60	User Defined Unit	0.00	24,600.00	0
User Defined Recreational	71.90	User Defined Unit	0.00	71,900.00	0
Apartments Low Rise	35.00	Dwelling Unit	138.73	52,100.00	100
Apartments Low Rise	50.00	Dwelling Unit	12.75	50,000.00	143
Single Family Housing	45.00	Dwelling Unit	52.15	81,000.00	129
Single Family Housing	30.00	Dwelling Unit	10.25	54,000.00	86
Single Family Housing	13.00	Dwelling Unit	8.03	23,400.00	37
Single Family Housing	40.00	Dwelling Unit	21.21	72,000.00	114
Single Family Housing	13.00	Dwelling Unit	6.01	23,400.00	37
Regional Shopping Center	30.00	1000sqft	0.00	30,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	67
Climate Zone	1			**Operational Year**	2030
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Project operational year = 2022

Land Use - Lot acerage and sizing from Phase 1 Site Plan and SPOD.

Construction Phase - Construction duration is from 4/1/2020 to 12/1/2023.

Off-road Equipment - Notes

Off-road Equipment - Notes

Off-road Equipment - Construction equipment list updated to match inputs provided by developer.

Off-road Equipment - Notes

Off-road Equipment - Notes

Off-road Equipment - Notes

Trips and VMT - Worker trips based on on-site construction employee estimates provided by developer. Worker Trip Length reduced based off expected on-site construction camps.

Demolition -

Grading - Based on earthwork calculations provided by Sherwood Design Engineers.

Architectural Coating -

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Energy Use - Notes

Fleet Mix -

Water Mitigation -

Waste Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3

tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	23.00
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	13.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00

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tblConstEquipMitigation	Tier	No Change	Tier 4 Final
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tblConstructionPhase	NumDays	10,000.00	29.00
tblConstructionPhase	NumDays	15,500.00	731.00
tblConstructionPhase	NumDays	11,000.00	1,249.00
tblConstructionPhase	NumDays	6,000.00	731.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConsumerProducts	ROG_EF	2.14E-05	1.62E-05
tblEnergyUse	LightingElect	0.00	4.74
tblEnergyUse	LightingElect	0.00	3.45
tblEnergyUse	LightingElect	0.00	4.74

tblEnergyUse	NT24E	0.00	15.83
tblEnergyUse	NT24E	0.00	3.98
tblEnergyUse	NT24E	0.00	15.83
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tblFireplaces	FireplaceDayYear	82.00	0.00
tblFireplaces	FireplaceDayYear	82.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	NumberGas	46.75	0.00
tblFireplaces	NumberGas	77.55	0.00
tblFireplaces	NumberNoFireplace	8.50	0.00
tblFireplaces	NumberNoFireplace	14.10	0.00
tblFireplaces	NumberWood	29.75	0.00
tblFireplaces	NumberWood	49.35	0.00
tblGrading	AcresOfGrading	8,680.63	653.35
tblGrading	MaterialExported	0.00	37,647.00
tblLandUse	LandUseSquareFeet	0.00	21,000.00
tblLandUse	LandUseSquareFeet	0.00	77,200.00

tblLandUse	LandUseSquareFeet	0.00	56,000.00
tblLandUse	LandUseSquareFeet	18,876.00	11,000.00
tblLandUse	LandUseSquareFeet	29,040.00	27,300.00
tblLandUse	LandUseSquareFeet	39,204.00	131,800.00
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tblLandUse	LandUseSquareFeet	88,572.00	90,500.00
tblLandUse	LandUseSquareFeet	117,612.00	189,900.00
tblLandUse	LandUseSquareFeet	132,132.00	59,200.00
tblLandUse	LandUseSquareFeet	0.00	24,600.00
tblLandUse	LandUseSquareFeet	0.00	26,000.00
tblLandUse	LandUseSquareFeet	0.00	27,000.00
tblLandUse	LandUseSquareFeet	0.00	6,500.00
tblLandUse	LandUseSquareFeet	0.00	71,900.00
tblLandUse	LandUseSquareFeet	35,000.00	52,100.00
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tblLandUse	LotAcreage	2.68	54.53
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tblLandUse	LotAcreage	0.43	16.09
tblLandUse	LotAcreage	0.67	28.15
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tblLandUse	LotAcreage	2.70	31.97
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tblLandUse	LotAcreage	4.22	8.03
tblLandUse	LotAcreage	4.22	6.01
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tblLandUse	LotAcreage	14.61	52.15
tblLandUse	LotAcreage	0.69	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	8.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	4.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
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tblOffRoadEquipment	UsageHours	8.00	10.00
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tblOffRoadEquipment	UsageHours	8.00	10.00
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tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblSolidWaste	SolidWasteGenerationRate	187.79	185.06
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tblSolidWaste	SolidWasteGenerationRate	0.00	31.50

tblTripsAndVMT	HaulingTripNumber	154.00	10.00
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tblTripsAndVMT	WorkerTripLength	16.80	7.00
tblTripsAndVMT	WorkerTripLength	16.80	7.00
tblTripsAndVMT	WorkerTripLength	16.80	7.00
tblTripsAndVMT	WorkerTripLength	16.80	7.00
tblTripsAndVMT	WorkerTripLength	16.80	7.00
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tblTripsAndVMT	WorkerTripNumber	115.00	180.00
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tblVehicleTrips	CNW_TL	6.60	0.00
tblVehicleTrips	CNW_TL	6.60	7.00
tblVehicleTrips	CNW_TL	6.60	0.00
tblVehicleTrips	CNW_TL	6.60	0.00
tblVehicleTrips	CNW_TL	6.60	7.00
tblVehicleTrips	CNW_TL	6.60	7.00
tblVehicleTrips	CNW_TL	6.60	7.00
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tblVehicleTrips	CNW_TL	6.60	0.00
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tblVehicleTrips	CW_TL	14.70	0.00
tblVehicleTrips	CW_TL	14.70	0.00
tblVehicleTrips	CW_TL	14.70	0.00
tblVehicleTrips	CW_TL	14.70	0.00
tblVehicleTrips	CW_TL	14.70	0.00

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tblVehicleTrips	DV_TP	11.00	0.00
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tblVehicleTrips	HS_TTP	19.60	0.00
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tblVehicleTrips	HW_TL	16.80	0.00
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tblVehicleTrips	PB_TP	9.00	0.00
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tblVehicleTrips	PR_TP	86.00	0.00
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tblVehicleTrips	PR_TP	0.00	100.00
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tblVehicleTrips	ST_TR	40.63	10.33
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tblVehicleTrips	ST_TR	8.96	0.00
tblVehicleTrips	ST_TR	94.36	41.92
tblVehicleTrips	ST_TR	49.97	18.88
tblVehicleTrips	ST_TR	9.91	0.00

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tblVehicleTrips	SU_TR	39.53	10.33
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tblVehicleTrips	SU_TR	5.95	3.14
tblVehicleTrips	SU_TR	1.55	0.00
tblVehicleTrips	SU_TR	72.16	41.92
tblVehicleTrips	SU_TR	25.24	18.88
tblVehicleTrips	SU_TR	8.62	0.00
tblVehicleTrips	SU_TR	0.00	22.98
tblVehicleTrips	SU_TR	0.00	1.69
tblVehicleTrips	WD_TR	6.59	4.39
tblVehicleTrips	WD_TR	11.03	0.00
tblVehicleTrips	WD_TR	35.74	10.33
tblVehicleTrips	WD_TR	32.93	0.00
tblVehicleTrips	WD_TR	8.17	3.14
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tblVehicleTrips	WD_TR	89.95	41.92
tblVehicleTrips	WD_TR	42.70	18.88
tblVehicleTrips	WD_TR	9.52	0.00
tblVehicleTrips	WD_TR	0.00	22.98
tblVehicleTrips	WD_TR	0.00	1.69
tblWater	IndoorWaterUseRate	5,538,092.18	5,748,750.00
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tblWater	IndoorWaterUseRate	0.00	390,915.00

tblWater	IndoorWaterUseRate	6,990,719.63	383,250.00
tblWater	IndoorWaterUseRate	8,700,802.11	13,673,813.00
tblWater	IndoorWaterUseRate	1,054,036.52	906,660.00
tblWater	IndoorWaterUseRate	13,780,430.54	39,600.00
tblWater	IndoorWaterUseRate	2,222,175.64	604,440.00
tblWater	IndoorWaterUseRate	9,186,717.61	13,481,640.00
tblWater	IndoorWaterUseRate	0.00	678,840.00
tblWater	IndoorWaterUseRate	0.00	102,368.00
tblWater	IndoorWaterUseRate	0.00	1,002,582.00
tblWater	OutdoorWaterUseRate	3,491,405.94	0.00
tblWater	OutdoorWaterUseRate	14,237,619.88	23,461,272.00
tblWater	OutdoorWaterUseRate	149,721,308.10	46,401,182.40
tblWater	OutdoorWaterUseRate	4,284,634.61	4,040,552.40
tblWater	OutdoorWaterUseRate	966,755.79	33,627,823.20
tblWater	OutdoorWaterUseRate	200,768.86	0.00
tblWater	OutdoorWaterUseRate	879,601.95	1,303,404.00
tblWater	OutdoorWaterUseRate	1,361,978.62	1,303,404.00
tblWater	OutdoorWaterUseRate	5,791,626.32	9,580,019.40
tblWater	OutdoorWaterUseRate	0.00	5,865,318.00
tblWater	OutdoorWaterUseRate	0.00	651,702.00
tblWoodstoves	NumberCatalytic	4.25	0.00
tblWoodstoves	NumberCatalytic	7.05	0.00
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tblWoodstoves	NumberNoncatalytic	7.05	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00

tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	10.5102	101.5893	67.9517	0.1284	22.3332	4.7448	27.0780	11.8930	4.4128	16.3057	0.0000	11,276.9455	11,276.9455	2.9510	0.0000	11,350.7206
2021	19.5258	145.4360	107.0125	0.2044	30.5771	6.6665	37.2436	16.2685	6.2080	22.4765	0.0000	17,934.4996	17,934.4996	4.5481	0.0000	18,048.2020
2022	16.4363	70.1320	68.7569	0.1309	9.3961	3.1364	12.5325	4.6505	2.9491	7.5996	0.0000	11,474.3979	11,474.3979	2.5093	0.0000	11,537.1311
2023	12.5575	39.1036	47.4715	0.0891	1.0920	1.7059	2.7979	0.2960	1.6163	1.9123	0.0000	7,797.7130	7,797.7130	1.4539	0.0000	7,834.0607
Maximum	**19.5258**	**145.4360**	**107.0125**	**0.2044**	**30.5771**	**6.6665**	**37.2436**	**16.2685**	**6.2080**	**22.4765**	**0.0000**	**17,934.4996**	**17,934.4996**	**4.5481**	**0.0000**	**18,048.2020**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	3.5284	22.2659	71.4232	0.1284	10.4881	0.1652	10.6533	5.4702	0.1576	5.6278	0.0000	11,276.9335	11,276.9335	2.9510	0.0000	11,350.7086
2021	9.8023	36.2558	113.9540	0.2044	14.5181	0.2526	14.7707	7.5259	0.2399	7.7658	0.0000	17,934.4807	17,934.4807	4.5481	0.0000	18,048.1830
2022	12.2649	27.2629	73.6022	0.1309	4.9380	0.1842	5.1222	2.2846	0.1736	2.4582	0.0000	11,474.3865	11,474.3865	2.5093	0.0000	11,537.1196
2023	10.4827	20.3621	49.7554	0.0891	1.0920	0.1204	1.2124	0.2960	0.1125	0.4085	0.0000	7,797.7057	7,797.7057	1.4539	0.0000	7,834.0533
Maximum	**12.2649**	**36.2558**	**113.9540**	**0.2044**	**14.5181**	**0.2526**	**14.7707**	**7.5259**	**0.2399**	**7.7658**	**0.0000**	**17,934.4807**	**17,934.4807**	**4.5481**	**0.0000**	**18,048.1830**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**38.88**	**70.21**	**-6.02**	**0.00**	**51.05**	**95.56**	**60.13**	**52.95**	**95.50**	**66.33**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**4-1-2020**	**6-30-2020**	26.4849	3.4412
2	**7-1-2020**	**9-30-2020**	42.7687	11.1380
3	**10-1-2020**	**12-31-2020**	42.8602	11.2295
4	**1-1-2021**	**3-31-2021**	39.1514	10.3128
5	**4-1-2021**	**6-30-2021**	39.5017	10.3427
6	**7-1-2021**	**9-30-2021**	43.1435	12.6905
7	**10-1-2021**	**12-31-2021**	43.2422	12.7892
8	**1-1-2022**	**3-31-2022**	36.4281	11.6811

9	**4-1-2022**	**6-30-2022**	19.3284	9.5869
10	**7-1-2022**	**9-30-2022**	15.4090	9.1331
11	**10-1-2022**	**12-31-2022**	15.4821	9.2061
12	**1-1-2023**	**3-31-2023**	13.9354	8.3429
13	**4-1-2023**	**6-30-2023**	14.0210	8.3664
14	**7-1-2023**	**9-30-2023**	14.1750	8.4584
		Highest	43.2422	12.7892

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	6.7220	0.0194	1.6819	9.0000e-005		9.3400e-003	9.3400e-003		9.3400e-003	9.3400e-003	0.0000	2.7573	2.7573	2.6500e-003	0.0000	2.8236
Energy	0.2861	2.5932	2.1281	0.0156		0.1977	0.1977		0.1977	0.1977	0.0000	7,519.9001	7,519.9001	0.2663	0.0958	7,555.0966
Mobile	2.4127	10.8956	37.6044	0.1340	14.6030	0.0986	14.7016	3.9108	0.0920	4.0028	0.0000	12,238.4382	12,238.4382	0.3515	0.0000	12,247.2260
Waste						0.0000	0.0000		0.0000	0.0000	283.3713	0.0000	283.3713	16.7468	0.0000	702.0405
Water						0.0000	0.0000		0.0000	0.0000	12.9563	192.8161	205.7724	1.3395	0.0332	249.1598
Total	**9.4208**	**13.5081**	**41.4144**	**0.1497**	**14.6030**	**0.3056**	**14.9086**	**3.9108**	**0.2990**	**4.2098**	**296.3276**	**19,953.9117**	**20,250.2392**	**18.7067**	**0.1290**	**20,756.3465**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	6.7220	0.0194	1.6819	9.0000e-005		9.3400e-003	9.3400e-003		9.3400e-003	9.3400e-003	0.0000	2.7573	2.7573	2.6500e-003	0.0000	2.8236
Energy	0.2115	1.9185	1.5843	0.0115		0.1461	0.1461		0.1461	0.1461	0.0000	2,093.1081	2,093.1081	0.0401	0.0384	2,105.5464
Mobile	2.4127	10.8956	37.6044	0.1340	14.6030	0.0986	14.7016	3.9108	0.0920	4.0028	0.0000	12,238.4382	12,238.4382	0.3515	0.0000	12,247.2260
Waste						0.0000	0.0000		0.0000	0.0000	113.3485	0.0000	113.3485	6.6987	0.0000	280.8162
Water						0.0000	0.0000		0.0000	0.0000	10.3650	167.1060	177.4710	1.0721	0.0267	212.2313
Total	**9.3462**	**12.8335**	**40.8706**	**0.1456**	**14.6030**	**0.2541**	**14.8571**	**3.9108**	**0.2475**	**4.1582**	**123.7135**	**14,501.4096**	**14,625.1231**	**8.1651**	**0.0651**	**14,848.6435**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.79**	**4.99**	**1.31**	**2.72**	**0.00**	**16.86**	**0.35**	**0.00**	**17.24**	**1.22**	**58.25**	**27.33**	**27.78**	**56.35**	**49.56**	**28.46**

2.3 Vegetation

Vegetation

	CO2e
Category	MT
Vegetation Land Change	-45,510.0000
Total	**-45,510.0000**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	4/1/2020	4/29/2020	7	29	
2	Site Preparation	Site Preparation	4/1/2020	4/1/2022	7	731	
3	Grading	Grading	5/1/2020	5/1/2022	7	731	
4	Building Construction	Building Construction	6/1/2020	12/1/2023	7	1279	
5	Paving	Paving	7/1/2020	12/1/2023	7	1249	
6	Architectural Coating	Architectural Coating	7/1/2021	12/1/2023	7	884	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 653.35

Acres of Paving: 2.78

Residential Indoor: 720,698; Residential Outdoor: 240,233; Non-Residential Indoor: 1,840,950; Non-Residential Outdoor: 613,650; Striped Parking Area: 7,266 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	10.00	81	0.73
Demolition	Excavators	3	10.00	158	0.38
Demolition	Rubber Tired Dozers	2	10.00	247	0.40
Site Preparation	Crushing/Proc. Equipment	2	10.00	85	0.78
Site Preparation	Rubber Tired Dozers	16	10.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	5	10.00	97	0.37
Grading	Crushing/Proc. Equipment	2	10.00	85	0.78
Grading	Excavators	20	10.00	158	0.38
Grading	Graders	11	10.00	187	0.41
Grading	Rubber Tired Dozers	5	10.00	247	0.40
Grading	Scrapers	4	10.00	367	0.48
Grading	Tractors/Loaders/Backhoes	4	10.00	97	0.37
Building Construction	Cranes	10	10.00	231	0.29
Building Construction	Crushing/Proc. Equipment	2	10.00	85	0.78
Building Construction	Forklifts	10	10.00	89	0.20
Building Construction	Generator Sets	10	10.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	4	10.00	97	0.37
Building Construction	Welders	8	10.00	46	0.45
Paving	Pavers	11	10.00	130	0.42
Paving	Paving Equipment	11	10.00	132	0.36
Paving	Rollers	11	10.00	80	0.38
Architectural Coating	Air Compressors	8	10.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	5.00	0.00	10.00	7.00	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	23	60.00	0.00	4,706.00	7.00	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	46	180.00	0.00	0.00	7.00	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	44	750.00	238.00	0.00	7.00	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	33	100.00	0.00	0.00	7.00	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	8	150.00	0.00	0.00	7.00	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0167	0.0000	0.0167	2.5200e-003	0.0000	2.5200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0600	0.6018	0.3943	7.0000e-004		0.0301	0.0301		0.0280	0.0280	0.0000	61.6225	61.6225	0.0174	0.0000	62.0574
Total	**0.0600**	**0.6018**	**0.3943**	**7.0000e-004**	**0.0167**	**0.0301**	**0.0467**	**2.5200e-003**	**0.0280**	**0.0305**	**0.0000**	**61.6225**	**61.6225**	**0.0174**	**0.0000**	**62.0574**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0000e-005	1.7000e-003	3.6000e-004	0.0000	8.0000e-005	1.0000e-005	1.0000e-004	2.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.3609	0.3609	1.0000e-005	0.0000	0.3612
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.1000e-004	3.3000e-004	3.1200e-003	0.0000	3.7000e-004	0.0000	3.7000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3485	0.3485	3.0000e-005	0.0000	0.3491
Total	**5.7000e-004**	**2.0300e-003**	**3.4800e-003**	**0.0000**	**4.5000e-004**	**1.0000e-005**	**4.7000e-004**	**1.2000e-004**	**1.0000e-005**	**1.4000e-004**	**0.0000**	**0.7094**	**0.7094**	**4.0000e-005**	**0.0000**	**0.7103**

3.2 Demolition - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.4900e-003	0.0000	7.4900e-003	1.1300e-003	0.0000	1.1300e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.3800e-003	0.0363	0.4220	7.0000e-004		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004	0.0000	61.6224	61.6224	0.0174	0.0000	62.0573
Total	**8.3800e-003**	**0.0363**	**0.4220**	**7.0000e-004**	**7.4900e-003**	**1.7000e-004**	**7.6600e-003**	**1.1300e-003**	**1.7000e-004**	**1.3000e-003**	**0.0000**	**61.6224**	**61.6224**	**0.0174**	**0.0000**	**62.0573**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0000e-005	1.7000e-003	3.6000e-004	0.0000	8.0000e-005	1.0000e-005	1.0000e-004	2.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.3609	0.3609	1.0000e-005	0.0000	0.3612
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.1000e-004	3.3000e-004	3.1200e-003	0.0000	3.7000e-004	0.0000	3.7000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3485	0.3485	3.0000e-005	0.0000	0.3491
Total	**5.7000e-004**	**2.0300e-003**	**3.4800e-003**	**0.0000**	**4.5000e-004**	**1.0000e-005**	**4.7000e-004**	**1.2000e-004**	**1.0000e-005**	**1.4000e-004**	**0.0000**	**0.7094**	**0.7094**	**4.0000e-005**	**0.0000**	**0.7103**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					16.5629	0.0000	16.5629	9.1035	0.0000	9.1035	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.3388	34.2788	14.8171	0.0285		1.7234	1.7234		1.5921	1.5921	0.0000	2,505.7323	2,505.7323	0.7587	0.0000	2,524.6997
Total	**3.3388**	**34.2788**	**14.8171**	**0.0285**	**16.5629**	**1.7234**	**18.2863**	**9.1035**	**1.5921**	**10.6956**	**0.0000**	**2,505.7323**	**2,505.7323**	**0.7587**	**0.0000**	**2,524.6997**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0104	0.3002	0.0630	6.7000e-004	0.0333	2.6400e-003	0.0360	8.6100e-003	2.5300e-003	0.0111	0.0000	63.8951	63.8951	1.7500e-003	0.0000	63.9389
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0580	0.0373	0.3551	4.4000e-004	0.0422	4.3000e-004	0.0426	0.0112	4.0000e-004	0.0116	0.0000	39.6554	39.6554	2.8600e-003	0.0000	39.7268
Total	**0.0684**	**0.3375**	**0.4181**	**1.1100e-003**	**0.0755**	**3.0700e-003**	**0.0786**	**0.0198**	**2.9300e-003**	**0.0228**	**0.0000**	**103.5505**	**103.5505**	**4.6100e-003**	**0.0000**	**103.6657**

3.3 Site Preparation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.4533	0.0000	7.4533	4.0966	0.0000	4.0966	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5103	2.6933	14.0511	0.0285		0.0188	0.0188		0.0188	0.0188	0.0000	2,505.7293	2,505.7293	0.7587	0.0000	2,524.6967
Total	**0.5103**	**2.6933**	**14.0511**	**0.0285**	**7.4533**	**0.0188**	**7.4721**	**4.0966**	**0.0188**	**4.1154**	**0.0000**	**2,505.7293**	**2,505.7293**	**0.7587**	**0.0000**	**2,524.6967**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0104	0.3002	0.0630	6.7000e-004	0.0333	2.6400e-003	0.0360	8.6100e-003	2.5300e-003	0.0111	0.0000	63.8951	63.8951	1.7500e-003	0.0000	63.9389
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0580	0.0373	0.3551	4.4000e-004	0.0422	4.3000e-004	0.0426	0.0112	4.0000e-004	0.0116	0.0000	39.6554	39.6554	2.8600e-003	0.0000	39.7268
Total	**0.0684**	**0.3375**	**0.4181**	**1.1100e-003**	**0.0755**	**3.0700e-003**	**0.0786**	**0.0198**	**2.9300e-003**	**0.0228**	**0.0000**	**103.5505**	**103.5505**	**4.6100e-003**	**0.0000**	**103.6657**

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					21.9827	0.0000	21.9827	12.0827	0.0000	12.0827	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.2665	43.8023	19.2958	0.0379		2.1659	2.1659		2.0002	2.0002	0.0000	3,325.9584	3,325.9584	1.0056	0.0000	3,351.0984
Total	**4.2665**	**43.8023**	**19.2958**	**0.0379**	**21.9827**	**2.1659**	**24.1487**	**12.0827**	**2.0002**	**14.0829**	**0.0000**	**3,325.9584**	**3,325.9584**	**1.0056**	**0.0000**	**3,351.0984**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0128	0.3648	0.0774	8.8000e-004	0.0345	3.0400e-003	0.0376	9.0400e-003	2.9000e-003	0.0119	0.0000	83.9788	83.9788	2.2500e-003	0.0000	84.0350
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0724	0.0442	0.4224	5.7000e-004	0.0560	5.4000e-004	0.0566	0.0149	5.0000e-004	0.0154	0.0000	51.0265	51.0265	3.3500e-003	0.0000	51.1104
Total	**0.0851**	**0.4090**	**0.4999**	**1.4500e-003**	**0.0905**	**3.5800e-003**	**0.0941**	**0.0240**	**3.4000e-003**	**0.0274**	**0.0000**	**135.0054**	**135.0054**	**5.6000e-003**	**0.0000**	**135.1455**

3.3 Site Preparation - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.8922	0.0000	9.8922	5.4372	0.0000	5.4372	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.6586	3.4360	18.6438	0.0379		0.0227	0.0227		0.0227	0.0227	0.0000	3,325.9544	3,325.9544	1.0056	0.0000	3,351.0944
Total	**0.6586**	**3.4360**	**18.6438**	**0.0379**	**9.8922**	**0.0227**	**9.9150**	**5.4372**	**0.0227**	**5.4599**	**0.0000**	**3,325.9544**	**3,325.9544**	**1.0056**	**0.0000**	**3,351.0944**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0128	0.3648	0.0774	8.8000e-004	0.0345	3.0400e-003	0.0376	9.0400e-003	2.9000e-003	0.0119	0.0000	83.9788	83.9788	2.2500e-003	0.0000	84.0350
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0724	0.0442	0.4224	5.7000e-004	0.0560	5.4000e-004	0.0566	0.0149	5.0000e-004	0.0154	0.0000	51.0265	51.0265	3.3500e-003	0.0000	51.1104
Total	**0.0851**	**0.4090**	**0.4999**	**1.4500e-003**	**0.0905**	**3.5800e-003**	**0.0941**	**0.0240**	**3.4000e-003**	**0.0274**	**0.0000**	**135.0054**	**135.0054**	**5.6000e-003**	**0.0000**	**135.1455**

3.3 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.4822	0.0000	5.4822	3.0126	0.0000	3.0126	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.8631	8.8456	4.3887	9.4500e-003		0.4259	0.4259		0.3935	0.3935	0.0000	829.0374	829.0374	0.2504	0.0000	835.2977
Total	**0.8631**	**8.8456**	**4.3887**	**9.4500e-003**	**5.4822**	**0.4259**	**5.9081**	**3.0126**	**0.3935**	**3.4061**	**0.0000**	**829.0374**	**829.0374**	**0.2504**	**0.0000**	**835.2977**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.9500e-003	0.0836	0.0183	2.2000e-004	0.0309	6.6000e-004	0.0315	7.7200e-003	6.3000e-004	8.3500e-003	0.0000	20.7283	20.7283	5.5000e-004	0.0000	20.7419
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0169	9.8100e-003	0.0936	1.4000e-004	0.0140	1.3000e-004	0.0141	3.7200e-003	1.2000e-004	3.8300e-003	0.0000	12.3065	12.3065	7.3000e-004	0.0000	12.3249
Total	**0.0199**	**0.0934**	**0.1120**	**3.6000e-004**	**0.0449**	**7.9000e-004**	**0.0456**	**0.0114**	**7.5000e-004**	**0.0122**	**0.0000**	**33.0348**	**33.0348**	**1.2800e-003**	**0.0000**	**33.0668**

3.3 Site Preparation - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.4670	0.0000	2.4670	1.3557	0.0000	1.3557	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1605	0.8259	4.6473	9.4500e-003		5.1900e-003	5.1900e-003		5.1900e-003	5.1900e-003	0.0000	829.0364	829.0364	0.2504	0.0000	835.2968
Total	**0.1605**	**0.8259**	**4.6473**	**9.4500e-003**	**2.4670**	**5.1900e-003**	**2.4722**	**1.3557**	**5.1900e-003**	**1.3609**	**0.0000**	**829.0364**	**829.0364**	**0.2504**	**0.0000**	**835.2968**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.9500e-003	0.0836	0.0183	2.2000e-004	0.0309	6.6000e-004	0.0315	7.7200e-003	6.3000e-004	8.3500e-003	0.0000	20.7283	20.7283	5.5000e-004	0.0000	20.7419
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0169	9.8100e-003	0.0936	1.4000e-004	0.0140	1.3000e-004	0.0141	3.7200e-003	1.2000e-004	3.8300e-003	0.0000	12.3065	12.3065	7.3000e-004	0.0000	12.3249
Total	**0.0199**	**0.0934**	**0.1120**	**3.6000e-004**	**0.0449**	**7.9000e-004**	**0.0456**	**0.0114**	**7.5000e-004**	**0.0122**	**0.0000**	**33.0348**	**33.0348**	**1.2800e-003**	**0.0000**	**33.0668**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.9571	0.0000	4.9571	2.5718	0.0000	2.5718	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.2841	36.3706	23.5247	0.0469		1.5595	1.5595		1.4406	1.4406	0.0000	4,113.0902	4,113.0902	1.2842	0.0000	4,145.1950
Total	**3.2841**	**36.3706**	**23.5247**	**0.0469**	**4.9571**	**1.5595**	**6.5166**	**2.5718**	**1.4406**	**4.0124**	**0.0000**	**4,113.0902**	**4,113.0902**	**1.2842**	**0.0000**	**4,145.1950**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1550	0.0996	0.9492	1.1800e-003	0.1128	1.1600e-003	0.1140	0.0300	1.0700e-003	0.0311	0.0000	105.9880	105.9880	7.6400e-003	0.0000	106.1789
Total	**0.1550**	**0.0996**	**0.9492**	**1.1800e-003**	**0.1128**	**1.1600e-003**	**0.1140**	**0.0300**	**1.0700e-003**	**0.0311**	**0.0000**	**105.9880**	**105.9880**	**7.6400e-003**	**0.0000**	**106.1789**

3.4 Grading - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.2307	0.0000	2.2307	1.1573	0.0000	1.1573	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.7181	3.5413	26.8988	0.0469		0.0220	0.0220		0.0220	0.0220	0.0000	4,113.0853	4,113.0853	1.2842	0.0000	4,145.1900
Total	**0.7181**	**3.5413**	**26.8988**	**0.0469**	**2.2307**	**0.0220**	**2.2527**	**1.1573**	**0.0220**	**1.1794**	**0.0000**	**4,113.0853**	**4,113.0853**	**1.2842**	**0.0000**	**4,145.1900**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1550	0.0996	0.9492	1.1800e-003	0.1128	1.1600e-003	0.1140	0.0300	1.0700e-003	0.0311	0.0000	105.9880	105.9880	7.6400e-003	0.0000	106.1789
Total	**0.1550**	**0.0996**	**0.9492**	**1.1800e-003**	**0.1128**	**1.1600e-003**	**0.1140**	**0.0300**	**1.0700e-003**	**0.0311**	**0.0000**	**105.9880**	**105.9880**	**7.6400e-003**	**0.0000**	**106.1789**

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.2154	0.0000	7.2154	3.8131	0.0000	3.8131	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.6286	50.2969	34.4019	0.0698		2.1317	2.1317		1.9688	1.9688	0.0000	6,126.4753	6,126.4753	1.9113	0.0000	6,174.2589
Total	**4.6286**	**50.2969**	**34.4019**	**0.0698**	**7.2154**	**2.1317**	**9.3471**	**3.8131**	**1.9688**	**5.7819**	**0.0000**	**6,126.4753**	**6,126.4753**	**1.9113**	**0.0000**	**6,174.2589**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2172	0.1325	1.2673	1.7100e-003	0.1680	1.6300e-003	0.1697	0.0447	1.5000e-003	0.0462	0.0000	153.0796	153.0796	0.0101	0.0000	153.3312
Total	**0.2172**	**0.1325**	**1.2673**	**1.7100e-003**	**0.1680**	**1.6300e-003**	**0.1697**	**0.0447**	**1.5000e-003**	**0.0462**	**0.0000**	**153.0796**	**153.0796**	**0.0101**	**0.0000**	**153.3312**

3.4 Grading - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.2469	0.0000	3.2469	1.7159	0.0000	1.7159	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0512	5.1371	40.0679	0.0698		0.0306	0.0306		0.0306	0.0306	0.0000	6,126.4680	6,126.4680	1.9113	0.0000	6,174.2515
Total	**1.0512**	**5.1371**	**40.0679**	**0.0698**	**3.2469**	**0.0306**	**3.2775**	**1.7159**	**0.0306**	**1.7465**	**0.0000**	**6,126.4680**	**6,126.4680**	**1.9113**	**0.0000**	**6,174.2515**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2172	0.1325	1.2673	1.7100e-003	0.1680	1.6300e-003	0.1697	0.0447	1.5000e-003	0.0462	0.0000	153.0796	153.0796	0.0101	0.0000	153.3312
Total	**0.2172**	**0.1325**	**1.2673**	**1.7100e-003**	**0.1680**	**1.6300e-003**	**0.1697**	**0.0447**	**1.5000e-003**	**0.0462**	**0.0000**	**153.0796**	**153.0796**	**0.0101**	**0.0000**	**153.3312**

3.4 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.6235	0.0000	2.6235	1.2891	0.0000	1.2891	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3381	14.0865	10.9709	0.0231		0.5870	0.5870		0.5422	0.5422	0.0000	2,031.0584	2,031.0584	0.6333	0.0000	2,046.8917
Total	**1.3381**	**14.0865**	**10.9709**	**0.0231**	**2.6235**	**0.5870**	**3.2105**	**1.2891**	**0.5422**	**1.8313**	**0.0000**	**2,031.0584**	**2,031.0584**	**0.6333**	**0.0000**	**2,046.8917**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0674	0.0391	0.3736	5.5000e-004	0.0557	5.1000e-004	0.0562	0.0148	4.7000e-004	0.0153	0.0000	49.0908	49.0908	2.9300e-003	0.0000	49.1640
Total	**0.0674**	**0.0391**	**0.3736**	**5.5000e-004**	**0.0557**	**5.1000e-004**	**0.0562**	**0.0148**	**4.7000e-004**	**0.0153**	**0.0000**	**49.0908**	**49.0908**	**2.9300e-003**	**0.0000**	**49.1640**

3.4 Grading - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.1806	0.0000	1.1806	0.5801	0.0000	0.5801	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3435	1.6621	13.2815	0.0231		9.5100e-003	9.5100e-003		9.5100e-003	9.5100e-003	0.0000	2,031.0560	2,031.0560	0.6333	0.0000	2,046.8893
Total	**0.3435**	**1.6621**	**13.2815**	**0.0231**	**1.1806**	**9.5100e-003**	**1.1901**	**0.5801**	**9.5100e-003**	**0.5896**	**0.0000**	**2,031.0560**	**2,031.0560**	**0.6333**	**0.0000**	**2,046.8893**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0674	0.0391	0.3736	5.5000e-004	0.0557	5.1000e-004	0.0562	0.0148	4.7000e-004	0.0153	0.0000	49.0908	49.0908	2.9300e-003	0.0000	49.1640
Total	**0.0674**	**0.0391**	**0.3736**	**5.5000e-004**	**0.0557**	**5.1000e-004**	**0.0562**	**0.0148**	**4.7000e-004**	**0.0153**	**0.0000**	**49.0908**	**49.0908**	**2.9300e-003**	**0.0000**	**49.1640**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.9588	17.4231	13.6386	0.0248		0.9177	0.9177		0.8779	0.8779	0.0000	2,122.2274	2,122.2274	0.4088	0.0000	2,132.4484
Total	**1.9588**	**17.4231**	**13.6386**	**0.0248**		**0.9177**	**0.9177**		**0.8779**	**0.8779**	**0.0000**	**2,122.2274**	**2,122.2274**	**0.4088**	**0.0000**	**2,132.4484**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1571	3.1758	1.0883	5.9900e-003	0.1503	0.0291	0.1793	0.0434	0.0278	0.0712	0.0000	567.2800	567.2800	0.0289	0.0000	568.0031
Worker	0.5642	0.3623	3.4544	4.3000e-003	0.4105	4.2300e-003	0.4148	0.1093	3.9000e-003	0.1132	0.0000	385.7386	385.7386	0.0278	0.0000	386.4333
Total	**0.7213**	**3.5381**	**4.5427**	**0.0103**	**0.5608**	**0.0333**	**0.5941**	**0.1527**	**0.0317**	**0.1844**	**0.0000**	**953.0186**	**953.0186**	**0.0567**	**0.0000**	**954.4364**

3.5 Building Construction - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4231	3.0799	14.4744	0.0248		0.0147	0.0147		0.0147	0.0147	0.0000	2,122.2248	2,122.2248	0.4088	0.0000	2,132.4458
Total	**0.4231**	**3.0799**	**14.4744**	**0.0248**		**0.0147**	**0.0147**		**0.0147**	**0.0147**	**0.0000**	**2,122.2248**	**2,122.2248**	**0.4088**	**0.0000**	**2,132.4458**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1571	3.1758	1.0883	5.9900e-003	0.1503	0.0291	0.1793	0.0434	0.0278	0.0712	0.0000	567.2800	567.2800	0.0289	0.0000	568.0031
Worker	0.5642	0.3623	3.4544	4.3000e-003	0.4105	4.2300e-003	0.4148	0.1093	3.9000e-003	0.1132	0.0000	385.7386	385.7386	0.0278	0.0000	386.4333
Total	**0.7213**	**3.5381**	**4.5427**	**0.0103**	**0.5608**	**0.0333**	**0.5941**	**0.1527**	**0.0317**	**0.1844**	**0.0000**	**953.0186**	**953.0186**	**0.0567**	**0.0000**	**954.4364**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.0092	27.0536	22.7724	0.0424		1.3549	1.3549		1.2956	1.2956	0.0000	3,619.6905	3,619.6905	0.6830	0.0000	3,636.7659
Total	**3.0092**	**27.0536**	**22.7724**	**0.0424**		**1.3549**	**1.3549**		**1.2956**	**1.2956**	**0.0000**	**3,619.6905**	**3,619.6905**	**0.6830**	**0.0000**	**3,636.7659**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2299	4.9783	1.6438	0.0102	0.2563	0.0346	0.2908	0.0741	0.0331	0.1071	0.0000	961.5871	961.5871	0.0467	0.0000	962.7541
Worker	0.9049	0.5520	5.2803	7.1100e-003	0.7002	6.7800e-003	0.7070	0.1864	6.2500e-003	0.1926	0.0000	637.8317	637.8317	0.0419	0.0000	638.8801
Total	**1.1348**	**5.5303**	**6.9241**	**0.0173**	**0.9564**	**0.0413**	**0.9978**	**0.2604**	**0.0393**	**0.2997**	**0.0000**	**1,599.4188**	**1,599.4188**	**0.0886**	**0.0000**	**1,601.6341**

3.5 Building Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.7030	5.1143	24.6818	0.0424		0.0228	0.0228		0.0228	0.0228	0.0000	3,619.6862	3,619.6862	0.6830	0.0000	3,636.7616
Total	**0.7030**	**5.1143**	**24.6818**	**0.0424**		**0.0228**	**0.0228**		**0.0228**	**0.0228**	**0.0000**	**3,619.6862**	**3,619.6862**	**0.6830**	**0.0000**	**3,636.7616**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2299	4.9783	1.6438	0.0102	0.2563	0.0346	0.2908	0.0741	0.0331	0.1071	0.0000	961.5871	961.5871	0.0467	0.0000	962.7541
Worker	0.9049	0.5520	5.2803	7.1100e-003	0.7002	6.7800e-003	0.7070	0.1864	6.2500e-003	0.1926	0.0000	637.8317	637.8317	0.0419	0.0000	638.8801
Total	**1.1348**	**5.5303**	**6.9241**	**0.0173**	**0.9564**	**0.0413**	**0.9978**	**0.2604**	**0.0393**	**0.2997**	**0.0000**	**1,599.4188**	**1,599.4188**	**0.0886**	**0.0000**	**1,601.6341**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.7369	24.3022	22.4477	0.0424		1.1719	1.1719		1.1208	1.1208	0.0000	3,620.1606	3,620.1606	0.6740	0.0000	3,637.0115
Total	**2.7369**	**24.3022**	**22.4477**	**0.0424**		**1.1719**	**1.1719**		**1.1208**	**1.1208**	**0.0000**	**3,620.1606**	**3,620.1606**	**0.6740**	**0.0000**	**3,637.0115**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2104	4.7240	1.4969	0.0101	0.2562	0.0305	0.2867	0.0741	0.0292	0.1032	0.0000	955.2043	955.2043	0.0451	0.0000	956.3314
Worker	0.8475	0.4917	4.6951	6.8700e-003	0.7002	6.3700e-003	0.7066	0.1864	5.8700e-003	0.1922	0.0000	617.0155	617.0155	0.0368	0.0000	617.9362
Total	**1.0579**	**5.2158**	**6.1920**	**0.0170**	**0.9564**	**0.0369**	**0.9933**	**0.2604**	**0.0350**	**0.2955**	**0.0000**	**1,572.2199**	**1,572.2199**	**0.0819**	**0.0000**	**1,574.2676**

3.5 Building Construction - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.6881	4.9911	24.6781	0.0424		0.0209	0.0209		0.0209	0.0209	0.0000	3,620.1563	3,620.1563	0.6740	0.0000	3,637.0072
Total	**0.6881**	**4.9911**	**24.6781**	**0.0424**		**0.0209**	**0.0209**		**0.0209**	**0.0209**	**0.0000**	**3,620.1563**	**3,620.1563**	**0.6740**	**0.0000**	**3,637.0072**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2104	4.7240	1.4969	0.0101	0.2562	0.0305	0.2867	0.0741	0.0292	0.1032	0.0000	955.2043	955.2043	0.0451	0.0000	956.3314
Worker	0.8475	0.4917	4.6951	6.8700e-003	0.7002	6.3700e-003	0.7066	0.1864	5.8700e-003	0.1922	0.0000	617.0155	617.0155	0.0368	0.0000	617.9362
Total	**1.0579**	**5.2158**	**6.1920**	**0.0170**	**0.9564**	**0.0369**	**0.9933**	**0.2604**	**0.0350**	**0.2955**	**0.0000**	**1,572.2199**	**1,572.2199**	**0.0819**	**0.0000**	**1,574.2676**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.3324	20.5990	20.4115	0.0389		0.9468	0.9468		0.9051	0.9051	0.0000	3,322.8485	3,322.8485	0.6099	0.0000	3,338.0957
Total	**2.3324**	**20.5990**	**20.4115**	**0.0389**		**0.9468**	**0.9468**		**0.9051**	**0.9051**	**0.0000**	**3,322.8485**	**3,322.8485**	**0.6099**	**0.0000**	**3,338.0957**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1226	3.3231	1.1218	9.1700e-003	0.2351	6.0200e-003	0.2412	0.0680	5.7500e-003	0.0737	0.0000	869.5279	869.5279	0.0246	0.0000	870.1432
Worker	0.7269	0.4014	3.8241	6.0800e-003	0.6426	5.5100e-003	0.6482	0.1710	5.0800e-003	0.1761	0.0000	546.6684	546.6684	0.0296	0.0000	547.4073
Total	**0.8495**	**3.7245**	**4.9459**	**0.0153**	**0.8778**	**0.0115**	**0.8893**	**0.2390**	**0.0108**	**0.2498**	**0.0000**	**1,416.1962**	**1,416.1962**	**0.0542**	**0.0000**	**1,417.5506**

3.5 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.6193	4.4800	22.6478	0.0389		0.0176	0.0176		0.0176	0.0176	0.0000	3,322.8445	3,322.8445	0.6099	0.0000	3,338.0917
Total	**0.6193**	**4.4800**	**22.6478**	**0.0389**		**0.0176**	**0.0176**		**0.0176**	**0.0176**	**0.0000**	**3,322.8445**	**3,322.8445**	**0.6099**	**0.0000**	**3,338.0917**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1226	3.3231	1.1218	9.1700e-003	0.2351	6.0200e-003	0.2412	0.0680	5.7500e-003	0.0737	0.0000	869.5279	869.5279	0.0246	0.0000	870.1432
Worker	0.7269	0.4014	3.8241	6.0800e-003	0.6426	5.5100e-003	0.6482	0.1710	5.0800e-003	0.1761	0.0000	546.6684	546.6684	0.0296	0.0000	547.4073
Total	**0.8495**	**3.7245**	**4.9459**	**0.0153**	**0.8778**	**0.0115**	**0.8893**	**0.2390**	**0.0108**	**0.2498**	**0.0000**	**1,416.1962**	**1,416.1962**	**0.0542**	**0.0000**	**1,417.5506**

3.6 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.8580	8.8965	9.2674	0.0144		0.4761	0.4761		0.4381	0.4381	0.0000	1,266.7850	1,266.7850	0.4097	0.0000	1,277.0276
Paving	5.4000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.8586**	**8.8965**	**9.2674**	**0.0144**		**0.4761**	**0.4761**		**0.4381**	**0.4381**	**0.0000**	**1,266.7850**	**1,266.7850**	**0.4097**	**0.0000**	**1,277.0276**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0647	0.0415	0.3960	4.9000e-004	0.0471	4.8000e-004	0.0476	0.0125	4.5000e-004	0.0130	0.0000	44.2217	44.2217	3.1900e-003	0.0000	44.3014
Total	**0.0647**	**0.0415**	**0.3960**	**4.9000e-004**	**0.0471**	**4.8000e-004**	**0.0476**	**0.0125**	**4.5000e-004**	**0.0130**	**0.0000**	**44.2217**	**44.2217**	**3.1900e-003**	**0.0000**	**44.3014**

3.6 Paving - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.8580	8.8965	9.2674	0.0144		0.0714	0.0714		0.0657	0.0657	0.0000	1,266.7835	1,266.7835	0.4097	0.0000	1,277.0261
Paving	5.4000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.8586**	**8.8965**	**9.2674**	**0.0144**		**0.0714**	**0.0714**		**0.0657**	**0.0657**	**0.0000**	**1,266.7835**	**1,266.7835**	**0.4097**	**0.0000**	**1,277.0261**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0647	0.0415	0.3960	4.9000e-004	0.0471	4.8000e-004	0.0476	0.0125	4.5000e-004	0.0130	0.0000	44.2217	44.2217	3.1900e-003	0.0000	44.3014
Total	**0.0647**	**0.0415**	**0.3960**	**4.9000e-004**	**0.0471**	**4.8000e-004**	**0.0476**	**0.0125**	**4.5000e-004**	**0.0130**	**0.0000**	**44.2217**	**44.2217**	**3.1900e-003**	**0.0000**	**44.3014**

3.6 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.5753	16.2094	18.3852	0.0286		0.8503	0.8503		0.7823	0.7823	0.0000	2,512.3210	2,512.3210	0.8125	0.0000	2,532.6344
Paving	1.0600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.5764**	**16.2094**	**18.3852**	**0.0286**		**0.8503**	**0.8503**		**0.7823**	**0.7823**	**0.0000**	**2,512.3210**	**2,512.3210**	**0.8125**	**0.0000**	**2,532.6344**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1207	0.0736	0.7040	9.5000e-004	0.0934	9.0000e-004	0.0943	0.0249	8.3000e-004	0.0257	0.0000	85.0442	85.0442	5.5900e-003	0.0000	85.1840
Total	**0.1207**	**0.0736**	**0.7040**	**9.5000e-004**	**0.0934**	**9.0000e-004**	**0.0943**	**0.0249**	**8.3000e-004**	**0.0257**	**0.0000**	**85.0442**	**85.0442**	**5.5900e-003**	**0.0000**	**85.1840**

3.6 Paving - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.5753	16.2094	18.3852	0.0286		0.1276	0.1276		0.1174	0.1174	0.0000	2,512.3180	2,512.3180	0.8125	0.0000	2,532.6314
Paving	1.0600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.5764**	**16.2094**	**18.3852**	**0.0286**		**0.1276**	**0.1276**		**0.1174**	**0.1174**	**0.0000**	**2,512.3180**	**2,512.3180**	**0.8125**	**0.0000**	**2,532.6314**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1207	0.0736	0.7040	9.5000e-004	0.0934	9.0000e-004	0.0943	0.0249	8.3000e-004	0.0257	0.0000	85.0442	85.0442	5.5900e-003	0.0000	85.1840
Total	**0.1207**	**0.0736**	**0.7040**	**9.5000e-004**	**0.0934**	**9.0000e-004**	**0.0943**	**0.0249**	**8.3000e-004**	**0.0257**	**0.0000**	**85.0442**	**85.0442**	**5.5900e-003**	**0.0000**	**85.1840**

3.6 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.3837	13.9583	18.2940	0.0286		0.7125	0.7125		0.6555	0.6555	0.0000	2,512.8326	2,512.8326	0.8127	0.0000	2,533.1501
Paving	1.0600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.3848**	**13.9583**	**18.2940**	**0.0286**		**0.7125**	**0.7125**		**0.6555**	**0.6555**	**0.0000**	**2,512.8326**	**2,512.8326**	**0.8127**	**0.0000**	**2,533.1501**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1130	0.0656	0.6260	9.2000e-004	0.0934	8.5000e-004	0.0942	0.0249	7.8000e-004	0.0256	0.0000	82.2687	82.2687	4.9100e-003	0.0000	82.3915
Total	**0.1130**	**0.0656**	**0.6260**	**9.2000e-004**	**0.0934**	**8.5000e-004**	**0.0942**	**0.0249**	**7.8000e-004**	**0.0256**	**0.0000**	**82.2687**	**82.2687**	**4.9100e-003**	**0.0000**	**82.3915**

3.6 Paving - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.3837	13.9582	18.2939	0.0286		0.1069	0.1069		0.0983	0.0983	0.0000	2,512.8296	2,512.8296	0.8127	0.0000	2,533.1471
Paving	1.0600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.3848**	**13.9582**	**18.2939**	**0.0286**		**0.1069**	**0.1069**		**0.0983**	**0.0983**	**0.0000**	**2,512.8296**	**2,512.8296**	**0.8127**	**0.0000**	**2,533.1471**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1130	0.0656	0.6260	9.2000e-004	0.0934	8.5000e-004	0.0942	0.0249	7.8000e-004	0.0256	0.0000	82.2687	82.2687	4.9100e-003	0.0000	82.3915
Total	**0.1130**	**0.0656**	**0.6260**	**9.2000e-004**	**0.0934**	**8.5000e-004**	**0.0942**	**0.0249**	**7.8000e-004**	**0.0256**	**0.0000**	**82.2687**	**82.2687**	**4.9100e-003**	**0.0000**	**82.3915**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.1893	11.7363	16.7946	0.0263		0.5875	0.5875		0.5405	0.5405	0.0000	2,306.2188	2,306.2188	0.7459	0.0000	2,324.8658
Paving	9.8000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.1902**	**11.7363**	**16.7946**	**0.0263**		**0.5875**	**0.5875**		**0.5405**	**0.5405**	**0.0000**	**2,306.2188**	**2,306.2188**	**0.7459**	**0.0000**	**2,324.8658**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0969	0.0535	0.5099	8.1000e-004	0.0857	7.4000e-004	0.0864	0.0228	6.8000e-004	0.0235	0.0000	72.8891	72.8891	3.9400e-003	0.0000	72.9876
Total	**0.0969**	**0.0535**	**0.5099**	**8.1000e-004**	**0.0857**	**7.4000e-004**	**0.0864**	**0.0228**	**6.8000e-004**	**0.0235**	**0.0000**	**72.8891**	**72.8891**	**3.9400e-003**	**0.0000**	**72.9876**

3.6 Paving - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.1893	11.7363	16.7946	0.0263		0.0881	0.0881		0.0811	0.0811	0.0000	2,306.2161	2,306.2161	0.7459	0.0000	2,324.8630
Paving	9.8000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.1902**	**11.7363**	**16.7946**	**0.0263**		**0.0881**	**0.0881**		**0.0811**	**0.0811**	**0.0000**	**2,306.2161**	**2,306.2161**	**0.7459**	**0.0000**	**2,324.8630**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0969	0.0535	0.5099	8.1000e-004	0.0857	7.4000e-004	0.0864	0.0228	6.8000e-004	0.0235	0.0000	72.8891	72.8891	3.9400e-003	0.0000	72.9876
Total	**0.0969**	**0.0535**	**0.5099**	**8.1000e-004**	**0.0857**	**7.4000e-004**	**0.0864**	**0.0228**	**6.8000e-004**	**0.0235**	**0.0000**	**72.8891**	**72.8891**	**3.9400e-003**	**0.0000**	**72.9876**

3.7 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	4.1277					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2685	1.8729	2.2295	3.6500e-003		0.1154	0.1154		0.1154	0.1154	0.0000	313.1991	313.1991	0.0215	0.0000	313.7365
Total	**4.3962**	**1.8729**	**2.2295**	**3.6500e-003**		**0.1154**	**0.1154**		**0.1154**	**0.1154**	**0.0000**	**313.1991**	**313.1991**	**0.0215**	**0.0000**	**313.7365**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0912	0.0557	0.5324	7.2000e-004	0.0706	6.8000e-004	0.0713	0.0188	6.3000e-004	0.0194	0.0000	64.3074	64.3074	4.2300e-003	0.0000	64.4131
Total	**0.0912**	**0.0557**	**0.5324**	**7.2000e-004**	**0.0706**	**6.8000e-004**	**0.0713**	**0.0188**	**6.3000e-004**	**0.0194**	**0.0000**	**64.3074**	**64.3074**	**4.2300e-003**	**0.0000**	**64.4131**

3.7 Architectural Coating - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	4.1277					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0365	0.1580	2.2478	3.6500e-003		7.3000e-004	7.3000e-004		7.3000e-004	7.3000e-004	0.0000	313.1988	313.1988	0.0215	0.0000	313.7361
Total	**4.1641**	**0.1580**	**2.2478**	**3.6500e-003**		**7.3000e-004**	**7.3000e-004**		**7.3000e-004**	**7.3000e-004**	**0.0000**	**313.1988**	**313.1988**	**0.0215**	**0.0000**	**313.7361**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0912	0.0557	0.5324	7.2000e-004	0.0706	6.8000e-004	0.0713	0.0188	6.3000e-004	0.0194	0.0000	64.3074	64.3074	4.2300e-003	0.0000	64.4131
Total	**0.0912**	**0.0557**	**0.5324**	**7.2000e-004**	**0.0706**	**6.8000e-004**	**0.0713**	**0.0188**	**6.3000e-004**	**0.0194**	**0.0000**	**64.3074**	**64.3074**	**4.2300e-003**	**0.0000**	**64.4131**

3.7 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	8.1881					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4977	3.4273	4.4131	7.2300e-003		0.1988	0.1988		0.1988	0.1988	0.0000	621.2918	621.2918	0.0405	0.0000	622.3030
Total	**8.6858**	**3.4273**	**4.4131**	**7.2300e-003**		**0.1988**	**0.1988**		**0.1988**	**0.1988**	**0.0000**	**621.2918**	**621.2918**	**0.0405**	**0.0000**	**622.3030**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1695	0.0984	0.9390	1.3700e-003	0.1400	1.2700e-003	0.1413	0.0373	1.1700e-003	0.0384	0.0000	123.4031	123.4031	7.3600e-003	0.0000	123.5872
Total	**0.1695**	**0.0984**	**0.9390**	**1.3700e-003**	**0.1400**	**1.2700e-003**	**0.1413**	**0.0373**	**1.1700e-003**	**0.0384**	**0.0000**	**123.4031**	**123.4031**	**7.3600e-003**	**0.0000**	**123.5872**

3.7 Architectural Coating - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	8.1881					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0723	0.3133	4.4589	7.2300e-003		1.4500e-003	1.4500e-003		1.4500e-003	1.4500e-003	0.0000	621.2910	621.2910	0.0405	0.0000	622.3023
Total	**8.2604**	**0.3133**	**4.4589**	**7.2300e-003**		**1.4500e-003**	**1.4500e-003**		**1.4500e-003**	**1.4500e-003**	**0.0000**	**621.2910**	**621.2910**	**0.0405**	**0.0000**	**622.3023**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1695	0.0984	0.9390	1.3700e-003	0.1400	1.2700e-003	0.1413	0.0373	1.1700e-003	0.0384	0.0000	123.4031	123.4031	7.3600e-003	0.0000	123.5872
Total	**0.1695**	**0.0984**	**0.9390**	**1.3700e-003**	**0.1400**	**1.2700e-003**	**0.1413**	**0.0373**	**1.1700e-003**	**0.0384**	**0.0000**	**123.4031**	**123.4031**	**7.3600e-003**	**0.0000**	**123.5872**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	7.5151					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4280	2.9100	4.0448	6.6400e-003		0.1582	0.1582		0.1582	0.1582	0.0000	570.2267	570.2267	0.0341	0.0000	571.0796
Total	**7.9431**	**2.9100**	**4.0448**	**6.6400e-003**		**0.1582**	**0.1582**		**0.1582**	**0.1582**	**0.0000**	**570.2267**	**570.2267**	**0.0341**	**0.0000**	**571.0796**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1454	0.0803	0.7648	1.2200e-003	0.1285	1.1000e-003	0.1296	0.0342	1.0200e-003	0.0352	0.0000	109.3337	109.3337	5.9100e-003	0.0000	109.4815
Total	**0.1454**	**0.0803**	**0.7648**	**1.2200e-003**	**0.1285**	**1.1000e-003**	**0.1296**	**0.0342**	**1.0200e-003**	**0.0352**	**0.0000**	**109.3337**	**109.3337**	**5.9100e-003**	**0.0000**	**109.4815**

3.7 Architectural Coating - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	7.5151					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0664	0.2876	4.0924	6.6400e-003		1.3300e-003	1.3300e-003		1.3300e-003	1.3300e-003	0.0000	570.2260	570.2260	0.0341	0.0000	571.0789
Total	**7.5814**	**0.2876**	**4.0924**	**6.6400e-003**		**1.3300e-003**	**1.3300e-003**		**1.3300e-003**	**1.3300e-003**	**0.0000**	**570.2260**	**570.2260**	**0.0341**	**0.0000**	**571.0789**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1454	0.0803	0.7648	1.2200e-003	0.1285	1.1000e-003	0.1296	0.0342	1.0200e-003	0.0352	0.0000	109.3337	109.3337	5.9100e-003	0.0000	109.4815
Total	**0.1454**	**0.0803**	**0.7648**	**1.2200e-003**	**0.1285**	**1.1000e-003**	**0.1296**	**0.0342**	**1.0200e-003**	**0.0352**	**0.0000**	**109.3337**	**109.3337**	**5.9100e-003**	**0.0000**	**109.4815**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.4127	10.8956	37.6044	0.1340	14.6030	0.0986	14.7016	3.9108	0.0920	4.0028	0.0000	12,238.4382	12,238.4382	0.3515	0.0000	12,247.2260
Unmitigated	2.4127	10.8956	37.6044	0.1340	14.6030	0.0986	14.7016	3.9108	0.0920	4.0028	0.0000	12,238.4382	12,238.4382	0.3515	0.0000	12,247.2260

4.2 Trip Summary Information

Guenoc Valley Mixed Use Planned Development Project - Phase 1A 2030 - Lake County, Annual

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	153.65	153.65	153.65	225,896	225,896
Apartments Low Rise	219.50	219.50	219.50	322,708	322,708
General Office Building	0.00	0.00	0.00		
General Office Building	0.00	0.00	0.00		
General Office Building	0.00	0.00	0.00		
Golf Course	185.94	185.94	185.94	1,308,296	1,308,296
Health Club	0.00	0.00	0.00		
Hotel	285.74	285.74	285.74	2,540,949	2,540,949
Hotel	191.54	191.54	191.54	1,703,273	1,703,273
Hotel	40.82	40.82	40.82	362,993	362,993
Hotel	254.34	254.34	254.34	2,261,724	2,261,724
Hotel	84.78	84.78	84.78	753,908	753,908
Hotel	62.80	62.80	62.80	558,450	558,450
Hotel	157.00	157.00	157.00	1,396,126	1,396,126
Medical Office Building	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Quality Restaurant	494.66	494.66	494.66	4,898,390	4,898,390
Quality Restaurant	964.16	964.16	964.16	9,547,710	9,547,710
Quality Restaurant	444.35	444.35	444.35	4,400,249	4,400,249
Regional Shopping Center	566.40	566.40	566.40	5,276,395	5,276,395
Single Family Housing	0.00	0.00	0.00		
Single Family Housing	0.00	0.00	0.00		
Single Family Housing	0.00	0.00	0.00		
Single Family Housing	0.00	0.00	0.00		
Single Family Housing	0.00	0.00	0.00		
User Defined Commercial	298.74	298.74	298.74	2,656,551	2,656,551
User Defined Commercial	114.90	114.90	114.90	1,021,751	1,021,751
User Defined Industrial	59.15	59.15	59.15	245,664	245,664
User Defined Recreational	0.00	0.00	0.00		
User Defined Recreational	0.00	0.00	0.00		
User Defined Recreational	0.00	0.00	0.00		
User Defined Recreational	0.00	0.00	0.00		
User Defined Recreational	0.00	0.00	0.00		
Total	4,578.47	4,578.47	4,578.47	39,481,033	39,481,033

4.3 Trip Type Information

Guenoc Valley Mixed Use Planned Development Project - Phase 1A 2030 - Lake County, Annual

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	0.00	7.00	7.00	42.30	19.60	38.10	100	0	0
Apartments Low Rise	0.00	7.00	7.00	42.30	19.60	38.10	100	0	0
General Office Building	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
General Office Building	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
General Office Building	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Golf Course	0.00	37.50	7.00	33.00	48.00	19.00	100	0	0
Health Club	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Hotel	0.00	37.50	7.00	19.40	61.60	19.00	100	0	0
Hotel	0.00	37.50	7.00	19.40	61.60	19.00	100	0	0
Hotel	0.00	37.50	7.00	19.40	61.60	19.00	100	0	0
Hotel	0.00	37.50	7.00	19.40	61.60	19.00	100	0	0
Hotel	0.00	37.50	7.00	19.40	61.60	19.00	100	0	0
Hotel	0.00	37.50	7.00	19.40	61.60	19.00	100	0	0
Hotel	0.00	37.50	7.00	19.40	61.60	19.00	100	0	0
Medical Office Building	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Quality Restaurant	0.00	37.50	7.00	12.00	69.00	19.00	100	0	0
Quality Restaurant	0.00	37.50	7.00	12.00	69.00	19.00	100	0	0
Quality Restaurant	0.00	37.50	7.00	12.00	69.00	19.00	100	0	0
Regional Shopping Center	0.00	37.50	7.00	16.30	64.70	19.00	100	0	0
Single Family Housing	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Single Family Housing	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Single Family Housing	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Single Family Housing	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Single Family Housing	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
User Defined Commercial	0.00	37.50	7.00	19.40	61.60	19.00	100	0	0
User Defined Commercial	0.00	37.50	7.00	19.40	61.60	19.00	100	0	0
User Defined Industrial	0.00	37.50	7.00	59.00	28.00	13.00	100	0	0
User Defined Recreational	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Recreational	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
User Defined Recreational	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
User Defined Recreational	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
User Defined Recreational	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.562691	0.032307	0.225633	0.110304	0.018549	0.003386	0.015829	0.023488	0.001071	0.000806	0.004279	0.000993	0.000664
General Office Building	0.562691	0.032307	0.225633	0.110304	0.018549	0.003386	0.015829	0.023488	0.001071	0.000806	0.004279	0.000993	0.000664
Golf Course	0.562691	0.032307	0.225633	0.110304	0.018549	0.003386	0.015829	0.023488	0.001071	0.000806	0.004279	0.000993	0.000664
Health Club	0.562691	0.032307	0.225633	0.110304	0.018549	0.003386	0.015829	0.023488	0.001071	0.000806	0.004279	0.000993	0.000664
Hotel	0.562691	0.032307	0.225633	0.110304	0.018549	0.003386	0.015829	0.023488	0.001071	0.000806	0.004279	0.000993	0.000664
Medical Office Building	0.562691	0.032307	0.225633	0.110304	0.018549	0.003386	0.015829	0.023488	0.001071	0.000806	0.004279	0.000993	0.000664
Parking Lot	0.562691	0.032307	0.225633	0.110304	0.018549	0.003386	0.015829	0.023488	0.001071	0.000806	0.004279	0.000993	0.000664
Quality Restaurant	0.562691	0.032307	0.225633	0.110304	0.018549	0.003386	0.015829	0.023488	0.001071	0.000806	0.004279	0.000993	0.000664
Regional Shopping Center	0.562691	0.032307	0.225633	0.110304	0.018549	0.003386	0.015829	0.023488	0.001071	0.000806	0.004279	0.000993	0.000664
Single Family Housing	0.562691	0.032307	0.225633	0.110304	0.018549	0.003386	0.015829	0.023488	0.001071	0.000806	0.004279	0.000993	0.000664
User Defined Commercial	0.562691	0.032307	0.225633	0.110304	0.018549	0.003386	0.015829	0.023488	0.001071	0.000806	0.004279	0.000993	0.000664
User Defined Industrial	0.562691	0.032307	0.225633	0.110304	0.018549	0.003386	0.015829	0.023488	0.001071	0.000806	0.004279	0.000993	0.000664
User Defined Recreational	0.562691	0.032307	0.225633	0.110304	0.018549	0.003386	0.015829	0.023488	0.001071	0.000806	0.004279	0.000993	0.000664

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Percent of Electricity Use Generated with Renewable Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	4,688.4988	4,688.4988	0.2120	0.0439	4,706.8698
NaturalGas Mitigated	0.2115	1.9185	1.5843	0.0115		0.1461	0.1461		0.1461	0.1461	0.0000	2,093.1081	2,093.1081	0.0401	0.0384	2,105.5464
NaturalGas Unmitigated	0.2861	2.5932	2.1281	0.0156		0.1977	0.1977		0.1977	0.1977	0.0000	2,831.4012	2,831.4012	0.0543	0.0519	2,848.2268

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	377985	2.0400e-003	0.0174	7.4100e-003	1.1000e-004		1.4100e-003	1.4100e-003		1.4100e-003	1.4100e-003	0.0000	20.1707	20.1707	3.9000e-004	3.7000e-004	20.2906
Apartments Low Rise	539979	2.9100e-003	0.0249	0.0106	1.6000e-004		2.0100e-003	2.0100e-003		2.0100e-003	2.0100e-003	0.0000	28.8153	28.8153	5.5000e-004	5.3000e-004	28.9866
General Office Building	2.28032e+006	0.0123	0.1118	0.0939	6.7000e-004		8.5000e-003	8.5000e-003		8.5000e-003	8.5000e-003	0.0000	121.6865	121.6865	2.3300e-003	2.2300e-003	122.4096

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	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Office Building	246204	1.3300e-003	0.0121	0.0101	7.0000e-005		9.2000e-004	9.2000e-004		9.2000e-004	9.2000e-004	0.0000	13.1384	13.1384	2.5000e-004	2.4000e-004	13.2165
General Office Building	27356	1.5000e-004	1.3400e-003	1.1300e-003	1.0000e-005		1.0000e-004	1.0000e-004		1.0000e-004	1.0000e-004	0.0000	1.4598	1.4598	3.0000e-005	3.0000e-005	1.4685
Golf Course	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Health Club	414882	2.2400e-003	0.0203	0.0171	1.2000e-004		1.5500e-003	1.5500e-003		1.5500e-003	1.5500e-003	0.0000	22.1397	22.1397	4.2000e-004	4.1000e-004	22.2713
Hotel	1.22899e+006	6.6300e-003	0.0602	0.0506	3.6000e-004		4.5800e-003	4.5800e-003		4.5800e-003	4.5800e-003	0.0000	65.5837	65.5837	1.2600e-003	1.2000e-003	65.9734
Hotel	1.87878e+006	0.0101	0.0921	0.0774	5.5000e-004		7.0000e-003	7.0000e-003		7.0000e-003	7.0000e-003	0.0000	100.2589	100.2589	1.9200e-003	1.8400e-003	100.8546
Hotel	2.73617e+006	0.0148	0.1341	0.1127	8.0000e-004		0.0102	0.0102		0.0102	0.0102	0.0000	146.0123	146.0123	2.8000e-003	2.6800e-003	146.8800
Hotel	228360	1.2300e-003	0.0112	9.4000e-003	7.0000e-005		8.5000e-004	8.5000e-004		8.5000e-004	8.5000e-004	0.0000	12.1862	12.1862	2.3000e-004	2.2000e-004	12.2586
Hotel	3.94232e+006	0.0213	0.1933	0.1623	1.1600e-003		0.0147	0.0147		0.0147	0.0147	0.0000	210.3774	210.3774	4.0300e-003	3.8600e-003	211.6276
Hotel	566748	3.0600e-003	0.0278	0.0233	1.7000e-004		2.1100e-003	2.1100e-003		2.1100e-003	2.1100e-003	0.0000	30.2438	30.2438	5.8000e-004	5.5000e-004	30.4236
Hotel	593736	3.2000e-003	0.0291	0.0245	1.7000e-004		2.2100e-003	2.2100e-003		2.2100e-003	2.2100e-003	0.0000	31.6840	31.6840	6.1000e-004	5.8000e-004	31.8723
Medical Office Building	164136	8.9000e-004	8.0500e-003	6.7600e-003	5.0000e-005		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004	0.0000	8.7589	8.7589	1.7000e-004	1.6000e-004	8.8110
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Quality Restaurant	1.23172e+006	6.6400e-003	0.0604	0.0507	3.6000e-004		4.5900e-003	4.5900e-003		4.5900e-003	4.5900e-003	0.0000	65.7293	65.7293	1.2600e-003	1.2100e-003	66.1199
Quality Restaurant	1.37116e+006	7.3900e-003	0.0672	0.0565	4.0000e-004		5.1100e-003	5.1100e-003		5.1100e-003	5.1100e-003	0.0000	73.1703	73.1703	1.4000e-003	1.3400e-003	73.6051
Quality Restaurant	2.6726e+006	0.0144	0.1310	0.1101	7.9000e-004		9.9600e-003	9.9600e-003		9.9600e-003	9.9600e-003	0.0000	142.6201	142.6201	2.7300e-003	2.6100e-003	143.4676
Regional Shopping Center	216300	1.1700e-003	0.0106	8.9100e-003	6.0000e-005		8.1000e-004	8.1000e-004		8.1000e-004	8.1000e-004	0.0000	11.5426	11.5426	2.2000e-004	2.1000e-004	11.6112
Single Family Housing	157515	1.7000e-003	0.0145	6.1800e-003	9.0000e-005		1.1700e-003	1.1700e-003		1.1700e-003	1.1700e-003	0.0000	16.8112	16.8112	3.2000e-004	3.1000e-004	16.9111

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	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	363495	1.9600e-003	0.0168	7.1300e-003	1.1000e-004		1.3500e-003	1.3500e-003		1.3500e-003	1.3500e-003	0.0000	19.3975	19.3975	3.7000e-004	3.6000e-004	19.5128
Single Family Housing	484660	2.6100e-003	0.0223	9.5000e-003	1.4000e-004		1.8100e-003	1.8100e-003		1.8100e-003	1.8100e-003	0.0000	25.8633	25.8633	5.0000e-004	4.7000e-004	26.0170
Single Family Housing	545243	2.9400e-003	0.0251	0.0107	1.6000e-004		2.0300e-003	2.0300e-003		2.0300e-003	2.0300e-003	0.0000	29.0962	29.0962	5.6000e-004	5.3000e-004	29.2691
User Defined Commercial	2.4402e+006	0.0132	0.1196	0.1005	7.2000e-004		9.0900e-003	9.0900e-003		9.0900e-003	9.0900e-003	0.0000	130.2184	130.2184	2.5000e-003	2.3900e-003	130.9922
User Defined Commercial	8.97064e+006	0.0484	0.4397	0.3694	2.6400e-003		0.0334	0.0334		0.0334	0.0334	0.0000	478.7075	478.7075	9.1800e-003	8.7800e-003	481.5522
User Defined Industrial	1.09424e+006	5.9000e-003	0.0536	0.0451	3.2000e-004		4.0800e-003	4.0800e-003		4.0800e-003	4.0800e-003	0.0000	58.3928	58.3928	1.1200e-003	1.0700e-003	58.7398
User Defined Recreational	2.85852e+006	0.0154	0.1401	0.1177	8.4000e-004		0.0107	0.0107		0.0107	0.0107	0.0000	152.5415	152.5415	2.9200e-003	2.8000e-003	153.4480
User Defined Recreational	3.0212e+006	0.0163	0.1481	0.1244	8.9000e-004		0.0113	0.0113		0.0113	0.0113	0.0000	161.2227	161.2227	3.0900e-003	2.9600e-003	162.1808
User Defined Recreational	3.1374e+006	0.0169	0.1538	0.1292	9.2000e-004		0.0117	0.0117		0.0117	0.0117	0.0000	167.4236	167.4236	3.2100e-003	3.0700e-003	168.4185
User Defined Recreational	755300	4.0700e-003	0.0370	0.0311	2.2000e-004		2.8100e-003	2.8100e-003		2.8100e-003	2.8100e-003	0.0000	40.3057	40.3057	7.7000e-004	7.4000e-004	40.5452
User Defined Recreational	8.35478e+006	0.0451	0.4096	0.3440	2.4600e-003		0.0311	0.0311		0.0311	0.0311	0.0000	445.8429	445.8429	8.5500e-003	8.1700e-003	448.4923
Total		**0.2861**	**2.5932**	**2.1281**	**0.0156**		**0.1977**	**0.1977**		**0.1977**	**0.1977**	**0.0000**	**2,831.4012**	**2,831.4012**	**0.0543**	**0.0519**	**2,848.2268**

5.2 Energy by Land Use - NaturalGas

Mitigated

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	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	207315	1.1200e-003	9.5500e-003	4.0600e-003	6.0000e-005		7.7000e-004	7.7000e-004		7.7000e-004	7.7000e-004	0.0000	11.0631	11.0631	2.1000e-004	2.0000e-004	11.1288
Apartments Low Rise	296164	1.6000e-003	0.0137	5.8100e-003	9.0000e-005		1.1000e-003	1.1000e-003		1.1000e-003	1.1000e-003	0.0000	15.8044	15.8044	3.0000e-004	2.9000e-004	15.8983
General Office Building	1.07175e+006	5.7800e-003	0.0525	0.0441	3.2000e-004		3.9900e-003	3.9900e-003		3.9900e-003	3.9900e-003	0.0000	57.1926	57.1926	1.1000e-003	1.0500e-003	57.5325
General Office Building	115716	6.2000e-004	5.6700e-003	4.7600e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004	0.0000	6.1750	6.1750	1.2000e-004	1.1000e-004	6.2117
General Office Building	12857.3	7.0000e-005	6.3000e-004	5.3000e-004	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.6861	0.6861	1.0000e-005	1.0000e-005	0.6902
Golf Course	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Health Club	214415	1.1600e-003	0.0105	8.8300e-003	6.0000e-005		8.0000e-004	8.0000e-004		8.0000e-004	8.0000e-004	0.0000	11.4420	11.4420	2.2000e-004	2.1000e-004	11.5100
Hotel	1.28949e+006	6.9500e-003	0.0632	0.0531	3.8000e-004		4.8000e-003	4.8000e-003		4.8000e-003	4.8000e-003	0.0000	68.8122	68.8122	1.3200e-003	1.2600e-003	69.2211
Hotel	1.85792e+006	0.0100	0.0911	0.0765	5.5000e-004		6.9200e-003	6.9200e-003		6.9200e-003	6.9200e-003	0.0000	99.1459	99.1459	1.9000e-003	1.8200e-003	99.7351
Hotel	107621	5.8000e-004	5.2800e-003	4.4300e-003	3.0000e-005		4.0000e-004	4.0000e-004		4.0000e-004	4.0000e-004	0.0000	5.7431	5.7431	1.1000e-004	1.1000e-004	5.7772
Hotel	267095	1.4400e-003	0.0131	0.0110	8.0000e-005		1.0000e-003	1.0000e-003		1.0000e-003	1.0000e-003	0.0000	14.2532	14.2532	2.7000e-004	2.6000e-004	14.3379
Hotel	279814	1.5100e-003	0.0137	0.0115	8.0000e-005		1.0400e-003	1.0400e-003		1.0400e-003	1.0400e-003	0.0000	14.9319	14.9319	2.9000e-004	2.7000e-004	15.0207
Hotel	579195	3.1200e-003	0.0284	0.0239	1.7000e-004		2.1600e-003	2.1600e-003		2.1600e-003	2.1600e-003	0.0000	30.9081	30.9081	5.9000e-004	5.7000e-004	31.0917
Hotel	885425	4.7700e-003	0.0434	0.0365	2.6000e-004		3.3000e-003	3.3000e-003		3.3000e-003	3.3000e-003	0.0000	47.2496	47.2496	9.1000e-004	8.7000e-004	47.5304
Medical Office Building	77143.9	4.2000e-004	3.7800e-003	3.1800e-003	2.0000e-005		2.9000e-004	2.9000e-004		2.9000e-004	2.9000e-004	0.0000	4.1167	4.1167	8.0000e-005	8.0000e-005	4.1412
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Quality Restaurant	1.07638e+006	5.8000e-003	0.0528	0.0443	3.2000e-004		4.0100e-003	4.0100e-003		4.0100e-003	4.0100e-003	0.0000	57.4399	57.4399	1.1000e-003	1.0500e-003	57.7812
Quality Restaurant	1.19824e+006	6.4600e-003	0.0587	0.0493	3.5000e-004		4.4600e-003	4.4600e-003		4.4600e-003	4.4600e-003	0.0000	63.9425	63.9425	1.2300e-003	1.1700e-003	64.3225

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Quality Restaurant	2.33555e+006	0.0126	0.1145	0.0962	6.9000e-004		8.7000e-003	8.7000e-003		8.7000e-003	8.7000e-003	0.0000	124.6337	124.6337	2.3900e-003	2.2800e-003	125.3743
Regional Shopping Center	101661	5.5000e-004	4.9800e-003	4.1900e-003	3.0000e-005		3.8000e-004	3.8000e-004		3.8000e-004	3.8000e-004	0.0000	5.4250	5.4250	1.0000e-004	1.0000e-004	5.4573
Single Family Housing	196267	1.0600e-003	9.0400e-003	3.8500e-003	6.0000e-005		7.3000e-004	7.3000e-004		7.3000e-004	7.3000e-004	0.0000	10.4735	10.4735	2.0000e-004	1.9000e-004	10.5358
Single Family Housing	261689	1.4100e-003	0.0121	5.1300e-003	8.0000e-005		9.7000e-004	9.7000e-004		9.7000e-004	9.7000e-004	0.0000	13.9647	13.9647	2.7000e-004	2.6000e-004	14.0477
Single Family Housing	294400	1.5900e-003	0.0136	5.7700e-003	9.0000e-005		1.1000e-003	1.1000e-003		1.1000e-003	1.1000e-003	0.0000	15.7103	15.7103	3.0000e-004	2.9000e-004	15.8037
Single Family Housing	85048.9	9.2000e-004	7.8400e-003	3.3400e-003	5.0000e-005		6.3000e-004	6.3000e-004		6.3000e-004	6.3000e-004	0.0000	9.0771	9.0771	1.7000e-004	1.7000e-004	9.1310
User Defined Commercial	2.13246e+006	0.0115	0.1045	0.0878	6.3000e-004		7.9400e-003	7.9400e-003		7.9400e-003	7.9400e-003	0.0000	113.7960	113.7960	2.1800e-003	2.0900e-003	114.4722
User Defined Commercial	7.83931e+006	0.0423	0.3843	0.3228	2.3100e-003		0.0292	0.0292		0.0292	0.0292	0.0000	418.3356	418.3356	8.0200e-003	7.6700e-003	420.8215
User Defined Industrial	514293	2.7700e-003	0.0252	0.0212	1.5000e-004		1.9200e-003	1.9200e-003		1.9200e-003	1.9200e-003	0.0000	27.4446	27.4446	5.3000e-004	5.0000e-004	27.6077
User Defined Recreational	2.49802e+006	0.0135	0.1225	0.1029	7.3000e-004		9.3100e-003	9.3100e-003		9.3100e-003	9.3100e-003	0.0000	133.3038	133.3038	2.5500e-003	2.4400e-003	134.0960
User Defined Recreational	2.64018e+006	0.0142	0.1294	0.1087	7.8000e-004		9.8400e-003	9.8400e-003		9.8400e-003	9.8400e-003	0.0000	140.8902	140.8902	2.7000e-003	2.5800e-003	141.7275
User Defined Recreational	2.74173e+006	0.0148	0.1344	0.1129	8.1000e-004		0.0102	0.0102		0.0102	0.0102	0.0000	146.3091	146.3091	2.8000e-003	2.6800e-003	147.1785
User Defined Recreational	660046	3.5600e-003	0.0324	0.0272	1.9000e-004		2.4600e-003	2.4600e-003		2.4600e-003	2.4600e-003	0.0000	35.2226	35.2226	6.8000e-004	6.5000e-004	35.4319
User Defined Recreational	7.30112e+006	0.0394	0.3579	0.3006	2.1500e-003		0.0272	0.0272		0.0272	0.0272	0.0000	389.6156	389.6156	7.4700e-003	7.1400e-003	391.9309
Total		**0.2115**	**1.9185**	**1.5843**	**0.0116**		**0.1461**	**0.1461**		**0.1461**	**0.1461**	**0.0000**	**2,093.1081**	**2,093.1081**	**0.0401**	**0.0384**	**2,105.5464**

5.3 Energy by Land Use - Electricity

Unmitigated

Guenoc Valley Mixed Use Planned Development Project - Phase 1A 2030 - Lake County, Annual

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	166567	48.4562	2.1900e-003	4.5000e-004	48.6460
Apartments Low Rise	237953	69.2231	3.1300e-003	6.5000e-004	69.4944
General Office Building	1.2907e+006	375.4800	0.0170	3.5100e-003	376.9513
General Office Building	139356	40.5403	1.8300e-003	3.8000e-004	40.6991
General Office Building	15484	4.5045	2.0000e-004	4.0000e-005	4.5221
Golf Course	0	0.0000	0.0000	0.0000	0.0000
Health Club	505896	147.1710	6.6500e-003	1.3800e-003	147.7476
Hotel	1.41665e+006	412.1209	0.0186	3.8600e-003	413.7357
Hotel	203658	59.2465	2.6800e-003	5.5000e-004	59.4786
Hotel	213356	62.0677	2.8100e-003	5.8000e-004	62.3109
Hotel	441632	128.4758	5.8100e-003	1.2000e-003	128.9792
Hotel	675130	196.4031	8.8800e-003	1.8400e-003	197.1726
Hotel	82060	23.8722	1.0800e-003	2.2000e-004	23.9657
Hotel	983228	286.0323	0.0129	2.6800e-003	287.1531
Medical Office Building	92904	27.0268	1.2200e-003	2.5000e-004	27.1327
Parking Lot	42383.9	12.3300	5.6000e-004	1.2000e-004	12.3783
Quality Restaurant	260442	75.7656	3.4300e-003	7.1000e-004	76.0624
Quality Restaurant	289926	84.3428	3.8100e-003	7.9000e-004	84.6733

Guenoc Valley Mixed Use Planned Development Project - Phase 1A 2030 - Lake County, Annual

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Quality Restaurant	565110	164.3970	7.4300e-003	1.5400e-003	165.0411
Regional Shopping Center	405600	117.9937	5.3400e-003	1.1000e-003	118.4560
Single Family Housing	112804	65.6319	2.9700e-003	6.1000e-004	65.8890
Single Family Housing	260317	75.7291	3.4200e-003	7.1000e-004	76.0258
Single Family Housing	347089	100.9721	4.5700e-003	9.4000e-004	101.3678
Single Family Housing	390475	113.5936	5.1400e-003	1.0600e-003	114.0387
User Defined Commercial	1.8968e+006	551.8020	0.0250	5.1600e-003	553.9642
User Defined Commercial	515970	150.1016	6.7900e-003	1.4000e-003	150.6897
User Defined Industrial	619360	180.1789	8.1500e-003	1.6900e-003	180.8849
User Defined Recreational	1.76658e+006	513.9193	0.0232	4.8100e-003	515.9329
User Defined Recreational	159705	46.4600	2.1000e-003	4.3000e-004	46.6421
User Defined Recreational	604422	175.8333	7.9500e-003	1.6400e-003	176.5223
User Defined Recreational	638820	185.8401	8.4000e-003	1.7400e-003	186.5682
User Defined Recreational	663390	192.9878	8.7300e-003	1.8100e-003	193.7439
Total		**4,688.4988**	**0.2120**	**0.0439**	**4,706.8698**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	0	0.0000	0.0000	0.0000	0.0000
General Office Building	0	0.0000	0.0000	0.0000	0.0000
Golf Course	0	0.0000	0.0000	0.0000	0.0000
Health Club	0	0.0000	0.0000	0.0000	0.0000
Hotel	0	0.0000	0.0000	0.0000	0.0000
Medical Office Building	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Quality Restaurant	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	0	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	6.7220	0.0194	1.6819	9.0000e-005		9.3400e-003	9.3400e-003		9.3400e-003	9.3400e-003	0.0000	2.7573	2.7573	2.6500e-003	0.0000	2.8236
Unmitigated	6.7220	0.0194	1.6819	9.0000e-005		9.3400e-003	9.3400e-003		9.3400e-003	9.3400e-003	0.0000	2.7573	2.7573	2.6500e-003	0.0000	2.8236

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.9831					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.6881					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0508	0.0194	1.6819	9.0000e-005		9.3400e-003	9.3400e-003		9.3400e-003	9.3400e-003	0.0000	2.7573	2.7573	2.6500e-003	0.0000	2.8236
Total	**6.7220**	**0.0194**	**1.6819**	**9.0000e-005**		**9.3400e-003**	**9.3400e-003**		**9.3400e-003**	**9.3400e-003**	**0.0000**	**2.7573**	**2.7573**	**2.6500e-003**	**0.0000**	**2.8236**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.9831					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.6881					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0508	0.0194	1.6819	9.0000e-005		9.3400e-003	9.3400e-003		9.3400e-003	9.3400e-003	0.0000	2.7573	2.7573	2.6500e-003	0.0000	2.8236
Total	**6.7220**	**0.0194**	**1.6819**	**9.0000e-005**		**9.3400e-003**	**9.3400e-003**		**9.3400e-003**	**9.3400e-003**	**0.0000**	**2.7573**	**2.7573**	**2.6500e-003**	**0.0000**	**2.8236**

7.0 Water Detail

7.1 Mitigation Measures Water

Use Reclaimed Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	177.4710	1.0721	0.0267	212.2313
Unmitigated	205.7724	1.3395	0.0332	249.1598

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	5.74875 / 0	10.8731	0.1877	4.5100e-003	16.9097
General Office Building	3.82593 / 23.4613	31.1243	0.1260	3.2200e-003	35.2354
Golf Course	0.390915 / 46.4012	47.9846	0.0149	7.5000e-004	48.5802
Health Club	0.38325 / 4.04055	4.8389	0.0127	3.4000e-004	5.2575
Hotel	13.6738 / 33.6278	60.1018	0.4481	0.0110	74.5945
Medical Office Building	0.90666 / 0	1.7148	0.0296	7.1000e-004	2.6669
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Quality Restaurant	0.0396 / 1.3034	1.4020	1.3500e-003	4.0000e-005	1.4488
Regional Shopping Center	0.60444 / 1.3034	2.4703	0.0198	4.9000e-004	3.1102
Single Family Housing	13.4816 / 9.58002	35.2531	0.4407	0.0107	49.4481
User Defined Commercial	0.67884 / 0	1.2839	0.0222	5.3000e-004	1.9968
User Defined Industrial	0.102368 / 5.86532	6.1656	3.6100e-003	1.4000e-004	6.2965
User Defined Recreational	1.00258 / 0.651702	2.5598	0.0328	7.9000e-004	3.6152
Total		**205.7724**	**1.3394**	**0.0332**	**249.1598**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	4.599 / 0	8.6984	0.1502	3.6100e-003	13.5277
General Office Building	3.06074 / 21.1151	27.2883	0.1009	2.6000e-003	30.5865
Golf Course	0.312732 / 41.7611	43.1122	0.0121	6.4000e-004	43.6072
Health Club	0.3066 / 3.6365	4.2825	0.0102	2.8000e-004	4.6190
Hotel	10.9391 / 30.265	51.5054	0.3586	8.8700e-003	63.1130
Medical Office Building	0.725328 / 0	1.3719	0.0237	5.7000e-004	2.1335
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Quality Restaurant	0.03168 / 1.17306	1.2543	1.0900e-003	4.0000e-005	1.2923
Regional Shopping Center	0.483552 / 1.17306	2.1090	0.0158	3.9000e-004	2.6214
Single Family Housing	10.7853 / 8.62202	29.1779	0.3526	8.5400e-003	40.5377
User Defined Commercial	0.543072 / 0	1.0272	0.0177	4.3000e-004	1.5974
User Defined Industrial	0.0818944 / 5.27879	5.5297	2.9200e-003	1.1000e-004	5.6368
User Defined Recreational	0.802066 / 0.586532	2.1142	0.0262	6.3000e-004	2.9588
Total		**177.4710**	**1.0721**	**0.0267**	**212.2313**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	113.3485	6.6987	0.0000	280.8162
Unmitigated	283.3713	16.7468	0.0000	702.0405

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	39.1	7.9370	0.4691	0.0000	19.6635
General Office Building	121.55	24.6736	1.4582	0.0000	61.1277
Golf Course	2.4	0.4872	0.0288	0.0000	1.2070
Health Club	673.74	136.7631	8.0825	0.0000	338.8249
Hotel	185.06	37.5655	2.2201	0.0000	93.0670
Medical Office Building	90.72	18.4153	1.0883	0.0000	45.6232
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Quality Restaurant	41.43	8.4099	0.4970	0.0000	20.8352
Regional Shopping Center	31.5	6.3942	0.3779	0.0000	15.8414
Single Family Housing	145.08	29.4499	1.7404	0.0000	72.9610
User Defined Commercial	31.5	6.3942	0.3779	0.0000	15.8414
User Defined Industrial	2.4	0.4872	0.0288	0.0000	1.2070
User Defined Recreational	31.5	6.3942	0.3779	0.0000	15.8414
Total		**283.3714**	**16.7468**	**0.0000**	**702.0405**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	15.64	3.1748	0.1876	0.0000	7.8654
General Office Building	48.62	9.8694	0.5833	0.0000	24.4511
Golf Course	0.96	0.1949	0.0115	0.0000	0.4828
Health Club	269.496	54.7053	3.2330	0.0000	135.5300
Hotel	74.024	15.0262	0.8880	0.0000	37.2268
Medical Office Building	36.288	7.3661	0.4353	0.0000	18.2493
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Quality Restaurant	16.572	3.3640	0.1988	0.0000	8.3341
Regional Shopping Center	12.6	2.5577	0.1512	0.0000	6.3366
Single Family Housing	58.032	11.7800	0.6962	0.0000	29.1844
User Defined Commercial	12.6	2.5577	0.1512	0.0000	6.3366
User Defined Industrial	0.96	0.1949	0.0115	0.0000	0.4828
User Defined Recreational	12.6	2.5577	0.1512	0.0000	6.3366
Total		**113.3485**	**6.6987**	**0.0000**	**280.8162**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

	Total CO2	CH4	N2O	CO2e
Category	MT			
Unmitigated	-45,510.0000	0.0000	0.0000	-45,510.0000

11.1 Vegetation Land Change

Vegetation Type

	Initial/Final	Total CO2	CH4	N2O	CO2e
	Acres	MT			
Trees	410 / 0	-45,510.0000	0.0000	0.0000	-45,510.0000
Total		**-45,510.0000**	**0.0000**	**0.0000**	**-45,510.0000**

Guenoc Valley Mixed Use Planned Development Project - Phase 1B and 1C 2030

Lake County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	146.00	Dwelling Unit	635.32	262,800.00	418
Single Family Housing	87.00	Dwelling Unit	259.75	156,600.00	249
Single Family Housing	89.00	Dwelling Unit	724.95	160,200.00	255
Single Family Housing	39.00	Dwelling Unit	201.18	70,200.00	112
Single Family Housing	29.00	Dwelling Unit	150.81	52,200.00	83
Single Family Housing	11.00	Dwelling Unit	81.96	19,800.00	31

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	67
Climate Zone	1			**Operational Year**	2030
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Notes

Construction Phase - Notes

Off-road Equipment - Notes

Off-road Equipment - Notes

Off-road Equipment - Notes

Off-road Equipment - Notes

Off-road Equipment - Notes

Off-road Equipment - Notes

Vehicle Trips - Notes

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Woodstoves - Notes

Construction Off-road Equipment Mitigation - Notes

Area Mitigation -

Energy Mitigation -

Water Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3

tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
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tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	20.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	21.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	13.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
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tblConstructionPhase	NumDays	11,000.00	141.00
tblConstructionPhase	NumDays	155,000.00	1,996.00
tblConstructionPhase	NumDays	10,000.00	0.00
tblConstructionPhase	NumDays	15,500.00	201.00
tblConstructionPhase	NumDays	11,000.00	141.00
tblConstructionPhase	NumDays	6,000.00	77.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConsumerProducts	ROG_EF	2.14E-05	1.62E-05
tblFireplaces	FireplaceDayYear	82.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	NumberGas	220.55	0.00
tblFireplaces	NumberNoFireplace	40.10	0.00
tblFireplaces	NumberWood	140.35	0.00
tblGrading	AcresOfGrading	2,386.88	38,750.00
tblLandUse	LotAcreage	3.57	81.96

tblLandUse	LotAcreage	47.40	635.32
tblLandUse	LotAcreage	9.42	150.81
tblLandUse	LotAcreage	12.66	201.18
tblLandUse	LotAcreage	28.25	259.75
tblLandUse	LotAcreage	28.90	724.95
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	10.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	11.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	11.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	16.00
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tblOffRoadEquipment	UsageHours	8.00	10.00

tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
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tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblVehicleTrips	ST_TR	9.91	5.89
tblVehicleTrips	SU_TR	8.62	5.89
tblVehicleTrips	WD_TR	9.52	5.89
tblWoodstoves	NumberCatalytic	20.05	0.00
tblWoodstoves	NumberNoncatalytic	20.05	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.2360	2.3637	1.2275	3.0400e-003	1.8769	0.1069	1.9838	1.0289	0.0984	1.1272	0.0000	267.4320	267.4320	0.0842	0.0000	269.5370
2024	3.1210	28.6781	26.1727	0.0569	27.3727	1.1887	28.5614	5.8935	1.1026	6.9961	0.0000	4,977.1993	4,977.1993	1.3895	0.0000	5,011.9356
2025	2.3131	18.9894	21.3863	0.0437	0.3686	0.7520	1.1205	0.0991	0.7152	0.8143	0.0000	3,762.5998	3,762.5998	0.6488	0.0000	3,778.8194
2026	2.2958	18.9660	21.2652	0.0436	0.3686	0.7518	1.1204	0.0991	0.7151	0.8142	0.0000	3,752.9650	3,752.9650	0.6475	0.0000	3,769.1532
2027	2.2781	18.9435	21.1547	0.0435	0.3685	0.7517	1.1202	0.0991	0.7149	0.8140	0.0000	3,744.0273	3,744.0273	0.6464	0.0000	3,760.1867
2028	2.2685	18.9745	21.1176	0.0435	0.3695	0.7535	1.1231	0.0994	0.7167	0.8161	0.0000	3,746.1962	3,746.1962	0.6471	0.0000	3,762.3748
2029	2.2440	18.9041	20.9677	0.0433	0.3685	0.7513	1.1198	0.0991	0.7146	0.8137	0.0000	3,728.6903	3,728.6903	0.6444	0.0000	3,744.8006
2030	12.3901	5.7595	12.3125	0.0235	0.1463	0.2086	0.3549	0.0391	0.2086	0.2476	0.0000	2,017.1049	2,017.1049	0.0859	0.0000	2,019.2531
Maximum	**12.3901**	**28.6781**	**26.1727**	**0.0569**	**27.3727**	**1.1887**	**28.5614**	**5.8935**	**1.1026**	**6.9961**	**0.0000**	**4,977.1993**	**4,977.1993**	**1.3895**	**0.0000**	**5,011.9356**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0451	0.1619	1.4637	3.0400e-003	0.8502	8.0000e-004	0.8510	0.4645	7.9000e-004	0.4653	0.0000	267.4317	267.4317	0.0842	0.0000	269.5367
2024	0.8823	3.6856	31.7732	0.0569	12.4677	0.0151	12.4828	2.6922	0.0150	2.7071	0.0000	4,977.1937	4,977.1937	1.3895	0.0000	5,011.9300
2025	0.7412	4.2827	24.1435	0.0437	0.3686	0.0118	0.3804	0.0991	0.0116	0.1107	0.0000	3,762.5958	3,762.5958	0.6488	0.0000	3,778.8154
2026	0.7239	4.2593	24.0224	0.0436	0.3686	0.0117	0.3802	0.0991	0.0115	0.1106	0.0000	3,752.9611	3,752.9611	0.6475	0.0000	3,769.1492
2027	0.7062	4.2369	23.9119	0.0435	0.3685	0.0115	0.3801	0.0991	0.0113	0.1104	0.0000	3,744.0233	3,744.0233	0.6464	0.0000	3,760.1827
2028	0.6923	4.2276	23.8823	0.0435	0.3695	0.0114	0.3809	0.0994	0.0112	0.1105	0.0000	3,746.1922	3,746.1922	0.6471	0.0000	3,762.3708
2029	0.6721	4.1975	23.7249	0.0433	0.3685	0.0112	0.3797	0.0991	0.0110	0.1101	0.0000	3,728.6864	3,728.6864	0.6444	0.0000	3,744.7966
2030	12.1288	4.1570	12.8195	0.0235	0.1463	0.0266	0.1729	0.0391	0.0265	0.0656	0.0000	2,017.1027	2,017.1027	0.0859	0.0000	2,019.2509
Maximum	**12.1288**	**4.2827**	**31.7732**	**0.0569**	**12.4677**	**0.0266**	**12.4828**	**2.6922**	**0.0265**	**2.7071**	**0.0000**	**4,977.1937**	**4,977.1937**	**1.3895**	**0.0000**	**5,011.9300**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**38.88**	**77.80**	**-13.83**	**0.00**	**51.00**	**98.10**	**57.79**	**50.50**	**98.02**	**69.54**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**12-1-2023**	**2-29-2024**	7.9719	0.7113
2	**3-1-2024**	**5-31-2024**	9.3168	1.1824

3	**6-1-2024**	**8-31-2024**	9.3120	1.1775
4	**9-1-2024**	**11-30-2024**	5.8608	1.2824
5	**12-1-2024**	**2-28-2025**	5.4012	1.2538
6	**3-1-2025**	**5-31-2025**	5.3691	1.2660
7	**6-1-2025**	**8-31-2025**	5.3635	1.2604
8	**9-1-2025**	**11-30-2025**	5.3162	1.2578
9	**12-1-2025**	**2-28-2026**	5.2563	1.2424
10	**3-1-2026**	**5-31-2026**	5.3590	1.2559
11	**6-1-2026**	**8-31-2026**	5.3537	1.2507
12	**9-1-2026**	**11-30-2026**	5.3059	1.2475
13	**12-1-2026**	**2-28-2027**	5.2458	1.2319
14	**3-1-2027**	**5-31-2027**	5.3490	1.2460
15	**6-1-2027**	**8-31-2027**	5.3441	1.2410
16	**9-1-2027**	**11-30-2027**	5.2957	1.2372
17	**12-1-2027**	**2-29-2028**	5.2940	1.2356
18	**3-1-2028**	**5-31-2028**	5.3399	1.2368
19	**6-1-2028**	**8-31-2028**	5.3353	1.2322
20	**9-1-2028**	**11-30-2028**	5.2863	1.2278
21	**12-1-2028**	**2-28-2029**	5.2261	1.2123
22	**3-1-2029**	**5-31-2029**	5.3306	1.2275
23	**6-1-2029**	**8-31-2029**	5.3264	1.2233
24	**9-1-2029**	**11-30-2029**	5.2767	1.2183
25	**12-1-2029**	**2-28-2030**	3.8635	1.3961
26	**3-1-2030**	**5-31-2030**	2.7268	2.7268
27	**6-1-2030**	**8-31-2030**	5.8988	5.5950
28	**9-1-2030**	**9-30-2030**	2.6038	2.4380
		Highest	9.3168	5.5950

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.3520	0.0342	2.9696	1.6000e-004		0.0165	0.0165		0.0165	0.0165	0.0000	4.8637	4.8637	4.6300e-003	0.0000	4.9795
Energy	0.0262	0.2239	0.0953	1.4300e-003		0.0181	0.0181		0.0181	0.0181	0.0000	1,271.5250	1,271.5250	0.0507	0.0142	1,277.0321
Mobile	0.8551	3.0247	9.5523	0.0305	3.2487	0.0232	3.2718	0.8700	0.0216	0.8916	0.0000	2,783.3382	2,783.3382	0.0881	0.0000	2,785.5405
Waste						0.0000	0.0000		0.0000	0.0000	83.8921	0.0000	83.8921	4.9579	0.0000	207.8391
Water						0.0000	0.0000		0.0000	0.0000	8.2888	57.8976	66.1864	0.8540	0.0206	93.6872
Total	**4.2332**	**3.2829**	**12.6172**	**0.0321**	**3.2487**	**0.0578**	**3.3065**	**0.8700**	**0.0562**	**0.9262**	**92.1809**	**4,117.6244**	**4,209.8053**	**5.9553**	**0.0349**	**4,369.0784**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.3520	0.0342	2.9696	1.6000e-004		0.0165	0.0165		0.0165	0.0165	0.0000	4.8637	4.8637	4.6300e-003	0.0000	4.9795
Energy	0.0142	0.1209	0.0514	7.7000e-004		9.7700e-003	9.7700e-003		9.7700e-003	9.7700e-003	0.0000	139.9963	139.9963	2.6800e-003	2.5700e-003	140.8283
Mobile	0.8551	3.0247	9.5523	0.0305	3.2487	0.0232	3.2718	0.8700	0.0216	0.8916	0.0000	2,783.3382	2,783.3382	0.0881	0.0000	2,785.5405
Waste						0.0000	0.0000		0.0000	0.0000	83.8921	0.0000	83.8921	4.9579	0.0000	207.8391
Water						0.0000	0.0000		0.0000	0.0000	6.6311	47.9951	54.6262	0.6832	0.0165	76.6334
Total	**4.2212**	**3.1799**	**12.5733**	**0.0314**	**3.2487**	**0.0495**	**3.2981**	**0.8700**	**0.0479**	**0.9179**	**90.5232**	**2,976.1933**	**3,066.7164**	**5.7365**	**0.0191**	**3,215.8208**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.28**	**3.14**	**0.35**	**2.06**	**0.00**	**14.42**	**0.25**	**0.00**	**14.82**	**0.90**	**1.80**	**27.72**	**27.15**	**3.67**	**45.21**	**26.40**

3.0 Construction Detail

Construction Phase

Guenoc Valley Mixed Use Planned Development Project - Phase 1B and 1C 2030 - Lake County, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	12/1/2023	11/30/2023	7	0	
2	Site Preparation	Site Preparation	12/1/2023	2/15/2024	7	77	
3	Grading	Grading	2/15/2024	9/2/2024	7	201	
4	Building Construction	Building Construction	9/2/2024	2/18/2030	7	1996	
5	Paving	Paving	2/18/2030	7/8/2030	7	141	
6	Architectural Coating	Architectural Coating	7/8/2030	11/25/2030	7	141	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 38750

Acres of Paving: 0

Residential Indoor: 1,461,645; Residential Outdoor: 487,215; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Guenoc Valley Mixed Use Planned Development Project - Phase 1B and 1C 2030 - Lake County, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Demolition	Excavators	0	8.00	158	0.38
Demolition	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	16	10.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	5	10.00	97	0.37
Grading	Excavators	20	10.00	158	0.38
Grading	Graders	11	10.00	187	0.41
Grading	Rubber Tired Dozers	5	10.00	247	0.40
Grading	Scrapers	4	10.00	367	0.48
Grading	Tractors/Loaders/Backhoes	4	10.00	97	0.37
Building Construction	Cranes	10	10.00	231	0.29
Building Construction	Forklifts	10	10.00	89	0.20
Building Construction	Generator Sets	10	10.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	4	10.00	97	0.37
Building Construction	Welders	8	10.00	46	0.45
Paving	Pavers	11	10.00	130	0.42
Paving	Paving Equipment	11	10.00	132	0.36
Paving	Rollers	11	10.00	80	0.38
Architectural Coating	Air Compressors	8	10.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	0	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	21	53.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	44	110.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	42	144.00	43.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	33	83.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	8	29.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Demolition - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Demolition - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.8669	0.0000	1.8669	1.0262	0.0000	1.0262	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2269	2.3582	1.1791	2.9500e-003		0.1068	0.1068		0.0983	0.0983	0.0000	259.0788	259.0788	0.0838	0.0000	261.1735
Total	**0.2269**	**2.3582**	**1.1791**	**2.9500e-003**	**1.8669**	**0.1068**	**1.9737**	**1.0262**	**0.0983**	**1.1245**	**0.0000**	**259.0788**	**259.0788**	**0.0838**	**0.0000**	**261.1735**

3.3 Site Preparation - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0400e-003	5.4900e-003	0.0484	9.0000e-005	0.0101	8.0000e-005	0.0102	2.6800e-003	7.0000e-005	2.7500e-003	0.0000	8.3532	8.3532	4.1000e-004	0.0000	8.3634
Total	**9.0400e-003**	**5.4900e-003**	**0.0484**	**9.0000e-005**	**0.0101**	**8.0000e-005**	**0.0102**	**2.6800e-003**	**7.0000e-005**	**2.7500e-003**	**0.0000**	**8.3532**	**8.3532**	**4.1000e-004**	**0.0000**	**8.3634**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.8401	0.0000	0.8401	0.4618	0.0000	0.4618	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0361	0.1564	1.4153	2.9500e-003		7.2000e-004	7.2000e-004		7.2000e-004	7.2000e-004	0.0000	259.0785	259.0785	0.0838	0.0000	261.1732
Total	**0.0361**	**0.1564**	**1.4153**	**2.9500e-003**	**0.8401**	**7.2000e-004**	**0.8408**	**0.4618**	**7.2000e-004**	**0.4625**	**0.0000**	**259.0785**	**259.0785**	**0.0838**	**0.0000**	**261.1732**

3.3 Site Preparation - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0400e-003	5.4900e-003	0.0484	9.0000e-005	0.0101	8.0000e-005	0.0102	2.6800e-003	7.0000e-005	2.7500e-003	0.0000	8.3532	8.3532	4.1000e-004	0.0000	8.3634
Total	**9.0400e-003**	**5.4900e-003**	**0.0484**	**9.0000e-005**	**0.0101**	**8.0000e-005**	**0.0102**	**2.6800e-003**	**7.0000e-005**	**2.7500e-003**	**0.0000**	**8.3532**	**8.3532**	**4.1000e-004**	**0.0000**	**8.3634**

3.3 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.7702	0.0000	2.7702	1.5227	0.0000	1.5227	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3404	3.4869	1.7617	4.3700e-003		0.1573	0.1573		0.1447	0.1447	0.0000	384.4560	384.4560	0.1243	0.0000	387.5646
Total	**0.3404**	**3.4869**	**1.7617**	**4.3700e-003**	**2.7702**	**0.1573**	**2.9275**	**1.5227**	**0.1447**	**1.6674**	**0.0000**	**384.4560**	**384.4560**	**0.1243**	**0.0000**	**387.5646**

3.3 Site Preparation - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0125	7.2200e-003	0.0643	1.3000e-004	0.0150	1.1000e-004	0.0151	3.9800e-003	1.0000e-004	4.0800e-003	0.0000	11.9424	11.9424	5.3000e-004	0.0000	11.9556
Total	**0.0125**	**7.2200e-003**	**0.0643**	**1.3000e-004**	**0.0150**	**1.1000e-004**	**0.0151**	**3.9800e-003**	**1.0000e-004**	**4.0800e-003**	**0.0000**	**11.9424**	**11.9424**	**5.3000e-004**	**0.0000**	**11.9556**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2466	0.0000	1.2466	0.6852	0.0000	0.6852	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0536	0.2321	2.1001	4.3700e-003		1.0700e-003	1.0700e-003		1.0700e-003	1.0700e-003	0.0000	384.4556	384.4556	0.1243	0.0000	387.5641
Total	**0.0536**	**0.2321**	**2.1001**	**4.3700e-003**	**1.2466**	**1.0700e-003**	**1.2476**	**0.6852**	**1.0700e-003**	**0.6863**	**0.0000**	**384.4556**	**384.4556**	**0.1243**	**0.0000**	**387.5641**

3.3 Site Preparation - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0125	7.2200e-003	0.0643	1.3000e-004	0.0150	1.1000e-004	0.0151	3.9800e-003	1.0000e-004	4.0800e-003	0.0000	11.9424	11.9424	5.3000e-004	0.0000	11.9556
Total	**0.0125**	**7.2200e-003**	**0.0643**	**1.3000e-004**	**0.0150**	**1.1000e-004**	**0.0151**	**3.9800e-003**	**1.0000e-004**	**4.0800e-003**	**0.0000**	**11.9424**	**11.9424**	**5.3000e-004**	**0.0000**	**11.9556**

3.4 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					24.3298	0.0000	24.3298	4.2979	0.0000	4.2979	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.8337	18.3392	16.5809	0.0367		0.7478	0.7478		0.6880	0.6880	0.0000	3,221.7078	3,221.7078	1.0420	0.0000	3,247.7570
Total	**1.8337**	**18.3392**	**16.5809**	**0.0367**	**24.3298**	**0.7478**	**25.0776**	**4.2979**	**0.6880**	**4.9858**	**0.0000**	**3,221.7078**	**3,221.7078**	**1.0420**	**0.0000**	**3,247.7570**

3.4 Grading - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1136	0.0655	0.5827	1.2000e-003	0.1356	9.8000e-004	0.1366	0.0361	9.0000e-004	0.0370	0.0000	108.3047	108.3047	4.7700e-003	0.0000	108.4240
Total	**0.1136**	**0.0655**	**0.5827**	**1.2000e-003**	**0.1356**	**9.8000e-004**	**0.1366**	**0.0361**	**9.0000e-004**	**0.0370**	**0.0000**	**108.3047**	**108.3047**	**4.7700e-003**	**0.0000**	**108.4240**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					10.9484	0.0000	10.9484	1.9340	0.0000	1.9340	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4502	1.9508	20.9745	0.0367		9.0000e-003	9.0000e-003		9.0000e-003	9.0000e-003	0.0000	3,221.7040	3,221.7040	1.0420	0.0000	3,247.7531
Total	**0.4502**	**1.9508**	**20.9745**	**0.0367**	**10.9484**	**9.0000e-003**	**10.9574**	**1.9340**	**9.0000e-003**	**1.9430**	**0.0000**	**3,221.7040**	**3,221.7040**	**1.0420**	**0.0000**	**3,247.7531**

3.4 Grading - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1136	0.0655	0.5827	1.2000e-003	0.1356	9.8000e-004	0.1366	0.0361	9.0000e-004	0.0370	0.0000	108.3047	108.3047	4.7700e-003	0.0000	108.4240
Total	**0.1136**	**0.0655**	**0.5827**	**1.2000e-003**	**0.1356**	**9.8000e-004**	**0.1366**	**0.0361**	**9.0000e-004**	**0.0370**	**0.0000**	**108.3047**	**108.3047**	**4.7700e-003**	**0.0000**	**108.4240**

3.5 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.7239	6.5161	6.6573	0.0130		0.2814	0.2814		0.2679	0.2679	0.0000	1,109.0558	1,109.0558	0.2125	0.0000	1,114.3693
Total	**0.7239**	**6.5161**	**6.6573**	**0.0130**		**0.2814**	**0.2814**		**0.2679**	**0.2679**	**0.0000**	**1,109.0558**	**1,109.0558**	**0.2125**	**0.0000**	**1,114.3693**

3.5 Building Construction - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.4200e-003	0.2116	0.0665	5.9000e-004	0.0153	3.6000e-004	0.0157	4.4400e-003	3.4000e-004	4.7800e-003	0.0000	56.3821	56.3821	1.5500e-003	0.0000	56.4207
Worker	0.0895	0.0516	0.4592	9.5000e-004	0.1068	7.7000e-004	0.1076	0.0284	7.1000e-004	0.0291	0.0000	85.3505	85.3505	3.7600e-003	0.0000	85.4446
Total	**0.0969**	**0.2632**	**0.5257**	**1.5400e-003**	**0.1222**	**1.1300e-003**	**0.1233**	**0.0329**	**1.0500e-003**	**0.0339**	**0.0000**	**141.7326**	**141.7326**	**5.3100e-003**	**0.0000**	**141.8653**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1556	1.1668	7.5259	0.0130		2.8500e-003	2.8500e-003		2.8500e-003	2.8500e-003	0.0000	1,109.0545	1,109.0545	0.2125	0.0000	1,114.3680
Total	**0.1556**	**1.1668**	**7.5259**	**0.0130**		**2.8500e-003**	**2.8500e-003**		**2.8500e-003**	**2.8500e-003**	**0.0000**	**1,109.0545**	**1,109.0545**	**0.2125**	**0.0000**	**1,114.3680**

3.5 Building Construction - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.4200e-003	0.2116	0.0665	5.9000e-004	0.0153	3.6000e-004	0.0157	4.4400e-003	3.4000e-004	4.7800e-003	0.0000	56.3821	56.3821	1.5500e-003	0.0000	56.4207
Worker	0.0895	0.0516	0.4592	9.5000e-004	0.1068	7.7000e-004	0.1076	0.0284	7.1000e-004	0.0291	0.0000	85.3505	85.3505	3.7600e-003	0.0000	85.4446
Total	**0.0969**	**0.2632**	**0.5257**	**1.5400e-003**	**0.1222**	**1.1300e-003**	**0.1233**	**0.0329**	**1.0500e-003**	**0.0339**	**0.0000**	**141.7326**	**141.7326**	**5.3100e-003**	**0.0000**	**141.8653**

3.5 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.0412	18.2263	19.9447	0.0392		0.7487	0.7487		0.7122	0.7122	0.0000	3,345.7773	3,345.7773	0.6343	0.0000	3,361.6340
Total	**2.0412**	**18.2263**	**19.9447**	**0.0392**		**0.7487**	**0.7487**		**0.7122**	**0.7122**	**0.0000**	**3,345.7773**	**3,345.7773**	**0.6343**	**0.0000**	**3,361.6340**

3.5 Building Construction - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0210	0.6239	0.1851	1.7800e-003	0.0463	1.0000e-003	0.0473	0.0134	9.5000e-004	0.0143	0.0000	169.0916	169.0916	4.4900e-003	0.0000	169.2038
Worker	0.2509	0.1392	1.2565	2.7500e-003	0.3223	2.2300e-003	0.3245	0.0857	2.0600e-003	0.0878	0.0000	247.7309	247.7309	0.0100	0.0000	247.9816
Total	**0.2719**	**0.7631**	**1.4416**	**4.5300e-003**	**0.3686**	**3.2300e-003**	**0.3718**	**0.0991**	**3.0100e-003**	**0.1021**	**0.0000**	**416.8225**	**416.8225**	**0.0145**	**0.0000**	**417.1854**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4694	3.5197	22.7019	0.0392		8.5900e-003	8.5900e-003		8.5900e-003	8.5900e-003	0.0000	3,345.7733	3,345.7733	0.6343	0.0000	3,361.6300
Total	**0.4694**	**3.5197**	**22.7019**	**0.0392**		**8.5900e-003**	**8.5900e-003**		**8.5900e-003**	**8.5900e-003**	**0.0000**	**3,345.7733**	**3,345.7733**	**0.6343**	**0.0000**	**3,361.6300**

3.5 Building Construction - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0210	0.6239	0.1851	1.7800e-003	0.0463	1.0000e-003	0.0473	0.0134	9.5000e-004	0.0143	0.0000	169.0916	169.0916	4.4900e-003	0.0000	169.2038
Worker	0.2509	0.1392	1.2565	2.7500e-003	0.3223	2.2300e-003	0.3245	0.0857	2.0600e-003	0.0878	0.0000	247.7309	247.7309	0.0100	0.0000	247.9816
Total	**0.2719**	**0.7631**	**1.4416**	**4.5300e-003**	**0.3686**	**3.2300e-003**	**0.3718**	**0.0991**	**3.0100e-003**	**0.1021**	**0.0000**	**416.8225**	**416.8225**	**0.0145**	**0.0000**	**417.1854**

3.5 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.0412	18.2263	19.9447	0.0392		0.7487	0.7487		0.7122	0.7122	0.0000	3,345.7773	3,345.7773	0.6343	0.0000	3,361.6340
Total	**2.0412**	**18.2263**	**19.9447**	**0.0392**		**0.7487**	**0.7487**		**0.7122**	**0.7122**	**0.0000**	**3,345.7773**	**3,345.7773**	**0.6343**	**0.0000**	**3,361.6340**

3.5 Building Construction - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0201	0.6148	0.1740	1.7800e-003	0.0463	9.5000e-004	0.0472	0.0134	9.1000e-004	0.0143	0.0000	168.3622	168.3622	4.3400e-003	0.0000	168.4708
Worker	0.2345	0.1249	1.1465	2.6500e-003	0.3223	2.1400e-003	0.3244	0.0857	1.9700e-003	0.0877	0.0000	238.8256	238.8256	8.9100e-003	0.0000	239.0485
Total	**0.2546**	**0.7397**	**1.3205**	**4.4300e-003**	**0.3686**	**3.0900e-003**	**0.3716**	**0.0991**	**2.8800e-003**	**0.1020**	**0.0000**	**407.1878**	**407.1878**	**0.0133**	**0.0000**	**407.5192**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4694	3.5197	22.7019	0.0392		8.5900e-003	8.5900e-003		8.5900e-003	8.5900e-003	0.0000	3,345.7733	3,345.7733	0.6343	0.0000	3,361.6300
Total	**0.4694**	**3.5197**	**22.7019**	**0.0392**		**8.5900e-003**	**8.5900e-003**		**8.5900e-003**	**8.5900e-003**	**0.0000**	**3,345.7733**	**3,345.7733**	**0.6343**	**0.0000**	**3,361.6300**

3.5 Building Construction - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0201	0.6148	0.1740	1.7800e-003	0.0463	9.5000e-004	0.0472	0.0134	9.1000e-004	0.0143	0.0000	168.3622	168.3622	4.3400e-003	0.0000	168.4708
Worker	0.2345	0.1249	1.1465	2.6500e-003	0.3223	2.1400e-003	0.3244	0.0857	1.9700e-003	0.0877	0.0000	238.8256	238.8256	8.9100e-003	0.0000	239.0485
Total	**0.2546**	**0.7397**	**1.3205**	**4.4300e-003**	**0.3686**	**3.0900e-003**	**0.3716**	**0.0991**	**2.8800e-003**	**0.1020**	**0.0000**	**407.1878**	**407.1878**	**0.0133**	**0.0000**	**407.5192**

3.5 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.0412	18.2263	19.9447	0.0392		0.7487	0.7487		0.7122	0.7122	0.0000	3,345.7773	3,345.7773	0.6343	0.0000	3,361.6340
Total	**2.0412**	**18.2263**	**19.9447**	**0.0392**		**0.7487**	**0.7487**		**0.7122**	**0.7122**	**0.0000**	**3,345.7773**	**3,345.7773**	**0.6343**	**0.0000**	**3,361.6340**

3.5 Building Construction - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0193	0.6055	0.1651	1.7700e-003	0.0463	9.1000e-004	0.0472	0.0134	8.7000e-004	0.0142	0.0000	167.6236	167.6236	4.2100e-003	0.0000	167.7289
Worker	0.2176	0.1118	1.0449	2.5500e-003	0.3223	2.0100e-003	0.3243	0.0857	1.8500e-003	0.0876	0.0000	230.6264	230.6264	7.9000e-003	0.0000	230.8238
Total	**0.2369**	**0.7173**	**1.2100**	**4.3200e-003**	**0.3685**	**2.9200e-003**	**0.3715**	**0.0991**	**2.7200e-003**	**0.1018**	**0.0000**	**398.2501**	**398.2501**	**0.0121**	**0.0000**	**398.5527**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4694	3.5197	22.7019	0.0392		8.5900e-003	8.5900e-003		8.5900e-003	8.5900e-003	0.0000	3,345.7733	3,345.7733	0.6343	0.0000	3,361.6300
Total	**0.4694**	**3.5197**	**22.7019**	**0.0392**		**8.5900e-003**	**8.5900e-003**		**8.5900e-003**	**8.5900e-003**	**0.0000**	**3,345.7733**	**3,345.7733**	**0.6343**	**0.0000**	**3,361.6300**

3.5 Building Construction - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0193	0.6055	0.1651	1.7700e-003	0.0463	9.1000e-004	0.0472	0.0134	8.7000e-004	0.0142	0.0000	167.6236	167.6236	4.2100e-003	0.0000	167.7289
Worker	0.2176	0.1118	1.0449	2.5500e-003	0.3223	2.0100e-003	0.3243	0.0857	1.8500e-003	0.0876	0.0000	230.6264	230.6264	7.9000e-003	0.0000	230.8238
Total	**0.2369**	**0.7173**	**1.2100**	**4.3200e-003**	**0.3685**	**2.9200e-003**	**0.3715**	**0.0991**	**2.7200e-003**	**0.1018**	**0.0000**	**398.2501**	**398.2501**	**0.0121**	**0.0000**	**398.5527**

3.5 Building Construction - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.0468	18.2762	19.9994	0.0393		0.7508	0.7508		0.7142	0.7142	0.0000	3,354.9438	3,354.9438	0.6360	0.0000	3,370.8440
Total	**2.0468**	**18.2762**	**19.9994**	**0.0393**		**0.7508**	**0.7508**		**0.7142**	**0.7142**	**0.0000**	**3,354.9438**	**3,354.9438**	**0.6360**	**0.0000**	**3,370.8440**

3.5 Building Construction - 2028

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0186	0.5981	0.1576	1.7700e-003	0.0464	8.6000e-004	0.0472	0.0134	8.3000e-004	0.0142	0.0000	167.4554	167.4554	4.0700e-003	0.0000	167.5572
Worker	0.2030	0.1002	0.9606	2.4800e-003	0.3232	1.8800e-003	0.3250	0.0860	1.7300e-003	0.0877	0.0000	223.7971	223.7971	7.0600e-003	0.0000	223.9737
Total	**0.2216**	**0.6983**	**1.1182**	**4.2500e-003**	**0.3695**	**2.7400e-003**	**0.3723**	**0.0994**	**2.5600e-003**	**0.1019**	**0.0000**	**391.2525**	**391.2525**	**0.0111**	**0.0000**	**391.5309**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4706	3.5293	22.7641	0.0393		8.6100e-003	8.6100e-003		8.6100e-003	8.6100e-003	0.0000	3,354.9398	3,354.9398	0.6360	0.0000	3,370.8400
Total	**0.4706**	**3.5293**	**22.7641**	**0.0393**		**8.6100e-003**	**8.6100e-003**		**8.6100e-003**	**8.6100e-003**	**0.0000**	**3,354.9398**	**3,354.9398**	**0.6360**	**0.0000**	**3,370.8400**

3.5 Building Construction - 2028

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0186	0.5981	0.1576	1.7700e-003	0.0464	8.6000e-004	0.0472	0.0134	8.3000e-004	0.0142	0.0000	167.4554	167.4554	4.0700e-003	0.0000	167.5572
Worker	0.2030	0.1002	0.9606	2.4800e-003	0.3232	1.8800e-003	0.3250	0.0860	1.7300e-003	0.0877	0.0000	223.7971	223.7971	7.0600e-003	0.0000	223.9737
Total	**0.2216**	**0.6983**	**1.1182**	**4.2500e-003**	**0.3695**	**2.7400e-003**	**0.3723**	**0.0994**	**2.5600e-003**	**0.1019**	**0.0000**	**391.2525**	**391.2525**	**0.0111**	**0.0000**	**391.5309**

3.5 Building Construction - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.0412	18.2263	19.9447	0.0392		0.7487	0.7487		0.7122	0.7122	0.0000	3,345.7773	3,345.7773	0.6343	0.0000	3,361.6340
Total	**2.0412**	**18.2263**	**19.9447**	**0.0392**		**0.7487**	**0.7487**		**0.7122**	**0.7122**	**0.0000**	**3,345.7773**	**3,345.7773**	**0.6343**	**0.0000**	**3,361.6340**

3.5 Building Construction - 2029

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0180	0.5890	0.1503	1.7600e-003	0.0462	8.2000e-004	0.0471	0.0134	7.8000e-004	0.0141	0.0000	166.4781	166.4781	3.9300e-003	0.0000	166.5763
Worker	0.1848	0.0888	0.8727	2.4000e-003	0.3223	1.7400e-003	0.3240	0.0857	1.6000e-003	0.0873	0.0000	216.4349	216.4349	6.2100e-003	0.0000	216.5903
Total	**0.2028**	**0.6779**	**1.0230**	**4.1600e-003**	**0.3685**	**2.5600e-003**	**0.3711**	**0.0991**	**2.3800e-003**	**0.1015**	**0.0000**	**382.9131**	**382.9131**	**0.0101**	**0.0000**	**383.1666**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4694	3.5197	22.7019	0.0392		8.5900e-003	8.5900e-003		8.5900e-003	8.5900e-003	0.0000	3,345.7733	3,345.7733	0.6343	0.0000	3,361.6300
Total	**0.4694**	**3.5197**	**22.7019**	**0.0392**		**8.5900e-003**	**8.5900e-003**		**8.5900e-003**	**8.5900e-003**	**0.0000**	**3,345.7733**	**3,345.7733**	**0.6343**	**0.0000**	**3,361.6300**

3.5 Building Construction - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0180	0.5890	0.1503	1.7600e-003	0.0462	8.2000e-004	0.0471	0.0134	7.8000e-004	0.0141	0.0000	166.4781	166.4781	3.9300e-003	0.0000	166.5763
Worker	0.1848	0.0888	0.8727	2.4000e-003	0.3223	1.7400e-003	0.3240	0.0857	1.6000e-003	0.0873	0.0000	216.4349	216.4349	6.2100e-003	0.0000	216.5903
Total	**0.2028**	**0.6779**	**1.0230**	**4.1600e-003**	**0.3685**	**2.5600e-003**	**0.3711**	**0.0991**	**2.3800e-003**	**0.1015**	**0.0000**	**382.9131**	**382.9131**	**0.0101**	**0.0000**	**383.1666**

3.5 Building Construction - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2293	1.3911	2.5733	5.8500e-003		0.0285	0.0285		0.0285	0.0285	0.0000	495.2972	495.2972	0.0186	0.0000	495.7611
Total	**0.2293**	**1.3911**	**2.5733**	**5.8500e-003**		**0.0285**	**0.0285**		**0.0285**	**0.0285**	**0.0000**	**495.2972**	**495.2972**	**0.0186**	**0.0000**	**495.7611**

3.5 Building Construction - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3400e-003	0.0780	0.0194	2.4000e-004	6.2000e-003	1.0000e-004	6.3100e-003	1.7900e-003	1.0000e-004	1.8900e-003	0.0000	22.2866	22.2866	5.1000e-004	0.0000	22.2993
Worker	0.0226	0.0106	0.1074	3.1000e-004	0.0433	2.2000e-004	0.0435	0.0115	2.0000e-004	0.0117	0.0000	28.2394	28.2394	7.4000e-004	0.0000	28.2579
Total	**0.0250**	**0.0886**	**0.1269**	**5.5000e-004**	**0.0495**	**3.2000e-004**	**0.0498**	**0.0133**	**3.0000e-004**	**0.0136**	**0.0000**	**50.5260**	**50.5260**	**1.2500e-003**	**0.0000**	**50.5572**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0630	0.4725	3.0477	5.8500e-003		1.1500e-003	1.1500e-003		1.1500e-003	1.1500e-003	0.0000	495.2967	495.2967	0.0186	0.0000	495.7605
Total	**0.0630**	**0.4725**	**3.0477**	**5.8500e-003**		**1.1500e-003**	**1.1500e-003**		**1.1500e-003**	**1.1500e-003**	**0.0000**	**495.2967**	**495.2967**	**0.0186**	**0.0000**	**495.7605**

3.5 Building Construction - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3400e-003	0.0780	0.0194	2.4000e-004	6.2000e-003	1.0000e-004	6.3100e-003	1.7900e-003	1.0000e-004	1.8900e-003	0.0000	22.2866	22.2866	5.1000e-004	0.0000	22.2993
Worker	0.0226	0.0106	0.1074	3.1000e-004	0.0433	2.2000e-004	0.0435	0.0115	2.0000e-004	0.0117	0.0000	28.2394	28.2394	7.4000e-004	0.0000	28.2579
Total	**0.0250**	**0.0886**	**0.1269**	**5.5000e-004**	**0.0495**	**3.2000e-004**	**0.0498**	**0.0133**	**3.0000e-004**	**0.0136**	**0.0000**	**50.5260**	**50.5260**	**1.2500e-003**	**0.0000**	**50.5572**

3.6 Paving - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.6711	3.4511	7.6821	0.0136		0.1603	0.1603		0.1603	0.1603	0.0000	1,168.0734	1,168.0734	0.0548	0.0000	1,169.4423
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.6711**	**3.4511**	**7.6821**	**0.0136**		**0.1603**	**0.1603**		**0.1603**	**0.1603**	**0.0000**	**1,168.0734**	**1,168.0734**	**0.0548**	**0.0000**	**1,169.4423**

3.6 Paving - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0375	0.0176	0.1782	5.2000e-004	0.0718	3.6000e-004	0.0721	0.0191	3.3000e-004	0.0194	0.0000	46.8375	46.8375	1.2300e-003	0.0000	46.8682
Total	**0.0375**	**0.0176**	**0.1782**	**5.2000e-004**	**0.0718**	**3.6000e-004**	**0.0721**	**0.0191**	**3.3000e-004**	**0.0194**	**0.0000**	**46.8375**	**46.8375**	**1.2300e-003**	**0.0000**	**46.8682**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.6711	3.4511	7.6821	0.0136		0.0240	0.0240		0.0240	0.0240	0.0000	1,168.0720	1,168.0720	0.0548	0.0000	1,169.4409
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.6711**	**3.4511**	**7.6821**	**0.0136**		**0.0240**	**0.0240**		**0.0240**	**0.0240**	**0.0000**	**1,168.0720**	**1,168.0720**	**0.0548**	**0.0000**	**1,169.4409**

3.6 Paving - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0375	0.0176	0.1782	5.2000e-004	0.0718	3.6000e-004	0.0721	0.0191	3.3000e-004	0.0194	0.0000	46.8375	46.8375	1.2300e-003	0.0000	46.8682
Total	**0.0375**	**0.0176**	**0.1782**	**5.2000e-004**	**0.0718**	**3.6000e-004**	**0.0721**	**0.0191**	**3.3000e-004**	**0.0194**	**0.0000**	**46.8375**	**46.8375**	**1.2300e-003**	**0.0000**	**46.8682**

3.7 Architectural Coating - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	11.2912					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1229	0.8049	1.6899	2.7900e-003		0.0191	0.0191		0.0191	0.0191	0.0000	240.0059	240.0059	9.7100e-003	0.0000	240.2487
Total	**11.4141**	**0.8049**	**1.6899**	**2.7900e-003**		**0.0191**	**0.0191**		**0.0191**	**0.0191**	**0.0000**	**240.0059**	**240.0059**	**9.7100e-003**	**0.0000**	**240.2487**

3.7 Architectural Coating - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0131	6.1400e-003	0.0623	1.8000e-004	0.0251	1.3000e-004	0.0252	6.6700e-003	1.2000e-004	6.7900e-003	0.0000	16.3649	16.3649	4.3000e-004	0.0000	16.3757
Total	**0.0131**	**6.1400e-003**	**0.0623**	**1.8000e-004**	**0.0251**	**1.3000e-004**	**0.0252**	**6.6700e-003**	**1.2000e-004**	**6.7900e-003**	**0.0000**	**16.3649**	**16.3649**	**4.3000e-004**	**0.0000**	**16.3757**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	11.2912					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0279	0.1210	1.7225	2.7900e-003		5.6000e-004	5.6000e-004		5.6000e-004	5.6000e-004	0.0000	240.0056	240.0056	9.7100e-003	0.0000	240.2484
Total	**11.3191**	**0.1210**	**1.7225**	**2.7900e-003**		**5.6000e-004**	**5.6000e-004**		**5.6000e-004**	**5.6000e-004**	**0.0000**	**240.0056**	**240.0056**	**9.7100e-003**	**0.0000**	**240.2484**

3.7 Architectural Coating - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0131	6.1400e-003	0.0623	1.8000e-004	0.0251	1.3000e-004	0.0252	6.6700e-003	1.2000e-004	6.7900e-003	0.0000	16.3649	16.3649	4.3000e-004	0.0000	16.3757
Total	**0.0131**	**6.1400e-003**	**0.0623**	**1.8000e-004**	**0.0251**	**1.3000e-004**	**0.0252**	**6.6700e-003**	**1.2000e-004**	**6.7900e-003**	**0.0000**	**16.3649**	**16.3649**	**4.3000e-004**	**0.0000**	**16.3757**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.8551	3.0247	9.5523	0.0305	3.2487	0.0232	3.2718	0.8700	0.0216	0.8916	0.0000	2,783.3382	2,783.3382	0.0881	0.0000	2,785.5405
Unmitigated	0.8551	3.0247	9.5523	0.0305	3.2487	0.0232	3.2718	0.8700	0.0216	0.8916	0.0000	2,783.3382	2,783.3382	0.0881	0.0000	2,785.5405

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	859.94	859.94	859.94	3,197,875	3,197,875
Single Family Housing	512.43	512.43	512.43	1,905,583	1,905,583
Single Family Housing	524.21	524.21	524.21	1,949,390	1,949,390
Single Family Housing	229.71	229.71	229.71	854,227	854,227
Single Family Housing	170.81	170.81	170.81	635,194	635,194
Single Family Housing	64.79	64.79	64.79	240,936	240,936
Total	2,361.89	2,361.89	2,361.89	8,783,205	8,783,205

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	16.80	7.10	7.90	42.30	19.60	38.10	86	11	3
Single Family Housing	16.80	7.10	7.90	42.30	19.60	38.10	86	11	3
Single Family Housing	16.80	7.10	7.90	42.30	19.60	38.10	86	11	3
Single Family Housing	16.80	7.10	7.90	42.30	19.60	38.10	86	11	3
Single Family Housing	16.80	7.10	7.90	42.30	19.60	38.10	86	11	3
Single Family Housing	16.80	7.10	7.90	42.30	19.60	38.10	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.562691	0.032307	0.225633	0.110304	0.018549	0.003386	0.015829	0.023488	0.001071	0.000806	0.004279	0.000993	0.000664

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Percent of Electricity Use Generated with Renewable Energy

Guenoc Valley Mixed Use Planned Development Project - Phase 1B and 1C 2030 - Lake County, Annual

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1,012.2454	1,012.2454	0.0458	9.4700e-003	1,016.2117
NaturalGas Mitigated	0.0142	0.1209	0.0514	7.7000e-004		9.7700e-003	9.7700e-003		9.7700e-003	9.7700e-003	0.0000	139.9963	139.9963	2.6800e-003	2.5700e-003	140.8283
NaturalGas Unmitigated	0.0262	0.2239	0.0953	1.4300e-003		0.0181	0.0181		0.0181	0.0181	0.0000	259.2796	259.2796	4.9700e-003	4.7500e-003	260.8204

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	1.05414e+006	5.6800e-003	0.0486	0.0207	3.1000e-004		3.9300e-003	3.9300e-003		3.9300e-003	3.9300e-003	0.0000	56.2527	56.2527	1.0800e-003	1.0300e-003	56.5870
Single Family Housing	1.07837e+006	5.8100e-003	0.0497	0.0211	3.2000e-004		4.0200e-003	4.0200e-003		4.0200e-003	4.0200e-003	0.0000	57.5459	57.5459	1.1000e-003	1.0600e-003	57.8878
Single Family Housing	1.76901e+006	9.5400e-003	0.0815	0.0347	5.2000e-004		6.5900e-003	6.5900e-003		6.5900e-003	6.5900e-003	0.0000	94.4011	94.4011	1.8100e-003	1.7300e-003	94.9620
Single Family Housing	133282	7.2000e-004	6.1400e-003	2.6100e-003	4.0000e-005		5.0000e-004	5.0000e-004		5.0000e-004	5.0000e-004	0.0000	7.1124	7.1124	1.4000e-004	1.3000e-004	7.1547
Single Family Housing	351379	1.8900e-003	0.0162	6.8900e-003	1.0000e-004		1.3100e-003	1.3100e-003		1.3100e-003	1.3100e-003	0.0000	18.7509	18.7509	3.6000e-004	3.4000e-004	18.8623
Single Family Housing	472544	2.5500e-003	0.0218	9.2700e-003	1.4000e-004		1.7600e-003	1.7600e-003		1.7600e-003	1.7600e-003	0.0000	25.2167	25.2167	4.8000e-004	4.6000e-004	25.3666
Total		**0.0262**	**0.2239**	**0.0953**	**1.4300e-003**		**0.0181**	**0.0181**		**0.0181**	**0.0181**	**0.0000**	**259.2796**	**259.2796**	**4.9700e-003**	**4.7500e-003**	**260.8204**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	189725	1.0200e-003	8.7400e-003	3.7200e-003	6.0000e-005		7.1000e-004	7.1000e-004		7.1000e-004	7.1000e-004	0.0000	10.1244	10.1244	1.9000e-004	1.9000e-004	10.1846
Single Family Housing	255147	1.3800e-003	0.0118	5.0000e-003	8.0000e-005		9.5000e-004	9.5000e-004		9.5000e-004	9.5000e-004	0.0000	13.6156	13.6156	2.6000e-004	2.5000e-004	13.6965
Single Family Housing	569174	3.0700e-003	0.0262	0.0112	1.7000e-004		2.1200e-003	2.1200e-003		2.1200e-003	2.1200e-003	0.0000	30.3733	30.3733	5.8000e-004	5.6000e-004	30.5538
Single Family Housing	582258	3.1400e-003	0.0268	0.0114	1.7000e-004		2.1700e-003	2.1700e-003		2.1700e-003	2.1700e-003	0.0000	31.0715	31.0715	6.0000e-004	5.7000e-004	31.2562
Single Family Housing	71964.5	3.9000e-004	3.3200e-003	1.4100e-003	2.0000e-005		2.7000e-004	2.7000e-004		2.7000e-004	2.7000e-004	0.0000	3.8403	3.8403	7.0000e-005	7.0000e-005	3.8631
Single Family Housing	955165	5.1500e-003	0.0440	0.0187	2.8000e-004		3.5600e-003	3.5600e-003		3.5600e-003	3.5600e-003	0.0000	50.9712	50.9712	9.8000e-004	9.3000e-004	51.2741
Total		**0.0142**	**0.1209**	**0.0514**	**7.8000e-004**		**9.7800e-003**	**9.7800e-003**		**9.7800e-003**	**9.7800e-003**	**0.0000**	**139.9963**	**139.9963**	**2.6800e-003**	**2.5700e-003**	**140.8283**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	1.26687e+006	368.5482	0.0167	3.4500e-003	369.9923
Single Family Housing	251639	73.2048	3.3100e-003	6.8000e-004	73.4916
Single Family Housing	338412	98.4478	4.4500e-003	9.2000e-004	98.8336
Single Family Housing	754918	219.6143	9.9300e-003	2.0500e-003	220.4749
Single Family Housing	772273	224.6630	0.0102	2.1000e-003	225.5433
Single Family Housing	95449.4	27.7673	1.2600e-003	2.6000e-004	27.8761
Total		**1,012.2454**	**0.0458**	**9.4600e-003**	**1,016.2117**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.3520	0.0342	2.9696	1.6000e-004		0.0165	0.0165		0.0165	0.0165	0.0000	4.8637	4.8637	4.6300e-003	0.0000	4.9795
Unmitigated	3.3520	0.0342	2.9696	1.6000e-004		0.0165	0.0165		0.0165	0.0165	0.0000	4.8637	4.8637	4.6300e-003	0.0000	4.9795

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.1291					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.1340					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0888	0.0342	2.9696	1.6000e-004		0.0165	0.0165		0.0165	0.0165	0.0000	4.8637	4.8637	4.6300e-003	0.0000	4.9795
Total	**3.3519**	**0.0342**	**2.9696**	**1.6000e-004**		**0.0165**	**0.0165**		**0.0165**	**0.0165**	**0.0000**	**4.8637**	**4.8637**	**4.6300e-003**	**0.0000**	**4.9795**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.1291					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.1340					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0888	0.0342	2.9696	1.6000e-004		0.0165	0.0165		0.0165	0.0165	0.0000	4.8637	4.8637	4.6300e-003	0.0000	4.9795
Total	**3.3519**	**0.0342**	**2.9696**	**1.6000e-004**		**0.0165**	**0.0165**		**0.0165**	**0.0165**	**0.0000**	**4.8637**	**4.8637**	**4.6300e-003**	**0.0000**	**4.9795**

7.0 Water Detail

7.1 Mitigation Measures Water

Use Reclaimed Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	54.6262	0.6832	0.0165	76.6334
Unmitigated	66.1864	0.8540	0.0206	93.6872

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	26.1268 / 16.4712	66.1864	0.8540	0.0206	93.6872
Total		**66.1864**	**0.8540**	**0.0206**	**93.6872**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	20.9014 / 14.8241	54.6262	0.6832	0.0165	76.6334
Total		**54.6262**	**0.6832**	**0.0165**	**76.6334**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	83.8921	4.9579	0.0000	207.8391
Unmitigated	83.8921	4.9579	0.0000	207.8391

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	413.28	83.8921	4.9579	0.0000	207.8391
Total		**83.8921**	**4.9579**	**0.0000**	**207.8391**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	413.28	83.8921	4.9579	0.0000	207.8391
Total		**83.8921**	**4.9579**	**0.0000**	**207.8391**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX BRA1

PHASE 1 BIOLOGICAL RESOURCES ASSESSMENT

Biological Resources Assessment

MAHA RESORT AND GUENOC VALLEY DEVELOPMENT, PHASE 1
LAKE COUNTY, CALIFORNIA

Prepared For:

Analytical Environmental Services
1801 7th Street, Suite 100
Sacramento, CA 95811

Prepared By:

WRA, Inc.
2169-G East Francisco Boulevard
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Contact: Matt Richmond
richmond@wra-ca.com

Date: February 2020

WRA Project No. 27162-2

EXECUTIVE SUMMARY

This Biological Resources Assessment provides an assessment of biological communities and special-status plant and wildlife species within the approximately 4,977-acre Study Area for Phase 1 of the proposed located on the approximately 22,695-acre Guenoc Ranch. The Ranch is located in unincorporated Lake and Napa counties, California, with the Phase 1 Study Area occurring entirely within Lake County. The property contains a mix of undeveloped lands, agricultural lands including cattle pastures and vineyards, and minor areas of infrastructure to support vineyard, winery, and cattle operations.

On multiple dates in 2017, 2018, and 2019, WRA biologists conducted surveys to document baseline conditions to support an assessment of biological resources under the California Environmental Quality Act. The specific focus of WRA's efforts within the Phase 1 Study Area included (1) mapping biological communities and landcover types, (2) conducting seasonally timed surveys for special-status plants, (3) assessing the potential for special-status plants to occur in areas not subject to seasonally timed surveys, (4) conducting limited, focused surveys for special-status wildlife species, and (5) assessing the potential for special-status wildlife species to occur in areas not subject to focused surveys. Due to the nature of wildlife use and movement across the property, wildlife surveys covered both the Phase 1 Study Area and adjacent areas outside of the Phase 1 Study Area. This report describes the methods and results of those surveys and assessments and also provides recommendations for avoiding or minimizing impacts to sensitive resources, as well as mitigation measures for unavoidable impacts. WRA also conducted an official delineation of aquatic resources following guidance from the U.S. Army Corps of Engineers. The methods and results of that effort are documented in a separate Aquatic Resources Delineation report (WRA 2019a); a high-level overview of the delineation is included here.

WRA documented 22 biological communities and other land use designations, 660 plant taxa, and 130 wildlife species. Eleven sensitive biological community types covering 2,085 acres were identified; this includes approximately 99 acres of wetlands, 32 acres of ponds and reservoirs, and 51 acres and 342,904 linear feet of streams and ditches. Twenty-six special-status plant species were observed, and an additional 81 special-status plant species were determined to have at least moderate potential to occur, primarily associated with serpentine habitats found throughout the Phase 1 Study Area. Fourteen special-status wildlife species were observed, and an additional 21 special-status wildlife species were determined to have potential to occur in one or more habitats within the Phase 1 Study Area.

WRA documented several federal- and state-protected species including Keck's checkerbloom (*Sidalcea keckii*; Federal Endangered), Lake County western flax (*Hesperolinon didymocarpum;* State Endangered), bald eagle (*Haliaeetus leucocephalus*; Federal Bald and Golden Eagle Protection Act, State Endangered), golden eagle (*Aquila chrysaetos*; Federal Bald and Golden Eagle Protection Act, California Fully Protected Species), foothill yellow-legged frog (*Rana boylii*; State Candidate), white tailed kite (*Elanus leucurus*; California Fully Protected Species), and peregrine falcon (*Falco peregrinus*; California Fully Protected Species). Keck's checkerbloom, Lake County western flax, and foothill yellow-legged frog were documented within the Phase 1 footprint, whereas bald eagle, golden eagle, and peregrine falcon nests were observed outside of the Phase 1 Study Area, in association with Detert Reservoir, McCreary Lake, Lake Burgundy, and other areas. White tailed kite was observed foraging near Lower Bohn Lake and other areas outside of the Phase 1 Study Area, but was not documented nesting within the Phase 1 Study Area or the larger Guenoc Ranch.

The Project proposes to avoid as much as possible and to minimize impacts to sensitive resources to the fullest extent feasible and practicable through a combination of (1) extensive pre-planning surveys to document and avoid sensitive resources during the design phase, (2) pre-construction surveys to account for project phasing and potential changes in the distribution of sensitive resources following the original pre-planning surveys, (3) robust best management practices to avoid and/or minimize potential impacts when working around sensitive resources or within suitable habitat for special-status species. Where it is infeasible to avoid impacts, the project proposes to offset impacts through the conservation of open space and other selected portions of the Ranch that contain high-quality examples of the relevent resources in question.

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LIST OF ACRONYMS AND ABBREVIATIONS

BCC	USFWS Bird of Conservation Concern
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFGC	California Fish and Game Code
CFP	California Fully Protected Species
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
Corps	U.S. Army Corps of Engineers
CRLF	California Red-Legged Frog
CWA	Clean Water Act
DBH	Diameter at Breast Height
EFH	Essential Fish Habitat
ESA	Federal Endangered Species Act
FC	Federal Candidate
FE	Federal-Endangered
FT	Federal-Threatened
FYLF	Foothill Yellow-Legged Frog
HMMP	Habitat Mitigation and Monitoring Plan
ITP	Individual Take Permit
MBTA	Migratory Bird Treaty Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
OWHM	Ordinary High Water Mark
Rank	California Rare Plant Rank
RWQCB	Regional Water Quality Control Board
SC	State-Candidate
SE	State-Endangered
SSC	CDFW Species of Special Concern
SSI	CDFW Special-Status Invertebrate
ST	State-Threatened
USDA	U.S. Department of Agriculture
USDOI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WBWG	Western Bat Working Group
WPT	Western pond turtle
WRA	WRA, Inc.

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1.0 INTRODUCTION

On multiple dates in 2017, 2018, and 2019, WRA, Inc. (WRA) performed an assessment of biological resources within the approximately 4,977-acre Study Area for Phase 1 of the proposed Maha Resort and Guenoc Valley Development located in Lake County, California (Figure 1, 2). The project is sited within the approximately 22,695-acre Guenoc Ranch, located on Butts Canyon Road, approximately 6 miles southeast of Middletown. Guenoc Ranch spans portions of both unincorporated Lake and Napa counties; however, the Study Area for Phase 1 occurs entirely within Lake County. The purpose of the assessment was to develop a baseline biological inventory to help guide planning efforts and to gather information on sensitive biological communities and special-status plant and wildlife species to support an evaluation of the proposed project under the California Environmental Quality Act (CEQA). This report describes the methods and results of the surveys and assessments conducted by WRA biologists to determine (1) the presence of sensitive biological communities, (2) the potential for biological communities on the site to support special-status plant and wildlife species, (3) the presence of any special-status plant or wildlife species encountered during seasonally timed, reconnaissance-level and focused surveys, and (4) the presence of any other sensitive natural resources protected by local, state, or federal laws and regulations.

A biological resources assessment provides general information on the presence, or potential presence, of sensitive habitats and species. The biological resources assessment is not an official protocol-level survey for listed species or an official wetland delineation that may be required for project approval by local, state, or federal agencies. An official delineation of aquatic resources was performed by WRA and is documented in a separate report (WRA 2020a). An overview of the delineation methods and results is provided here for completeness. The assessments presented here are based on information available at the time of the study and on conditions observed on the dates the site was visited.

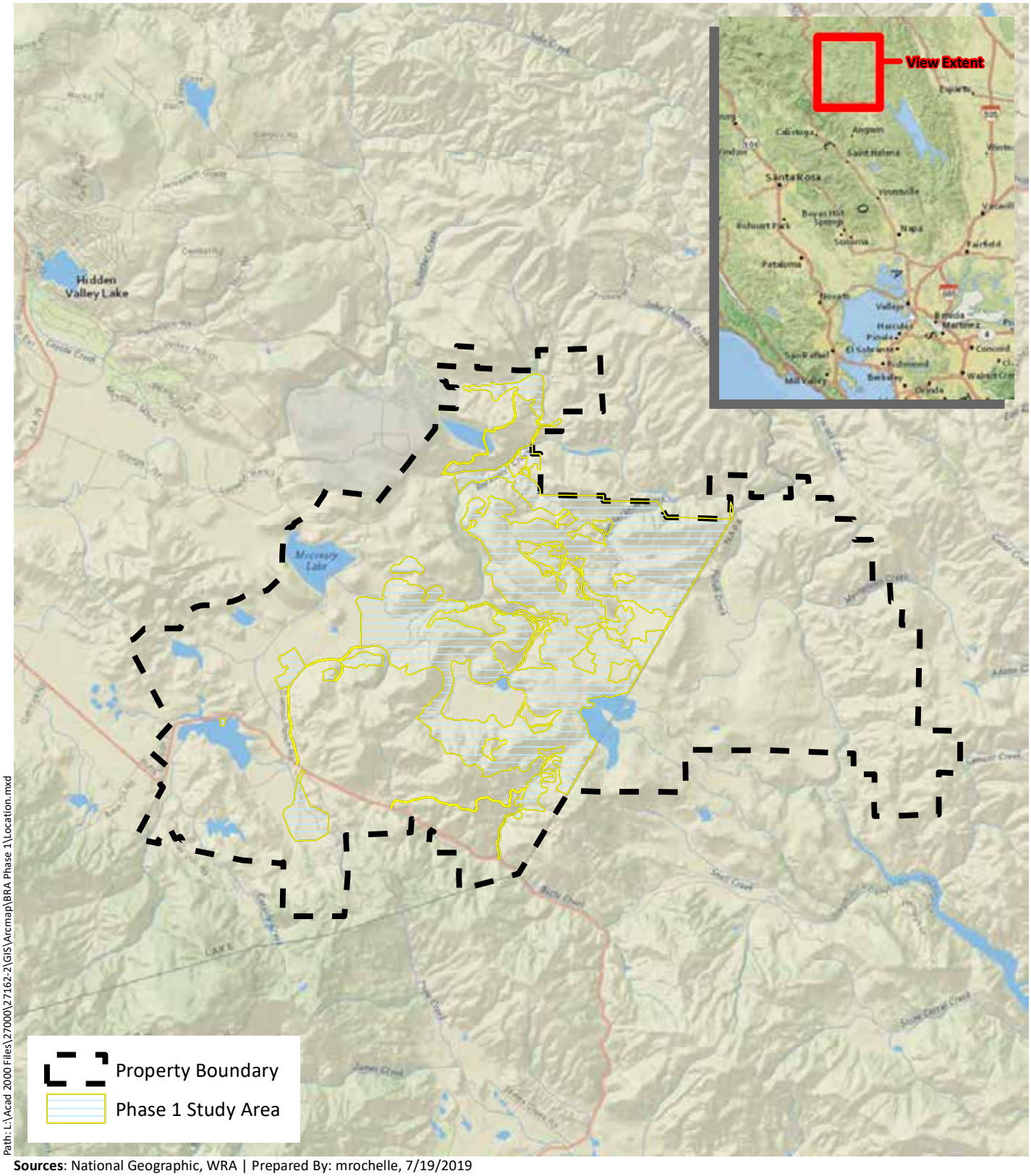
2.0 REGULATORY BACKGROUND

The following sections describe the regulatory context of the biological resources assessment, including laws and regulations that were applied to the field investigations.

2.1 Biological Communities

2.1.1 Non-Sensitive Biological Communities

Non-sensitive biological communities include plant communities with a California Department of Fish and Wildlife (CDFW) rarity ranking of S4 or S5, as well as other non-sensitive land use designations such as agriculture, developed areas, etc. These biological communities and land uses are not protected by federal, state, or local laws and are not considered sensitive under CEQA.



Sources: National Geographic, WRA | Prepared By: mrochelle, 7/19/2019

Figure 1. Phase 1 Study Area Location

Maha Resort and Guenoc Valley
Development, Phase 1
Lake County, California

0 1 2 Miles

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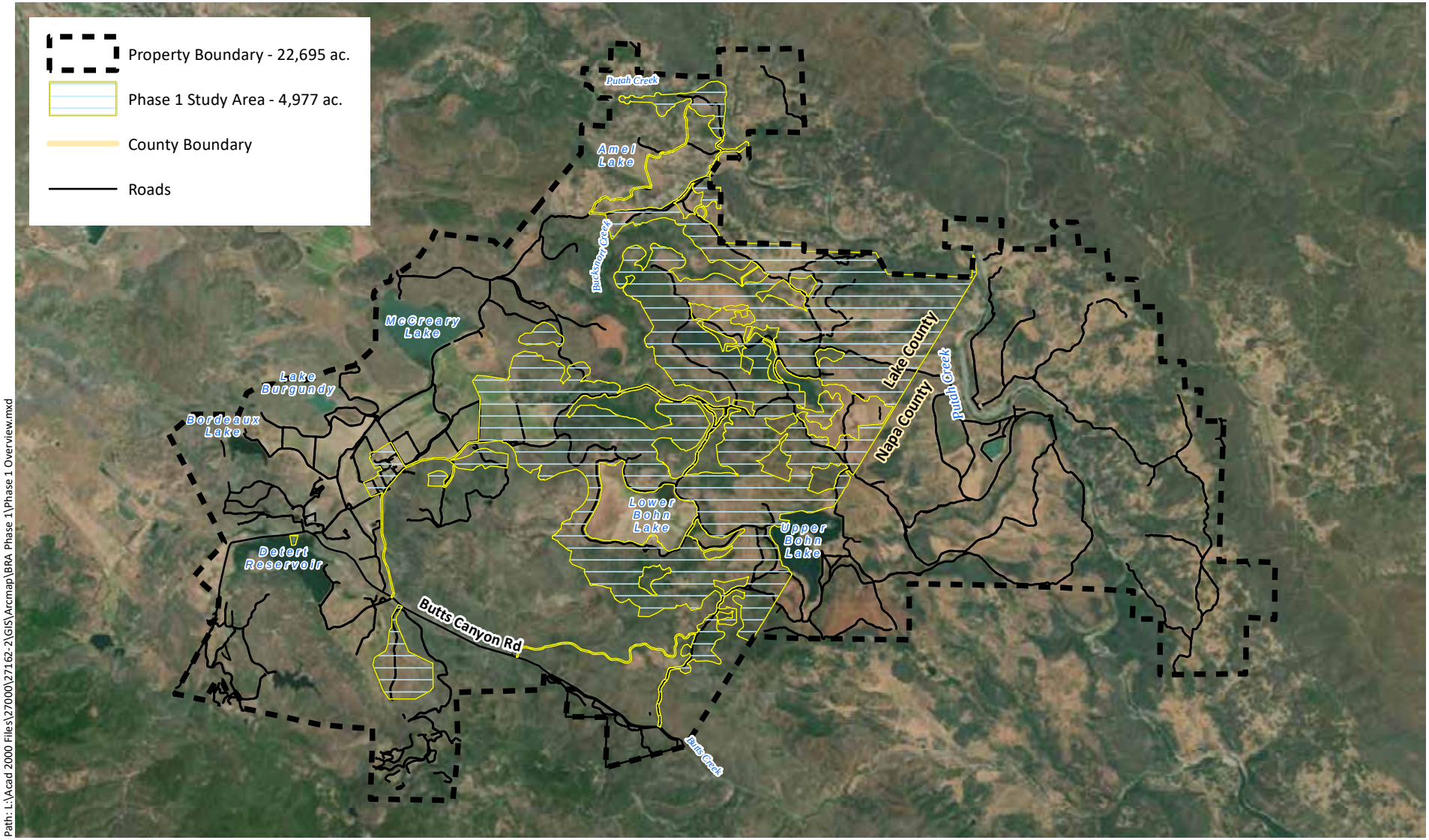

Path: L:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Phase 1 Overview.mxd

Sources: Esri Streaming - NAIP 2016, WRA | Prepared By: mrochelle, 7/19/2019

Figure 2. Phase 1 Study Area Overview

Maha Resort and Guenoc Valley
Development, Phase 1
Lake County, California

0 1 2 Miles

N

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2.1.2 Sensitive Biological Communities

Sensitive biological communities include habitats that fulfill special functions or have special values, such as wetlands, streams, or riparian habitat. These habitats are protected under federal regulations such as the Clean Water Act (CWA); state regulations such as the Porter-Cologne Act, the California Fish and Game Code (CFGC), and CEQA; or local ordinances such as the County of Lake's Municipal Code and Zoning Ordinance.

Sensitive Terrestrial Communities

Other sensitive biological communities not discussed above include habitats that fulfill special functions or have special values. Natural communities considered sensitive are those identified in local or regional plans, policies, regulations, or by the CDFW. The CDFW ranks sensitive communities as "threatened" or "very threatened" and keeps records of their occurrences in its California Natural Diversity Database (CNDDB; CDFW 2019). Sensitive plant communities are also identified by CDFW (CDFW 2018a). Vegetation alliances are ranked 1 through 5 based on NatureServe's methodology, with those alliances ranked globally (G) or statewide (S) as 1 through 3 considered sensitive. Impacts to sensitive natural communities identified in local or regional plans, policies, or regulations or those identified by the CDFW or U.S. Fish and Wildlife Service (USFWS) are considered and evaluated under CEQA (California Code of Regulations [CCR] Title 14, Div. 6, Chap. 3). Specific habitats may also be identified as sensitive in city or county general plans or ordinances; the County of Lake specifically protects oak woodlands.

Sensitive Aquatic Communities

Waters of the United States

Section 404 of the Clean Water Act gives the Environmental Protection Agency (EPA) and the Corps regulatory and permitting authority regarding discharge of dredged or fill material into "navigable waters of the United States." Section 502(7) of the CWA defines "navigable waters" as "waters of the United States, including territorial seas." Section 328 of Chapter 33 in the Code of Federal Regulations (CFR) defines the term "waters of the United States" as it applies to the jurisdictional limits of the authority of the Corps under the CWA. A summary of the definition of "waters of the United States" in 33 CFR 328.3 (a) includes (1) waters used for commerce; (2) interstate waters and wetlands; (3) territorial seas; (4) impoundments of waters listed here; (5) tributaries to the above waters; (6) waters and wetlands adjacent to the above waters; and (7) prairie potholes, Carolina and Delmarva bays, pocosins, western vernal pools, and Texas coastal prairie wetlands, provided these features have a significant nexus to the above listed waters[1]; (8) all waters located within the 100-year floodplain of waters listed above in items 1-3 or within 4,000 feet of the high tide line (HTL) or ordinary high water mark (OHWM) of a water listed above in items 1-5, provided those waters are determined to have a significant nexus to waters identified in items 1-3 above. For purposes of the determining Corps jurisdiction under the CWA, "navigable waters" as defined in the CWA are the same as "waters of the U.S." defined in 33 CFR 328.3.

[1] Wetlands and non-wetland waters in this category are similarly situated and are combined, for purposes of a significant nexus analysis, in the watershed that drains to the nearest water identified in paragraphs (a)(1) through (3) of 33 CFR 328.3.

Areas not considered to be “waters of the United States” as defined in 33 CFR 328.3 (a)(8), are summarized as follows: (1) waste treatment systems; (2) prior converted cropland; (3) specific classes of ditches, including (i) ditches with ephemeral flow that are not a relocated tributary or excavated in a tributary, (ii) ditches with intermittent flow that are not a relocated tributary, excavated in a tributary, or drain wetlands, and (iii) ditches that do not flow, either directly or through another water, into a water identified in 33 CFR 328.3 paragraphs (a) (1) through (3); (4) artificially irrigated areas that would otherwise revert to dry land and manmade aquatic features in otherwise dry land such as stock watering ponds, irrigation ponds, settling basins, fields flooded for rice growing, log cleaning ponds, cooling ponds, reflecting pools, swimming pools, small ornamental waters, depressions incidental to mining and construction activity, erosional features, and puddles; (5) groundwater; (6) stormwater control features; (7) wastewater recycling structures, groundwater recharge basins, percolation ponds for wastewater recycling, and distribution networks for wastewater recycling.

Potential wetlands, as defined in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), are identified by the presence of (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. Other areas such as streams and ponds, often referred to as “other waters”, are characterized by an ordinary high water mark (OHWM). The placement of fill material into Waters of the U.S generally requires an individual or nationwide permit from the Corps under Section 404 of the CWA.

Waters of the State

The term “Waters of the State” is defined by the Porter-Cologne Act as “any surface water or groundwater, including saline waters, within the boundaries of the state.” The Regional Water Quality Control Board (RWQCB) protects all waters in its regulatory scope and has special responsibility for wetlands, riparian areas, and headwaters. These waterbodies have high resource value, are vulnerable to filling, and are not systematically protected by other programs. RWQCB jurisdiction includes “isolated” wetlands and waters that may not be regulated by the Corps under Section 404 of the CWA. Waters of the State are regulated by the RWQCB under the State Water Quality Certification Program which regulates discharges of fill and dredged material under Section 401 of the CWA and the Porter-Cologne Water Quality Control Act. Projects that require a Corps permit, or fall under other federal jurisdiction, and have the potential to impact Waters of the State, are required to comply with the terms of the Water Quality Certification determination. If a proposed project does not require a federal permit, but does involve dredge or fill activities that may result in a discharge to Waters of the State, the RWQCB has the option to regulate the dredge and fill activities under its state authority in the form of Waste Discharge Requirements.

Streams, Lakes, and Riparian Habitat

Streams and lakes, as habitat for fish and wildlife species, are subject to jurisdiction by CDFW under Sections 1600 to 1616 of the CFGC. Alterations to or work within or adjacent to streambeds or lakes generally require a Section 1602 Lake and Streambed Alteration Agreement. The term “stream”, which includes creeks and rivers, is defined as “a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life [including] watercourses having a surface or subsurface flow that supports or has supported riparian vegetation” (14 CCR 1.72). In addition, the term “stream” can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife. “Riparian” is defined as “on, or pertaining to,

the banks of a stream." Riparian vegetation is defined as "vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself". Removal of riparian vegetation also requires a Section 1602 Lake and Streambed Alteration Agreement from CDFW.

The County of Lake has developed a "Waterway Combining District" zoning designation that applies to all perennial and intermittent streams, including adjacent wetlands and riparian vegetation (Section 37 of the Zoning Ordinance). The County defines a protected riparian zone as an area extending:

- 30 feet from the top of bank any perennial stream,
- 20 feet from the top of bank of any intermittent stream,
- 20 feet from the edge of any adjacent wetlands or the ordinary high water mark of other bodies of water, or
- To the outer extent of vegetation dominated by common riparian species such as Fremont cottonwood (*Populus fremontii*), white alder (*Alnus rhombifolia*), box elder (*Acer negundo*), dogwood (*Cornus* spp.), willow (*Salix* spp.), and big leaf maple (*Acer macrophyllum*) (this latter zone may extend beyond 30 feet).

The County restricts development and other activities within the riparian zone defined above, with a number of exemptions for agriculture, management, and other resource-dependent activities as outlined in Sections 37.5 and 37.6 of the zoning ordinance.[2]

2.2 Special-Status Species

Special-status species include those plant and wildlife species that have been formally listed, are proposed as endangered or threatened, or are candidates for such listing under the Federal Endangered Species Act (ESA) or California Endangered Species Act (CESA). These acts afford protection to both listed species and those that are formal candidates for listing. Plant species on the California Native Plant Society (CNPS) Rare and Endangered Plant Inventory (CNPS 2019a) with California Rare Plant Ranks (Rank) of 1 and 2 are also considered special-status plant species and must be considered under CEQA. Rank 3 and Rank 4 species are afforded little or no protection under CEQA, but are included in this analysis for completeness. A description of the CNPS Ranks is provided below in Table 1.

[2] Section 30-9 of the County Municipal Code provides different watercourse setbacks based on stream class and erosion hazard ratings. Based on conversations with the Lake County Planning Department, WRA believes that the watercourse setbacks provided in Article 37 of the Zoning Ordinance take precedence.

Table 1. Description of CNPS California Rare Plant Ranks and Threat Codes

California Rare Plant Ranks (formerly known as CNPS Lists)	
Rank 1A	Presumed extirpated in California and either rare or extinct elsewhere
Rank 1B	Rare, threatened, or endangered in California and elsewhere
Rank 2A	Presumed extirpated in California, but more common elsewhere
Rank 2B	Rare, threatened, or endangered in California, but more common elsewhere
Rank 3	Plants about which more information is needed - A review list
Rank 4	Plants of limited distribution - A watch list
Threat Ranks	
0.1	Seriously threatened in California
0.2	Moderately threatened in California
0.3	Not very threatened in California

The federal Bald and Golden Eagle Protection Act also provides broad protections to both eagle species. Additionally, CDFW Species of Special Concern (SSC), CDFW California Fully Protected (CFP) species, USFWS Birds of Conservation Concern (BCC), and CDFW Special-Status Invertebrates (SSI) are all considered special-status species. Although these aforementioned species generally have no special legal status, they are given special consideration under CEQA. Bat species are also evaluated for conservation status by the Western Bat Working Group (WBWG), a non-governmental entity; bats named as a "High Priority" or "Medium Priority" species for conservation by the WBWG are typically considered special-status and also considered under CEQA.

In addition to regulations for species that carry a special designation, most native birds in the United States (including non-status species) have baseline protections under the federal Migratory Bird Treaty Act of 1918 (MBTA) and the CFGC under sections 3503, 3503.5 and 3513. In addition to prohibiting the unauthorized intentional take of adult birds, these laws codes also prohibit the destruction or collection of active nests, including eggs and young.

Critical Habitat

Critical habitat is a term defined in the ESA as a designated geographic area that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. The ESA requires federal agencies to consult with the USFWS to conserve listed species on their lands and to ensure that any activities or projects they fund, authorize, or carry out will not jeopardize the survival of a threatened or endangered species. In consultation for those species with critical habitat, federal agencies must also ensure that their activities or projects do not adversely modify critical habitat to the point that it will no longer aid in the species' recovery.

3.0 ENVIRONMENTAL SETTING

The Property is an approximately 22,695-acre property located in unincorporated Lake and Napa counties, approximately 6 miles southeast of the town of Middletown (Figure 1). The property contains a mix of undeveloped lands, agricultural lands including cattle pastures and vineyards, and minor areas of infrastructure to support vineyard, winery, and cattle operations. The property is bounded to the north by the U.S. Coast Guard LORAN Reservation, Putah Creek, and the Cedars mountain range; to the east by Putah Creek and Mysterious Valley; to the south by Table Mountain and Pope Valley; and to the west by Long Valley and Coyote Valley.

The approximately 4,977-acre Phase 1 Study Area that was examined for this report contains a subset of Guenoc Ranch that occurs entirely within Lake County. The location and extent of the Phase 1 Study Area is shown on Figures 1 and 2.

3.1 Climate and Hydrology

The Property experiences a Mediterranean climate, with cool, wet winters and hot, dry summers. Average annual rainfall is approximately 43 inches, as measured at the Natural Resources Conservation Service (NRCS) weather station in Middletown, approximately 3.5 miles to the west of the site. The majority of rain falls between November and March. Average annual temperature is 51 degrees Fahrenheit, as measured at the NRCS weather station in Clear Lake, approximately 10 miles to the northwest of the property. The average summer temperature (June through August) is 71 degrees Fahrenheit; the average winter temperature (December through February) is 44 degrees. Nearly all precipitation falls as rain.

Guenoc Ranch is located entirely within the Putah Creek watershed which drains into Lake Berryessa, located approximately 8 miles to the southeast of the property. The property contains significant hydrologic resources, with a large network of ponds and reservoirs connected by perennial to intermittent streams and agricultural ditches and channels. Putah Creek, a perennial stream, runs along the northern and eastern portions of the property, and many of the drainages within the property drain into Putah Creek. Other major creeks within the property include Bucksnort Creek, Butcherknife Creek, Hunting Creek, Butts Creek, and Cassidy Creek. Major ponds and reservoirs within the Property include Detert Reservoir, McCreary Lake, Lake Burgundy, Lake Bordeaux, Upper Bohn Lake, Lower Bohn Lake, and Amel Lake. Many of the reservoirs within the property are connected through a network of natural streams and manmade ditches, allowing water to be moved across the site in response to management needs.

3.2 Geology and Soils

The Property contains a variety of geologic substrates including ultramafic rocks (primarily serpentinite, with minor inclusions of peridotite, gabbro, and diabase), rocks of the Franciscan complex (primarily sandstone with smaller amounts of shale, chert, limestone, and conglomerate), and volcanic flow rocks of the Clear Lake Volcanic Field (volcanic flow rocks with minor pyroclastic deposits, primarily andesite with minor amounts of dacite and basalt) (USGS 2017).

Soils mapped within Guenoc Ranch are shown on Figure 3. A list of soils and their acreage within the Phase 1 Study Area, as well as their parent material, is provided as Table 2. (California Soil Resources Lab [CSRL] 2019; USDA 1989). The ultramafic, or serpentine, origin of many of the soils found within the Phase 1 Study Area results in a unique physical and chemical composition that hinders the growth of most species that have not evolved on these soil types. As a result, serpentine soils harbor unique native plant assemblages that are resistant to invasion by non-

native species and often support numerous special-status plants that are restricted to serpentine soils (Kruckeberg 1984; Alexander et al. 2007). Volcanic soils on the property may provide a similarly unique edaphic, or soil, condition that supports an atypically high diversity of native plants, including many special-status species.

In addition to the unique soil conditions found at Guenoc Ranch, a large portion of the site burned in the Valley Fire of 2015, resulting in ideal conditions for many special-status plants known to occur following fires (i.e., "fire followers"). These species are present in the seedbank, but often require a release from competition and a unique germination trigger associated with fire such as heat or smoke. The high numbers of special-status plants observed at the site is in part due to the recent fire, and it is likely that many of the occurrences will dwindle in size or disappear over time as communities develop toward climax conditions.

3.3 Vegetation and Land Use

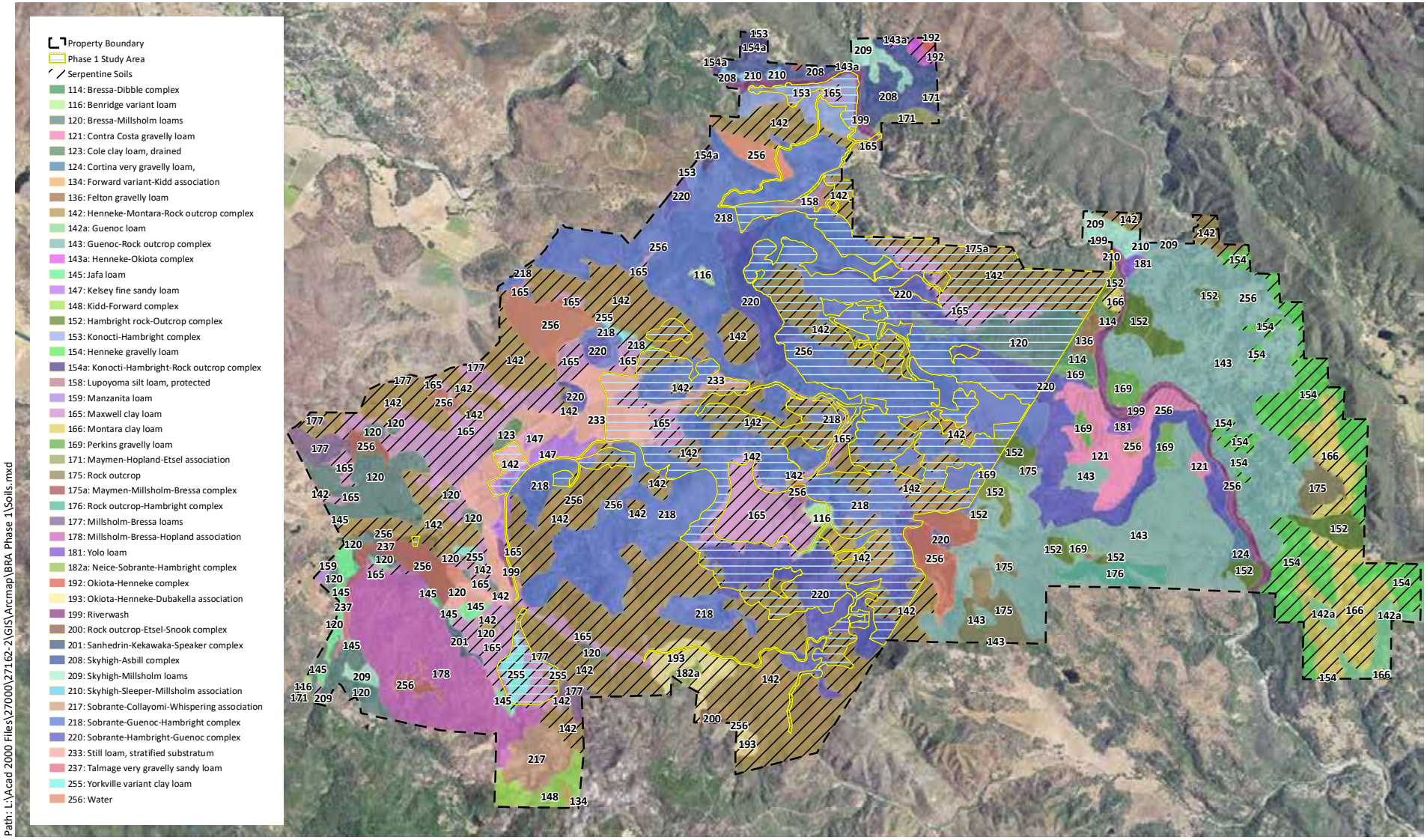
The Phase 1 Study Area is located within the Inner North Coast Ranges geographic subdivision described by the Jepson Flora Project (2019). This area is characterized by widespread serpentine and volcanic soils experiencing relatively low rainfall and hot, dry summers; the resulting vegetation is dominated by a mix of chaparral, foothill pine woodland, and blue oak woodland, with grasslands in valley bottoms and alluvial positions. As is the case with Guenoc Ranch, many of the valley bottoms and alluvial positions throughout the region were historically converted for grazing lands, vineyards, or other agricultural uses. Much of the vegetation across the property burned during the Valley Fire of 2015, leaving many communities in an early seral stage of development, often with relict snags and downed woody debris giving evidence of the climax community that was present before the fire and may return over time.

4.0 METHODS

On multiple dates in 2017, 2018, and 2019, the Phase 1 Study Area was traversed on foot to determine (1) plant communities present within the Phase 1 Study Area, (2) whether existing conditions provide suitable habitat for any special-status plant or wildlife species, and (3) whether sensitive habitats are present. A list of all survey dates and the associated level of effort (i.e., person hours) is provided as Table 3. All plant and wildlife species encountered during the surveys were documented. Plant nomenclature follows Baldwin et al. (2012) and subsequent revisions by the Jepson Flora Project (2019), except where noted. For cases in which regulatory agencies, CNPS, or other entities base rarity on older taxonomic treatments, precedence was given to the treatment used by those entities. Detailed methods for each component of the assessment are provided in the following sections.

4.1 Biological Communities

Prior to the site visits, detailed soil survey data for Lake and Napa counties was reviewed using the CSRL SoilWeb Google Earth application (2019) to determine whether any unique soil types that could support sensitive plant communities and/or aquatic features are present in the Phase 1 Study Area. WRA generated field maps at a scale sufficient (1:500) to navigate through the Phase 1 Study Area and to identify distinct features (e.g., changes in vegetation, individual trees, rock outcrops). Field maps contained recent (April – August 2016) high-quality aerial photographs overlain with 10-foot contour lines. Field maps were of sufficient resolution to allow biologists to hand-draw vegetation polygons and other features, with a ground resolution of 0.3 to 0.6 meter. Hand-drawn polygons were digitized in the office using ArcGIS software. Each biologist also



Path: L:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Soils.mxd

Sources: Esri Streaming - NAIP 2016, SURGGO Soils, WRA | Prepared By: mrochelle, 7/19/2019

Figure 3. Soils within the Property Boundary

Maha Resort and Guenoc Valley
Development, Phase 1
Lake County, California

0 1 2 Miles

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Table 2. Soils Mapped within the Phase 1 Study Area

Soil Map Unit	Parent Material	Acres
Benridge variant loam	Basalt	13.04
Bressa-Dibble complex	Sandstone and shale	0.43
Bressa-Millsholm loams	Sandstone	240.61
Cole clay loam, drained	Mixed alluvium	0.06
Hambright rock-Outcrop complex	Basic volcanic rock	12.95
Henneke-Montara-Rock outcrop complex	Serpentine	1,550.99
Kelsey fine sandy loam	Mixed alluvium	28.62
Konocti-Hambright complex	Basalt	71.57
Lupoyoma silt loam, protected	Mixed alluvium	17.47
Maxwell clay loam	Serpentine	379.92
Maymen-Hopland-Etsel association	Sandstone and shale	1.12
Maymen-Millsholm-Bressa complex	Sedimentary rock	7.28
Millsholm-Bressa-Hopland association	Sandstone and shale	0.01
Millsholm-Bressa loams	Sandstone and shale	3.59
Okiota-Henneke-Dubakella association	Serpentine	6.10
Perkins gravelly loam	Igneous rock	1.14
Riverwash	Mixed alluvium	19.42
Skyhigh-Sleeper-Millsholm association	Sandstone and shale	1.55
Sobrante-Guenoc-Hambright complex	Basalt	1,706.59
Sobrante-Hambright-Guenoc complex	Basalt	650.06
Still loam, stratified substratum	Sandstone and shale	186.50
Yorkville variant clay loam	Serpentine	59.11
Water	n/a	18.89
	Total:	4,977.02

Table 3. Summary of Survey Dates and Level of Effort

Survey Dates	Survey Description	Person Hours[3]
June 5-8, 2017	Special-status plant surveys, vegetation mapping	162
June 19, 2017	General wildlife surveys and assessments	20
June 26, 2017	General wildlife surveys and assessments	18
August 25, 2017	Special-status plant surveys	18
March 29-30, 2018	Special-status plant surveys	70
April 2-4, 2018	Focused raptor surveys and general wildlife surveys	90
April 16-20, 2018	Special-status plant surveys	220
April 24-26, 2018	Focused raptor surveys and general wildlife surveys	90
May 1-4, 2018	Delineation of aquatic resources	240
May 8-10, 2018	Focused raptor surveys and general wildlife surveys	90
May 15-17, 2018	Special-status plant surveys	178
May 22-24, 2018	Focused raptor surveys and general wildlife surveys	106
May 30-June 1, 2018	Delineation of aquatic resources	160
June 13-16, 2018	Special-status plant surveys	130
August 14-16, 2018	Focused amphibian surveys	40
August 21-22, 2018	Special-status plant surveys and delineation of aquatic resources	70
August 28, 2018	Special-status plant surveys	24
September 6-7, 2018	Special-status plant surveys and delineation of aquatic resources	50
April 24-26, 2019	Special-status plant surveys, vegetation mapping, and wetland delineation	57
May 2-3, 2019	Special-status plant surveys, vegetation mapping, and wetland delineation	40
May 7-9, 2019	Special-status plant surveys, vegetation mapping, and wetland delineation	97
May 14-15, 2019	General wildlife surveys and assessments	39
May 28, 2019	Special-status plant surveys	12

[3] Includes some overlap with surveys conducted within the Phase 2 and Open Space portions of the property; those surveys are documented in a separate report (WRA 2019b).

Survey Dates	Survey Description	Person Hours[3]
June 17, 2019	Wetland delineation	24
June 20, 2019	Wetland delineation	16
	Total:	**2,061**

carried a Trimble Geo XH GPS unit with sub-meter accuracy to map small-scale or localized features such as rare plant occurrences or wetland boundaries.

Terrestrial Communities

To map plant communities, WRA botanists traversed the site on foot during daylight hours and documented the plant communities observed using the field maps described above. Areas that were inaccessible due to dangerous or steep terrain, impenetrable chaparral, or dense poison oak were observed from an appropriate vantage using binoculars to allow for identification of plant alliances and an assessment of the potential for special-status plant species to occur in those areas. During the site visits, biological communities present in the Phase 1 Study Area were classified based on a hierarchical approach combining the habitat- and physiognomic-based community descriptions in the CDFG publication *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986) with the species-based plant alliance descriptions in the CDFW and CNPS *Manual of California Vegetation* (CNPS 2019b). In some cases, it was necessary to identify variants of community types or to describe ruderal or non-vegetated areas that are not described in the literature. Biological communities were classified as sensitive or non-sensitive as defined by their CDFW ranking (CDFW 2019, CNPS 2019b), CEQA guidelines, and other applicable laws and regulations.

Aquatic Communities

During the assessment, WRA documented the extent of aquatic resources potentially subject to federal or state jurisdiction. To map extent of aquatic resources potentially subject to federal jurisdiction by the Corps, WRA followed the methods outlined in *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Corps Manual; Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Arid West Supplement; Corps 2008), and *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* ("OHWM Guide"; Lichvar and McColley 2008). Jurisdictional wetlands were identified and their boundaries mapped using the Routine Method described in the Corps Manual. The limits of federal of jurisdiction over non-wetland waters under Section 404 of the CWA were mapped based on field indicators described in the OHWM Guide.

In addition to mapping the extent of potential federal jurisdiction over aquatic resources, WRA also mapped the extent of potential state jurisdiction over aquatic resources, as potentially regulated by the RWQCB and/or CDFW. Neither of these agencies has formally issued guidance for determining the extent of their jurisdiction over aquatic resources. However, in common practice, the RWQCB regulates all wetlands, as well as streams to the top of bank or the outer edge of the riparian canopy. The CDFW commonly regulates all lakes to the OHWM and all streams to the top of bank or the outer edge of the riparian canopy. As such, WRA mapped

approximate extent of the top of bank and the riparian canopy along all streams within the Phase 1 Study Area.

A detailed accounting of the methods used to delineate aquatic resources can be found in the separate Aquatic Resources Delineation Report (WRA 2020a).

4.2 Special-Status Species

Literature Review

Potential occurrence of special-status species in the Phase 1 Study Area was evaluated by first determining which special-status species occur in the vicinity of the Phase 1 Study Area through a literature and database review. Database searches for known occurrences of special-status species focused on the 7.5-minute USGS quadrangles that include and surround the property: Aetna Springs, Calistoga, Chiles Valley, Clearlake Highlands, Detert Reservoir, Glascock Mountain, Jericho Valley, Knoxville, Lower Lake, Mark West Springs, Middletown, Mount Saint Helena, Saint Helena, Walter Springs, Whispering Pines, and Wilson Valley. The following sources were reviewed to determine which special-status plant and wildlife species have been documented to occur in the vicinity of these quadrangles:

- California Natural Diversity Database (CDFW 2019)
- USFWS Information for Planning and Conservation Species Lists (USFWS 2019)
- CNPS Rare Plant Inventory (CNPS 2019a)
- CDFG publication *California Bird Species of Special Concern* (Shuford and Gardali 2008)
- CDFW publication *Fish Species of Special Concern in California* (Moyle et. al. 2015)
- USFWS publication *Birds of Conservation Concern* (2008)
- Western Bat Working Group Online Species Accounts (2019)
- CDFW and University of California Press publication *California Amphibian and Reptile Species of Special Concern* (Thomson et al. 2016)

Site Assessment

During the site assessment, habitat conditions observed within the Phase 1 Study Area were evaluated for their potential to support special-status plant and wildlife species documented from the literature and database review. The potential for each special-status species to occur in the Phase 1 Study Area was then evaluated according to the following criteria:

- **No Potential.** Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).

- **Unlikely.** Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.

- **Moderate Potential.** Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.

- **High Potential.** All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

- **Present.** Species is observed on the site or has been recorded (i.e. CNDDB, other reports) on the site recently.

The site assessment is intended to identify the presence or absence of suitable habitat for each special-status species known to occur in the vicinity to determine its potential to occur within the Phase 1 Study Area. The site assessment does not constitute a protocol-level survey and is not intended to determine the actual presence or absence of a species; however, all special-status species observed during the site visits were documented. Following seasonally timed surveys for special-status plants (see below), the potential for each species to occur was reassessed based on the results of the surveys.

In cases where little information is known about species occurrences and habitat requirements, the species evaluation was based on best professional judgment of WRA biologists with experience working with the species and habitats in question. If necessary, recognized experts in individual species biology were contacted to obtain the most up to date information regarding species biology and ecology.

For some species, a site assessment visit at the level conducted for this report may not be sufficient to determine presence or absence of a species to the specifications of regulatory agencies. In these cases, a species may be assumed to be present or further protocol-level special-status species surveys may be necessary. Special-status species for which further protocol-level surveys may be necessary are described below in Section 6.0.

Special-Status Plants

Seasonally timed reconnaissance-level surveys for special-status plants were conducted over multiple dates in 2017, 2018, 2019 (Table 3) to complement the special-status species habitat assessment. The majority of the Phase 1 Study Area was subject to a full suite of seasonally timed surveys, with at least one round of surveys each in the months of March, April, May, June, August, and September; however, some portions of the Phase 1 Study Area we only subject to a single round of late-season surveys in 2018 or a single round of early- to mid-season surveys in 2019; these areas are shown in Appendix E.

During these surveys, the Phase 1 Study Area was traversed on foot using intuitively guided, meandering transects. The locations of observed special-status plant species were recorded using a combination of Trimble Geo XH GPS units with sub-meter accuracy and hand-drawn locations on field maps that contained recent (April – August 2016), high-resolution (0.3- to 0.6-meter ground resolution) aerial photographs overlain with 10-foot contours. Hand-drawn locations were digitized in the office using ArcGIS software.

Special-Status Wildlife

General Wildlife Surveys

WRA biologists conducted biological site assessments and general wildlife surveys within the Phase 1 Study Area on multiple dates in 2017, 2018, and 2019 (Table 3). Because wildlife species have the ability to move into a project area and potential direct and indirect impacts to wildlife species could occur beyond the immediate footprint of any future development proposed for the site, wildlife surveys were covered both the Phase 1 Study Area, as well as selected portions of the remainder of the property within Lake County.

Surveys for fish and amphibian species were conducted in and around aquatic features using the naked eye and binoculars. Surveys for bats focused on visually investigating select buildings within the Phase 1 Study Area for the presence of roosting animals. In addition, a Sonobat recording device was deployed on the nights of August 14 and 15, 2018 at a small in-line reservoir determined to contain suitable bat habitat located south of the vineyards at Lower Bohn Lake. Audio generated from the recording device was analyzed using Sonobat software to determine what bat species are present within the area.

In addition to general wildlife surveys, WRA conducted several rounds of focused wildlife surveys, which investigated the property for the presence of raptors and special-status amphibians. The methods of those focused surveys are described below.

Raptor Surveys

In 2018, 12 days of focused raptor surveys were conducted over the course of four periods: April 2-4, April 24-26, May 8-10, and May 22-24. Over this two-month period, 50 fixed-point surveys were conducted during weather conducive to visual and auditory detections of raptors. Survey points were chosen based on a GIS viewshed analysis and were located on peaks throughout the property to maximize the area within line-of-sight. In addition to fixed-point surveys, 27 roving surveys were conducted within the Phase 1 Study Area, both from vehicle and on foot. These surveys were conducted to cover “blind spots” that were not directly visible from the fixed observation points. For a detailed description of the methods used during focused raptor surveys, see Appendix H.

Amphibian Visual Encounter Surveys

On August 14-16, 2018, and May 14-15, 2019, WRA biologists conducted night-time focused surveys for special-status native anurans, including California red-legged frog (*Rana draytonii*; CRLF) and foothill yellow-legged frog (*Rana boylii*; FYLF), at selected habitats across the Property. Stock ponds and other impoundments selected for surveys were smaller, more remote habitat features that were relatively isolated from large reservoirs and operational agricultural ponds that were more likely to support non-native aquatic predators. These smaller, isolated features were determined to have the highest potential to host CRLF, if present, due to their relative lack of predatory fish and bullfrogs (*Lithobates* sp.) compared to larger ponds and reservoirs that are connected by streams and manmade channels that allow these invasive species to move from one feature to another. Additionally, select reaches of several streams were also surveyed for the presence of FYLF and CRLF. Biologists traversed aquatic features by foot using flashlights and binoculars to detect species eyeshine within and adjacent to the aquatic features.

5.0 RESULTS

The following sections summarize the results of WRA's surveys from 2017 to 2019 within the Study Area for Phase 1. An overview of biological communities observed within the Phase 1 Study Area is provided as Table 4. Maps showing the location and extent of biological communities are provided as Appendix A; maps showing the location and extent of aquatic resources and riparian habitat are provided as Appendix B. A list of all plant species observed within the Phase 1 Study Area is provided as Appendix C. A summary of the special-status plant species documented from the region and their potential to occur within the Phase 1 Study Area is provided as Appendix D. Maps showing the location of special-status plants mapped within the Phase 1 Study Area are included as Appendix E. A list of all wildlife species observed within the property is provided as Appendix F. A summary of the special-status wildlife species documented from the region and their potential to occur within the Phase 1 Study Area is provided as Appendix G. Detailed methods and results of the focused raptor surveys are provided as Appendix H. Representative photographs of the Phase 1 Study Area are provided as Appendix I.

5.1 Biological Communities

The Phase 1 Study Area is dominated by a mix of blue oak woodland, foothill pine woodland, chamise chaparral, leather oak chaparral, and non-native annual grasslands, with other communities and specific plant alliances present over smaller areas. The large number of seeps, ponds, reservoirs, and major streams on the property have also resulted in a large amount of wetlands and wet meadow features. Many of these features have been historically altered to support ranching and agricultural activities.

The Phase 1 Study Area contains a large area of serpentine soils dominated by a mix of foothill pine woodland and chaparral communities. These serpentine habitats have a high concentration of native plant species compared to adjacent habitats on non-serpentine soils which are dominated by blue oak woodlands with a high concentration of non-native and invasive species in the understory. Serpentine habitats within the Phase 1 Study Area also contain a high concentration of special-status plant species, as discussed in Section 5.2.

Portions of the Phase 1 Study Area burned during the Valley Fire of 2015. In some areas, the burn was light and the pre-fire vegetation was not completely destroyed. In other areas, the burn was severe and the pre-fire vegetation was killed. In these areas, vegetation that was once dominated by foothill pine woodland or other woodland types has transitioned to shrub-dominated habitats such as scrub or leather oak chaparral. It is anticipated that vegetation in burn-affected areas will transition through a number of successional stages over the coming years to decades.

Table 4 summarizes the area of each biological community type or land use designation observed in the Phase 1 Study Area, including 11 non-sensitive communities or other non-vegetated land use designations and 11 sensitive communities, including aquatic habitat types. Biological communities and other land use designations mapped in the Phase 1 Study Area are shown in Appendix A; aquatic resources and riparian habitat are shown in Appendix B. Descriptions for each biological community are contained in the following sections, organized by non-sensitive and sensitive habitats and by growth form (i.e., tree, shrub, herb), with alliances listed alphabetically therein.

Table 4. Biological Communities Mapped within the Phase 1 Study Area

Vegetation Structure/ Land Use	Community (Holland 1986)	Vegetation Alliance (CDFW 2018a; CNPS 2019b)	Sensitive Status	Rarity Ranking	Acres within Phase 1 Study Area
Terrestrial Communities					
Tree-dominated	White alder riparian forest	White alder groves *Alnus rhombifolia* Forest Alliance	Sensitive[4]	G4S4	0.64[5]
	Serpentine digger [foothill] pine-chaparral woodland	Foothill pine woodland *Pinus sabiniana* woodland alliance	Non-sensitive[6]	G4S4	350.48
	Blue oak woodland	Blue oak woodland *Quercus douglasii* woodland alliance	Sensitive[7]	G4S4	1,041.14
		Blue oak savanna[8] *Quercus douglasii* woodland alliance	Sensitive[6]	G4S4	485.85
	Valley oak woodland	Valley oak woodland *Quercus lobata* woodland alliance	Sensitive	G3S3	42.66
	Interior live oak woodland	Interior live oak woodland *Quercus wislizeni* forest alliance	Sensitive[6]	G4S4	318.62
Shrub-dominated	Deer weed scrub	Deer weed scrub *Acmispon glaber* [*Lotus scoparius*] shrubland alliance	Non-sensitive	G5S5	4.67

[4] Although listed as apparently secure at the global (G4) and state (S4) levels by the CDFW, where they occur within the Study Area, white alder groves qualify as forested wetlands and are therefore treated as sensitive. White alder groves may also include one or more sensitive associations such as the white alder – American dogwood association or the white alder – western azalea association (CDFW 2018a).
[5] Includes 0.64 acre of habitat qualifying as forested wetlands subject to federal and state regulation.
[6] Although the foothill pine woodland alliance is listed as apparently secure at the global (G4) and state (S4) levels, there may be sensitive associations within the alliance present such the foothill pine – leather oak provisional alliance (CDFW 2018a).
[7] Although listed as apparently secure at the global (G4) and state (S4) levels by the CDFW, blue oak woodland, blue oak savanna, and interior live oak woodland are protected by the County of Lake and are therefore treated as sensitive.
[8] Blue oak savanna is not described by CDFW (2018a) or CNPS (2019b).

Vegetation Structure/ Land Use	Community (Holland 1986)	Vegetation Alliance (CDFW 2018a; CNPS 2019b)	Sensitive Status	Rarity Ranking	Acres within Phase 1 Study Area
Shrub-dominated	Chamise chaparral	Chamise chaparral *Adenostoma fasciculatum* shrubland alliance	Non-sensitive[9]	G5S5	541.32
	Serpentine chaparral	Whiteleaf manzanita chaparral *Arctostaphylos viscida* shrubland alliance	Non-sensitive[10]	G4S4	81.04
	Serpentine chaparral	Musk brush chaparral[11] *Ceanothus jepsonii* shrubland alliance	Sensitive[12]	n/a	31.11
	Serpentine chaparral	California yerba santa scrub *Eriodictyon californicum* shrubland alliance	Non-sensitive	G4S4	7.70
	Scrub oak chaparral	Scrub oak chaparral *Quercus berberidifolia* shrubland alliance	Non-sensitive	G4S4	40.16
	Leather oak chaparral	Leather oak chaparral *Quercus durata* shrubland alliance	Non-sensitive[13]	G4S4	316.33
	North coast riparian scrub	Brewer willow thickets *Salix breweri* Shrubland Alliance	Sensitive	G2S2	2.25[14]

[9] Although the chamise chaparral alliance is listed as apparently secure at the global (G4) and state (S4) levels, there may be sensitive associations within the alliance present such as the leather oak – chamise provisional association (CDFW 2018a).
[10] Although the whiteleaf manzanita chaparral alliance is listed as apparently secure at the global (G4) and state (S4) levels, there may be sensitive associations within the alliance present such as the whiteleaf manzanita – musk brush provisional association (CDFW 2018a).
[11] This community is not described by Holland (1986), CDFW (2018a), or CNPS (2019b), but may be considered part of the leather oak – musk brush provisional association (CDFW 2018a).
[12] This community is being treated as part of the leather oak – musk brush provisional association which is considered sensitive by the CDFW (2018a).
[13] Although the leather oak chaparral alliance is listed as apparently secure at the global (G4) and state (S4) levels, there may be sensitive associations within the alliance present such as the leather oak – chamise provisional association (CDFW 2018a).
[14] Includes 2.25 acres that qualify as scrub-shrub wetlands subject to federal and state regulation.

Vegetation Structure/ Land Use	Community (Holland 1986)	Vegetation Alliance (CDFW 2018a; CNPS 2019b)	Sensitive Status	Rarity Ranking	Acres within Phase 1 Study Area
Herb-dominated	Non-native grasslands	Multiple	Non-sensitive	n/a	910.45
	Valley needlegrass grasslands	Purple needle grass grasslands – (an association of needle grass – melic grass grassland [*Nassella* spp. – *Melica* spp. Herbaceous Alliance])	Sensitive[15]	G4S4	10.91
Aquatic Communities					
Emergent Wetlands	Multiple	Multiple	Sensitive	Multiple	99.28
Ponds and Reservoirs	n/a	n/a	Sensitive	n/a	31.99
Streams	n/a	n/a	Sensitive	n/a	51.4
Other Land Use Designations					
Agriculture	n/a	n/a	Non-sensitive	n/a	510.93
Developed	n/a	n/a	Non-sensitive	n/a	82.91
Rock Outcrop	n/a	n/a	Non-sensitive	n/a	15.18
				Total:	4977.02

[15] Although the Nassella – Melica herbaceous alliance is listed as apparently secure at the global (G4) and state (S4) levels, purple needlegrass grasslands are considered a sensitive plant association by the CDFW (2018a) and native grasslands are generally protected under CEQA; therefore purple needlegrass grasslands are treated as sensitive.

5.1.1 Non-Sensitive Biological Communities

Non-Sensitive Tree-Dominated Communities

Foothill pine woodland (*Pinus sabiniana* Woodland Alliance); Rank G4S4. Foothill pine woodland typically occurs on streamside terraces, valleys, slopes and ridges on shallow, often infertile, moderately drained soils throughout cismontane California. Often this alliance is intermixed with chaparral (CNPS 2019b). Within the Phase 1 Study Area, foothill pine woodland was located along alluvial terraces and on both rocky and finer-substrate slopes. On rocky substrates, it occurred with a chaparral understory, often on serpentine soils. In these situations, the overstory was composed of open foothill pine. The understory was variously composed of open to dense shrubs, including whiteleaf manzanita (*Arctostaphylos viscida*), leather oak (*Quercus durata*), and California yerba santa (*Eriodictyon californicum*). Herbaceous cover was typically of low density and included species such as woolly sunflower (*Eriophyllum lanatum*), small fescue (*Festuca microstachys*), golden buckwheat (*Eriogonum luteolum* var*. luteolum*), and Napa cryptantha (*Cryptantha hispidula*). Where soils are less rocky, foothill pine woodland often occurs in mixed stands of blue oak (*Quercus douglasii*) and interior live oak (*Q. wislizeni*). In such situations, blue oak and interior live oak can be co- or subdominant in the overstory, with overall canopy cover ranging from closed to somewhat open. The understory shrubs are generally sparse, consisting of species such as common manzanita (*Arctostaphylos manzanita* ssp. *manzanita*) and poison oak (*Toxicodendron diversilobum*). Where canopy cover is dense, herbaceous cover is typically sparse. Where canopy cover is more open, the herbaceous layer is often dense grassland characterized by non-native annual species.

Foothill pine woodland intergrades with leather oak scrub, California yerba santa chaparral, whiteleaf manzanita scrub, blue oak woodland, and interior live oak woodland. In many areas, foothill pine was the dominant tree species prior to the Valley Fire of 2015, but was killed in the fire and is giving way to resprouting leather oak or California yerba santa. In these areas, the vegetation was mapped as foothill pine woodland if a large number of trees survived the fire; however, if only a small number of pines survived, the vegetation was mapped based on the dominant understory shrub, generally leather oak or yerba santa.

The foothill pine woodland alliance is considered non-sensitive; however, there may be sensitive associations within the alliance present within the Phase 1 Study Area such as the foothill pine – leather oak provisional association (CDFW 2018a).

Non-Sensitive Shrub-Dominated Communities

Deer weed scrub (*Acmispon glaber* shrubland Alliance); Rank G5S5. Deer weed scrub typically occurs in areas of recent disturbance such as clearing, fire, or intermittent flooding throughout cismontane California (CNPS 2019b). Within the Phase 1 Study Area, this alliance was observed in a limited number of areas affected by the Valley Fire of 2015, and it is expected that this community will transition into other shrub- or tree-dominated alliances in the years and decades to come. Trees were absent. The shrub layer was open to dense, dominated by deer weed, with lower cover of leather oak, yerba santa, and pitcher sage (*Lepechinia calycina*). The herbaceous layer was denser in more open stands and was characterized by annual grasses such as small fescue and soft chess (*Bromus hordeaceus*). Deer weed scrub is considered non-sensitive.

Chamise chaparral (*Adenostoma fasciculatum* Shrubland Alliance); Rank G5S5. Chamise chaparral is known from the interior North Coast Ranges south to interior and coastal South Coast Ranges, Transverse Ranges, and Sierra Nevada Foothills. This community is typically located on steep, dry, south-facing terrain underlain by shallow, often nutrient-poor (e.g., serpentine), well-drained substrates (CNPS 2019b). Within the Phase 1 Study Area, this community is located primarily on south-facing aspects and ridgelines underlain by well-drained stony clay loam derived from volcanic parent material and to a lesser extent from serpentine parent material. Chamise chaparral was typically dense and often monotypically composed of chamise. Occasional other shrub species were present, including leather oak and yerba santa. Occasional trees were present, including foothill pine, blue oak, and interior live oak. The herbaceous layer is typically sparse to absent, particularly in dense stands. In more open stands, the interstitial areas are characterized by sparse annual herbs.

Chamise chaparral is considered a non-sensitive alliance. However, there may be sensitive associations within the alliance present within the Phase 1 Study Area such as the leather oak – chamise provisional association (CDFW 2018a).

Whiteleaf manzanita chaparral (*Arctostaphylos viscida* Shrubland Alliance); Rank G4S4. Whiteleaf manzanita chaparral occurs on ridges and upper slopes on shallow, weathered substrate developed from sandstone, granitic, or ultramafic substrates in the northern and central cismontane mountain ranges of California (CNPS 2019b). Stands of whiteleaf manzanita chaparral were found at scattered locations within the Phase 1 Study Area on gently to moderately sloped serpentine substrate. The tree layer is sparse to absent, comprised of foothill pine and interior live oak. The shrub layer is typically dense and tall, dominated by whiteleaf manzanita, with leather oak, chamise, yerba santa, and toyon (*Heteromeles arbutifolia*). The herbaceous layer is often sparse, composed of species such as woolly sunflower, small fescue, and Napa cryptantha. In many areas, whiteleaf manzanita was present at high cover, but was mixed with foothill pine at greater than 10 percent cover, and in these areas, the vegetation was mapped as foothill pine woodland.

Whiteleaf manzanita chaparral is considered a non-sensitive alliance. However, there may be sensitive associations within the alliance present within the Phase 1 Study Area such as the whiteleaf manzanita – musk brush provisional association (CDFW 2018a)..

California yerba santa scrub (*Eriodictyon californicum* Shrubland Alliance); Rank G4S4. California yerba santa scrub typically occurs on lower to middle slopes of serpentine, metavolcanic, and plutonic substrates in the eastern foothills of the Northern Coast Range and along the western foothills of the Sierra Nevada Range in California (CNPS 2019b). Within the Study Area, California yerba santa scrub typically occurs in areas that burned in the 2015 Valley Fire, on rocky, serpentine and volcanic substrate. Stands range from dense to open, with the interstitial areas characterized by sparse herbs. The tree layer is sparse to absent and composed of foothill pine, blue oak, or interior live oak. The shrub layer is dominated by California yerba santa with chamise, buckbrush, deer weed, poison oak, and leather oak as sub-dominants. In many areas, this community forms a patchwork mosaic within larger stands of leather oak chaparral and chamise chaparral, making it difficult to draw distinctions between the California yerba santa scrub and the other two communities. In this cases, smaller stands of California yerba santa scrub were lumped into the larger surrounding community, whether leather oak or chamise. California yerba santa scrub is best described under Holland's mixed serpentine chaparral. California yerba santa scrub is considered non-sensitive.

Scrub oak chaparral (*Quercus berberidifolia* Shrubland Alliance); Rank G4S4. Scrub oak chaparral typically occurs on steep, north-facing slopes on deep to shallow, well-drained soils throughout cismontane California. This vegetation alliance is dominated by scrub oak in the shrub layer canopy with several other scrubby species present such as leather oak, yerba santa, and toyon. Emergent trees may be present at low cover (CNPS 2019b). Within the Phase 1 Study Area, scrub oak chaparral was located in a limited number of locations, typically on northern and eastern slopes on serpentine soils and along ridgelines and dry slopes on non-serpentine soils. Scrub oak chaparral is considered non-sensitive.

Leather oak chaparral (*Quercus durata* Shrubland Alliance); Rank G4S4. Leather oak chaparral is known from the North and Central Coast Ranges and Sierra Nevada Foothills from Del Norte County south to Santa Barbara County. This vegetation alliance is typically located on hills, steep slopes, and ridgelines underlain by shallow, rocky substrate derived from serpentine soils (CNPS2019b). Within the Phase 1 Study Area, leather oak chaparral is located on a range of aspects and on ridgelines underlain by soils derived from serpentine; often intergrading with foothill pine woodland. In areas affected by the Valley Fire, leather oak represents the dominant shrub, re-sprouting from its base in all but the most severely burned areas. The shrub canopy is generally open in areas burned during the Valley Fire and dense in unburned areas. Tree cover is sparse to absent, typically consisting of foothill pine. The shrub canopy is dominated by leather oak, with occasional co- or sub-dominance by toyon, yerba santa, whiteleaf manzanita, and chamise.

Leather oak chaparral is considered a non-sensitive alliance; however, there may be associations within this alliance that are considered sensitive by the CDFW such as the foothill pine – leather oak provisional association or the leather oak – chamise provisional association.

Non-Sensitive Herb-Dominated Communities

Non-native annual grasslands (various Semi-Natural Herbaceous Stands); No Rank. Non-native annual grasslands occur throughout California on all aspects and topographic positions underlain by a variety of substrates. Within the Phase 1 Study Area, non-native annual grasslands include elements of multiple vegetation alliances including:

- Wild oat grass grasslands (*Avena barbata, A. fatua* Herbaceous Semi-Natural Alliance); No Rank
- Annual brome grasslands (*Bromus diandrus, B. hordeaceus – Brachypodium distachyon* Herbaceous Semi-Natural Alliance); No Rank
- Wild barley grasslands (*Hordeum murinum* Herbaceous Semi-Natural Alliance; undescribed); No Rank
- Perennial ryegrass fields (*Festuca perennis* Herbaceous Semi-Natural Alliance); No Rank
- Barbed goat grass patches (*Aegilops triuncialis* Provisional Herbaceous Semi-Natural Alliance); No Rank
- Cheatgrass – medusahead grassland (*Bromus tectorum - Elymus caput-medusae* Herbaceous Semi-Natural Alliance); No Rank
- Yellow star-thistle fields (*Centaurea* [*solstitialis, melitensis*] Herbaceous Semi-Natural Alliance); No Rank

These grasslands are located on all aspects and topographic positions, and are underlain by nearly all mapped soil units found within the Phase 1 Study Area. Non-native annual grasslands

are considered non-sensitive. Yellow star-thistle fields is included in this category because this species typically occurred within the matrix of grasses. In cases where non-native annual grasslands occurred in seasonal wetland habitat, they were mapped as seasonal wetlands, rather than as grasslands and their acreage is incorporated into the seasonal wetland acreage reported in Table 4.

Other Non-Sensitive Land Use Designations

Agriculture. Large portions of the Phase 1 Study Area have been or are currently being converted to vineyard production. Areas of existing vineyards, as well as areas with active clearing, planting, and other vineyard creation activities were mapped as agricultural areas. These areas contain some natural vegetation, primarily non-native, weedy annual species, but in large part are dominated by grape vines with little to no understory. Soils within these areas are regularly disturbed, greatly reducing their potential to host special-status plants. Agricultural areas are not considered sensitive.

Developed. Some portions of the Phase 1 Study Area were historically converted to development supporting agriculture and ranching activities; these areas include roadways, work yards, barns, ranch houses, driveways, and other associated buildings and features, as well as landscaped vegetation such as lawns. Developed areas are not considered sensitive.

Rock Outcrop. While not described in the literature and generally considered non-sensitive, rock outcrops may provide important habitat features for special-status plant and wildlife species. Vegetation is typically absent to sparse, although some stunted vegetation may be present. Within the Phase 1 Study Area, rock outcrops occurred as large cliff faces and denuded serpentine ridges and other outcroppings.

5.1.2 Sensitive Biological Communities

Sensitive Tree-Dominated Communities

White alder groves (*Alnus rhombifolia* Forest Alliance); Rank G4S4. White alder groves typically occurs along riparian corridors, incised canyons, seeps, stream banks, mid-channel bars, floodplains, and stream terraces throughout California (CNPS 2019b). White alder is typically co-dominant with a variety of other riparian trees. The shrub layer is generally sparse to absent, and the herbaceous layer is variable. Within the Phase 1 Study Area, white alder groves occur along a low-gradient portion of Butcherknife Creek, where it occurred as the dominant with a mix of sedge and grass species in the understory. Where white alder groves occur within the Phase 1 Study Area, they qualify as forested wetlands subject to federal and state regulation. Although this alliance is not considered sensitive by the CDFW, because it is considered wetland habitat, it is treated as a sensitive community here. In addition, there may be sensitive associations within this alliance present within the Phase 1 Study Area such as white alder – American dogwood association or the white alder – western azalea association (CDFW 2018a).

Blue oak woodland & savanna (*Quercus douglasii* Woodland Alliance); Rank G4S4. Blue oak woodland and savanna are typically located on valley bottoms, foothills, and rocky outcrops on shallow, moderately to excessively drained soil low in fertility throughout cismontane California. Blue oaks are dominant or co-dominant with other oak species and species such as buckeye (*Aesculus californica*) and foothill pine. The canopy of blue oak woodland is typically intermittent to continuous, often occurring as broad savanna (CNPS 2019b). Within the Phase 1 Study Area,

blue oak woodland and savanna was observed on valley bottoms and slopes, typically on deeper, finer-textured serpentine and volcanic soils.

Although CDFW does not distinguish between blue oak woodland and savanna, blue oak habitats were mapped into these two categories to facilitate impact and mitigation calculations. Blue oak woodland and savanna we differentiated by a desktop visual assessment of tree density and canopy closure. Savanna included areas with approximately 60 percent or less total canopy cover and with less than two thirds of tree canopies touching; areas with greater cover of blue oaks or a higher percentage of tree canopies touching were considered woodland. Although it is not considered a sensitive alliance by the CDFW, blue oak woodland and savanna is protected by the County of Lake.

Valley oak woodland (*Quercus lobata* Woodland Alliance); Rank G3S3. Valley oak woodland is known from the southern Cascade Range, Coast Ranges, Central Valley, Transverse Range, and Sierra Valley Foothills from Siskiyou County south to Los Angeles County. This community is typically located on deep, poorly drained clay soils in valley bottoms, alluvial floodplains, and lower slopes (CNPS 2019b). Within the Phase 1 Study Area, valley oak woodland was observed in alluvial terraces along perennial streams. Canopy cover was continuous to intermittent, dominated by valley oak with scattered arroyo willow (*Salix lasiolepis*) and Fremont cottonwood. Valley oak woodland is considered a sensitive vegetation alliance by the CDFW, and where it occurs within the Phase 1 Study Area, it would generally be considered riparian vegetation, adding an additional layer of protection. Valley oak woodland is also protected by the County of Lake.

Interior live oak woodland (*Quercus wislizenii* Woodland Alliance); Rank G4S4. Interior live oak woodland typically occurs on upland slopes, valley bottoms, and terraces on shallow, moderately to excessively drained soils throughout cismontane California. Interior live oaks are dominant or co-dominant in the tree canopy layer with other oak species, California buckeye, madrone (*Arbutus menziesii*), and/or foothill pine. Canopy cover is intermittent or savanna-like (CNPS 2019b). Within the Phase 1 Study Area, interior live oak woodland was observed in a variety of topographic positions, both on and off of serpentine. In most cases, interior live oak woodland canopy was dense, characterized by pure interior live oak, with occasional co- or subdominance by blue oak or foothill pine. In dense canopy, the understory that was often open and sparse occasionally dense with shrubs as poison oak. Interior live oak woodland was sometimes characterized by a more open canopy, and in such situations, the understory was characterized either by dense shrubs such as chamise and common manzanita or by dense non-native annual grasses. Although it is not considered a sensitive alliance by the CDFW, interior live oak woodland is protected by the County of Lake.

Sensitive Shrub-Dominated Communities

Musk brush chaparral (*Ceanothus jepsonii* Shrubland Alliance); No Rank. While not described as its own alliance in the literature, musk brush (*Ceanothus jepsonii*) was observed as the dominant plant in chaparral communities on serpentine soils in several portions of the Phase 1 Study Area. The tree layer was sparse to absent and composed of foothill pine and interior live oak. The shrub layer was typically dense and dominated by musk brush, with leather oak, whiteleaf manzanita, and chamise as sub-dominants. The herbaceous layer is sparse to dense and composed of species such as small fescue, Napa cryptantha, and woolly sunflower, and woolly malacothrix (*Malacothrix floccifera*). This community is best described under Holland's mixed serpentine chaparral. Although CDFW does not recognize this community as its own

alliance, it does recognize a leather oak – musk brush provisional association, which is sensitive (CDFW 2018a); therefore, this community is considered sensitive.

Brewer willow thickets (*Salix breweri* Shrubland Alliance); Rank G2S2. Brewer willow thickets typically occur along creek bottoms and stream terraces, typically on serpentine-derived alluvium. This community occurs throughout the North Coast Range as well as the northern, interior portion of the South Coast Range. Brewer willow is the dominant species, with other shrubs such as coffeeberry (*Frangula californica*), spice bush (*Calycanthus occidentalis*), and western azalea (*Rhododendron occidentale*) as co-dominants (CNPS 2019b). Within the Phase 1 Study Area, Brewer willow thickets were primarily observed along McCain and Butts creeks. Stands were typically dense, dominated by Brewer willow, with other shrubs such as western azalea present at low cover. Where the community occurs along low-gradient streams, it generally qualified as scrub-shrub wetlands. Where the community occurs along relatively high-gradient streams, it generally did not qualify as scrub-shrub wetlands, but was considered riparian vegetation.

Sensitive Herb-Dominated Communities

Purple needle grass grasslands. Purple needle grass grasslands occurs in valley and foothill areas on all topographic locations. The community occurs throughout cismontane California. Purple needle grass grassland is part of the needle grass – melic grass grassland alliance (*Nassella* spp. – *Melica* spp. Herbaceous Alliance). Although this alliance is listed as apparently secure at the global (G4) and state (S4) levels by the CDFW, the purple needlegrass association within the alliance is considered sensitive (CDFW 2018a). Within the Phase 1 Study Area, purple needle grass grassland was observed in a limited number of locations set within larger expanses of non-native annual grassland. Following CNPS 2019b, stands of purple needle grass were mapped where purple needlegrass was characteristic, typically a minimum of 10 percent absolute cover. In most cases, non-native annual grasses comprised the highest cover. Although the broader needle grass – melic grass grassland alliance is not considered sensitive, the purple needle grass grassland association is considered sensitive by the CDFW. In addition, native grasslands are generally protected under CEQA.

Sensitive Aquatic Communities

A formal aquatic resources delineation documenting the extent of wetlands and non-wetland waters within the Phase 1 Study Area that are potentially subject to jurisdiction by the Corps, RWQCB, and/or CDFW was conducted during multiple site visits in 2018 and 2019 (Table 3). The vegetation-related results of the delineation are summarized here; for full details of the delineation, see the separate Aquatic Resources Delineation Report (WRA 2020a).

Emergent Wetlands; No Rank. A variety of wetland habitats were observed within the Phase 1 Study Area, including forested wetlands, scrub-shrub wetlands, perennial marshes, and seasonal wetlands. Forested and scrub-shrub wetlands are dominated by white alder groves along Butcherknife Creek and Brewer willow thickets along Butts Creek; these communities are described above in the sensitive tree and shrub sub-sections, respectively. Emergent wetlands included perennial marshes and seasonal wetlands, described below.

Perennial marshes occur at the edges of larger ponds and reservoirs and may occupy the entirety of more shallow features. These habitats are dominated by a range of perennial vegetation alliances including:

- Pale spike rush marsh (*Eleocharis macrostachya* Herbaceous Alliance); Rank G4S4
- Hardstem bulrush marsh (*Schoenoplectus acutus* Herbaceous Alliance); Rank G5S4
- Cattail marsh (*Typha latifolia* Herbaceous Alliance); Rank G5S5

Seasonal wetlands are biotic communities in which the water table is near the surface for a portion of the year long enough to support hydrophytic vegetation, but dries out during some portion of the normal growing season. Within the Phase 1 Study Area, several seasonal wetland types were observed which are best described by their different vegetation alliances:

- Bent grass-tall fescue meadows (*Agrostis gigantea, A. stolonifera-Festuca arundinacea* Herbaceous Semi-Natural Alliance); No Rank
- Fremont's goldfields – downingia vernal pools (*Lasthenia fremontii – Downingia* [*bicornuta*] Herbaceous Alliance; Rank G2S2
- California button celery patches (*Eryngium aristulatum* Herbaceous Alliance); Rank G3S3
- Common monkeyflower seeps (*Mimulus* [*guttatus*]) Herbaceous Alliance); Rank G4?S3?
- Meadow barley patches (*Hordeum brachyantherum* Herbaceous Alliance); Rank G4S3
- Mediterranean barley patches (*Hordeum marinum* Herbaceous Semi-Natural Alliance; undescribed); No Rank
- White-tip clover swales (*Trifolium variegatum* Herbaceous Alliance); Rank G3S3
- Rabbit's foot grass swales (*Polypogon monspeliensis* Herbaceous Semi-Natural Alliance; undescribed); No Rank

Although the wetland habitats observed within the Phase 1 Study Area contain a mix of sensitive and non-sensitive vegetation alliances, all wetland habitats are considered sensitive under CEQA and are protected under other federal and state laws.

Ponds and Reservoirs; No Rank. The Phase 1 Study Area contains a number of ponds and reservoirs, ranging from small depressions that pond water during only a portion of the growing season to larger features that hold water year round. Many of these features were historically created by damming natural drainage courses to support ranching and agricultural activities. These features provide a resource for wildlife species; however, because they offer a source of perennial water, they also support a number of non-native aquatic wildlife species that may limit the potential for other native aquatic species including American bullfrog (*Lithobates catesbeianus*) and a number of non-native fishes. Ponds and reservoirs, despite their origin, are generally considered sensitive under CEQA and are protected under other federal and state laws as aquatic habitats.

Streams; No Rank. The Phase 1 Study Area contains a number of ephemeral, intermittent, and perennial streams. Ephemeral streams are linear features within which water flows only during or immediately after a significant rain event. These streams are dry for the majority of the year. Intermittent streams are linear features within which water flows for a portion of the year, generally drying out during the driest time of the year. Perennial streams are linear features within which water flows the entire year, even during the dry season. For the purposes of this report, streams were classified as ephemeral, intermittent, or perennial based on the County Code, which defines streams based on their symbology on USGS maps, with solid blue line streams considered

perennial, dashed blue line streams considered intermittent, and all other streams considered ephemeral.

Larger streams within the Phase 1 Study Area include Putah Creek, Bucksnort Creek, Butts Creek, and Butcherknife Creek. These streams are intermittent to perennial and generally have a well-developed riparian corridor dominated by valley oak, white alder, and red, arroyo, and Brewer willows. Where these streams occur near old barns and homesteads, northern California black walnut (*Juglans hindsii*) is also present. These well-developed riparian corridors provide a valuable resource for wildlife species. The extent of riparian vegetation within the Phase 1 Study Area is shown in Appendix B. Streams and their riparian corridors are considered sensitive under CEQA and may be protected by other federal and state laws.

5.2 Special-Status Plant Species

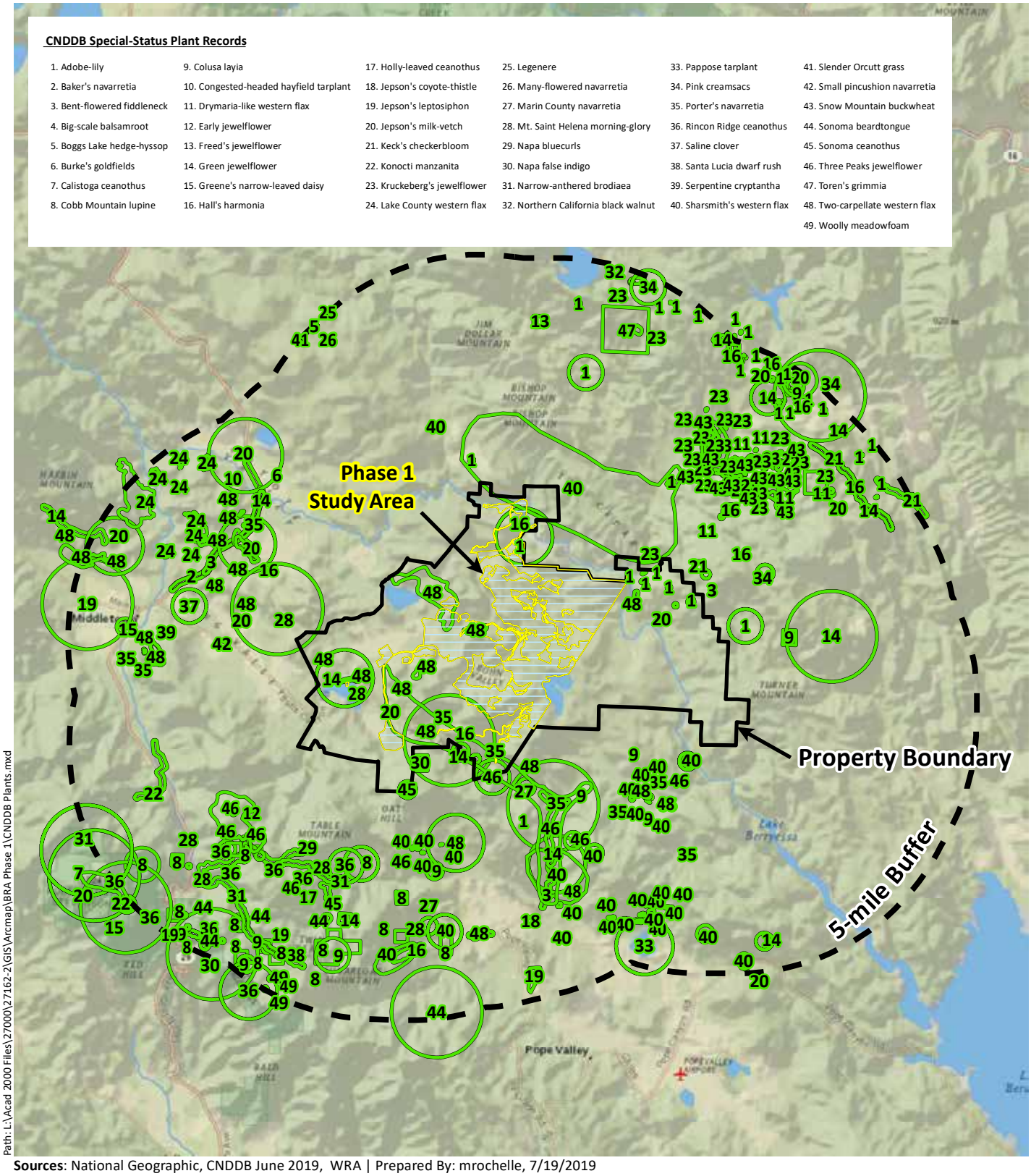
WRA botanists identified a total of 660 vascular plant taxa within the larger Guenoc Ranch property, including 500 native taxa, 160 non-native taxa. Of the 160 non-native species observed at the site, 60 are listed as invasive by the Cal-IPC (2019). A list of all plant species observed within the Guenoc Ranch property is provided as Appendix C.

Based upon a review of the resources and databases listed in Section 4.0, it was determined that 131 special-status plant species have been documented from one or more of the 7.5-minute quadrangles in the vicinity of the larger Guenoc Ranch property (see Section 4.0); Figure 4 shows the subset of those species that occur within 5 miles of the site. Appendix D lists all special-status species documented from the referenced quadrangles and provides a summary of their preferred habitats and their potential for occurring within the Phase 1 Study Area based on the types and condition of habitats found there. The Phase 1 Study Area does not contain designated Critical Habitat for any plant species.

During the site assessment and reconnaissance-level surveys, 26 special-status plant species were observed in the Phase 1 Study Area, and it was determined that the Phase 1 Study Area has moderate to high potential to support an additional 81 special-status plant species. The large area of serpentine and volcanic substrates and recent fire disturbance within the Phase 1 Study Area provides moderate to high potential for a large number of rare plant species to occur. The potential for these species to occur will undoubtedly change over time as plant communities undergo post-fire succession and/or future disturbances occur. The remaining 24 species were determined to have little to no potential to occur within the Phase 1 Study Area based on one or more of the following factors:

- The species is unique to a small, well-defined geographic range (i.e., a very limited range of endemism) and has never been observed in the vicinity of the Phase 1 Study Area;
- Specific hydrologic characteristics, such as perennial saline conditions, are absent from the Phase 1 Study Area;
- Unique pH characteristics, such as alkali scalds or acidic soils, are absent from the Phase 1 Study Area;
- Suitable habitat is not present such as redwood forest or other mesic coniferous forest, coastal habitats, alpine habitats, etc.

Special-status plant species observed within the Phase 1 Study Area are listed in Table 5 and described below; their locations and extents are shown in Appendix E. Additional special-status



Sources: National Geographic, CNDDB June 2019, WRA | Prepared By: mrochelle, 7/19/2019

Figure 4. CNDDB Special-Status Plant Records within 5 miles of the Guenoc Ranch

Maha Resort and Guenoc Valley
Development, Phase 1
Lake County, California

0 2.5 5 Miles

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ENVIRONMENTAL CONSULTANTS

Table 5. Special-Status Plant Species Observed within the Phase 1 Study Area

Scientific Name	Common Name	Conservation Status	Acreage	Estimated Number of Individuals
Federal- and State-Listed				
Sidalcea keckii	Keck's checkerbloom	FE, Rank 1B.1	26.87	6,873
Hesperolinon didymocarpum	Lake County western flax	SE, Rank 1B.2	13.91	6,680
CNPS Rank 1				
Astragalus rattanii var. *jepsonianus*	Jepson's milk-vetch	Rank 1B.2	0.15	200
Balsamorhiza macrolepis	Big-scale balsamroot	Rank 1B.2	0.25	50
Erigeron greenei	Greene's narrow-leaved fleabane	Rank 1B.2	0.26	3,117
Hesperolinon bicarpellatum	Two-carpellate western flax	Rank 1B.2	48.54	58,272
Layia septentrionalis	Colusa layia	Rank 1B.2	16.70	30,045
Streptanthus hesperidis	Green jewelflower	Rank 1B.2	31.71	6,633
CNPS Rank 4				
Antirrhinum virga	Tall snapdragon	Rank 4.3	<0.01	3
Astragalus breweri	Brewer's milk-vetch	Rank 4.3	3.81	2,531
Astragalus clevelandii	Cleveland's milk-vetch	Rank 4.3	1.06	753
Calochortus uniflorus	Pink star-tulip	Rank 4.2	0.55	120
Calystegia collina ssp. *oxyphylla*	Mt. Saint Helena morning glory	Rank 4.2	8.58	8,688
Clarkia gracilis ssp. *tracyi*	Tracy's clarkia	Rank 4.2	1.77	531
Collomia diversifolia	Serpentine collomia	Rank 4.3	35.52	34,302
Delphinium uliginosum	Swamp larkspur	Rank 4.2	3.20	2,597
Erythranthe nudata	Bare monkeyflower	Rank 4.3	3.60	8,086
Erythronium helenae	St. Helena fawn lily	Rank 4.2	53.77	52,070

Scientific Name	Common Name	Conservation Status	Acreage	Estimated Number of Individuals
Fritillaria purdyi	Purdy's fritillary	Rank 4.3	1.99	680
Helianthus exilis	Serpentine sunflower	Rank 4.2	4.60	4,458
Lomatium hooveri	Hoover's lomatium	Rank 4.3	5.14	1,300
Monardella viridis	Green monardella	Rank 4.3	7.64	2,523
Navarretia cotulifolia	Cotula navarretia	Rank 4.2	0.67	1,785
Navarretia jepsonii	Jepson's navarretia	Rank 4.3	11.22	38,820
Senecio clevelandii var. clevelandii	Cleveland's ragwort	Rank 4.3	<0.01	20
Toxicoscordion fontanum	Marsh zigadenus	Rank 4.2	1.14	573

plant species determined to have moderate potential to occur within the Phase 1 Study Area are listed in Table 6 and their preferred habitats are listed in Appendix D.

5.2.1 Special-Status Plant Species Observed within the Phase 1 Study Area

Special-status plant species observed within the Phase 1 Study Area are described below, grouped by conservation status and organized alphabetically by scientific name therein.

Federal-Listed Species

Keck's checkerbloom (*Sidalcea keckii*); FE, Rank 1B.1. Keck's checkerbloom is an annual herb in the mallow (Malvaceae) family that blooms from April through June. It typically occurs on exposed serpentine clays in cismontane woodland or non-native valley and foothill grassland habitats at elevations ranging from 250 to 2,200 feet (CNPS 2019a). This species has a serpentine affinity rank of "strong indicator" (3) (Safford et al. 2005). The nearest and most recently documented occurrence in the vicinity of the property is from May 2002 near Pocock Creek, approximately 1.5 miles to the east (CDFW 2019).

Within the Phase 1 Study Area, thousands of individuals of Keck's checkerbloom were observed in several locations, primarily in the northern portion of the Study Area. The species occurred on all aspects on serpentine clay substrates in annual grassland or in grassy openings within chaparral and blue oak woodland. Associated species included small fescue, California plantain (*Plantago erecta*), Cleveland's tarweed (*Hemizonia congesta* ssp. *clevelandii*), and soft chess.

State-Listed Species

Lake County western flax (*Hesperolinon didymocarpum*); SE, Rank 1B.2. Lake County western flax is an annual forb in the flax family (Linaceae) that blooms from May through July. It typically occurs on serpentine substrates in chaparral, cismontane woodland, and valley and foothill grassland habitats at elevations ranging from 1,070 to 1,190 feet (CNPS 2019a, CDFW 2019). This species has a serpentine affinity rank of "strict endemic" (6.2) (Safford et al. 2005). The nearest documented occurrence in the vicinity of the property is from June 1994 near Middletown, approximately 5.5 miles west of the property (CDFW 2019). The most recent documented occurrence in the vicinity of the property is from May 2014 near Middletown, approximately 7.25 miles west of the Study Area (CDFW 2019).

Within the Phase 1 Study Area, thousands of individuals of Lake County western flax were observed in the central and southern portions of the Study Area. The species occurred in burned and unburned chaparral habitat on rocky, serpentine substrates. Associated species included small fescue, leather oak, yerba santa, woolly sunflower, common hareleaf (*Lagophylla ramosissima*), and common soaproot (*Chlorogalum pomeridianum* var. *pomeridianum*).

CNPS Rank 1 Species

Jepson's milk-vetch (*Astragalus rattanii* var. *jepsonianus*); Rank 1B.2. Jepson's milk-vetch is an annual herb in the pea family (Fabaceae) that blooms from March to June. It typically occurs in chaparral, cismontane woodland, and valley and foothill grassland, often on serpentine substrate, at elevations ranging from 970 to 2,300 feet (CNPS 2019a). This species has a serpentine affinity rank of "broad endemic/strong indicator" (4.3) (Safford et al. 2005). The nearest documented occurrence in the vicinity of the property is from April 1994, within the Phase 1 Study Area, at the intersection of Butts Canyon Road and an unnamed, paved road from Butts Canyon leading to the vineyards south of Butts Canyon Road. (CDFW 2019). The most recent

documented occurrence in the vicinity of the property is from April 2019, east of the University of California McLaughlin Reserve, approximately 5 miles northeast of the Study Area (Calflora 2019).

Within the Phase 1 Study Area, approximately 200 individuals of Jepson's milk-vetch were observed at a single location, on both sides of an intermittent stream southeast of the intersection of Butts Canyon Road and an unnamed, paved road leading from Butts Canyon Road to vineyards on the slope to the south. The species occurred on gravelly berms and adjacent gravelly areas, on serpentine substrate. Associated species included goat grass (*Aegilops triuncialis*), soft chess, red brome (*Bromus madritensis* ssp. *rubens*), and trefoil (*Acmispon* sp.).

Big-scale balsamroot (*Balsamorhiza macrolepis*); Rank 1B.2. Big-scale balsamroot is a perennial herb in the sunflower family (Asteraceae) that blooms from March to June. It typically occurs on thin, rocky substrates sometimes derived from serpentine or volcanics in cismontane woodland and valley and foothill grassland habitats at elevations ranging from 295 to 3,100 feet (CDFW 2019, CNPS 2019a). This species has a serpentine affinity rank of "strong indicator" (2.5) (Safford et al. 2005). The nearest and most recent documented occurrence in the vicinity of the property is from July 1986, south of Dunnigan Hill near the Lake/Napa county line, approximately 3 miles northeast of the property (CDFW 2019).

Within the Phase 1 Study Area, approximately 50 individuals of big-scale balsamroot were observed at two locations in the far northern portion of the Study Area, in north-facing blue oak woodland near Putah Creek. Associated species included non-native annual grasses, common soaproot, blue-eyed grass (*Sisyrinchium bellum*), and common buttercup (*Ranunculus californicus* var. *californicus*).

Greene's narrow-leaved fleabane (*Erigeron greenei*); Rank 1B.2. Greene's narrow-leaved fleabane is a perennial forb in the sunflower family (Asteraceae) that blooms from May to September. It typically occurs on rocky substrate derived from volcanics or serpentine within shrubby vegetation in chaparral habitat at elevations ranging from 260 to 3,270 feet (CDFW 2019, CNPS 2019a). This species has a serpentine affinity rank of strict endemic (5.7) (Safford et al. 2005); however, this species has been documented from volcanic substrates as well. The nearest documented occurrence in the vicinity of the property is from August 1971 at the foot of Rabbit Hill, approximately 6.5 miles west of the Study Area (CDFW 2019). The most recent documented occurrence in the vicinity of the property is from June 1996 between Soda Valley and Little Sugarloaf Peak, approximately 17.5 miles southeast of the Study Area (CDFW 2019).

Within the Phase 1 Study Area, thousands of individuals of Greene's narrow-leaved fleabane were observed in numerous locations throughout the Study Area. It occurred in rocky, sloped, burned and unburned chaparral habitat, usually on serpentine substrate. Observed associated species include leather oak, yerba santa, woolly sunflower, green monardella (*Monardella viridis*), and small fescue.

Two-carpellate western flax (*Hesperolinon bicarpellatum*); Rank 1B.2. Two-carpellate western flax is an annual forb in the flax family (Linaceae) that blooms from May through July. It typically occurs on serpentine substrates in chaparral habitat at elevations ranging from 195 to 3,270 feet (CNPS 2019a, CDFW 2019). This species has a serpentine affinity rank of strict endemic (6.2) (Safford et al. 2005). The nearest documented occurrence in the vicinity of the property is from June 2017, within the Phase 1 Study Area, just east of Bucksnort Creek near the southern border of the Study Area (CDFW 2019). The most recent documented occurrence in the vicinity of the property is from May 2018 along the upper slope of Dead Horse Flat, approximately 3.25 miles west of the Study Area (CDFW 2019).

Within the Phase 1 Study Area, tens of thousands of individuals of two-carpellate western flax were observed at numerous locations throughout the Study area. It occurred in burned and unburned areas, most commonly on rocky volcanic or serpentine substrates in chaparral or Sargent cypress woodland habitats, but it occasionally occurred on finer-textured substrates. Observed associated species include Sargent cypress, whiteleaf manzanita, green jewelflower (*Streptanthus hesperidis*), foothill pine, woolly sunflower, chamise, Sonoma lessingia (*Lessingia ramulosa*), and small fescue.

Colusa layia (*Layia septentrionalis*); Rank 1B.2. Colusa layia is an annual forb in the sunflower family (Asteraceae) that blooms from April through May. It typically occurs in openings and herbaceous areas underlain by serpentine substrates within chaparral, cismontane woodland, and valley and foothill grassland habitats at elevations ranging from 330 to 3,595 feet (CNPS 2019a, CDFW 2019). This species has a serpentine affinity rank of "strong indicator" (3.2) (Safford et al. 2005). The nearest documented occurrence in the vicinity of the property is from April 1980 in Routan Creek Canyon, approximately 1 mile south of the Study Area (CDFW 2019). The most recent documented occurrence in the vicinity of the property is from May 2010 between Snell Valley and Spanish Valley, approximately 2.25 miles south of the Study Area (CDFW 2019).

Within the Phase 1 Study Area, tens of thousands of individuals of Colusa layia were observed at several locations, primarily in the northern and central portions of the Study Area. The species occurred within and occasionally at the edges of blue oak woodland on sloping to flat terrain, typically in areas that were unburned or experienced low-intensity burns during the 2015 Valley Fire. Associated species included blue oak, Italian thistle (*Carduus pycnocephalus* ssp. *pycnocephalus*), blue dicks (*Dichelostemma capitatum*), and several species of non-native annual grasses.

Green jewelflower (*Streptanthus hesperidis*); Rank 1B.2. Green jewelflower is an annual forb in the mustard family (Brassicaceae) that blooms from May through July. It typically occurs in openings of brushy wooded areas underlain by serpentine substrates in chaparral and cismontane woodland habitat at elevations ranging from 420 to 2,470 feet (CNPS 2019a, CDFW 2019). This species has a serpentine affinity rank of "strict endemic" (6.1) (Safford et al. 2005). The nearest documented occurrence to the property is from June 1952 along Butts Canyon Road, near the southern boundary of the Phase 1 Study Area (CDFW 2019). The most recent documented occurrence in the vicinity of the property is from June 2007 at the northern edge of Las Posadas State Forest, approximately 10.75 miles south of the Study Area (CDFW 2019).

Within the Phase 1 Study Area, thousands of individuals of green jewelflower were observed at numerous locations throughout the Study Area. The species occurred in burned and unburned, often sparsely vegetated rocky areas in chaparral on serpentine substrates. Associated species included leather oak, whiteleaf manzanita, yerba santa, serpentine collomia (*Collomia diversifolia*), woolly sunflower, golden buckwheat, Napa cryptantha, and small fescue.

CNPS Rank 4 Species

Tall snapdragon (*Antirrhinum virga*); Rank 4.3. Tall snapdragon is a perennial forb in the plantain (Plantaginaceae) family that blooms from June through July. The species typically occurs in rock openings on serpentine soils within chaparral and lower montane coniferous forests at elevations ranging from 300 to 6,045 feet (CNPS 2019a). This species has a serpentine affinity rank of "strong indicator" (2.8) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from June 1983 near Twin Peaks Mine, approximately 2.25 miles southwest of the Study Area (CCH 2019). The most recent documented occurrence

in the vicinity of the property is from June 2014 at Livermore Ranch, approximately 4.5 miles southwest of the Study Area (CCH 2019).

Within the Phase 1 Study Area, approximately three individuals of tall snapdragon were observed in a single location within the Phase 1 Study Area. The species occurred in chaparral and foothill pine woodland habitats on rhyolitic and sandstone substrates in areas that burned in the 2015 Valley Fire. Associated species included foothill pine, leather oak, deer weed, chamise, and yerba santa.

Brewer's milk-vetch (*Astragalus breweri*); Rank 4.3. Brewer's milk-vetch is an annual forb in the pea family (Fabaceae) that blooms from April through June. The species typically occurs in openings underlain by gravelly substrates derived serpentine or volcanic substrates in chaparral, cismontane woodland, meadows and seeps, and valley and foothill grassland habitat at elevations ranging from 290 to 2,375 feet (CNPS 2019a). This species has a serpentine affinity rank of "strong indicator" (3.2) (Safford et al. 2005). The nearest and most recent documented occurrence in the vicinity of the property is from January 2016 along Butts Canyon Road near Detert Reservoir, approximately 1 mile west of the Phase 1 Study Area (CCH 2019).

Within the Phase 1 Study Area, thousands of individuals of Brewer's milk-vetch were observed in the central portion of the Phase 1 Study Area. It occurred chaparral and grassland habitats on rocky and fine-textured serpentine substrates. Associated species included leather oak, woolly sunflower, Napa cryptantha, Italian ryegrass (*Festuca perennis*), and other non-native annual grass species.

Cleveland's milk-vetch (*Astragalus clevelandii*); Rank 4.3. Cleveland's milk-vetch is an annual forb in the pea family (Fabaceae) that blooms from June through September. It typically occurs on serpentine substrates, particularly in and around seeps and swales, within chaparral, cismontane woodland, and riparian forest habitats at elevations ranging from 650 to 4,875 feet (CNPS 2019a, CCH 2019). This species has a serpentine affinity rank of "strict endemic" (6.1) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from June 1945 along Butts Canyon Road, approximately 0.25 mile west of the Phase 1 Study Area (CCH 2018). The most recent previously documented occurrence in the vicinity of the property is from June 2018 in Morgan Valley, approximately 6 miles northeast of the Phase 1 Study Area (Calflora 2019).

Within the Phase 1 Study Area, hundreds of Cleveland's milk-vetch were observed at numerous locations in and along the edges of ephemeral to perennial streams, seeps, and wetlands on serpentine substrates. Associated species included Brewer's willow, swamp larkspur (*Delphinium uliginosum*), marsh zigadenus (*Toxicoscordion fontanum*), and seep monkeyflower (*Erythranthe guttata*).

Pink star-tulip (*Calochortus uniflorus*); Rank 4.2. Pink star-tulip is a perennial bulbiferous forb in the lily family (Liliaceae) that blooms from April through June. The species typically occurs in coastal prairie, coastal scrub, meadows and seeps, and North Coast coniferous forest at elevations ranging from 33 to 3,510 feet (CNPS 2019a). This species has a serpentine affinity rank of "weak indicator" (1.7) (Safford et al. 2005). Known associated species include California oatgrass (*Danthonia californica*), western buttercup (*Ranunculus occidentalis*), cream sacs (*Castilleja rubicundula*), cream cups (*Platystemon californicus*), and smooth tidytips (*Layia chrysanthemoides*). The nearest and most recent previously documented occurrence in the vicinity of the property is from May 1999 in Snell Valley, approximately 2.5 miles east of the Phase 1 Study Area (CCH 2019).

Within the Phase 1 Study Area, hundreds of individuals of pink star-tulip were observed at three locations in the central and western portions of the Phase 1 Study Area. The species occurs on serpentine substrate in seasonal wetland seeps in open, herbaceous areas adjacent to chaparral habitat. Associated species include swamp larkspur, marsh zigadenus, bare monkeyflower (*Erythranthe nudata*), and Italian ryegrass.

Mt. Saint Helena morning glory (*Calystegia collina* ssp. *oxyphylla*); Rank 4.2. Mt. Saint Helena morning-glory is a perennial forb in the morning-glory family (Convolvulaceae) that blooms from April through June. The species typically occurs on slopes and hillsides in barrens or openings within chaparral habitat at elevations ranging from 815 to 3,315 feet (CNPS 2019a). This species has a serpentine affinity rank of "strict endemic" (5.6) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from May 1998 along Butts Canyon Road, adjacent to the Phase 1 Study Area (CCH 2019). The most recent previously documented occurrence in the vicinity of the property is near Highway 29, approximately 5.5 miles southwest of the Phase 1 Study Area (CCH 2019).

Within the Phase 1 Study Area, thousands of individuals of Mt. Saint Helena morning glory were observed at numerous locations throughout the Phase 1 Study Area. The species occurs in chaparral and woodland habitats on rocky, typically serpentine substrates in burned and unburned areas. Associated species included leather oak, chamise, woolly sunflower, foothill pine, Sargent cypress, two-carpellate western flax, and small fescue.

Tracy's clarkia (*Clarkia gracilis* ssp. *tracyi*); Rank 4.2. Tracy's clarkia is an annual forb in the evening primrose family (Onagraceae) that blooms from April through July. The species typically occurs in openings and bare areas underlain by serpentine substrates within chaparral habitat at elevations ranging from 210 to 2,115 feet (CNPS 2019a, CDFW 2019). This species has a serpentine affinity rank of "broad endemic" (5.0) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from June 1980 along Butts Canyon Road, approximately 0.75 mile southeast of the Phase 1 Study Area (CCH 2019). The most recent previously documented occurrence in the vicinity of the property is from is from May 2016 at the University of California McLaughlin Reserve, approximately 6 miles northeast of the Phase 1 Study Area (CCH 2019).

Within the Phase 1 Study Area, hundreds of individuals of Tracy's clarkia were observed at several locations in the central and southern portions of the Phase 1 Study Area. The species occurred in chaparral and annual grassland habitats on serpentine substrates in areas that burned in the 2015 Valley Fire. Associated species included leather oak, small fescue, two-carpellate western flax, narrow tarplant (*Holocarpha virgata* ssp. *virgata*), and Coast Range mariposa lily (*Calochortus vestae*).

Serpentine collomia (*Collomia diversifolia*); Rank 4.3. Serpentine collomia is an annual forb in the phlox family (Polemoniaceae) that blooms from May through June. The species typically occurs on rocky or gravelly serpentine substrates within chaparral and cismontane woodland habitats at elevations ranging from 975 to 1,950 feet (CNPS 2019a). This species has a serpentine affinity rank of "strict endemic" (5.6) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from May 2015 along Butts Canyon Road, within the Phase 1 Study Area (CCH 2019). The most recent previously documented occurrence in the vicinity of the property is from May 2017 along Hunting Creek, approximately 3 miles east of the Phase 1 Study Area (Calfora 2019).

Within the Phase 1 Study Area, tens of thousands of individuals of serpentine collomia were observed at numerous locations throughout the Phase 1 Study Area. The species occurred on rocky, serpentine substrates in chaparral and woodland habitats. Associated species included leather oak, woolly sunflower, Mt. Saint Helena morning-glory, small fescue, green jewelflower, and toyon.

Swamp larkspur (*Delphinium uliginosum*); Rank 4.2. Swamp larkspur is a perennial herb in the buttercup (Ranunculaceae) family that blooms from May through June. The species typically occurs in serpentine seeps, chaparral openings, and valley and foothill grassland habitats at elevations ranging from 1,100 to 2,000 feet (CNPS 2019a). This species has a serpentine affinity rank of "strict endemic" (5.7) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from May 1952 along Butts Canyon Road, adjacent to the Phase 1 Study Area (CCH 2019). The most recent previously documented occurrence in the vicinity of the property is from May 2010 along Butts Canyon Road, approximately 1.25 miles southeast of the Phase 1 Study Area (CCH 2019).

Within the Phase 1 Study Area, thousands of individuals of swamp larkspur were observed at numerous locations in and along the edges of ephemeral to perennial streams, seeps, and wetlands on serpentine substrates. Associated species included Cleveland's milk-vetch, marsh zigadenus, seep monkeyflower, and Italian ryegrass.

Bare monkeyflower (*Erythranthe nudata*); Rank 4.3. Bare monkeyflower is an annual herb in the lopseed family (Phrymaceae) that blooms from May through June. The species typically occurs in seeps and other wet spots in chaparral and cismontane woodland habitats on serpentine substrates at elevations ranging from 655 feet to 2,300 feet (CNPS 2019a). This species has a serpentine affinity rank of "strict endemic" (5.6) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from May 2015 along Butts Canyon Road, within the Phase 1 Study Area (CCH 2019). The most recent previously documented occurrence in the vicinity of the property is also from May 2015 along Butts Canyon Road, but is approximately 1.25 miles southeast of the Phase 1 Study Area (CCH 2019).

Within the Phase 1 Study Area, thousands of individuals of bare monkeyflower were observed at numerous locations throughout the Phase 1 Study Area. The species occurred in and along the edges of ephemeral to perennial streams, seeps, and wetlands, as well as occasionally in mesic, non-wetland areas, but always on serpentine substrates. Associated species included foothill pine, seep monkeyflower, leather oak, woolly sunflower, and swamp larkspur.

St. Helena fawn lily (*Erythronium helenae*); Rank 4.2. St. Helena fawn lily is a perennial bulbiferous herb in the lily (Lilliaceae) family that blooms from March to May. The species typically occurs on volcanic or serpentine soils in chaparral, cismontane woodland, valley and foothill grassland, and lower montane coniferous forest habitats at elevations ranging from 1,050 to 1,660 feet (CNPS 2019a). This species has a serpentine affinity rank of "broad endemic" (4.5) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from March 1963 along Butts Canyon Road, within the Phase 1 Study Area (CCH 2019). The most recent previously documented occurrence in the vicinity of the property is from April 2016 along Livermore Road, near Highway 29, approximately 5.25 miles southwest of the Phase 1 Study Area (CCH 2019).

Within the Phase 1 Study Area, tens of thousands of individuals of St. Helena fawn lily were observed at several locations in the central and southern portions of the Phase 1 Study Area. The species occurred in burned and unburned areas on moderately steep, north-facing, rocky

slopes in leather oak chaparral habitat on serpentine substrates. Associated species included green monardella, toyon, Greene's narrow-leaved fleabane, coffeeberry, and whiteleaf manzanita.

Purdy's fritillary (*Fritillaria purdyi*); Rank 4.3. Purdy's fritillary is a low-growing, bulbiferous perennial forb in the lily family (Liliaceae) that blooms from March through June. The species typically occurs on dry ridges underlain by serpentine substrate in chaparral, cismontane woodland, and lower montane coniferous forest habitats at elevations ranging from 565 to 7,330 feet (CNPS 2019a, Jepson eFlora 2019). This species has a serpentine affinity rank of "broad endemic" (4.3) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from March 1982 along Butts Canyon Road, approximately 1.25 miles southeast of the Phase 1 Study Area (CCH 2019). The most recent previously documented occurrence in the vicinity of the property is from April 2005 at the McLaughlin Reserve, approximately 6 miles northeast of the Phase 1 Study Area (CCH 2019).

Within the Phase 1 Study Area, hundreds of individuals of Purdy's fritillary were observed at numerous locations in the central and southern portions of the Phase 1 Study Area. The species occurred on rocky, serpentine substrates in chaparral and woodland habitats in areas that burned in the 2015 Valley Fire. Associated species included leather oak, whiteleaf manzanita, foothill pine, green jewelflower, serpentine collomia, Napa cryptantha, and small fescue.

Serpentine sunflower (*Helianthus exilis*); Rank 4.2. Serpentine sunflower is an annual forb in the sunflower family that blooms from June through November. The species typically occurs in in seeps and other wet areas in chaparral and cismontane woodland on serpentine soils (CNPS 2019a). This species has a serpentine affinity rank of "strict endemic" (5.7) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from October 1994 along Butts Canyon Road, approximately 3 miles southeast of the Phase 1 Study Area (CCH 2019). The most recent previously documented occurrence in the vicinity of the property is from July 2005 at the McLaughlin Reserve, approximately 5 miles northeast of the Phase 1 Study Area (Calflora 2019).

Within the Phase 1 Study Area, thousands of individuals of serpentine sunflower were observed at numerous locations in the central and southern portions of the Phase 1 Study Area. The species occurred in and adjacent to wetlands, seeps, and streams on serpentine substrates. Associated species included Brewer's willow, swamp larkspur, Cleveland's ragwort (*Senecio clevelandii* var. *clevelandii*), white hedgenettle (*Stachys albens*), and leather oak.

Hoover's lomatium (*Lomatium hooveri*); Rank 4.3. Hoover's lomatium is a perennial herb in the carrot (Apiaceae) family that blooms from April through July. The species typically occurs in open chaparral and cismontane woodland habitats on rocky serpentine substrates at elevations ranging from 975 through 3,000 feet (CNPS 2019a). This species has a serpentine affinity rank of "strict endemic" (5.9) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from January 2007, near Aetna Springs, approximately 3.5 miles south of the Phase 1 Study Area (CCH 2019). The most recent previously documented occurrence in the vicinity of the property is from May 2007 at the McLaughlin Reserve, approximately 6 miles northeast of the Phase 1 Study Area (CCH 2019).

Within the Phase 1 Study Area, thousands of individuals of Hoover's lomatium were observed at numerous locations in the northern and central portions of the Phase 1 Study Area. The species occurred in unburned and burned areas, most commonly in shaded blue oak woodland and occasionally in chaparral on rocky, serpentine substrates. Associated species included blue oak,

leather oak, toyon, Hartweg's lomatium (*Lomatium marginatum* var. *marginatum*), Jepson's lomatium (*L. marginatum* var. *purpureum*), and a range of non-native annual grasses.

Green monardella (*Monardella viridis*); Rank 4.3. Green monardella is a perennial forb in the mint family (Lamiaceae) that blooms from June through September. The species typically occurs in chaparral, cismontane woodland, and broadleaf upland forest habitats on serpentine substrates at elevations ranging from 325 to 3,285 feet (CNPS 2019a). This species has a serpentine affinity rank of "broad endemic/strict indicator" (4.3) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from May 2015 along Butts Canyon Road, within the Phase 1 Study Area (CCH 2019). The most recent previously documented occurrence in the vicinity of the property is from June 2015 on Snell Peak, approximately 0.5 mile east of the Phase 1 Study Area (CCH 2019).

Within the Phase 1 Study Area, thousands of individuals of green monardella were observed at numerous locations throughout the Phase 1 Study Area. The species occurred in burned and unburned chaparral on serpentine and volcanic substrates. Associated species included woolly sunflower, leather oak, toyon, Mt. Saint Helena morning-glory, and small fescue.

Cotula navarretia (*Navarretia cotulifolia*); Rank 4.2. Cotula navarretia is an annual forb in the phlox family (Polemoniaceae) that blooms from May through June. The species typically occurs on vernally wet areas underlain by adobe clay in chaparral, cismontane woodland, and valley and foothill grassland habitats at elevations ranging from 10 to 6,005 feet (CNPS 2019a, Jepson Flora Project 2019). The species does not have a serpentine affinity rank (Safford et al. 2005), suggesting it does not have a particular affinity for serpentine soils. The nearest previously documented occurrence in the vicinity of the property is from April 1935 near Aetna Springs, approximately 1.5 miles south of the Phase 1 Study Area (CCH 2019). The most recent previously documented occurrence in the vicinity of the property is from May 1982 along Pope Canyon Rd, approximately 7 miles southeast of the Phase 1 Study Area (CCH 2019).

Within the Phase 1 Study Area, thousands of individuals of cotula navarretia were observed at three locations in the central and northern portions of the Phase 1 Study Area. The species occurred on heavy, serpentine clay soils in mesic grassland. Associated species included slim oat (*Avena barbata*), Italian ryegrass, small fescue, and Douglas' microseris (*Microseris douglasii* ssp. *douglasii*).

Jepson's navarretia (*Navarretia jepsonii*); Rank 4.3. Jepson's navarretia is an annual herb in the phlox (Polemoniaceae) family that blooms from April through June. The species typically occurs in transitional zones between cismontane woodland, chaparral, and valley and foothill annual grassland habitats on clay soils (often serpentine) at elevations ranging from 550 to 2,800 feet (CNPS 2019a). This species has a serpentine affinity rank of "strict endemic" (5.6) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from May 1946 near Detert Reservoir, approximately 1.25 miles west of the Phase 1 Study Area (CCH 2019). The most recent previously documented occurrence in the vicinity of the property is from May 2015 in the Missimer – Snell Valley Preserve, approximately 2.75 miles east of the Phase 1 Study Area (CCH 2019).

Within the Phase 1 Study Area, tens of thousands of individuals of Jepson's navarretia were observed at numerous locations throughout the Phase 1 Study Area. The species occurred on heavy, sometimes rocky, serpentine or mixed serpentine/volcanic clay soils in grassland habitat or in grassy openings in chaparral and foothill pine woodland. Associated species included Cleveland's tarplant, small fescue, common soaproot, and trefoil.

Marsh zigadenus (*Toxicoscordion fontanum*); Rank 4.2. Marsh zigadenus is a bulbiferous perennial forb in the false-helleborine family (Melanthiaceae) that blooms from April to July. The species typically occurs in vernally mesic areas underlain by clay soils derived from serpentine in chaparral, cismontane woodland, lower montane coniferous forest, meadow and seep, and marsh and swamp habitats at elevations ranging from 45 to 3,250 feet (CNPS 2019a, CDFW 2019). This species has a serpentine affinity rank of "broad endemic/strong indicator" (3.8) (Safford et al. 2005). The nearest and most recent previously documented occurrence in the vicinity of the property is from May 2010 along Butts Canyon Road, within the Phase 1 Study Area (CCH 2019).

Within the Phase 1 Study Area, hundreds of individuals of marsh zigadenus were observed at numerous locations. The species occurred in and along the edges of ephemeral to perennial streams, seeps, and wetlands on serpentine substrates. Associated species included seep monkeyflower, Italian ryegrass, swamp larkspur, and iris-leaved rush (*Juncus xiphioides*).

5.2.2 Special-Status Plant Species with Potential to Occur

In addition to those special-status plant species that were observed within the Phase 1 Study Area, the 81 special-status plant species listed in Table 6 were determined to have at least a moderate potential to occur based on the types and condition of habitats found there. These species were not observed during seasonally appropriate surveys for special-status plants; however, their presence cannot be ruled out as suitable habitat is present and the species may be present in low numbers or may have been historically present and remain onsite in a dormant condition waiting for favorable climatic conditions. For example, many species may be present in the seed bank, but may only germinate following fire or during periods of substantial rainfall. The preferred habitat and blooming period for each of these species is described in Appendix D.

Table 6. Special-Status Plant Species with Potential to Occur within the Phase 1 Study Area

Scientific Name	Common Name	Conservation Status
Allium fimbriatum var. *purdyi*	Purdy's onion	Rank 4.3
Amorpha californica var. napensis	Napa false indigo	Rank 1B.2
Amsinckia lunaris	Bent-flowered fiddleneck	Rank 1B.2
Antirrhinum subcordatum	Dimorphic snapdragon	Rank 4.3
Arabis modesta	Modest rockcress	Rank 4.3
Arabis oregana	Oregon rockcress	Rank 4.3
Arctostaphylos manzanita ssp. *elegans*	Konocti manzanita	Rank 1B.3
Asclepias solanoana	Serpentine milkweed	Rank 4.2
Astragalus claranus	Clara Hunt's milk-vetch	FE, ST Rank 1B.3
Brasenia schreberi	Watershield	Rank 2B.3
Brodiaea leptandra	Narrow-anthered Brodiaea	Rank 1B.2
Calamagrostis ophitidis	Serpentine reed grass	Rank 4.3
Calyptridium quadripetalum	Four-petaled pussypaws	Rank 4.3
Calystegia collina ssp. *venusta*	South coast range morning-glory	Rank 4.3

Scientific Name	Common Name	Conservation Status
Castilleja rubicundula var. *rubicundula*	Pink cream sacs	Rank 1B.2
Ceanothus confusus	Rincon Ridge ceanothus	Rank 1B.1
Ceanothus divergens	Calistoga ceanothus	Rank 1B.2
Ceanothus purpureus	Holly-leaved ceanothus	Rank 1B.2
Ceanothus sonomensis	Sonoma ceanothus	Rank 1B.2
Chlorogalum pomeridianum var. minus	Dwarf soaproot	Rank 1B.2
Clarkia breweri	Brewer's clarkia	Rank 4.2
Cordylanthus tenuis ssp. brunneus	Serpentine bird's-beak	Rank 4.3
Cryptantha dissita	Serpentine cryptantha	Rank 1B.2
Cryptantha excavata	Deep-scarred cryptantha	Rank 1B.1
Cryptantha rostellata	Red-stemmed cryptantha	Rank 4.2
Downingia willamettensis	Cascade downingia	Rank 2B.2
Eriastrum brandegeeae	Brandegee's eriastrum	Rank 1B.1
Erigeron biolettii	Streamside daisy	Rank 3
Eriogonum nervulosum	Snow Mountain buckwheat	Rank 1B.2
Eriogonum umbellatum var. *bahiiforme*	Bay buckwheat	Rank 4.2
Eryngium constancei	Loch Lomond button celery	FE, SE Rank 1B.1
Eryngium jepsonii	Jepson's coyote thistle	Rank 1B.2
Fritillaria pluriflora	Adobe lily	Rank 1B.2
Gratiola heterosepala	Boggs Lake hedge hyssop	SE, Rank 1B.2
Harmonia hallii	Hall's harmonia	Rank 1B.2
Harmonia nutans	Nodding harmonia	Rank 4.3
Hemizonia congesta ssp. *congesta*	Congested-headed hayfield tarplant	Rank 1B.2
Hesperolinon adenophyllum	Glandular western flax	Rank 1B.2
Hesperolinon drymarioides	Drymaria-like western flax	Rank 1B.2
Hesperolinon sharsmithiae	Sharsmith's western flax	Rank 1B.2
Horkelia bolanderi	Bolander's horkelia	Rank 1B.2
Juncus luciensis	Santa Lucia dwarf rush	Rank 1B.2
Lasthenia burkei	Burke's goldfields	FE, SE Rank 1B.1
Legenere limosa	Legenere	Rank 1B.1
Leptosiphon acicularis	Bristly leptosiphon	Rank 4.2
Leptosiphon jepsonii	Jepson's leptosiphon	Rank 1B.2
Leptosiphon latisectus	Broad-lobed leptosiphon	Rank4.3

Scientific Name	Common Name	Conservation Status
Lessingia hololeuca	Woolly-headed lessingia	Rank 3
Lilium rubescens	Redwood lily	Rank 4.2
Limnanthes floccosa ssp. *floccosa*	Woolly meadowfoam	Rank 4.2
Limnanthes vinculans	Sebastopol meadowfoam	FE, SE Rank 1B.1
Lomatium repostum	Napa lomatium	Rank 4.3
Lupinus sericatus	Cobb Mountain lupine	Rank 1B.2
Malacothamnus helleri	Heller's bush-mallow	Rank 3.3
Micropus amphibolus	Mt.Diablo cottonweed	Rank 3.2
Microseris paludosa	Marsh microseris	Rank 1B.2
Microseris sylvatica	Sylvan microseris	Rank 4.2
Navarretia leucocephala ssp. *bakeri*	Baker's navarretia	Rank 1B.1
Navarretia myersii ssp. deminuta	Small pincushion navarretia	Rank 1B.2
Navarretia nigelliformis ssp. nigelliformis	Adobe navarretia	Rank 4.2
Navarretia paradoxinota	Porter's navarretia	Rank 1B.3
Navarretia rosulata	Marin County navarretia	Rank 1B.2
Orcuttia tenuis	Slender Orcutt grass	FT, SE, Rank 1B.1
Orobanche valida ssp. *howellii*	Howell's broomrape	Rank 4.3
Penstemon newberryi var. *sonomensis*	Sonoma beardtongue	Rank 1B.3
Plagiobothrys hystriculus	Bearded popcornflower	Rank 1B.1
Potamageton zosteriformis	Eel-grass pondweed	Rank 2B.2
Ranunculus lobbii	Lobb's aquatic buttercup	Rank 4.2
Sedella leiocarpa	Lake County stonecrop	FE, SE Rank 1B.1
Sidalcea hickmanii ssp. *napensis*	Napa checkerbloom	Rank 1B.1
Sidalcea oregana ssp. *hydrophila*	Marsh checkerbloom	Rank 1B.2
Streptanthus brachiatus ssp. *brachiatus*	Socrates Mine jewelflower	Rank 1B.2
Streptanthus brachiatus ssp. *hoffmanii*	Freed's jewelflower	Rank 1B.2
Streptanthus morrisonii ssp. elatus	Three Peaks jewelflower	Rank 1B.2
Streptanthus morrisonii ssp. *kruckebergii*	Kruckeberg's jewelflower	Rank 1B.2
Streptanthus vernalis	Early jewelflower	Rank 1B.2
Stuckenia filiformis ssp. alpina	Slender-leaved pondweed	Rank 2B.2
Thelypodium brachycarpum	Short-podded Thelypodium	Rank 4.2
Trichostema ruygtii	Napa bluecurls	Rank 1B.2

Scientific Name	Common Name	Conservation Status
Triteleia lugens	Dark-mouthed triteleia	Rank 4.3
Viburnum ellipticum	Oval-leaved viburnum	Rank 2B.3

5.3 Special-Status Wildlife Species

WRA wildlife biologists observed a total of 130 wildlife species within the larger Guenoc Ranch property[16], including 19 mammal species, 82 bird species, 12 reptile and amphibian species, 10 fish species, and seven invertebrate species. A list of all wildlife species observed is provided as Appendix F.

Based upon a review of the resources listed in Section 4.0, it was determined that 60 special-status wildlife species have been documented in one or more of the referenced 7.5-minute quadrangles in the vicinity of the larger Guenoc Ranch (see Section 4.0). Figure 5 shows the subset of those species that occur within 5 miles of the property. Appendix G summarizes the potential for each of these species to occur within the Phase 1 Study Area. Fourteen special-status wildlife species were observed within or adjacent to the Phase 1 Study Area, and an additional 21 special-status wildlife species were determined to have a moderate to high potential to occur within the Phase 1 Study Area. The Phase 1 Study Area does not contain designated Critical Habitat for any species. The remaining 25 species were determined to be unlikely or have no potential to occur in the Phase 1 Study Area for one or more of the following reasons:

- The Phase 1 Study Area is outside of the known or historical range of the species;
- The Phase 1 Study Area lacks specific habitat requirements (i.e. marsh, old growth conifers, etc.),
- Invasive or detrimental species, such as non-native fish and bullfrogs, are present and reduce habitat suitability; or,
- There are barriers to dispersal that make it unlikely for the species to occur on-site.

Table 7 lists the special-status wildlife species observed within the Phase 1 Study Area; Figure 6 shows their locations. Descriptions of these species, their preferred habitat, and their observed and potential distribution across the Phase 1 Study Area are provided below and summarized in Appendix G. Table 8 lists the special-status wildlife species determined to have moderate to high potential to occur within the Phase 1 Study Area.

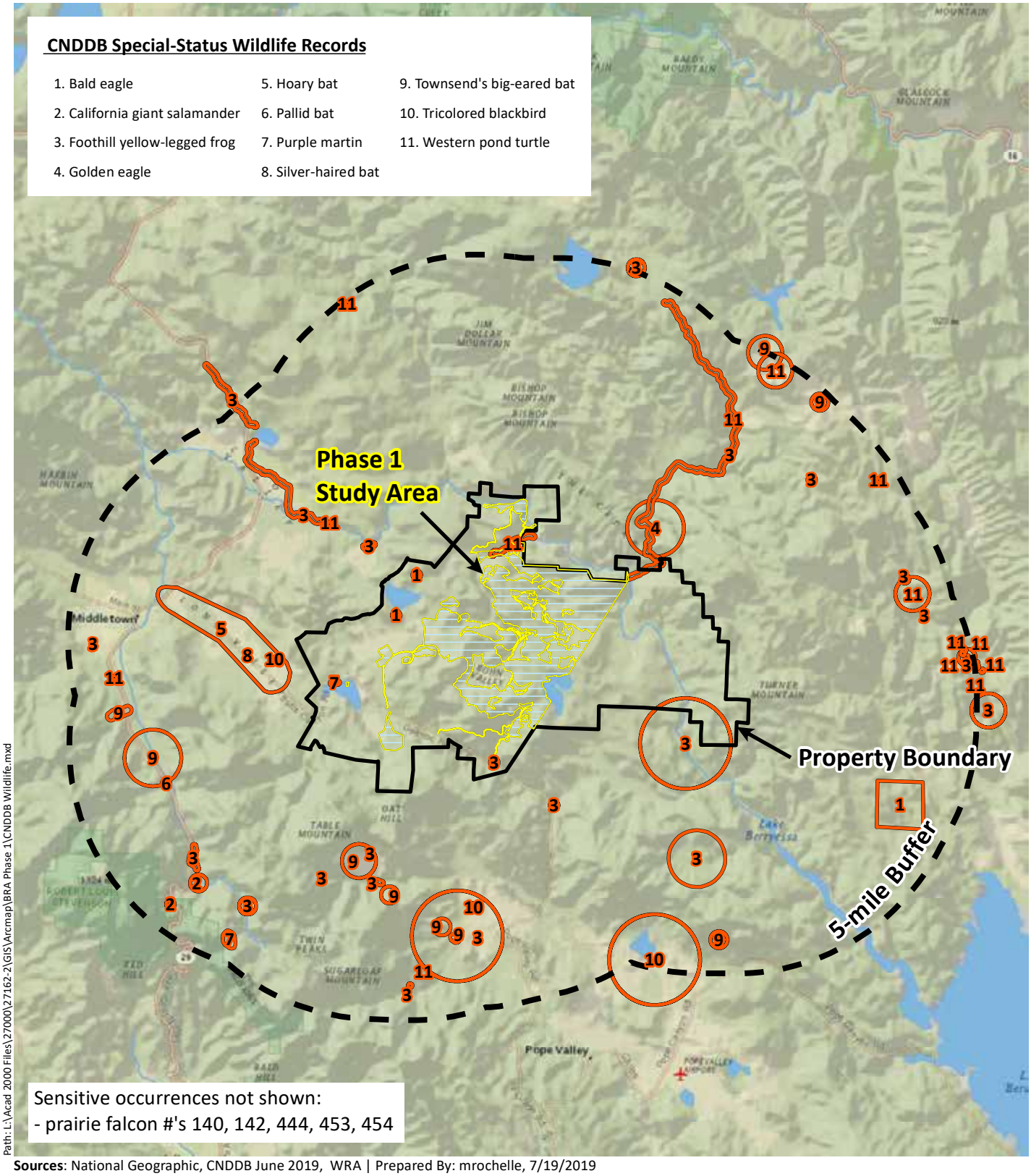
Focused raptor surveys in 2018 identified 14 raptor species and eight active raptor nests located within or adjacent to the Phase 1 Study Area. In 2019, an additional raptor species (Cooper's hawk) was observed. A total of 63 avian species were identified within the Property. Detailed results of focused raptor surveys are provided in Appendix H.

[16] All wildlife species observed within the Property in 2018 and 2019 were documented and are included in this list. Due to the ability of wildlife to move between suitable habitats within the Property, specific locations were not noted unless the species was special-status or a nesting raptor.

Focused surveys for amphibians determined that FYLF is present within the southern edge of the Phase 1 Study Area, in association with Butts Creek. Additionally, surveys identified FYLF egg masses in Butts Creek, indicating that the species breeds there. Although FYLF has been documented as extant in the Phase 1 Study Area, the presence of numerous non-native predators including American bullfrog, non-native centrarchid fishes, and crayfish, may be limiting the distribution and overall success of FYLF within the Phase 1 Study Area.

Focused surveys conducted for CRLF had negative results. All of the lentic and lotic habitats, at the time of the surveys, were documented to be infested with invasive American bullfrogs and sport fishes, including largemouth and smallmouth bass, bluegill, and green sunfish. Additionally signal-band crayfish were also observed in several of the habitats. Red swamp crayfish were observed in at least one area. The presence and density of these invasive aquatic species was determined to preclude the presence of CRLF from inhabiting the surveyed aquatic habitats and make it unlikely to occur within the Phase 1 Study Area.

In addition to the special-status wildlife species that may occur, non-status wildlife species occur and may use portions of the Phase 1 Study Area as a migration corridor. Large expanses of uncultivated land can be used by native species, such as mule deer (*Odocoileus hemionus*), mountain lion (*Puma concolor*), and black bear (*Ursus americanus*), to move to various territories seasonally and throughout their life cycle. Within the Phase 1 Study Area habitats including, but not limited to, open grassland valleys, oak woodlands, chaparral, and stream corridors may facilitate wildlife movement. Additionally, the many lakes, reservoirs, and ponds in and within close proximity to the Phase 1 Study Area are anticipated to attract native wildlife species. Therefore, portions of the Phase 1 Study Area may occur within one or more wildlife migration corridors and additional focused studies may be needed to identify those corridors.



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Sources: National Geographic, CNDDB June 2019, WRA | Prepared By: mrochelle, 7/19/2019

Figure 5. CNDDB Special-Status Wildlife Records within 5 miles of the Guenoc Ranch

Maha Resort and Guenoc Valley
Development, Phase 1
Lake County, California

0 2.5 5 Miles

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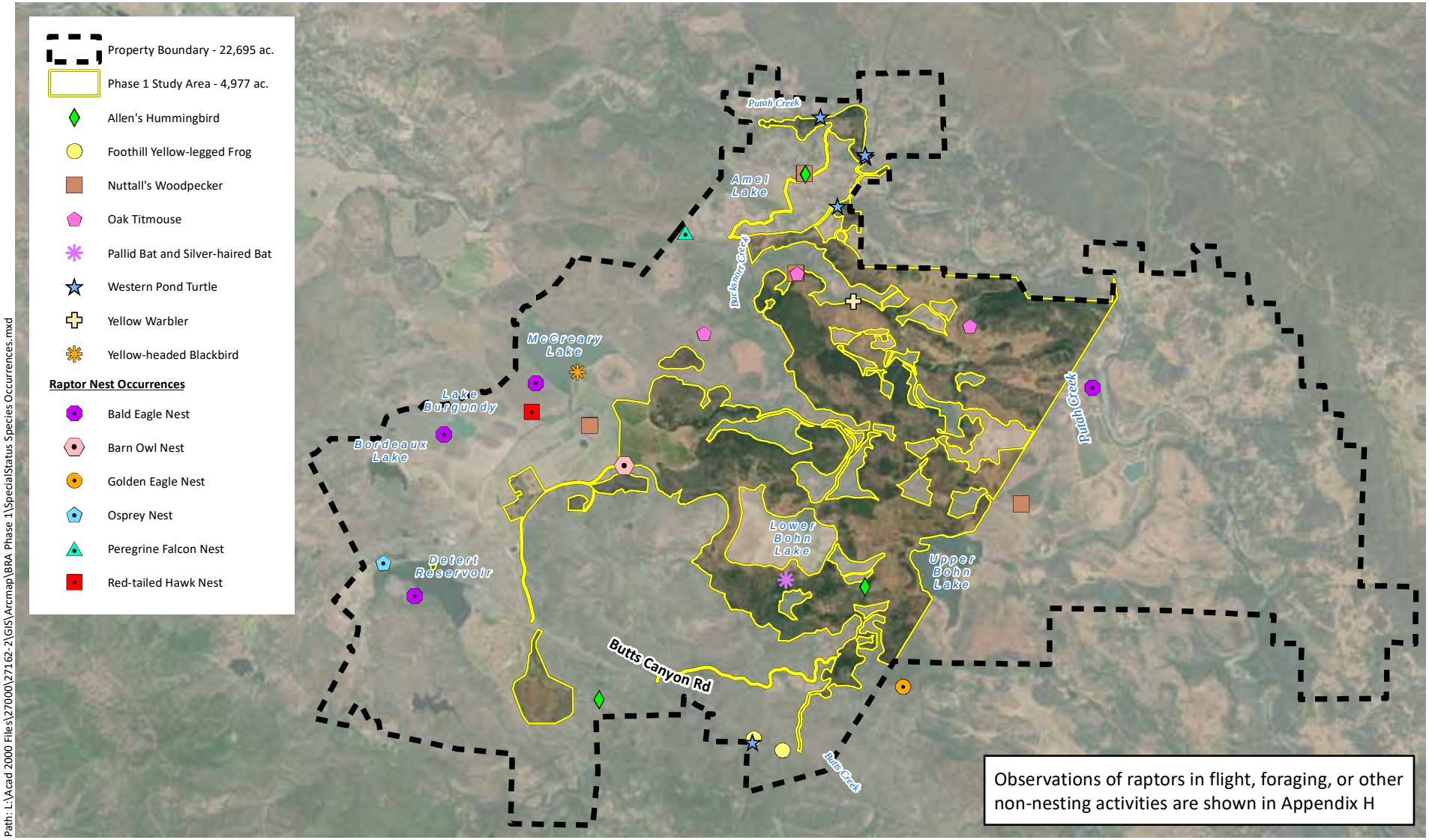
Table 7. Special-Status Wildlife Species Observed within or adjacent to the Phase 1 Study Area

Scientific Name	Common Name	Conservation Status
Birds		
Aquila chrysaetos	Golden eagle	BGEA, CFP, BCC
Baeolophus inornatus	Oak titmouse	BCC
Circus cyaneus	Northern harrier	SSC
Elanus leucurus	White-tailed kite	CFP
Falco peregrinus	Peregrine falcon	CFP, BCC
Haliaeetus leucocephalus	Bald eagle	BGEA, SE, CFP, BCC
Picoides nuttallii	Nuttall's woodpecker	BCC
Selasphorus sasin	Allen's hummingbird	BCC
Setophaga petechia	Yellow warbler	BCC, SSC
Xanthocephalus xanthocephalus	Yellow-headed blackbird	SSC
Mammals		
Antrozous pallidus	Pallid bat	SSC, WBWG High
Lasionycteris noctivagans	Silver-haired bat	WBWG Medium
Reptiles and Amphibians		
Actinemys marmorata	Western pond turtle	SSC
Rana boylii	Foothill yellow-legged frog	SC, SSC



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Sources: Esri Streaming - NAIP 2016, WRA | Prepared By: mrochelle, 7/19/2019

Figure 6. Special-Status Wildlife Species Observed within the Guenoc Resort

Maha Resort and Guenoc Valley
Development, Phase 1
Lake County, California

0 1 2 Miles

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wra ENVIRONMENTAL CONSULTANTS

5.3.1 Special-Status Wildlife Species Observed within the Phase 1 Study Area

Special-status wildlife species observed or documented within the Phase 1 Study Area are described in the following sections, grouped by conservation status and alphabetically by scientific name within each group.

Federal-Protected and State-Listed Species

Golden eagle (*Aquila chrysaetos*); Federal Bald and Golden Eagle Protection Act, California Fully Protected Species, USFWS Bird of Conservation Concern. Golden eagle is a large raptor that occurs in open and semi-open areas from sea level to high elevations. Typical occupied habitats include grasslands, shrublands, deserts, woodlands, and coniferous forests. Breeding activity occurs broadly from January through August and is usually initiated from January to March in California. The large stick nests of this species are reused over multiple years and may be maintained throughout the year. Nests are most often located on the ledges of steep cliffs, but nesting also occurs in large trees and on tall manmade structures (e.g., utility towers) (Kochert et al. 2002). Golden eagles forage over wide areas, feeding primarily on medium-sized mammals (e.g., ground squirrels and rabbits), large birds, and carrion.

The Phase 1 Study Area contains suitable nesting and foraging habitat for this species. An active golden eagle nest was observed approximately 0.2 mile south of the Phase 1 Study Area (Figure 6). Adult and juvenile golden eagles were observed flying, foraging, and perching within a variety of habitats within the Phase 1 Study Area (Appendix H); however, no active golden eagle nests were observed within the Phase 1 Study Area. This species has potential to nest within the Phase 1 Study Area.

Bald eagle (*Haliaeetus leucocephalus*); Federal Bald and Golden Eagle Protection Act, State Endangered, CDFW Fully Protected Species, USFWS Bird of Conservation Concern. Bald eagle occurs primarily as a winter visitor but also as a year-round (breeding) resident throughout most of California. Habitat is somewhat variable, but the species is usually strongly associated with larger bodies of water including lakes, reservoirs, major river systems, estuaries, and the ocean. Breeding occurs primarily in forested areas near water bodies; wintering habitat is more general, but is generally located near water. Their sizable nests are typically built in in the upper portions of large, live trees that provide dominant views of surrounding areas (Buehler 2000). Bald eagles are highly opportunistic foragers; fish and waterfowl are usually favored, but a variety of live prey and carrion are consumed.

Adult and juvenile bald eagles were observed flying and roosting adjacent to multiple reservoirs in and adjacent to the Phase 1 Study Area, as well as in other habitats (Appendix H). In 2018, four bald eagle nests were observed in areas outside of the Phase 1 Study Area, including one each at Detert Reservoir, Lake Burgundy, McCreary Lake, and Putah Creek (Figure 6). Nests of this species have been previously documented in the CNDDB adjacent to the Phase 1 Study Area around McCreary Reservoir (CDFW 2019). No active nests were observed within the Phase 1 Study Area.

Foothill yellow-legged frog (*Rana boylii*); State Candidate Threatened. Foothill yellow-legged frog historically occurred in coastal and mountain streams from southern Oregon to Los Angeles County, but has declined in many parts of this range. This species is strongly associated with rivers and creeks, and prefers shallow, flowing water with a rocky substrate. Individuals do not typically move overland and are rarely observed far from a source of permanent water. In a study in northern California, adults were typically observed within ten feet and rarely over 40 feet

from streams (Bourque 2008). Although upland habitat usage is not well-studied, the data suggest that movements away from water are related to flood events (Kupferberg 1996, Bourque 2008, Thomson et al. 2016) or autumnal rains (Cook et al 2012). Frogs in intermittent streams may move more than those in perennial streams, but movements are generally limited to within the creek corridor (Kupferberg 1996, Bourque 2008, Gonsolin 2010). Aquatic breeding sites are often located near stream confluences, with egg masses typically deposited behind or sometimes under rocks in low-flow areas with cobble and/or gravel substrate (Thomson et al. 2016).

During site assessments by WRA, foothill yellow-legged frog was observed within the Phase 1 Study Area, in association with Butts Creek, near its confluence with McCain Creek (Figure 6). Perennial and intermittent streams with rocky substrates throughout the Phase 1 Study Area provide potentially suitable habitat for the species, including both Butts and Putah creeks and potentially portions of Butcherknife, Bucksnort, and McCain creeks when favorable water levels are present.

California Fully Protected Species

White-tailed kite (*Elanus leucurus*); California Fully Protected Species. The white-tailed kite is resident in open to semi-open habitats throughout the lower elevations of California, including grasslands, savannahs, woodlands, agricultural areas and wetlands. Vegetative structure and prey availability seem to be more important habitat elements than associations with specific plants or vegetative communities (Dunk 1995). Nests are constructed mostly of twigs and placed in trees, often at habitat edges. Nest trees are highly variable in size, structure, and immediate surroundings, ranging from shrubs to trees greater than 150 feet tall (Dunk 1995). This species preys upon a variety of small mammals, as well as other vertebrates and invertebrates.

The Phase 1 Study Area contains open foraging habitat as well as trees and shrubs suitable for nesting by this species. White-tailed kite was observed foraging within the Phase 1 Study Area, primarily in association with Lower Bohn Lake (Appendix H); however, no indication of nesting was observed.

American peregrine falcon (*Falco peregrinus anatum*); California Fully Protected Species, USFWS Bird of Conservation Concern (Federal Delisted, State Delisted). This large falcon occurs as a generally uncommon resident as well as a winter visitor and migrant throughout much of California. Occupied habitat (both breeding and non-breeding) is highly variable, but this species is typically associated with open areas and/or bodies of water. Nesting typically occurs on the ledges of steep cliffs, or on man-made structures with ledges above sheer faces such as bridges and the tops of buildings (White et. al 2002). The peregrine falcon preys upon a wide variety of animals, mostly birds; on the Pacific coast, waterbirds (e.g., waterfowl, shorebirds, and seabirds) are especially favored (White et. al 2002). This species forages over wide areas, even during the breeding season.

Reservoirs and rocky cliffs within and adjacent to the Phase 1 Study Area provide potential foraging and nesting habitat for this species. An active peregrine falcon nest was observed on a south-facing rocky cliff north of Bucksnort Creek, less than 0.5 mile to the west of the Phase 1 Study Area (Figure 6); however, this species was not observed foraging or flying over the Phase 1 Study Area and no active nests were observed within the Phase 1 Study Area.

USFWS Birds of Concern, CDFW Species of Concern, WBWG Rated-Bats

Western pond turtle (*Actinemys marmorata*); CDFW Species of Special Concern. Western pond turtle (WPT) is the only native freshwater turtle in California. This turtle is uncommon to common in suitable aquatic habitat throughout California, west of the Sierra-Cascade crest and Transverse Ranges. Western pond turtle inhabits annual and perennial aquatic habitats, such as coastal lagoons, lakes, ponds, marshes, rivers, and streams from sea level to 5,500 feet in elevation. Pond turtle also occupies man-made habitats such as stock ponds, wastewater storage, percolation ponds, canals, and reservoirs. This species requires low-flowing or stagnant freshwater aquatic habitat with suitable basking structures, including rocks, logs, algal mats, mud banks and sand. Warm, shallow, nutrient-rich waters are ideal as they support WPT prey items, which include aquatic invertebrates and occasionally fish, carrion, and vegetation. Turtles require suitable aquatic habitat for most of the year; however, WPT often occupies creeks, rivers, and coastal lagoons that become seasonally unsuitable. To escape periods of high water flow, high salinity, or prolonged dry conditions, WPT may move upstream and/or take refuge in vegetated, upland habitat for up to four months (Rathbun et al. 2002). Although upland habitat is utilized for refuging and nesting, this species preferentially utilizes aquatic and riparian corridors for movement and dispersal. WPT nests from late April through July. This species requires open, dry upland habitat with friable soils for nesting and prefer to nest on unshaded slopes within 15 to 330 feet of suitable aquatic habitat (Rathbun et al. 1992). Nests are well-concealed, though native mammals are occasionally able to locate and predate upon eggs.

Western Pond Turtle was observed within portions of Bucksnort Creek, Putah Creek, and an unnamed reservoir south of Butts Creek on the west side of Butts Canyon Road (Figure 6). In addition, the other streams and large open water reservoirs with the Phase 1 Study Area provide suitable aquatic habitat, and the associated open grasslands adjacent to these features may support nesting.

Pallid bat (*Antrozous pallidus*); CDFW Species of Special Concern, WBWG High Priority. Pallid bat is broadly distributed throughout much of western North America and typically occurs in association with open, rocky areas. Occupied habitats are highly variable and range from deserts to forests in lowland areas and include higher-elevation forests. Roosting may occur singly or in groups of up to hundreds of individuals. Roosts must offer protection from high temperatures and are typically located in rock crevices, mines, caves, or tree hollows; manmade structures are also used, including buildings (both vacant and occupied) and bridges. Pallid bats are primarily insectivorous, feeding on large prey that is usually taken on the ground but sometimes in flight (WBWG 2018).

The Phase 1 Study Area contains shrubland, forested habitats, rocky outcroppings, chaparral, agricultural areas and buildings that may be suitable for roosting by this species. In addition, the Phase 1 Study Area contains stream, riparian, and grassland habitats bordering open water which provides foraging habitat for this species. Pallid bat was detected within the Phase 1 Study Area using a Sonobat recording device located near a small reservoir south of Lower Bohn Lake (Figure 6). Pallid bat is assumed to be present in other portions of the Phase 1 Study Area, particularly near ponds and reservoirs.

Oak titmouse (*Baeolophus inornatus*); USFWS Bird of Conservation Concern. This relatively common species is year-round resident throughout much of California including most of the coastal slope, the Central Valley and the western Sierra Nevada foothills. In addition, the species may also occur in residential settings where landscaping provides foraging and nesting habitat. Its primary habitat is woodland dominated by oaks. Local populations have adapted to

woodlands of pines and/or junipers in some areas (Cicero 2000). The oak titmouse nests in tree cavities, usually natural cavities or those excavated by woodpeckers, though they may partially excavate their own (Cicero 2000). Seeds and arboreal invertebrates make up the birds' diet. The Phase 1 Study Area contains woodland and tree cavities suitable for nesting by this species.

Oak titmouse was observed in woodland communities throughout Guenoc Ranch, including at least one location within the Phase 1 Study Area (Figure 6). Although no nests were documented, it is assumed that this species nests within the Phase 1 Study Area.

Northern harrier (*Circus hudsonius [cyaneus]*); CDFW Species of Special Concern. The northern harrier occurs as a resident and winter visitor in open habitats throughout most of California, including freshwater and brackish marshes, grasslands and fields, agricultural areas, and deserts. Harriers typically nest in treeless areas within patches of dense, relatively tall, vegetation, the composition of which is highly variable; nests are placed on the ground and often located near water or within wetlands (Shuford and Gardali 2008). Harriers are birds of prey and subsist on a variety of small mammals and other vertebrates.

This species was observed foraging in marsh and grassland throughout the Phase 1 Study Area (Figure 6); however, no nesting activity was observed within or adjacent to the Phase 1 Study Area.

Silver-haired bat (*Lasionycteris noctivagans*); WBWG Medium Priority. Silver-haired bats occur in temperate forests (coniferous, deciduous, and mixed) from southern Alaska to northeastern Mexico. Females form maternity roosts almost exclusively inside hollows or under loose bark of large trees and may switch roosts several times (WBWG 2018). Hibernation occurs in trees, rock crevices, leaf litter, in and under buildings, and in caves and mines. Foraging for insects occurs above the tree canopy. Silver-haired bats are known to migrate south in the winter, although overwintering at northern latitudes has also been documented (WBWG 2018).

The Phase 1 Study Area contains potentially suitable woodland, forest, riparian, and open habitat suitable for this species. This species is likely to roost in hollow trees, snags, rock crevices, and buildings in the Phase 1 Study Area. Silver-haired bat was detected within the Phase 1 Study Area using a Sonobat recording device located near a small reservoir south of Lower Bohn Lake (Figure 6). Silver-haired bat is assumed to be present in other portions of the Phase 1 Study Area, particularly near ponds and reservoirs.

Nuttall's woodpecker (*Picoides nuttallii*); USFWS Bird of Conservation Concern. Nuttall's woodpecker, common in much of its range, is a year-round resident throughout most of California west of the Sierra Nevada Range. Typical habitat is oak or mixed woodland and riparian areas (Lowther 2000). Nesting occurs in tree cavities, principally those of oaks and larger riparian trees. Nuttall's woodpecker also occurs in older residential settings and orchards where large trees provide suitable foraging and nesting habitat. This species forages on a variety of arboreal invertebrates.

The Phase 1 Study Area contains numerous woodland areas and trees with cavities suitable for nesting by this species. Nuttall's woodpecker was observed within the woodland communities within and adjacent to the Phase 1 Study Area (Figure 6), and the species is assumed to nest there.

Allen's hummingbird (*Selasphorus sasin*); USFWS Bird of Conservation Concern. Allen's hummingbird, common in many portions of its range, is a summer resident along the majority of California's coast and a year-round resident in portions of coastal southern California and the Channel Islands. Breeding occurs in association with the coastal fog belt, and typical habitats used include coastal scrub, riparian, woodland and forest edges, and eucalyptus and cypress groves (Mitchell 2000). It feeds on nectar, as well as insects and spiders.

The Phase 1 Study Area contains woodland and riparian habitats with nectar sources that may support nesting. This species was observed in multiple locations within and adjacent to the Phase 1 Study Area (Figure 6) and has potential to occur in numerous habitats throughout the site.

(Brewster's) Yellow warbler (*Setophaga petechia brewsteri*); CDFW Species of Special Concern, USFWS Bird of Conservation Concern. The yellow warbler is a neotropical migrant bird that is widespread in North America, but has declined throughout much of its California breeding range. The Brewster's (*brewsteri*) subspecies is a summer resident and represents the vast majority of yellow warblers that breed in California. West of the Central Valley, typical yellow warbler breeding habitat consists of dense riparian vegetation along watercourses, including wet meadows, with willow growth especially being favored (Shuford and Gardali 2008). Insects comprise the majority of the diet.

The Phase 1 Study Area contains riparian areas with dense vegetation to support nesting by this species. This species was observed within at least one location within the Phase 1 Study Area (Figure 6) and has potential to occur within riparian habitat throughout the Phase 1 Study Area.

Yellow-headed blackbird (*Xanthocephalus xanthocephalus*); CDFW Species of Special Concern. The yellow-headed blackbird occurs as a summer resident and migrant in southern California, with a patchy breeding distribution. This species nests colonially or semi-colonially in marshes dominated by tall emergent vegetation (e.g., cattails, tules), and with relatively deep water. Because of the latter requirement, marshes utilized for nesting are often along the edges of lakes and larger ponds (Shuford and Gardali 2008). Adults during the breeding season forage primarily for large aquatic insects such as dragonflies and damselflies.

The Phase 1 Study Area contains marshes with tall emergent vegetation suitable for this species. Yellow-headed blackbird was observed nesting in emergent vegetation outside of the Phase 1 Study Area (Figure 6), near McCreary Lake, and has potential to occur in association with other large ponds and reservoirs throughout the Phase 1 Study Area.

5.3.2 Special-Status Wildlife Species with Potential to Occur

In addition to the wildlife species that were documented within or immediately adjacent to the Phase 1 Study Area, the 21 special-status wildlife species listed in Table 8 were determined to have moderate to high potential to occur based on the types and condition of habitats found there. The preferred habitat for each of these species is described in Appendix G.

Table 8. Special-Status Wildlife Species with Potential to Occur within the Phase 1 Study Area

Scientific Name	Common Name	Conservation Status
Mammals		
Bassariscus astutus	Ring-tailed cat (ringtail)	CFP
Corynorhinus townsendii	Townsend's big-eared bat	SSC, WBWG High
Lasiurus blossevillii	Western red bat	SSC, WBWG High
Lasiurus cinereus	Hoary bat	WBWG Medium
Myotis evotis	Long-eared myotis	WBWG Medium
Myotis thysanodes	Fringed myotis	WBWG High
Myotis volans	Long-legged myotis	WBWG High
Taxidea taxus	American badger	SSC
Birds		
Agelaius tricolor	Tricolored blackbird	ST, SSC, BCC
Ammodramus savannarum	Grasshopper sparrow	BCC
Asio otus	Long-eared owl	SSC
Athene cunicularia	Burrowing owl	SSC, BCC
Contopus cooperi	Olive-sided flycatcher	SSC, BCC
Falco mexicanus	Prairie falcon	BCC
Icteria virens	Yellow-breasted chat	SSC
Ixobrychus exilis	Least bittern	SSC, BCC
Lanius ludovicianus	Loggerhead shrike	SSC, BCC
Melanerpes lewis	Lewis' woodpecker	BCC
Progne subis	Purple martin	SSC
Spinus [*Carduelis*] *lawrencei*	Lawrence's goldfinch	BCC
Spizella atrogularis	Black-chinned sparrow	BCC

6.0 SUMMARY AND RECOMMENDATIONS

Ten sensitive plant communities were identified within the Phase 1 Study Area, including approximately 100 acres of wetlands, 51 acres and 345,000 linear feet of streams, and 32 acres of ponds, reservoirs, and other open-water habitats. Twenty-six special-status plant species and 14 special-status wildlife species were observed within the Phase 1 Study Area. An additional 81 special-status plant species and 21 special-status wildlife species were determined to have moderate to high potential to occur within the Phase 1 Study Area. The project has the potential to result in direct and indirect impacts to these sensitive resources, and the measures presented below are recommended to reduce those impacts to a less than significant level under CEQA.

The preferred approach for minimizing impacts to sensitive resources found within the Phase 1 Study Area is avoidance during project design. In some areas it may be impracticable or

infeasible to avoid sensitive resources and some impacts may be anticipated. These impacts should be minimized to the fullest extent practicable and feasible through the use of Best Management Practices (BMPs) and other measures. The remaining minor impacts may be mitigated through a combination of onsite preservation and enhancement of sensitive biological communities and habitats for special-status plant and wildlife species.

6.1 General Measures

The following general BMPs and avoidance and minimization measures are recommended:

1. An environmental awareness training program shall be provided to personnel working on the project. The training should include materials that describe the sensitive habitats and species present and the measures that have been incorporated into the project to protect those habitats and species. The training materials should be prepared by a qualified biologist who will train a member of the contractor's crew to provide follow-up trainings to newly hired employees during the construction period. These materials may be updated as new information is available.

2. All work areas, including parking and staging areas, should be the minimum size necessary to implement the project and should be clearly delimited prior to implementation of any work.

3. All trash and debris should be confined in enclosed bins located within staging areas.

4. No pets should be allowed within the construction area.

5. Any soil or other material stockpiled during construction that could be easily transported by wind or rain should be covered when not actively in use.

6. No materials should be placed where they may enter sensitive habitat, receiving waters, or a storm drain, or be subject to wind or runoff erosion and dispersion.

7. Appropriate washout, trackout, and dust control BMPs should be implemented during construction.

8. All vehicles and equipment scheduled for use in construction on the site should be clean and free of mud or vegetation that could introduce plant pathogens or propagules of non-native plants. This includes equipment hauled into the site. The importance of this measure will be discussed in the environmental awareness training materials.

9. No construction vehicles or machinery should be allowed outside of the delimited parking, staging, and work areas.

10. All vehicles and equipment used on site should be well maintained and checked upon site entry for fuel, oil, and hydraulic fluid leaks or other problems that could result in spills of toxic materials. Drip pans should be used under all vehicles and equipment when not in active use.

11. All vehicle fueling and maintenance activities should occur at least 100 feet away from any wetland, stream, or other water body.

12. Operation of vehicles and equipment should be limited to the hours from 7:00 am to 7:00 pm or from half an hour after sunrise to half an hour before sunset.

13. A Stormwater Pollution Prevention Plan (SWPPP) should be developed for the project in accordance with the Lake County Clean Water Program and all measures included in the SWPPP should be implemented during all phases of construction, as appropriate.

14. Temporary erosion control materials should be inspected on a regular basis consistent with the SWPPP during construction, and any required repairs should be implemented immediately.

15. For any work within aquatic features or their setback, the contractor should be prepared to handle any localized hazardous waste spills (e.g. gas, oil, or pesticides). Spill control and clean-up materials (e.g., oil absorbent pads, fiber rolls) should be kept on-site at all times in case a spill occurs. Any waste materials including, but not limited to, raw cement/concrete or washings thereof, asphalt, paint, construction waste, or other coating material, oil or other petroleum products, or any other substances which could be hazardous to aquatic life, should be prevented from contaminating the soil and/or entering any waterways.

16. All erosion control materials should use certified weed-free straw or other biodegradable, weed-free materials. No materials containing monofilament netting should be used.

6.2 Biological Communities

6.2.1 Sensitive Terrestrial Communities

The Phase 1 Study Area contains seven sensitive terrestrial communities including four woodland communities (blue oak woodland, blue oak savanna, interior live oak woodland, and valley oak woodland) and one herbaceous community (purple needle grass grassland). While they have no legal standing, chaparral communities on serpentine soils within the Phase 1 Study Area provide high value for rare plants and may contain one or more sensitive associations and should also be considered for avoidance to the extent feasible and practicable during project design and entitlement.

The following measures are recommended to avoid impacts to sensitive terrestrial communities:

1. Minimize impacts to sensitive terrestrial communities to the extent practicable and feasible through avoidance during project design.

2. Given the limited distribution of valley oak woodland, which has a CDFW rarity ranking of S3 indicating that it has limited distribution within California, as well as the difficulty in regenerating this community, it should be avoided in its entirety if possible and if not possible completely mitigated to include an increase in planting to meet the goal of no significant impact consistent with the Oak mitigation plan prepared under #4 below.

3. To mitigate for unavoidable impacts to oak trees, an oak woodland mitigation plan should be developed that minimizes impacts and compensates for any loss of oak woodland (or in the case of oak savannah, individual trees) through a combination of enhancement (e.g., weed management within existing oak woodlands), restoration or creation (e.g., oak planting or seeding), transplanting, and/or preservation (e.g., placement of conservation easements over existing stands of high quality oak woodlands at least acre per acre 1:1). The plan should also include a monitoring and adaptive management component and clear performance standards. The plan should be approved by the County of Lake prior to any impacts.

4. Purple needle grass grassland should be avoided to the extent practicable and feasible. To mitigate for unavoidable impacts to purple needle grass grassland, mitigation should be developed that minimizes impacts and compensates for any loss of native grassland through some combination of enhancement (e.g., weed management within existing native grasslands), restoration or creation (e.g., native grassland seeding), and preservation (e.g., placement of conservation easements over existing stands of high quality native grasslands). The mitigation should also include a robust monitoring and adaptive management component and clear performance standards. Mitigation should be approved by the County of Lake prior to any impacts.

5. To the extent feasible and practicable, minimize impacts to serpentine chaparral communities which have high potential to host rare plants and may contain one or more sensitive plant associations.

6.2.2 Sensitive Aquatic Communities

The Phase 1 Study Area contains a large network of wetlands, streams, ponds, and reservoirs, and riparian habitat, which are variously regulated by the Corps, RWQCB, and/or CDFW. The following measures are recommended to avoid, minimize, or mitigate for impacts to aquatic communities:

1. The County of Lake defines setbacks from streams, ponds, wetlands, and riparian habitats that should be incorporated into the project design:

    a) 30 feet from the top of bank any perennial stream,
    b) 20 feet from the top of bank of any intermittent stream,
    c) 20 feet from the edge of any adjacent wetlands or the ordinary high water mark of other bodies of water, or
    d) To the outer extent of vegetation dominated by common riparian species such as Fremont cottonwood (*Populus fremontii*), white alder (*Alnus rhombifolia*), box elder (*Acer negundo*), dogwood (*Cornus* spp.), willow (*Salix* spp.), and big leaf maple (*Acer macrophyllum*) (this latter zone may extend beyond 30 feet).

    No setbacks are clearly defined by the County for ephemeral streams. However, for the purposes of this report, it is assumed that ephemeral streams are “other bodies of water” as stated in c) above. Therefore, a minimum setback of 20 feet, or as directed by a qualified biologist, from the ordinary high water mark on natural

ephemeral streams should be incorporated. No setback is required for man-made stormwater or irrigation ditches. In areas where ground disturbance will occur in close proximity to aquatic resources or riparian habitat, sediment control measures such as silt fencing and/or straw wattles should be installed between the work area and the appropriate setback.

2. Prior to any impacts to protected aquatic resources, the project proponent should submit applications for necessary permits from the Corps, RWQCB, CDFW, and/or County of Lake. Any avoidance, minimization, or compensatory mitigation measures required by those permits should be incorporated into the project design. An aquatic resources mitigation plan (HMMP) will be submitted as part of the permit applications in accordance with federal and state requirements. It is likely that most of the compensatory mitigation actions can be accomplished on-site within the project boundaries; however, off-site mitigation and purchase of mitigation credits may also be appropriate in some cases.

6.3 Special-Status Plant Species

WRA documented 26 special-status plant species within the Phase 1 Study Area during seasonally timed surveys conducted in 2017, 2018, and 2019, including one federal-listed species, one state-listed species, six CNPS Rank 1 species, and 18 CNPS Rank 4 species. The bulk of these plants occur either on serpentine soils or in wetlands and along stream corridors; however, special-status plants occur in other habitats as well. The following measures are recommended to avoid, minimize, or mitigate for impacts to special-status plants:

1. Pre-construction botanical surveys of herb-dominated habitats with the potential to support special-status plants (i.e. grasslands, wetlands) shall be conducted prior to ground breaking for each specific project component if more than one complete year has passed since most recent survey (i.e. areas surveyed in 2017 require surveys in 2020, however areas surveyed in 2019 require surveys in 2021). Pre-construction surveys of shrub or woodland dominated habitats with the potential to support special-status plants shall be surveyed prior to groundbreaking for each specific project component if more than four years have passed since most recent survey (i.e. shrub/woodland areas surveyed in 2017 will require surveys in 2022). Initial vegetation clearing along proposed roadways for fire management shall also be subject to these standards. Pre-construction surveys shall be completed by a qualified biologist during the appropriate identification period for plants with the potential to occur in the area scheduled for ground breaking.

2. To the extent feasible and practicable, all occurrences of special-status plants should be avoided during project design. To ensure no indirect impacts, individual occurrences of special-status plants should be avoided by a minimum of 20 feet. Where ground disturbance will occur within 100 feet upslope of occurrences of special-status plants during the wet season (October 1 through April 1), silt fencing or straw wattles should be installed between the work area and the 20-foot setback and should not be removed until the disturbed areas have been revegetated or otherwise stabilized and the risk of erosion has been minimized.

3. When avoidance is not feasible or practicable, species-specific mitigation should be developed that minimizes impacts and compensates for any loss of federal or state listed rare, threatened, or endangered plant occurrences through a

combination of enhancement (e.g., weed management and supplemental seeding within existing stands of the species in question), restoration or creation (e.g., establishment of new populations), and preservation (e.g., placement of appropriate protective assurances over existing examples of high quality occurrences). This mitigation for these species may need approval by the appropriate federal and/or state agency under which they are listed as part of the permitting process.

4. Any mitigation should follow generally acceptable rare plant mitigation guidelines and should consider the specific ecology of the species in question, as well as the conservation status and the number of occurrences within the overall ranch. The mitigation should also include regularly scheduled monitoring, an adaptive management component, and clear performance standards to ensure success.

5. Federal-listed, state-listed, and CNPS Rank 1 species should be prioritized for avoidance. Where avoidance of these species is not possible, they should be considered for relocation or reestablishment in other portions of the property.

6. CNPS Rank 4 species that occur in limited numbers and/or limited locations (e.g., tall snapdragon, which occurred in only three locations across the Phase 1 Study Area) should be reviewed with the County of Lake to determine appropriate mitigation measures.

7. CNPS Rank 4 species that occur in large numbers and numerous locations (e.g., Jepson's navarretia, which occurred on serpentine balds in numerous locations across the property and numbered in the hundreds of thousands) should be reviewed with the County of Lake to determine appropriate mitigation measures.

8. Impacts to federal- or state-listed plant species may require consultation with the USFWS under Section 7 or Section 10 of the Endangered Species Act and/or application for a CFGC Section 2080 Consistency Determination (if a USFWS Biological Opinion is issued) or Section 2081 Incidental Take Permit (if a USFWS Biological Opinion is not issued or the species is state-listed only).

6.4 Special-Status Wildlife Species

Fourteen special-status wildlife species were documented within or adjacent to the Phase 1 Study Area, including one State-Endangered species, one State-Candidate species, and several California Fully Protected species, in addition to other special-status species. An additional 21 special-status wildlife species were determined to have potential to occur. The Phase 1 Study Area is not located within Critical Habitat as designated by USFWS or NMFS, as Lake Berryessa forms a total barrier to anadromous fish including steelhead and Chinook salmon. The following recommendations and potential constraints are provided based on the potential for special-status species and their habitat to occur within the Phase 1 Study Area. Where applicable, species with similar requirements and guidance are grouped together.

6.4.1 Special-Status Mammals

Bats

Two special-status bat species and five non-status bat species were observed within the Phase 1 Study Area. There is moderate or high potential for an additional six bat species to occur within the undisturbed oak woodland, riparian woodland, rock outcrops and buildings within the Phase 1 Study Area. Direct impacts to roosting special-status bat species could occur due to the removal or modification of large trees (diameter at breast height [DBH] >12 inches), snags, and/or buildings. The destruction or injury of special-status bats or loss of a maternity roost would constitute a potentially significant impact under CEQA and is a violation of the CFGC. Indirect impacts to maternity roosting and/or roosting bat species may include roost abandonment due to noise, increased nighttime lighting and/or other human disturbances during construction, and would also constitute a potentially significant impact under CEQA.

The following measures are recommended to avoid impacts to roosting bats:

1. Pre-construction survey(s) for bat roosts should be conducted by concentrating on large trees (DBH >12 inches), broadleaf trees in riparian woodland habitat, buildings, bridges, and cliffs/rocky outcroppings within 100 feet of any planned work areas. Surveys should occur no more than 14 days prior to the start of work, and one or more surveys may be needed for the biologist to evaluate whether potential roost habitat occurs and to determine the type (i.e., maternity or non-maternity) and status (i.e., active or inactive) of the roost. If an active maternity or special-status bat roost is found and is proposed to be removed or directly impacted as a result of project activities, consultation with CDFW may be required.

2. If large trees (DBH >12 inches) identified as potential bat roosts that are not active maternity or special-status roosts are to be removed, they should be flagged by the surveying biologist. On the first day of removal of flagged trees, if weather conditions permit, limbs shall be removed in the late afternoon from flagged trees. This disturbance should cause any roosting bats to locate an alternative roost during their nighttime foraging. As potentially roosting bats will have left over the course of the night, the rest of the tree can be harvested on the second day. On the second day, if weather conditions permit, the trees shall be felled as late in the afternoon as is practicable. If weather conditions are not conducive to having the tree taken down on the second day and the procedure has been interrupted, an additional emergence survey shall be conducted the evening before taking the tree down in late afternoon.

Other Mammals

American badger is a SSC with moderate potential to occur in the Phase 1 Study Area. Ringtail is a CFP species with moderate potential to occur in the Phase 1 Study Area. Direct impacts to open grassland and oak woodland could potentially impact habitat for American badger and ringtail. The following measures are recommended to avoid impacts to American badger and ringtail:

1. No more than 14 days before the start of ground disturbance activities within open grassland, oak woodland, or riparian forest habitat, a biologist should conduct pre-construction surveys to determine if American badger or ringtail dens are present.

2. If American badger dens are determined to be present, the biologist should monitor them for activity to determine whether the den is active. If the den is determined to be occupied by a female with young, ground disturbance and construction

activity should be avoided within 50 feet of the den until the young have matured and dispersed. If the den is determined to be active, but a female with young are not present, burrow exclusion using passive measures such as one-way doors or equivalent should be attempted for a minimum of three days to discourage their use prior to any project-related ground disturbance. If the biologist determines that the dens have become inactive as a result of the exclusion methods, the dens should be excavated by hand to prevent them from being re-occupied during construction.

3. If ringtail dens with young are determined to be present within the work area, the biologist should establish a clearly marked exclusionary buffer of no less than 50 feet and no ground disturbance should take place within the buffer until the biologist determines the den is no longer active with young.

6.4.2 Special-Status Birds

Raptors

Targeted raptor surveys determined that golden eagle, bald eagle, white-tailed kite, northern harrier and American peregrine falcon nest in portions of the larger Guenoc Ranch outside of the Phase 1 Study Area. Although it was not observed, suitable habitat for prairie falcon is present and it was determined that the species has a moderate potential to occur in the Phase 1 Study Area. The Phase 1 Study Area provides foraging habitat and has the potential to support nesting for each of these species. In 2018, surveys identified three bald eagle nests within 0.5 mile of the Phase 1 Study Area, active peregrine falcon nests within 0.75 mile of the Phase 1 Study Area, and a golden eagle nest within 0.2 mile of the Phase 1 Study Area, as well as non-status raptor nests within the Study Area.

Eagle nests are protected by the Bald and Golden Eagle Protection Act, the MBTA, and the CFGC. Direct impacts to nest trees (e.g., trimming or completely removing the nest tree or adjacent trees) while the nest is active may result in death or injury to eggs or young, and potentially adults as well. Additionally, indirect disturbance caused by project related activities (e.g., noise, vibration and/or visual disruption resulting from grading or construction), and introduction of toxic of otherwise harmful chemicals into the prey base of bald and golden eagles have the potential to impact eagle nesting activities. Any direct impacts that result in nest failure or mortality may constitute a violation of the Bald and Golden Eagle Protection Act, as well potentially the MBTA and multiple sections of the CFGC. White-tailed kite and peregrine falcon nests are also protected by the MBTA and CFGC. Protective exclusion buffers around active raptor nests can vary greatly and may extend up to 0.5 mile. The following measures are recommended to avoid impacts to raptors:

1. Prior to starting construction activities during the nesting season, generally defined as February 1 through August 31, targeted surveys for active raptor nests should be conducted. An active nest contains eggs or young.

2. For construction activities planned within 0.5 miles of a documented eagle or protected falcon species nest, pre-construction surveys should be conducted in accordance with the most current guidance available from USFWS and CDFW.

3. If a non-status raptor nest containing eggs or young is determined to be present within the work area, then a protective buffer should be implemented and no

project work should occur within the buffered area until the chicks have fledged and no longer require parental support for survival, or the nest has been determined to be inactive. Buffer size should be determined by the biologist based on species, nest location, planned disturbance footprint, and presence of any visual or auditory buffers.

4. If a special-status raptor nest is determined to be present within the work area, or within 0.5 mile of the work area, consultation with the USFWS and/or CDFW should occur and any measures recommended or required by those agencies should be incorporated into the project design.

Burrowing Owl

Burrowing owl is listed as a species of special concern by the CDFW. While the species was not observed during site assessments, ground squirrels and potentially suitable habitat was present, and suitable burrows may exist in the future. This species is migratory, and may occur in portions of the Phase 1 Study Area. Project activities that would remove or destroy burrows and impact grassland habitat containing suitable burrows, may result in a direct impact to burrowing owl. The following measures are recommended to avoid impacts to burrowing owls:

1. A pre-construction survey should be performed prior to start of ground disturbance activities where ground squirrel burrow complexes are present. This survey should occur regardless of the time of year, as burrowing owls may use the Study Area during the non-nesting season. The survey should be performed according to the standards set forth by the Staff Report for Burrowing Owl Mitigation (CDFW 2012), unless more current guidance has been released.

2. If the species or its sign, which includes feathers, pellets, or whitewash, are found at a burrow during the nesting period, project activities should excluded from within a 250-foot buffer surrounding the occupied burrows occur until the owls are no longer present or the burrows have been abandoned. The nesting period is defined as February 1 through August 31.

3. Passive exclusion techniques, such as one-way doors, can be used to exclude burrowing owl from occupied burrows outside the nesting season or if a burrow is determined not to support an active nest. An active nest include those with eggs or young. Once exclusion is completed, the burrows should be collapsed to avoid attracting owl back to the planned or active work area.

Nesting Birds

In addition to the aforementioned raptor species, the site assessment determined that special status bird species Allen's hummingbird, Nuttall's woodpecker, oak titmouse, yellow-headed blackbird, and yellow warbler are present within or adjacent to the Phase 1 Study Area. Ten other special status bird species, in addition to burrowing owl previously discussed, were determined to have a moderate to high potential to occur within the Phase 1 Study Area. A variety of native bird species protected under the MBTA as well as the CFCG may use the Phase 1 Study Area for nesting.

Avoidance of nesting birds is considered a general biological resources "best practice" in California and avoids potential enforcement action by the CDFW. Nesting bird pre-construction survey obligations are a common component of various permits and authorizations, including local

grading permits, and such, may be deemed applicable to project activities within the Phase 1 Study Area.

Initial vegetation removal, clearing, grubbing activities, along with building removal and demolition of structures, have the potential to affect nesting migratory birds including: prairie falcon, long-eared owl, least bittern, purple martin, olive-sided flycatcher, Allen's hummingbird, Nuttall's woodpecker, Lewis' woodpecker, loggerhead shrike, oak titmouse, yellow warbler, yellow-breasted chat, black-chinned sparrow grasshopper sparrow, Lawrence's goldfinch, yellow-headed blackbird, and tricolored blackbird. Adverse effects to nesting birds covered by the MBTA and the CFGC, including active nests, eggs and young, would constitute a potential impact that may occur as a result of these activities. While project-specific impacts may require additional measures, the following programmatic-level measures are recommended to avoid impacts to nesting birds:

1. If vegetation removal, demolition of buildings or work on bridges, or initial ground disturbance activity occur during the nesting season, defined as February 1 through August 31, then a pre-construction nesting bird survey within the work area should be completed by a biologist no more than 14 days (or the time interval set by Department permits issued for the project) prior to the start of work.

2. If active nests (nests with eggs and/or chicks) are observed during the pre-construction survey, project activities should avoid the area as determined by the biologist and resume the protective buffer only after the young have fledged the nest or the nest otherwise becomes inactive. Buffer size should be determined by the biologist based on species, nest location, planned disturbance footprint, and presence of any visual or auditory buffers.

6.4.3 Special-Status Reptiles and Amphibians

This assessment determined that western pond turtle (WPT) and foothill yellow-legged frog (FYLF) are present in the Phase 1 Study Area. Direct impacts to stream features, floodplains, wetlands, ponds, and reservoirs may result in the loss of suitable habitat or potential take of amphibian and reptile species. Work taking place within any river, stream, or lake in the Phase 1 Study Area subject to Fish and Wildlife jurisdiction would require a CDFW Lake or Streambed Alteration Agreement (LSAA). Measures that may be included in an LSAA are discussed below.

Western Pond Turtle

This assessment determined that western pond turtle (WPT) is present in the Phase 1 Study Area. Direct impacts to stream features, floodplains, wetlands, ponds, and reservoirs could result in the loss of suitable habitat or potential take of WPT if they are present. Direct mortality, loss of aquatic habitat, or loss of nesting habitat may be considered potentially significant impacts under CEQA. While project-specific impacts may require additional measures, the following programmatic-level measures are recommended to avoid impacts to WPT:

1. To the extent possible, initial ground disturbance, vegetation clearing, and associated project activities within 300 feet of ponds, reservoirs, or wetted streams which may support western pond turtle should occur between July 1 and October 31 to avoid the peak nesting season and winter inactivity periods for western pond turtle.

2. No more than 14 days prior to the start of work within 300 feet of ponds, reservoirs, or wetted streams with the potential to support western pond turtle, a pre-construction survey for western pond turtle shall be completed. If the species is observed, the biologist should provide measures to avoid direct impacts based on the planned work. Such measures may include a protective no-work buffer, exclusion fencing, monitoring, or coordination with CDFW if relocation is required.

Foothill Yellow-Legged Frog

Work within streams, riparian areas, and along streamside corridors could impact FYLF by disrupting migratory movements, rearing, or breeding and could result in direct injury or mortality of individuals. Additional impacts may occur from the removal or altering of habitat, such as those associated with the loss of cover or altering localized water flow. Although there is no time of year when complete avoidance of FYLF is possible if working in an area where the species is known to occur, there are periods when encountering the species is less likely (CDFW 2018b). Conducting work outside the typical FYLF breeding season away from wetted features allows for the greatest opportunity for avoidance (CDFW 2018b). While project-specific impacts may require additional measures, the following measures are recommended to avoid impacts to FYLF:

1. Work within 100 feet of any wetted stream feature or associated riparian area where foothill yellow-legged frog (FYLF) has been documented should occur during the dry months (July 1 through October 31) as possible. Timing shall also occur outside of the FYLF breeding season (March 1 to June 30) to the extent possible.

2. Pre-construction surveys for FYLF within any wetted stream feature near a work area should be conducted by a qualified biologist at least 14 days prior to the onset of construction activities. Surveys should cover at least 500 feet upstream and 500 feet downstream of the work area for presence of all life stages. Surveys should be conducted during the day and under optimal conditions for detecting FYLF. Additional pre-construction surveys may be required as determined by the qualified biologist. If FYLF are detected, measures to avoid the species should be implemented. Such measures may include, but are not limited to, a protective no-work buffer, exclusion fencing, monitoring, and/or coordination with CDFW.

FYLF is currently a candidate species for listing under CESA and as such is afforded the protections conveyed by CESA, including protection from “take” without a permit. The clade that occurs in the Project Area has been evaluated as not warranting listing under CESA at this time by the CDFW Staff Review and the CDFG commission has voted to adopt this finding. While the species is technically still a candidate for listing, the ending of candidacy for this clade is imminent and is not likely to result in listing under CESA. However, this clade will remain a species of special concern and will continue to be considered during CEQA processes and permitting processes administered by CDFW. While the implementation of the above described measures should minimize impacts to the species, there is a potential for incidental take of FYLF to occur during work activities in and adjacent to FYLF habitat and this take would still require an ITP, if it occurs during the candidacy period.

6.3.4 Wildlife Corridors

This assessment determined that portions of the Phase 1 Study Area may facilitate wildlife movement and may be considered a wildlife corridor. The conversion of raw land, conversion to

agriculture or installation of buildings and fencing, and increased prevalence of human disturbance can diminish or eliminate properties that make an area a corridor for native species. Under CEQA, project impacts to wildlife corridors should be assessed and evaluated.

WRA recommends that a wildlife corridor assessment be conducted utilizing GIS-based software or similar acceptable method to evaluate topography and biological communities as identified in the Phase 1 Study Area based on species-specific habitat requirements for wildlife species that utilize corridors for long-distance movement. The assessment will help identify areas where wildlife movement may be facilitated and help identify if avoidance and minimization measures should be implemented.

That being said there is an approximately 3,000 acre protect open space/wildlife corridor and preserved riparian corridors that runs through Phase 1 that provides wildlife passageways.

7.0 REFERENCES

Alexander, E.B., R.G. Coleman, T. Keeler-Wolf, S.P. Harrison. 2007. Serpentine Geoecology of Western North America. Oxford University Press, New York, NY.

Baldwin, BG, DH Goldman, DJ Keil, R Patterson, TJ Rosatti, and DH Wilken (eds.). 2012. The Jepson Manual: Vascular Plants of California, second edition. University of California Press, Berkeley, CA.

Bolster, B.C., editor. 1998. Terrestrial Mammal Species of Special Concern in California Draft Update. Report submitted to California Department of Fish and Game Wildlife Management Division, Nongame Bird and Mammal Conservation Program for Contract No.FG3146WM.

Bourque, R.M. 2008. Spatial ecology of an inland population of the foothill yellow-legged frog (*Rana boylii*) in Tehama County, California. Master's thesis, Humboldt State University, Arcata, CA

Buehler, D. 2000. Bald Eagle (*Haliaeetus leucocephalus*), The Birds of North America (P. G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America: https://birdsna.org/Species-Account/bna/species/baleag.

Calflora. 2019. Calflora: Information on California plants for education, research, and conservation, based on data contributed by dozens of public and private institutions and individuals, including the Consortium of California Herbaria. Berkeley, CA. Available at: http://www.calflora.org/; most recently accessed: May 2019.

[CDFG] California Department of Fish and Game. 2012. Staff Report on Burrowing Owl Mitigation. State of California Natural Resources Agency, Department of Fish and Game.

[CDFW] California Department of Fish and Wildlife. 2018a. California Natural Community List. Biogeographic Data Branch. Vegetation Classification and Mapping Program, Sacramento, CA. October 15.

[CDFW] California Department of Fish and Wildlife. 2018b. Considerations for Conserving the Foothill Yellow-Legged Frog. Habitat Conservation Planning Branch, Sacramento, CA.

[CDFW] California Department of Fish and Wildlife. 2019. California Natural Diversity Database. Wildlife and Habitat Data Analysis Branch, Sacramento, CA. Accessed on multiple dates in 2017, 2018, and 2019.

[CNPS] California Native Plant Society. 1998. Policy on Mitigaiton Guidelines Regarding Impacts to Rare, Threatened, and Endagnered Plants. California Native Plant Society Rare Plant Scientific Advisory Committee. Sacramento.

[CNPS] California Native Plant Society. 2019a. Inventory of Rare and Endangered Plants (online edition, v8-02). Sacramento, California. Online at: http://rareplants.cnps.org/; accessed on multiple dates in 2017, 2018, and 2019.

[CNPS] California Native Plant Society. 2019b. A Manual of California Vegetation, Online Edition. Sacramento, California. Online at: http://vegetation.cnps.org/; accessed on multiple dates in 2017, 2018, and 2019.

Cicero, C. 2000. Oak Titmouse (*Baeolophus inornatus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/485a

Collinge, Sharon K. ; Holyoak, Marcel ; Barr, Cheryl B. ; Marty, Jaymee T./ Riparian habitat fragmentation and population persistence of the threatened valley elderberry longhorn beetle in central California. In: Biological Conservation. 2001 ; Vol. 100, No. 1. pp. 103-113

Cook D. G., S. White, P. White, and E White. 2012. Rana boylii (Foothill Yellow-legged Frog), Upland Movement. Herpetological Review 43(2): 325-326

[CSRL] California Soil Resource Lab. 2019. SoilWeb Earth. Online at: www.casoilresource.lawr.ucdavis.edu; accessed on multiple dates in 2017, 2018, and 2019.

Dolan, RW and LF LaPré. 1989. Taxonomy of *Streptanthus* sect. *biennes,* the *Streptanthus morrisonii* Complex (Brassicaceae). Madroño 36(1): 33-40.

Dunk, JR. 1995. White-tailed Kite (*Elanus leucurus*), The Birds of North America Online (A Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/178.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Department of the Army, Waterways Experiment Station, Vicksburg, Mississippi 39180-0631.

Gonsolin, T.E. 2010. Ecology of foothill yellow-legged frogs in upper Coyote Creek, Santa Clara County, CA. Master's thesis, San Jose State University, San Jose, CA.

Holland, RF. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. Prepared for the California Department of Fish and Game, Sacramento, CA.

Jepson Flora Project (eds.). 2019. Jepson eFlora. Online at: http://ucjeps.berkeley.edu/IJM.html; accessed on multiple dates in 2017, 2018, and 2019.

Kochert, M., K. Steenhof, C. McIntyre, E. Craig. 2002. Golden Eagle (*Aquila chrysaetos*). Pp.1-44 in A. Poole, F. Gill, eds. The Birds of North America, Vol. 684. Philadelphia: The Birds of North America.

Kruckeberg, A.R. 1984. California Serpentines: Flora, Vegetation, Geology, Soils, and Management Problems. University of California Press, Berkeley, CA.

Kupferberg, S.J. 1996. Hydrologic and geomorphic factors affecting conservation of a river-breeding frog (*Rana boylii*). Ecological Applications 6:1332-1344.

Lichvar, R. and S. McColley. 2008. A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States: A Delineation Manual. Cold Regions Research and Engineering Laboratory. ERDC/CRREL TR-08-12.

Lowther, Peter E. 2000. Nuttall's Woodpecker (*Picoides nuttallii*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online:http://bna.birds.cornell.edu/bna/species/555

Mitchell, D.E. 2000. Allen's Hummingbird (*Selasphorus sasin*), The Birds of North America Online (A Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online:http://bna.birds.cornell.edu/bna/species/501.

Moyle, P.B., R.M. Quinones, J.V. Katz, and J. Weaver. 2015. Fish Species of Special Concern in California. California Department of Fish and Wildlife, Sacramento, CA.

Potter, D., H. Bartosh, G. Dangl, J. Yang, R. Bittman, and J. Preece. 2018. Clarifying the Conservation Status of Northern California Black Walnut (*Juglans hindsii*) Using Microsatellite Markers. Madroño 65: 131-140.

Rathbun, GB, NJ Scott, Jr., and TG Murphey. 2002. Terrestrial habitat use by Pacific pond turtles in a Mediterranean climate. The Southwestern Naturalist 47: 225-235.

Rathbun, GB, N Seipel and DC Holland. 1992. Nesting behavior and movements of western pond turtles, *Clemmys marmorata*. The Southwestern Naturalist 37: 319-324.

Safford, H.D., J.H. Viers, and S.P. Harrison. 2005. Serpentine Endemism in the California Flora: A Database of Serpentine Affinity. Madroño, vol52(4): pp. 222-257.

Shuford, W.D., and T. Gardali (eds). 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and CDFG, Sacramento.

Thomson, R.C., A.N. Wright, and H.B. Shaffer. 2016. California Amphibian and Reptile Species of Special Concern. Co-published by the California Department of Fish and Wildlife and University of California Press. Oakland, California.

[USDA] U.S. Department of Agriculture. 1989. Soil Survey of Lake County, California. In cooperation with the University of California Agricultural Experiment Station.

[USDOI] U.S. Dept of the Interior. 2017. “The Migratory Bird Treaty Act Does Not Prohibit Incidental Take.” Memorandum M-37050, from the Principal Deputy Solicitor. December. 41 pp.

[USFWS] U.S. Fish and Wildlife Service. 2019. Information for Conservation and Planning Database. Available online at: https://ecos.fws.gov/ipac/; accessed: May 2019.

[USFWS] United States Fish and Wildlife Service. 2008. Birds of Conservation Concern. Division of Migratory Bird Management. Arlington, Virginia.

[USGS] U.S. Geological Survey. 2017. California Geologic Map Data. Online at: https://mrdata.usgs.gov/geology/state/state.php?state=CA; accessed June 2017.

[WBWG] Western Bat Working Group. 2019. Species Accounts. Prepared by Betsy C. Bolster. Online at: http://wbwg.org/western-bat-species; accessed May 2019.

White, C. M., N. J. Clum, T. J. Cade, and W. G. Hunt (2002). Peregrine Falcon (*Falco peregrinus*), version 2.0. In The Birds of North America (A. F. Poole and F. B. Gill, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA.

WRA, Inc. 2020a. Aquatic Resources Delineation, Maha Resort and Guenoc Valley Development, Phase 1. Report prepared for Lotusland Investment Holdings, Inc.

WRA, Inc. 2020b. Biological Resources Assessment. Maha Resort and Guenoc Valley Development, Phase 2 and Open Space. Prepared for Analytical Environmental Services.

APPENDIX A

BIOLOGICAL COMMUNITIES MAPPED WITHIN THE PHASE 1 STUDY AREA

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 1)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

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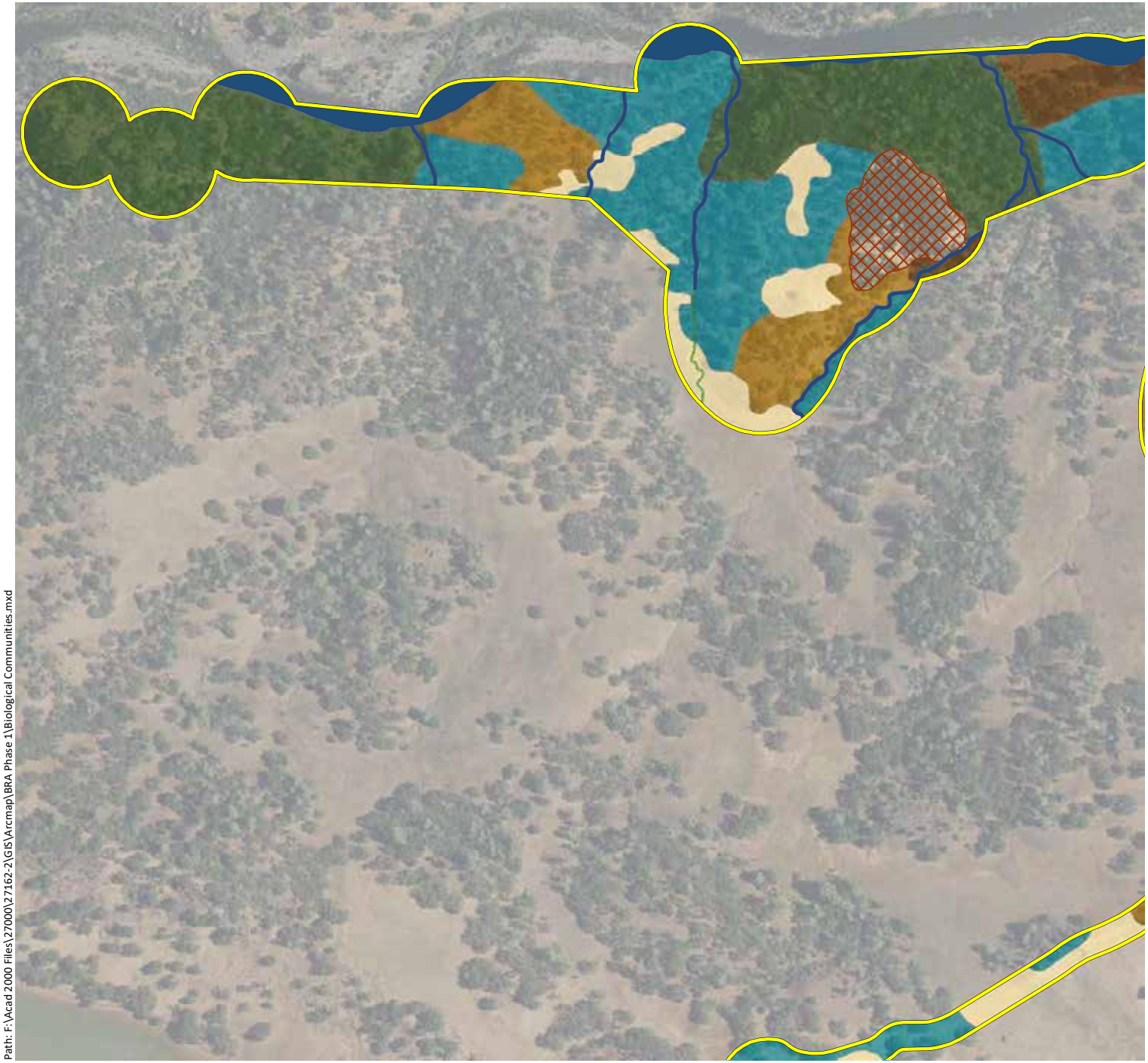
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 2)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 3)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 4)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 5)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

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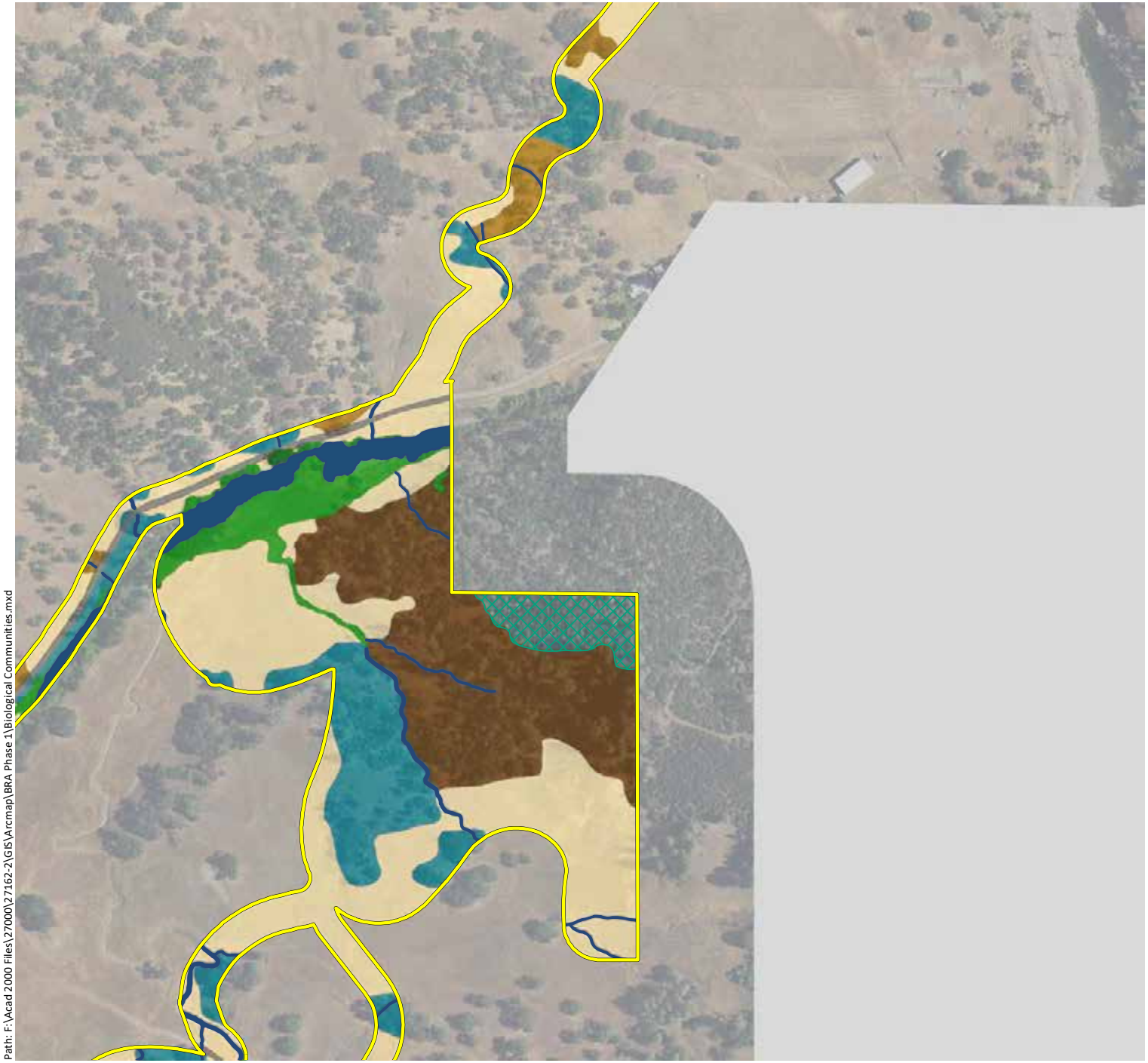
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 6)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

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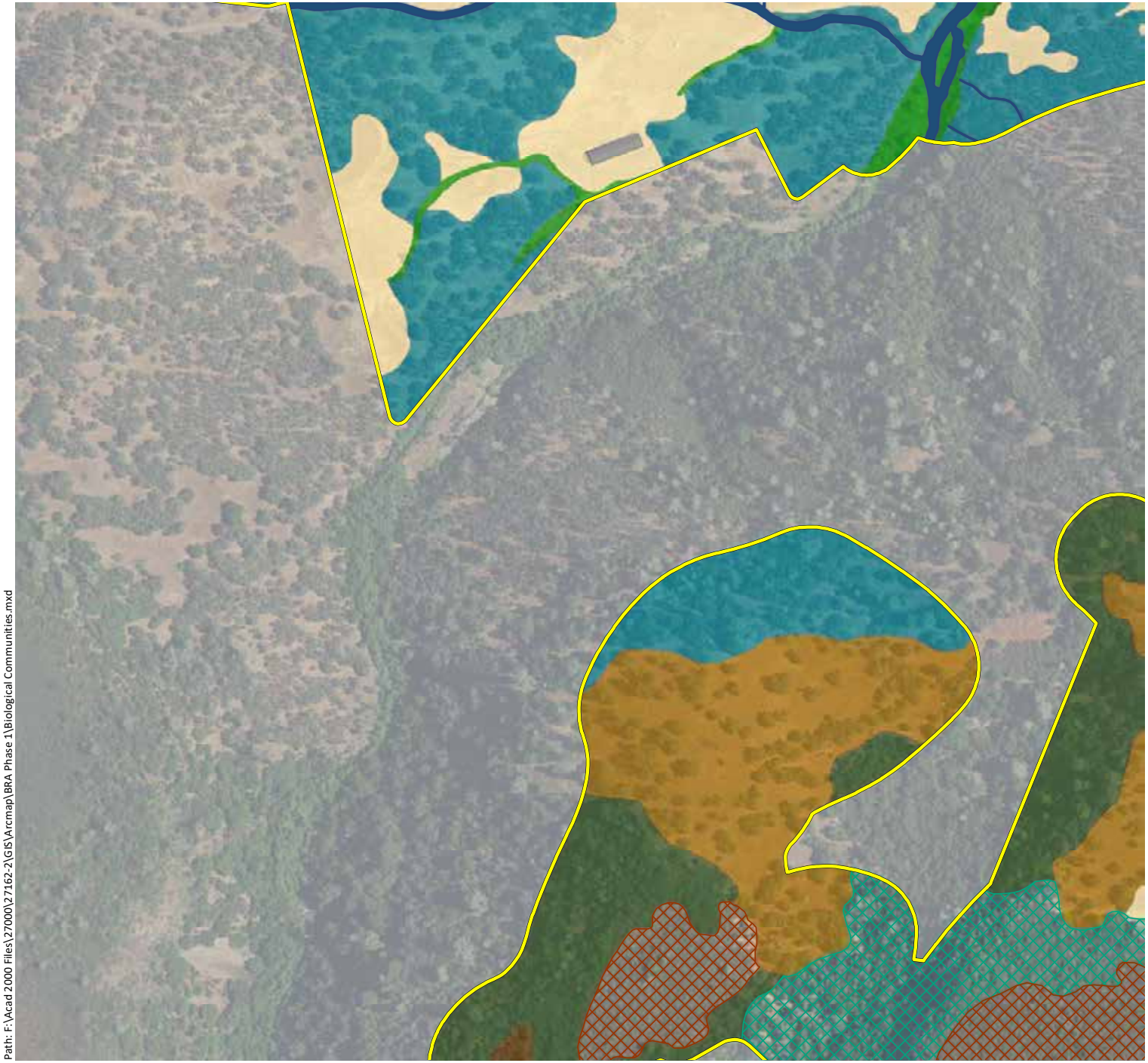
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 7)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

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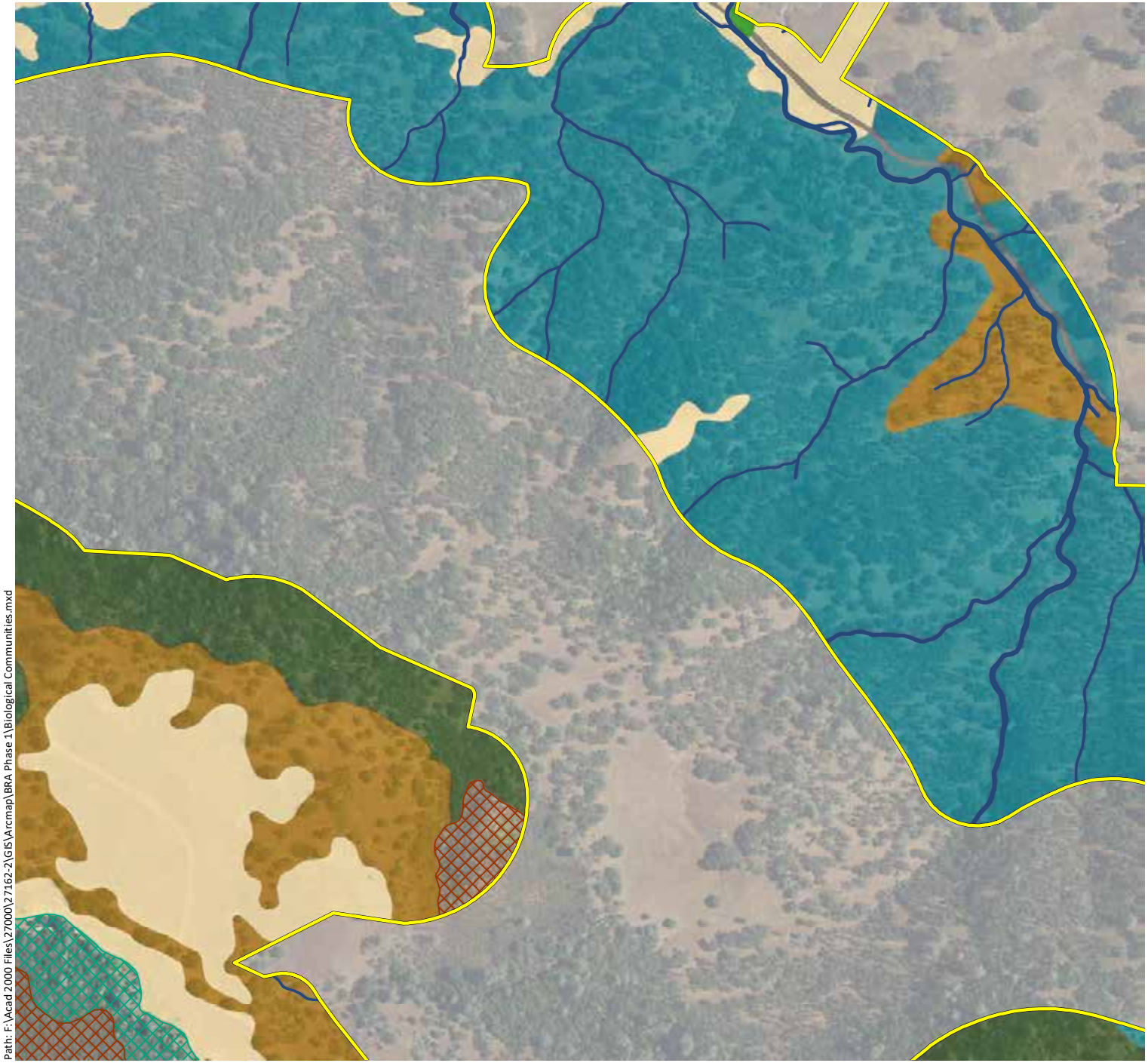
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 8)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 9)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

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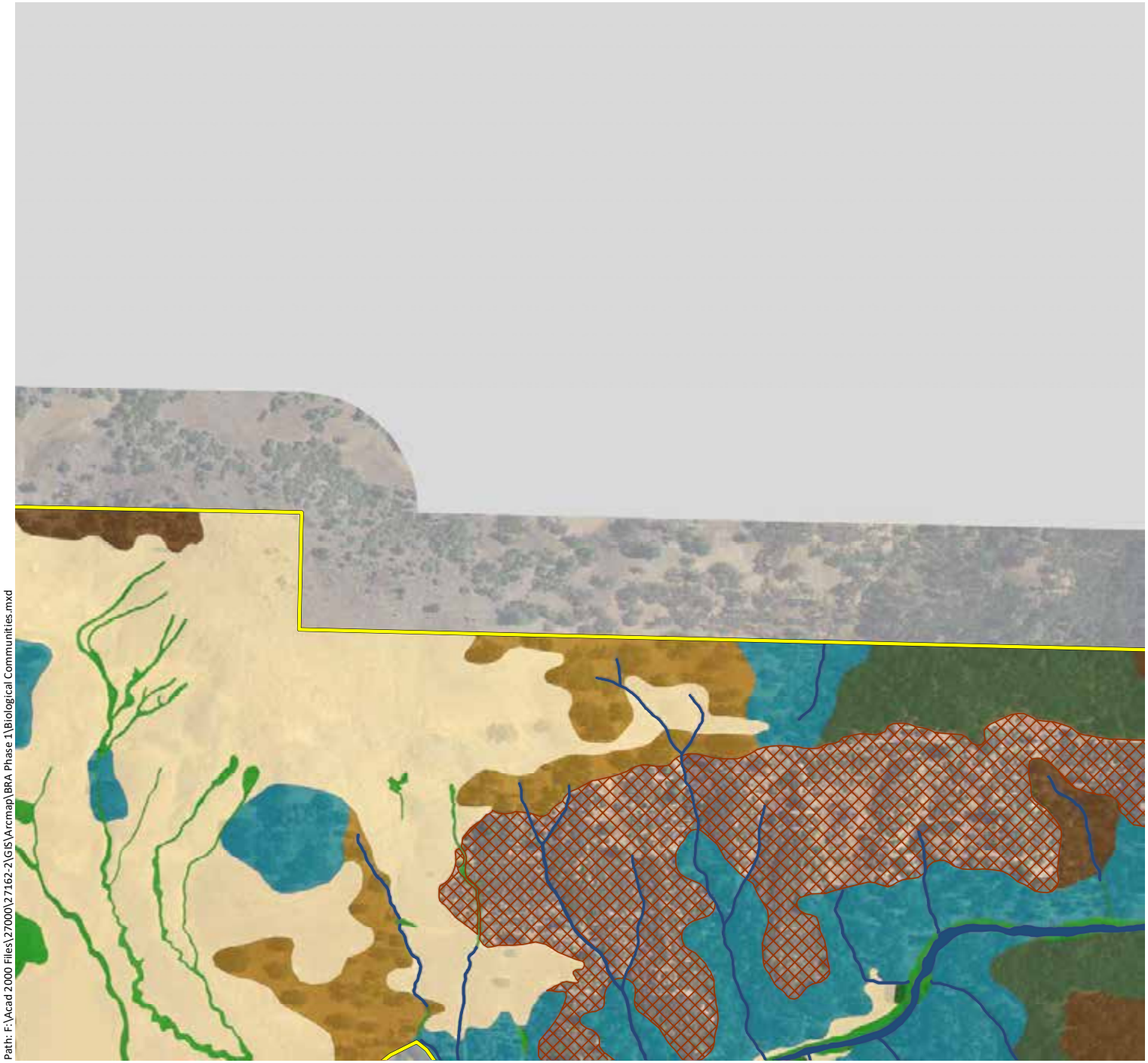
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area (Mapbook Sheet 10)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

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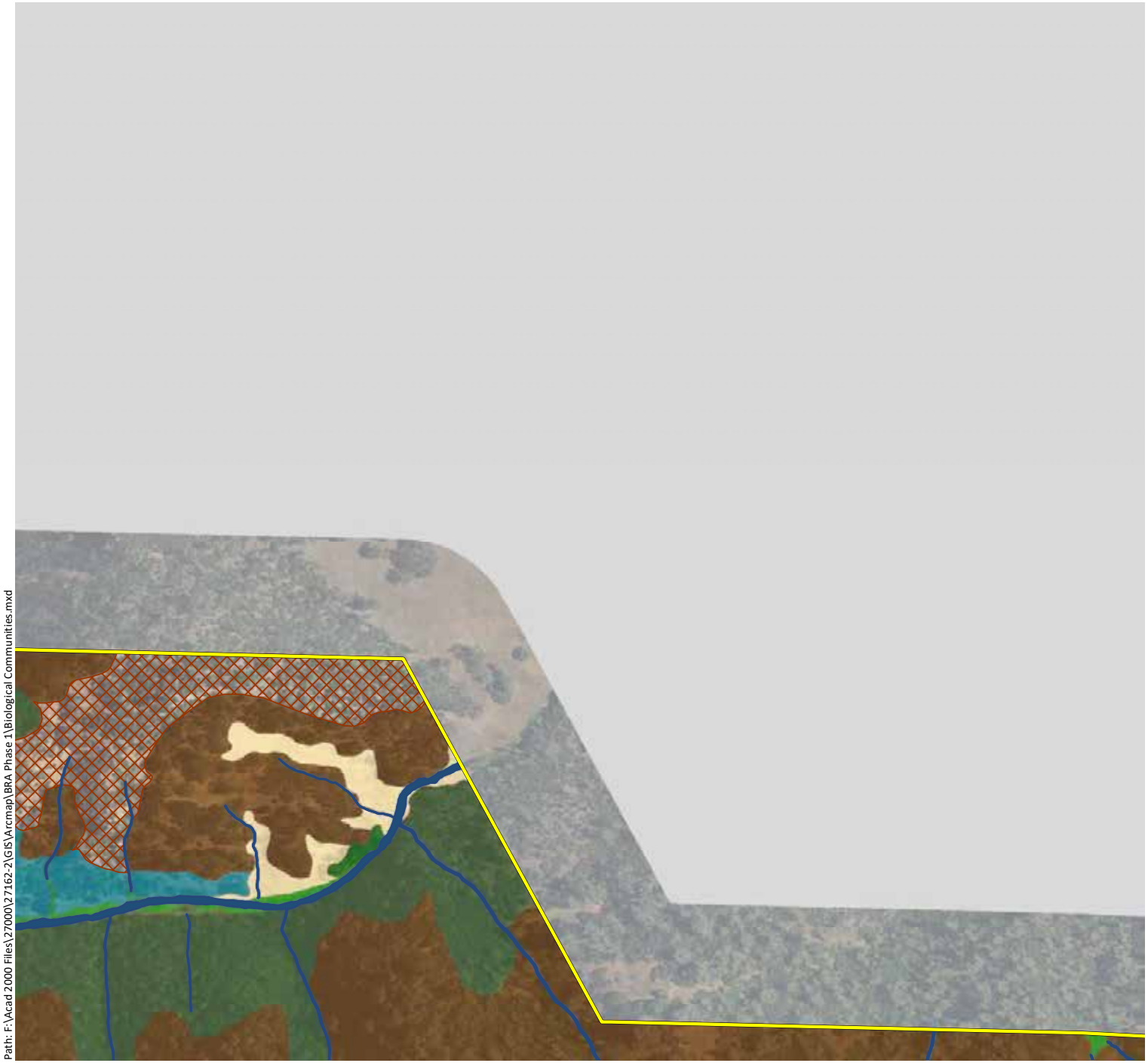
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area (Mapbook Sheet 11)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 12)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

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Feet

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area (Mapbook Sheet 13)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 14)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 15)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

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Feet

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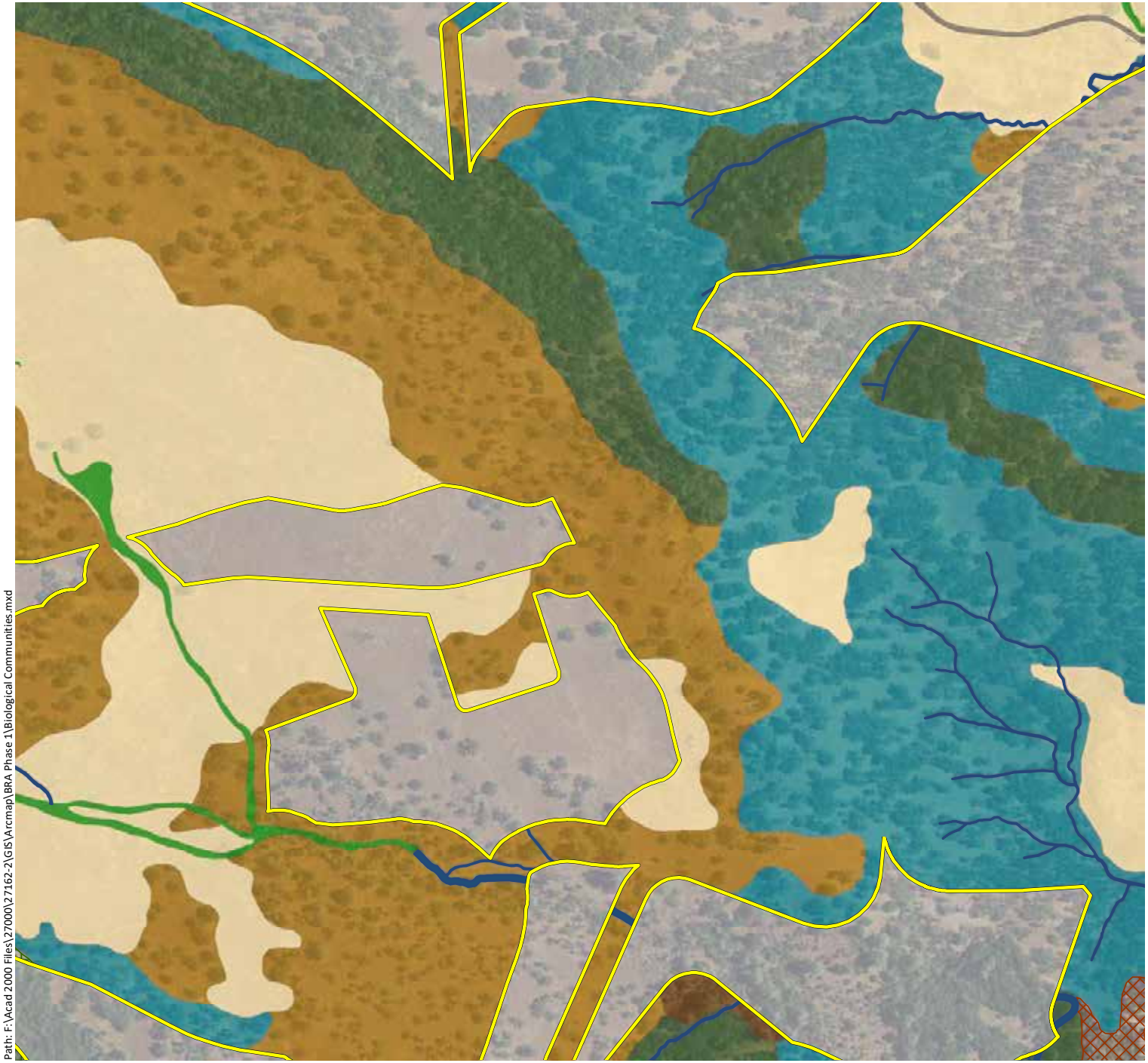
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Biological Communities.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 16)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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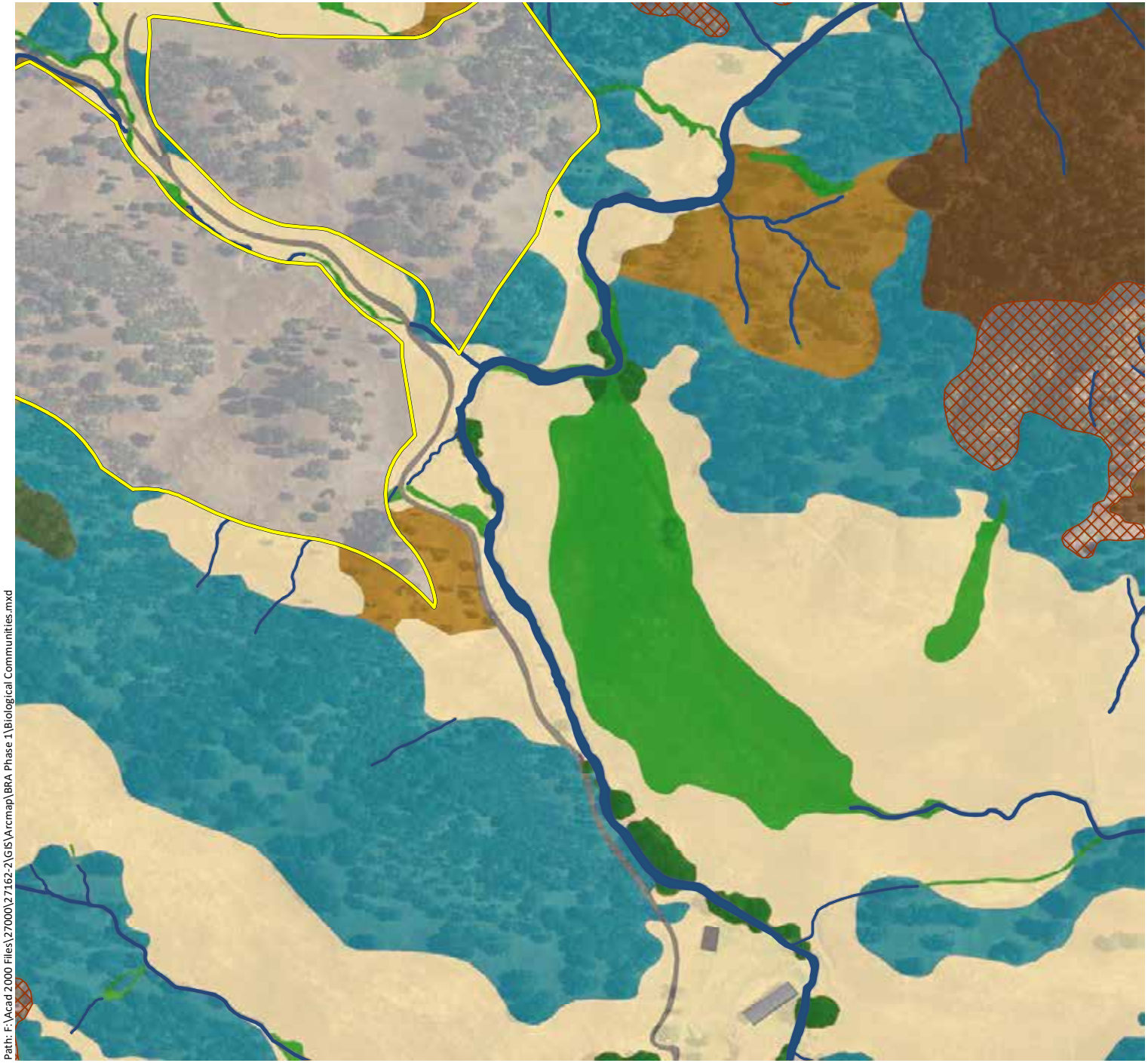
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 17)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area (Mapbook Sheet 18)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 19)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 20)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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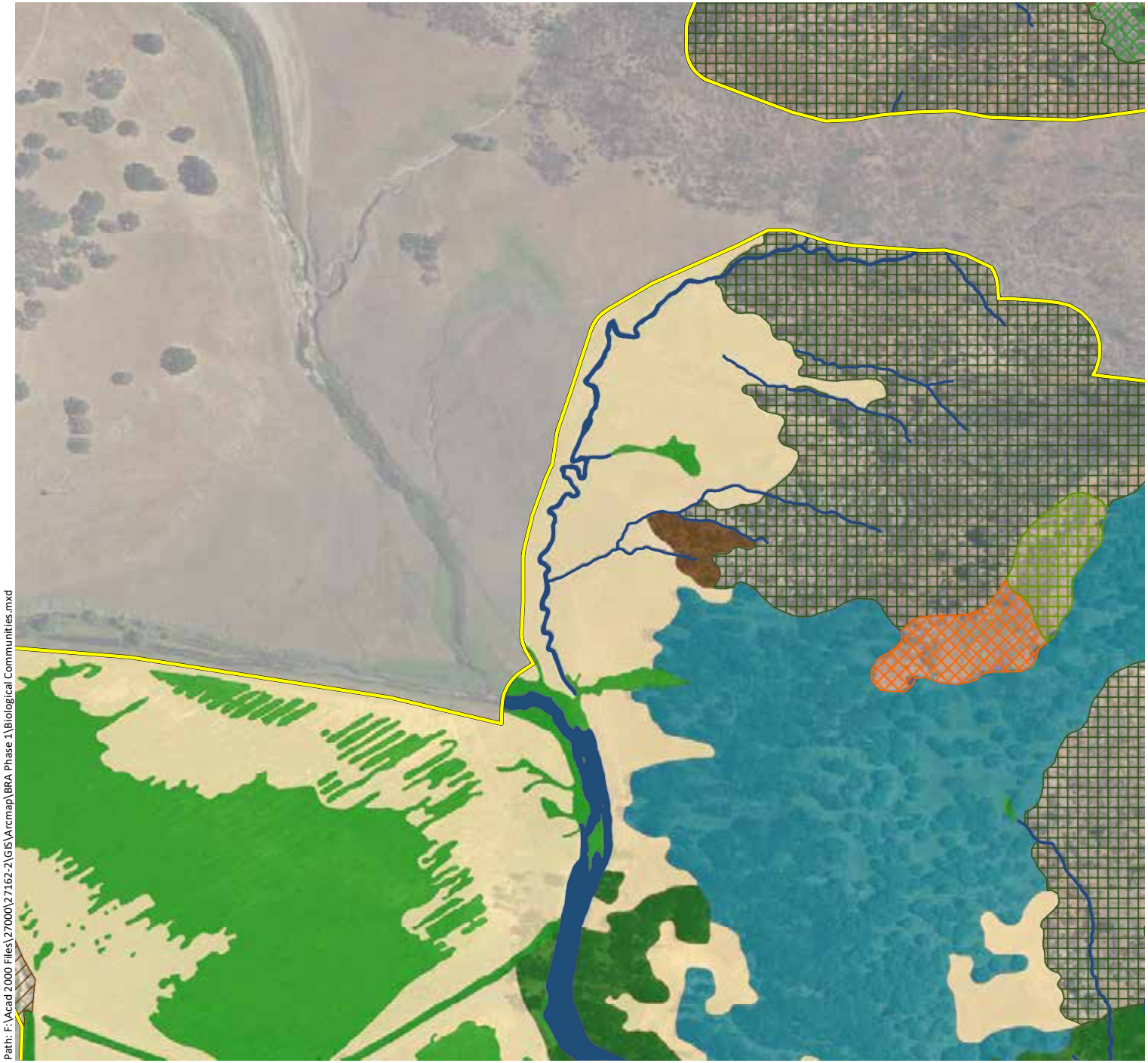
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area (Mapbook Sheet 21)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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ENVIRONMENTAL CONSULTANTS

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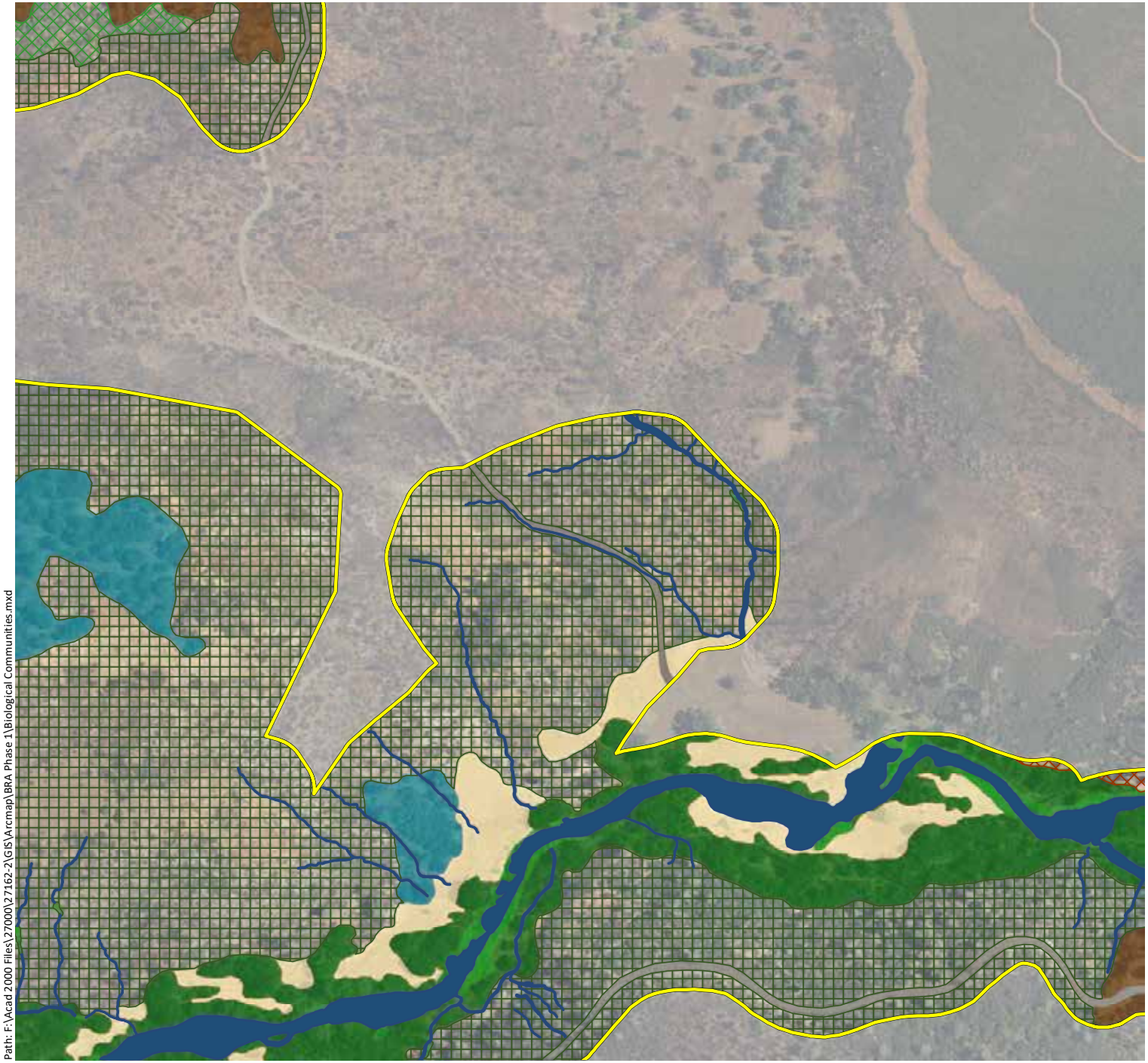
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area (Mapbook Sheet 22)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Biological Communities.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 23)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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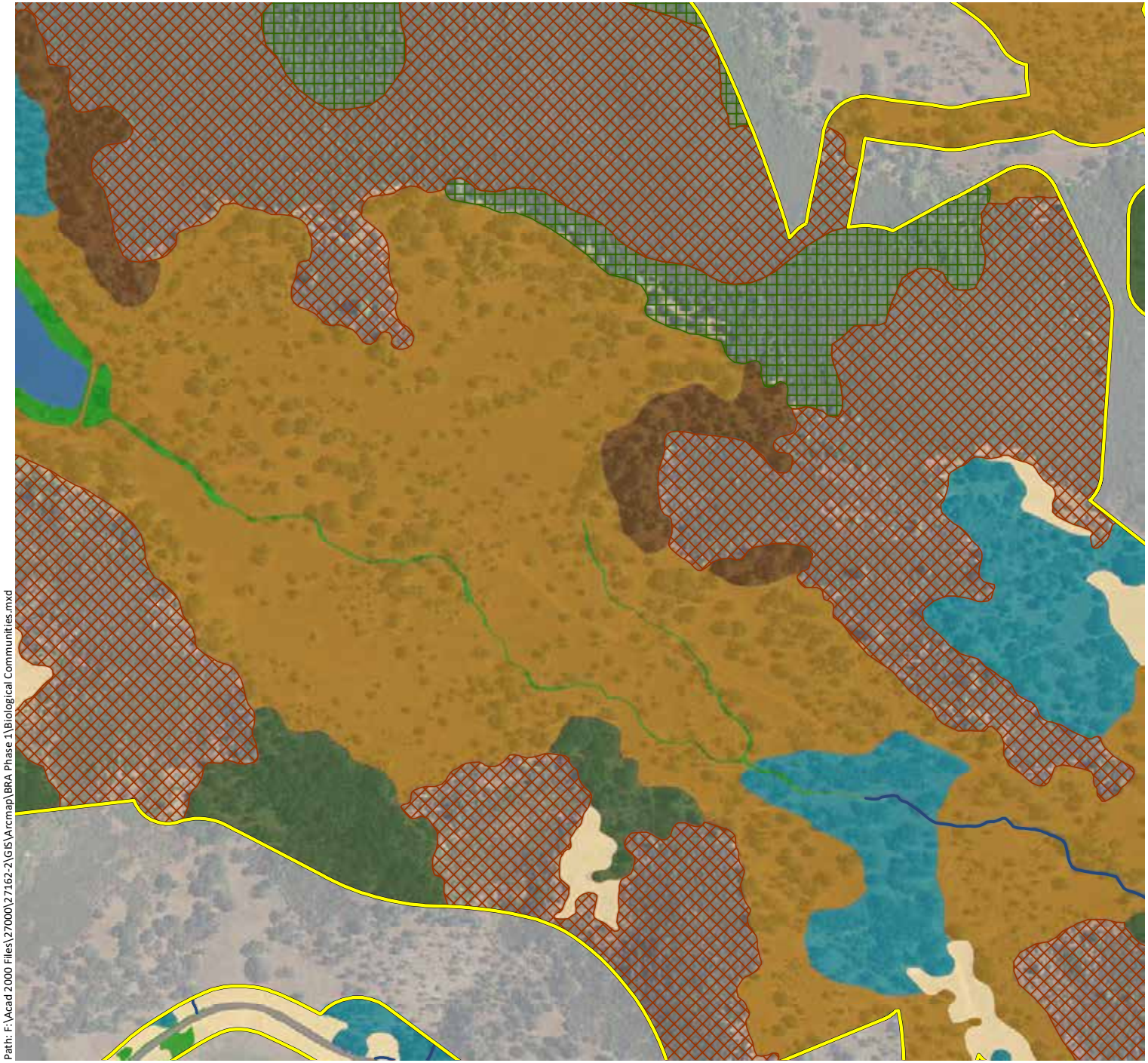
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Biological Communities.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 24)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

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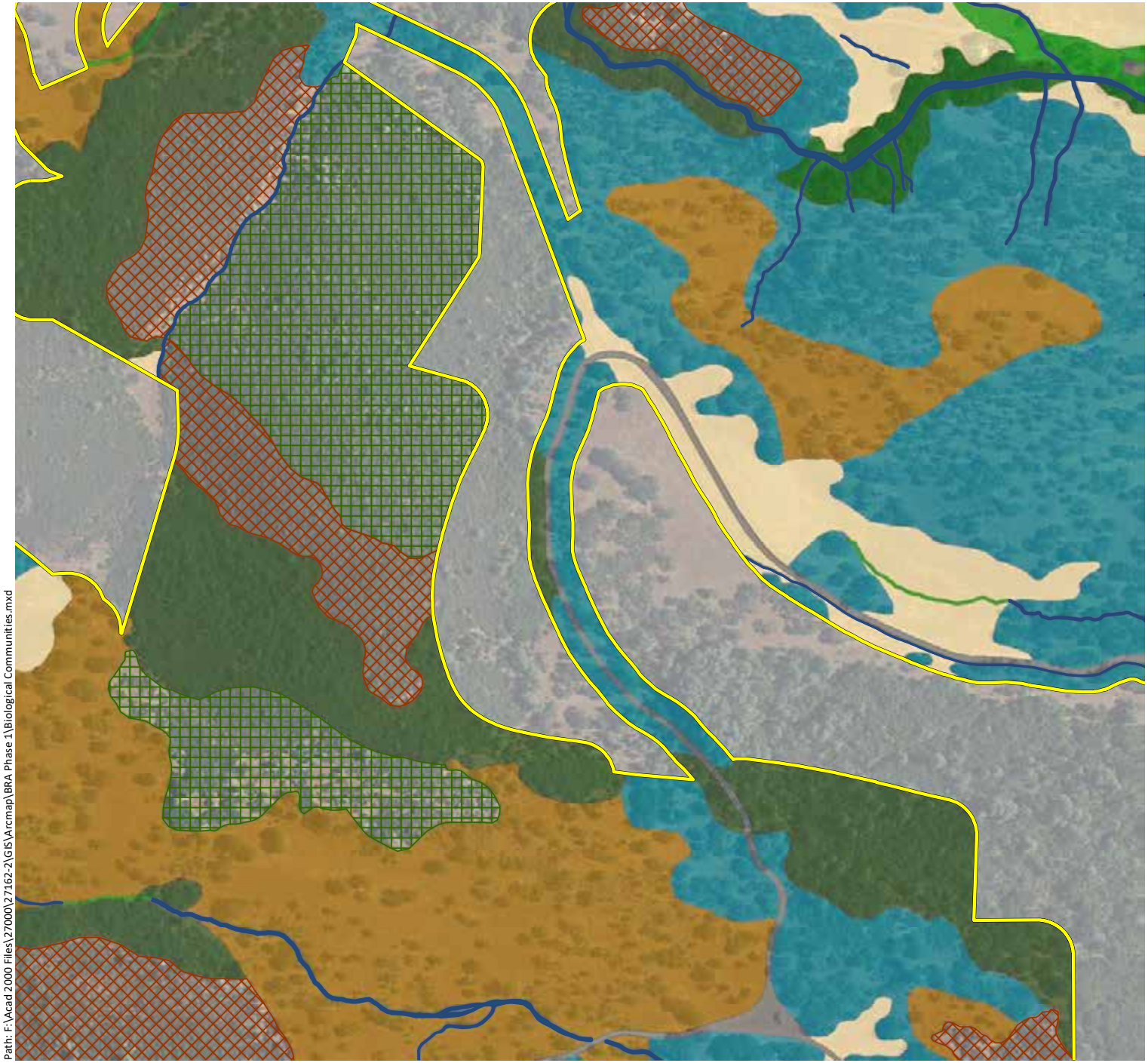
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area (Mapbook Sheet 25)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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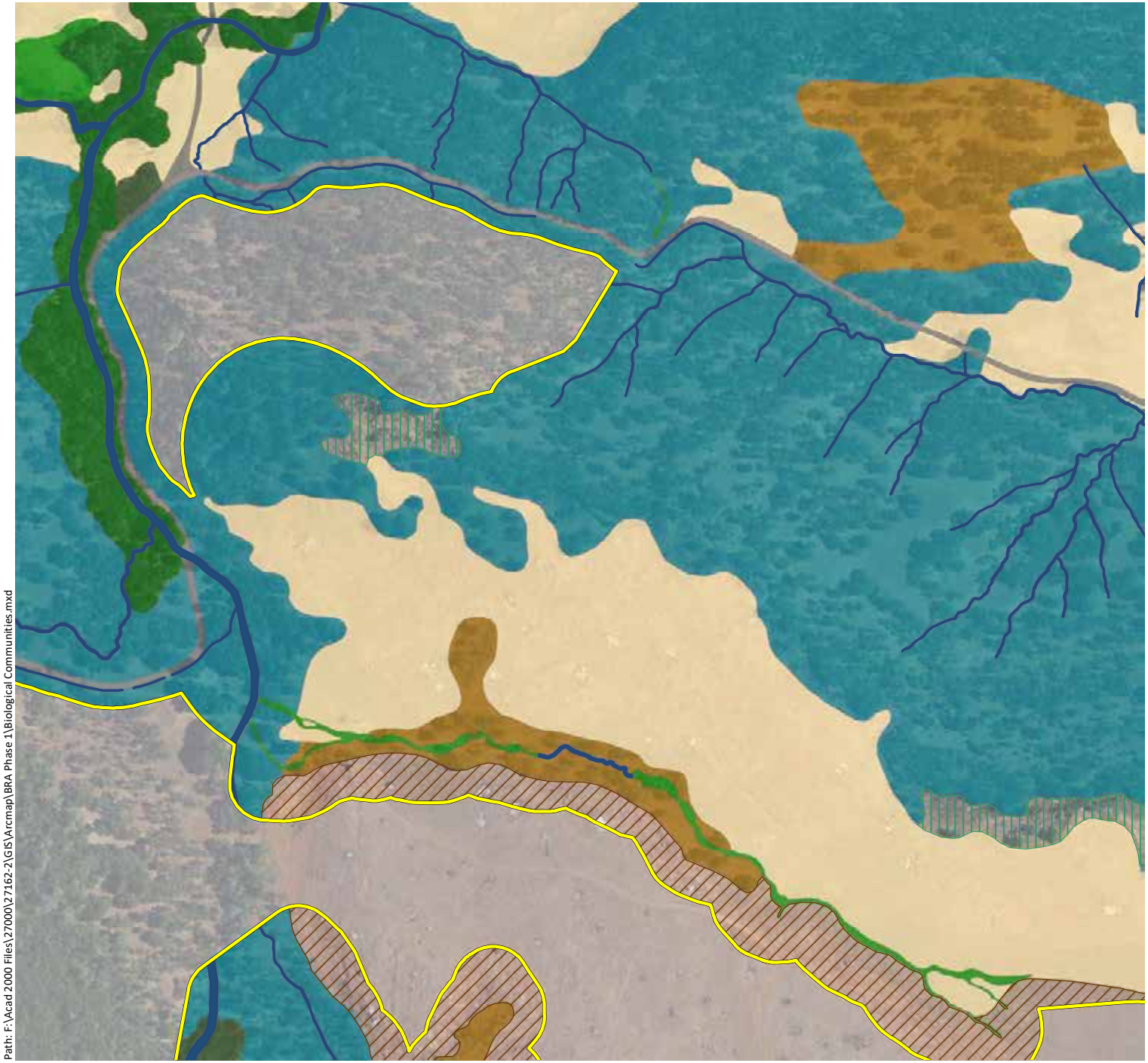
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 26)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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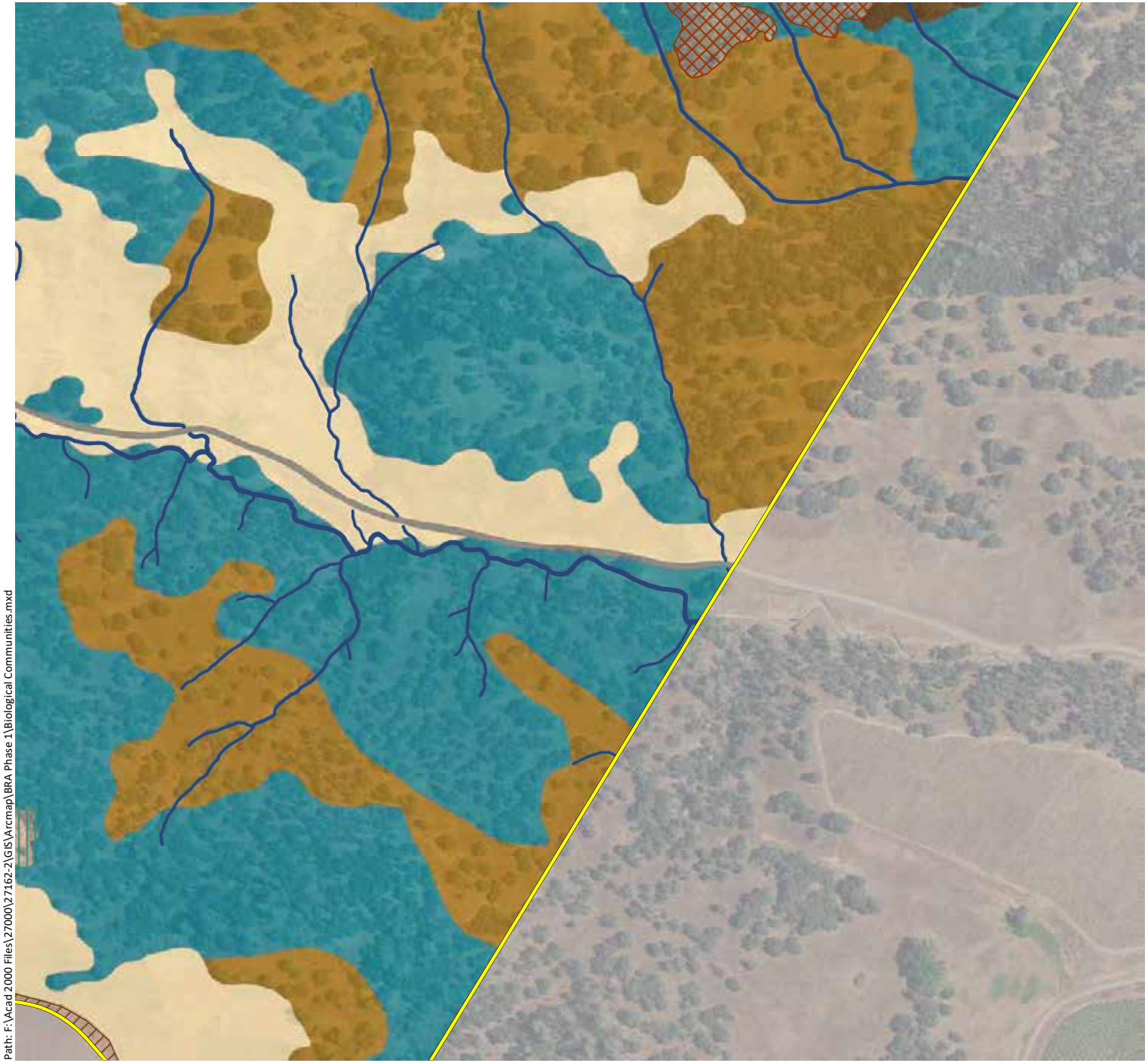
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Biological Communities.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 27)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 28)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Biological Communities.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 29)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Biological Communities.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 30)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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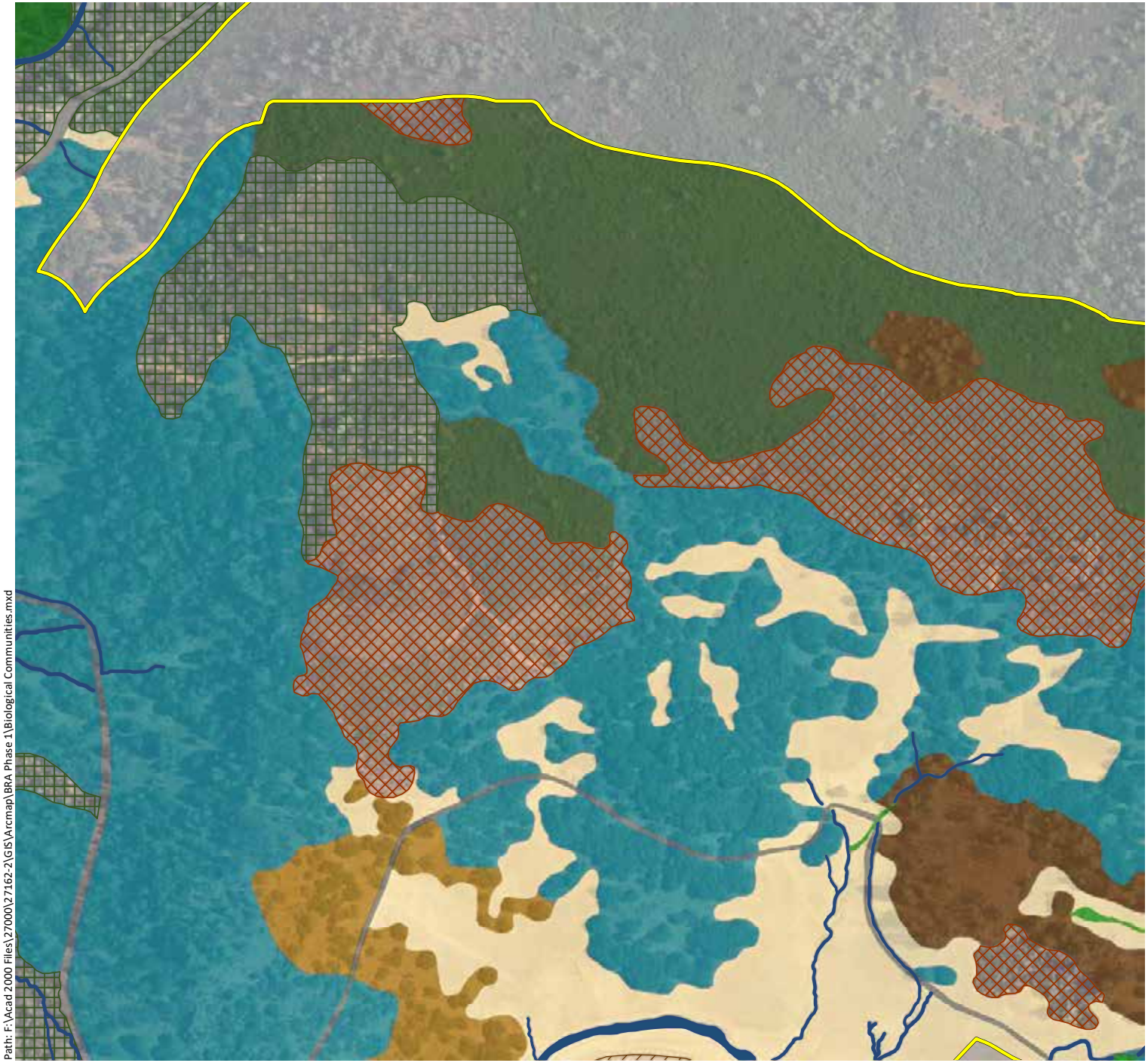
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Biological Communities.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 31)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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ENVIRONMENTAL CONSULTANTS

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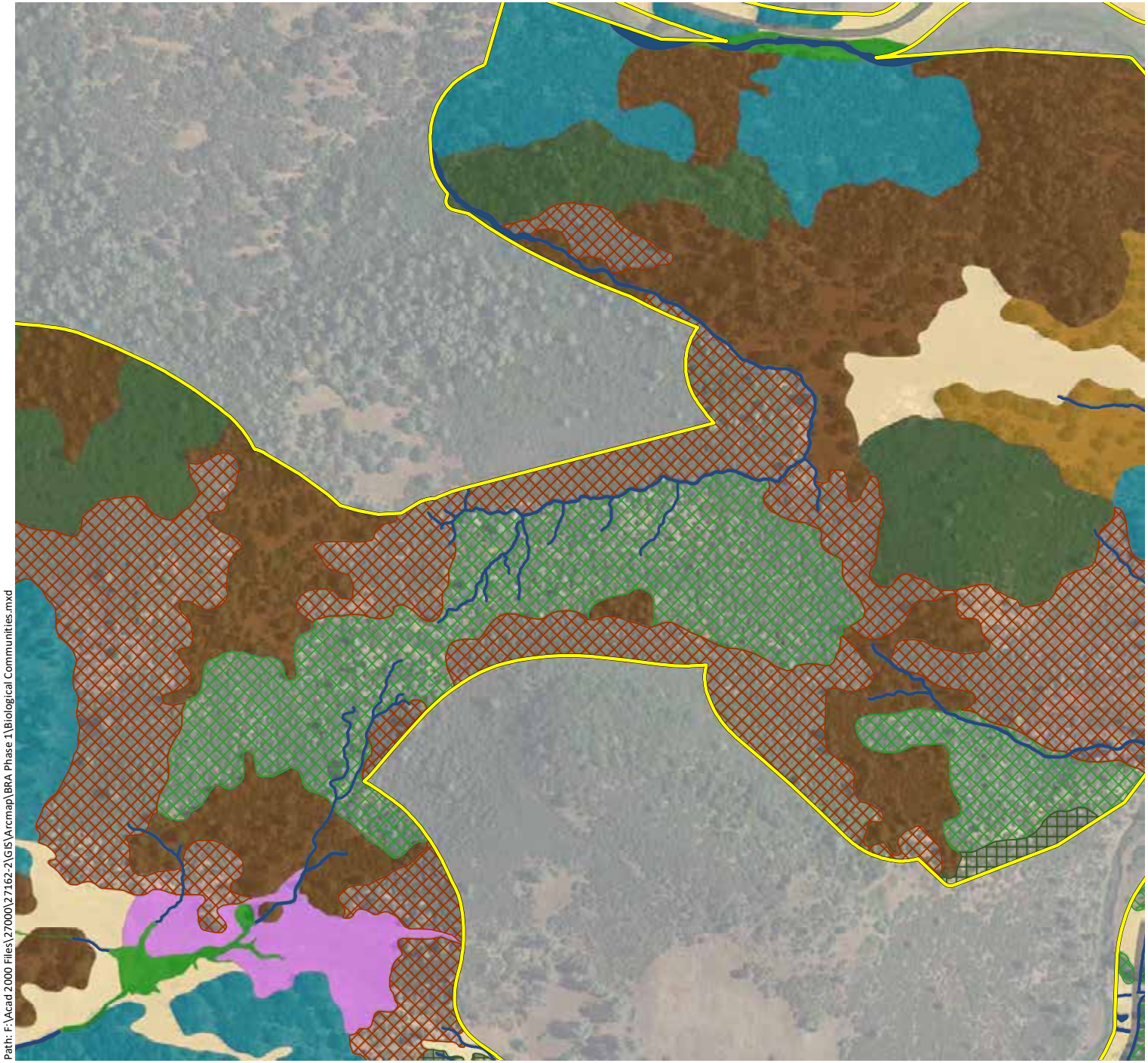
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 32)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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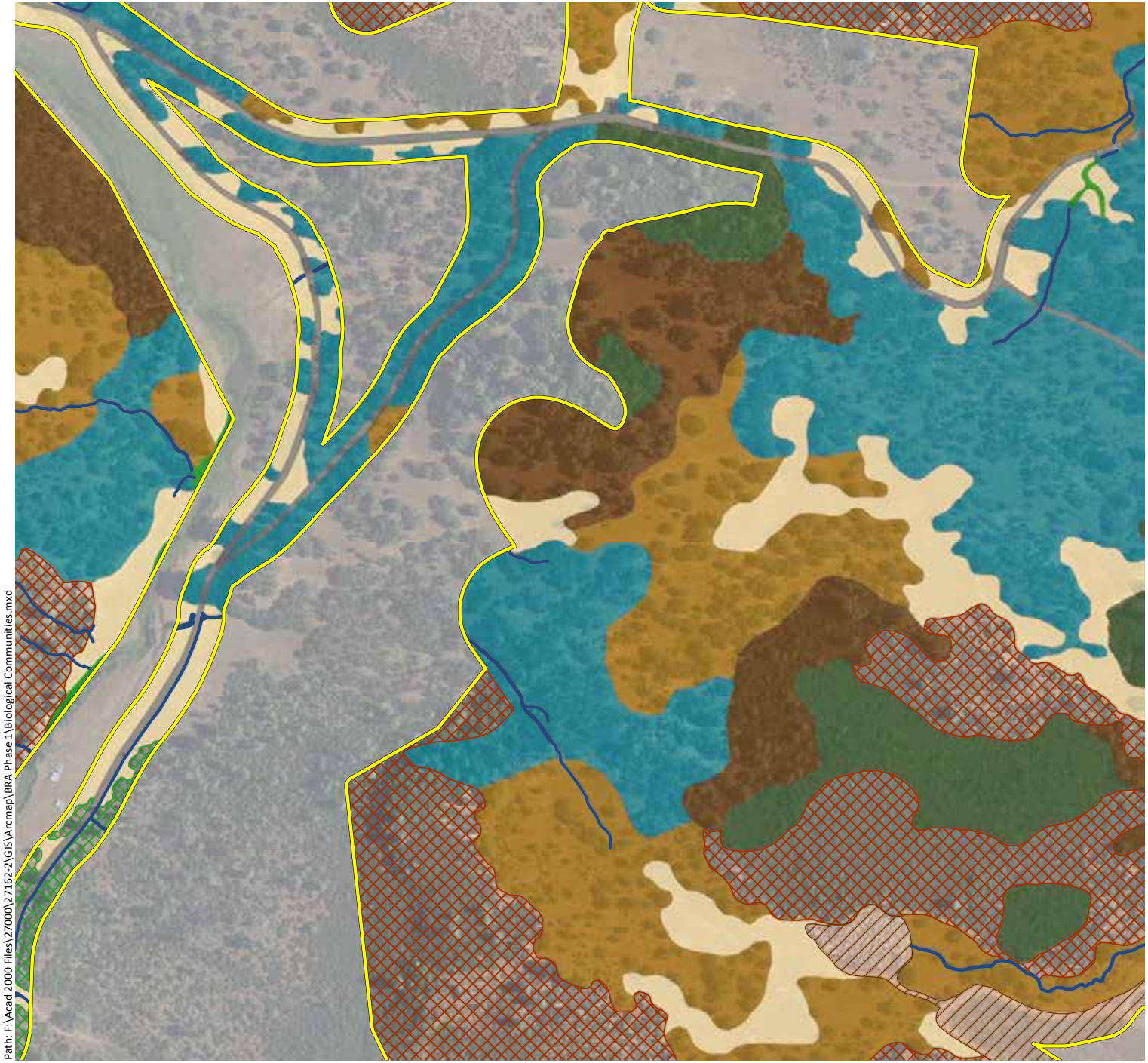
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 33)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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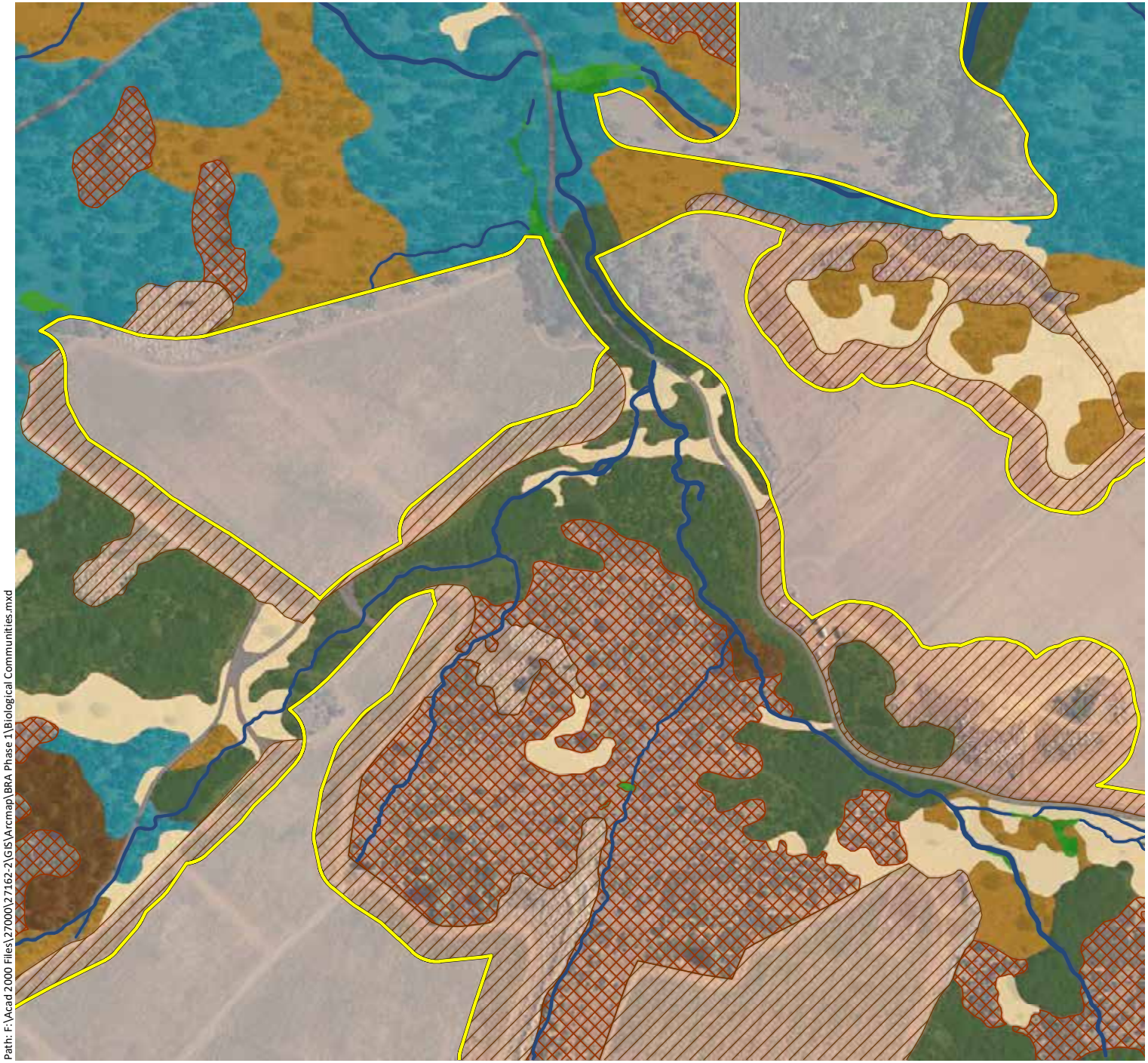
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 34)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Biological Communities.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 35)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 36)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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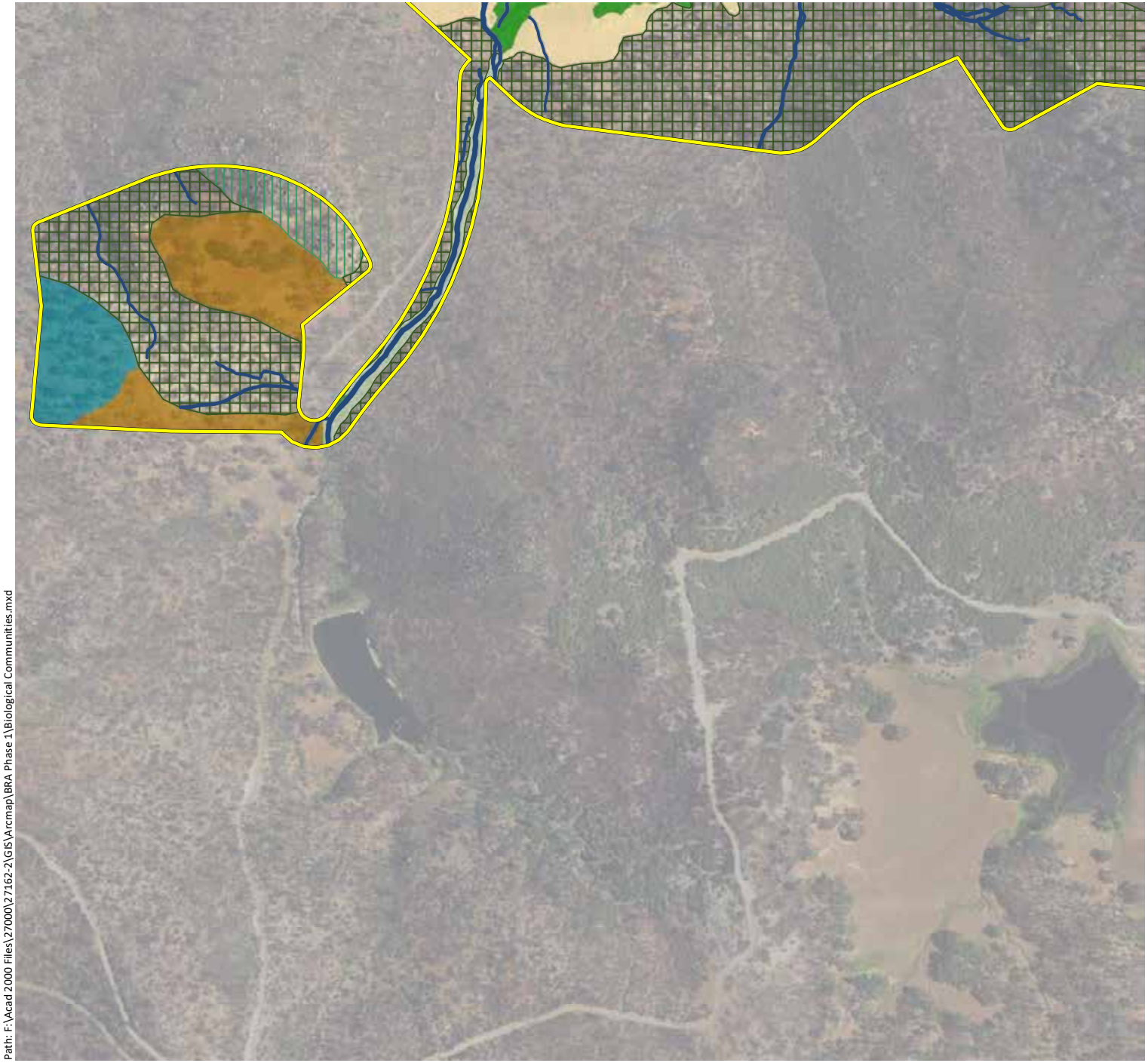
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Biological Communities.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 37)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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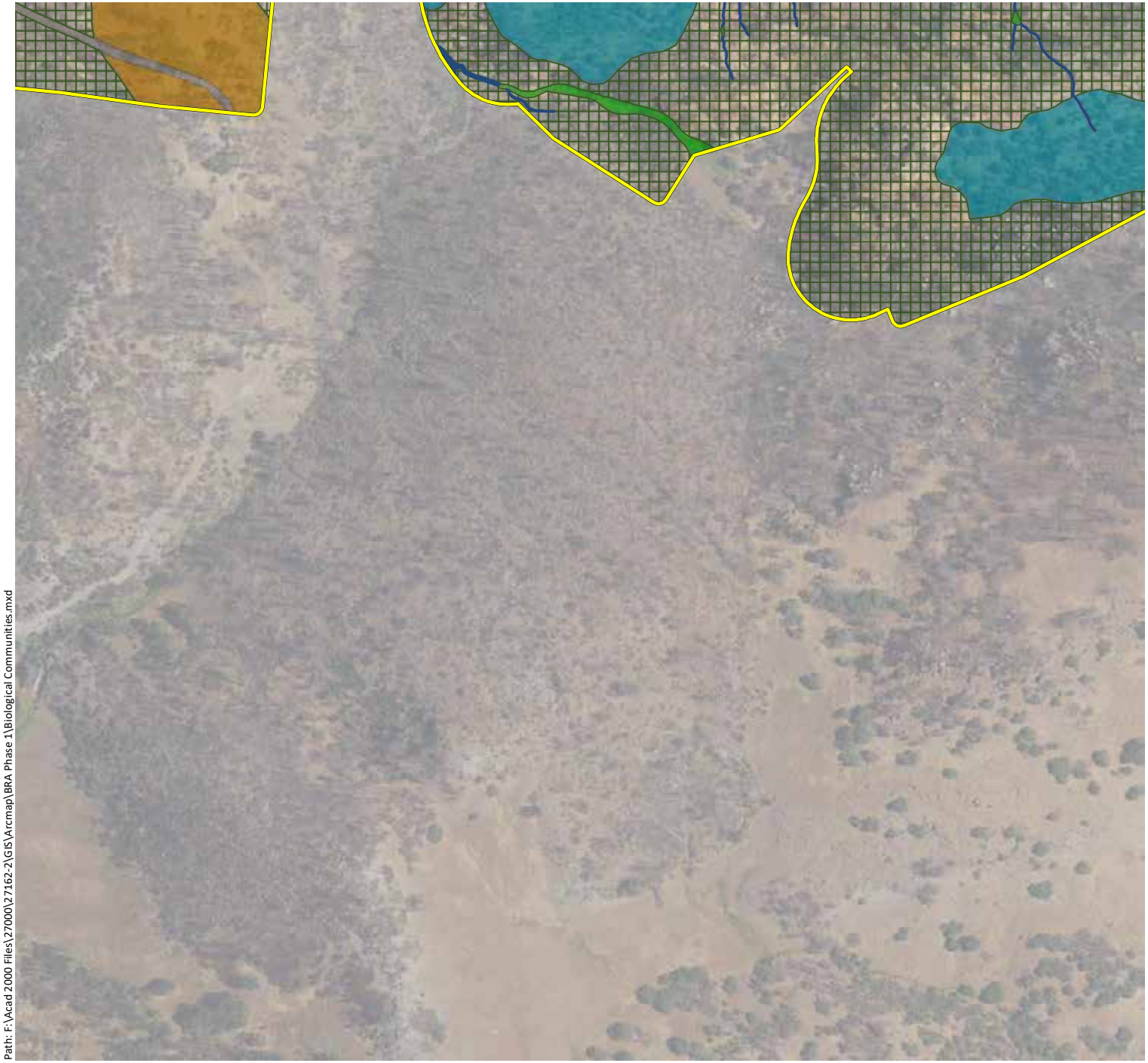
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 38)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 39)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area (Mapbook Sheet 40)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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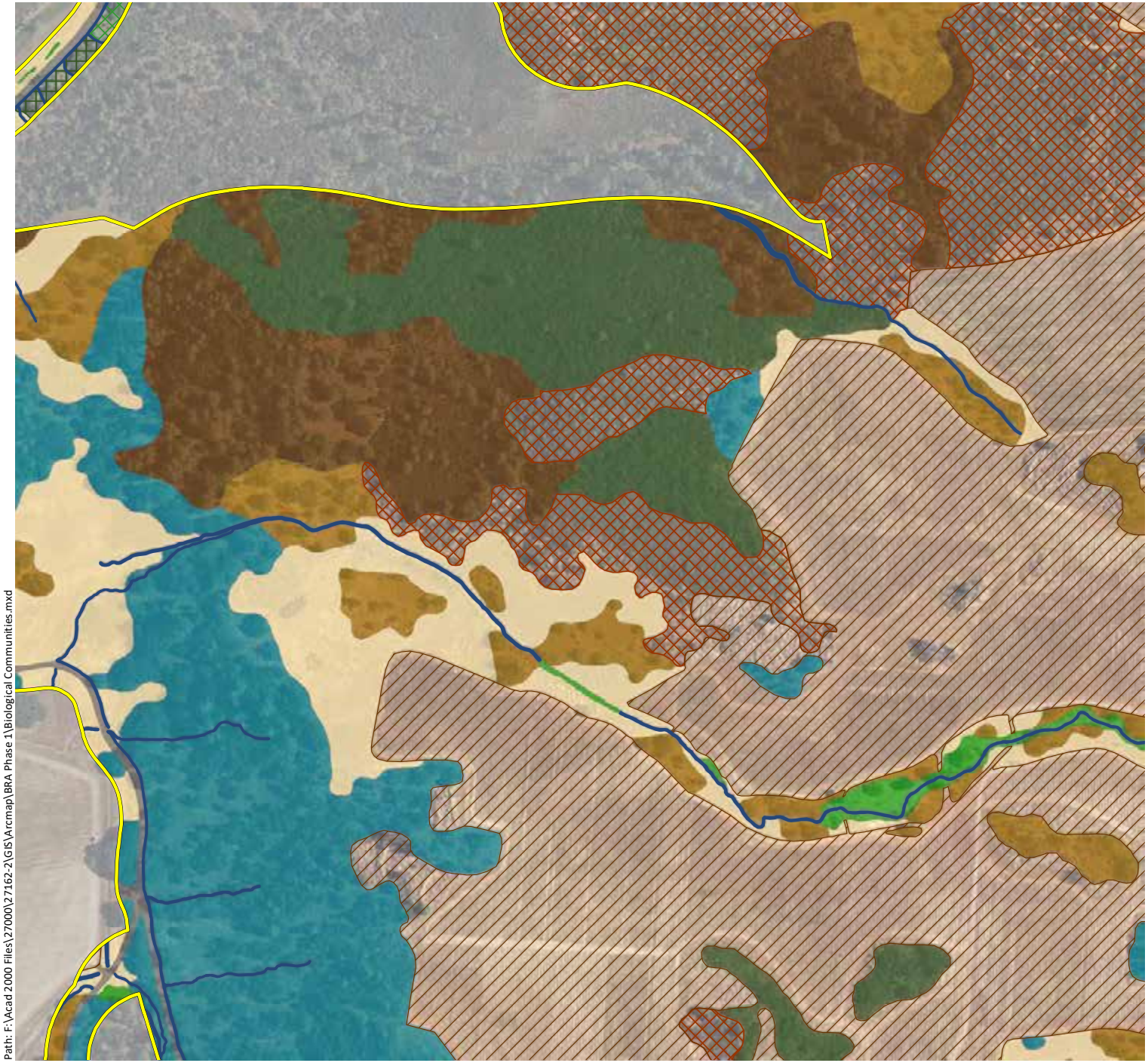
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area (Mapbook Sheet 41)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 42)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area (Mapbook Sheet 43)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Biological Communities.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 44)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Biological Communities.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 45)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

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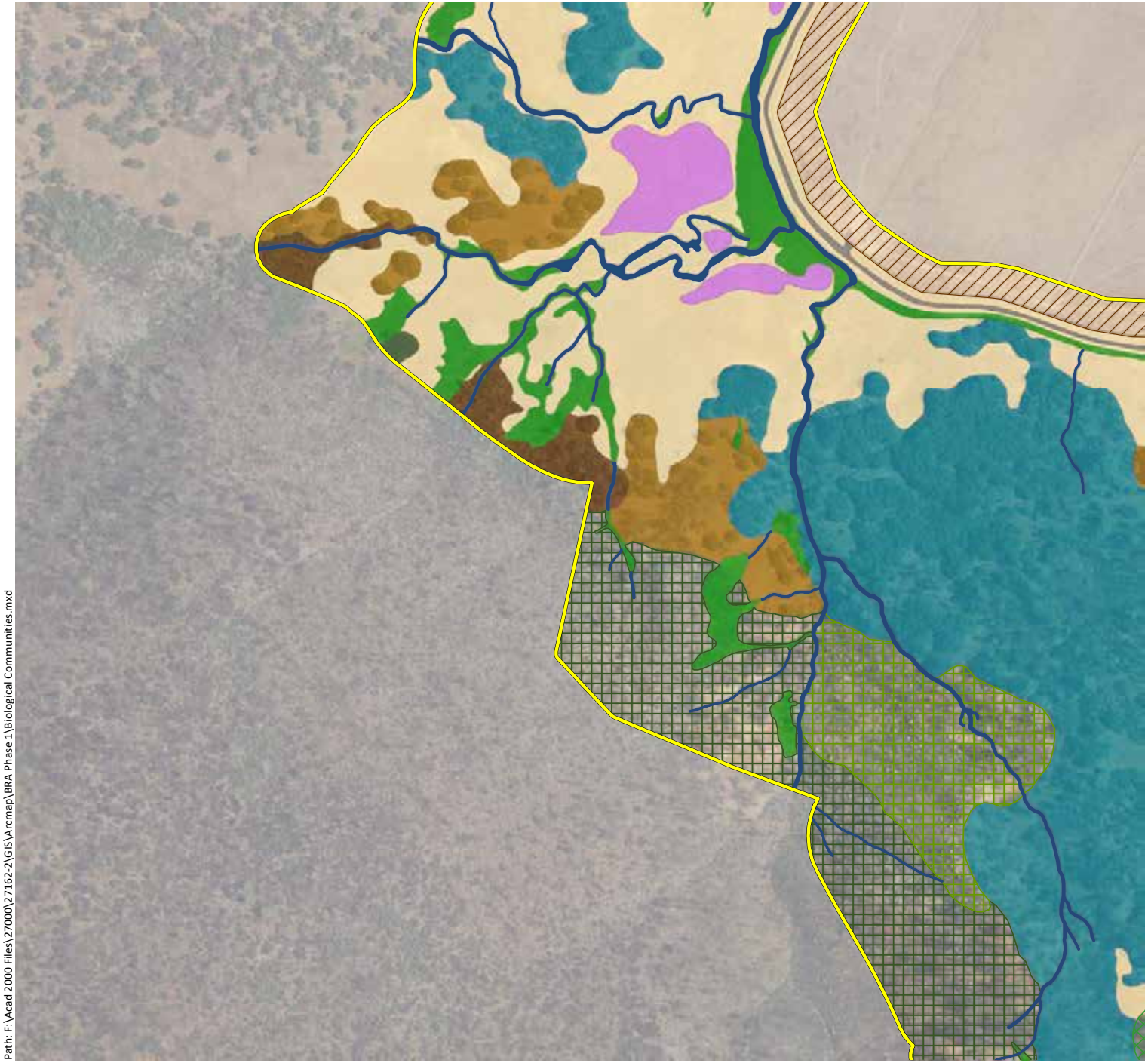
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 46)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

wra
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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area (Mapbook Sheet 47)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Biological Communities.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 48)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Biological Communities.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 49)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area (Mapbook Sheet 50)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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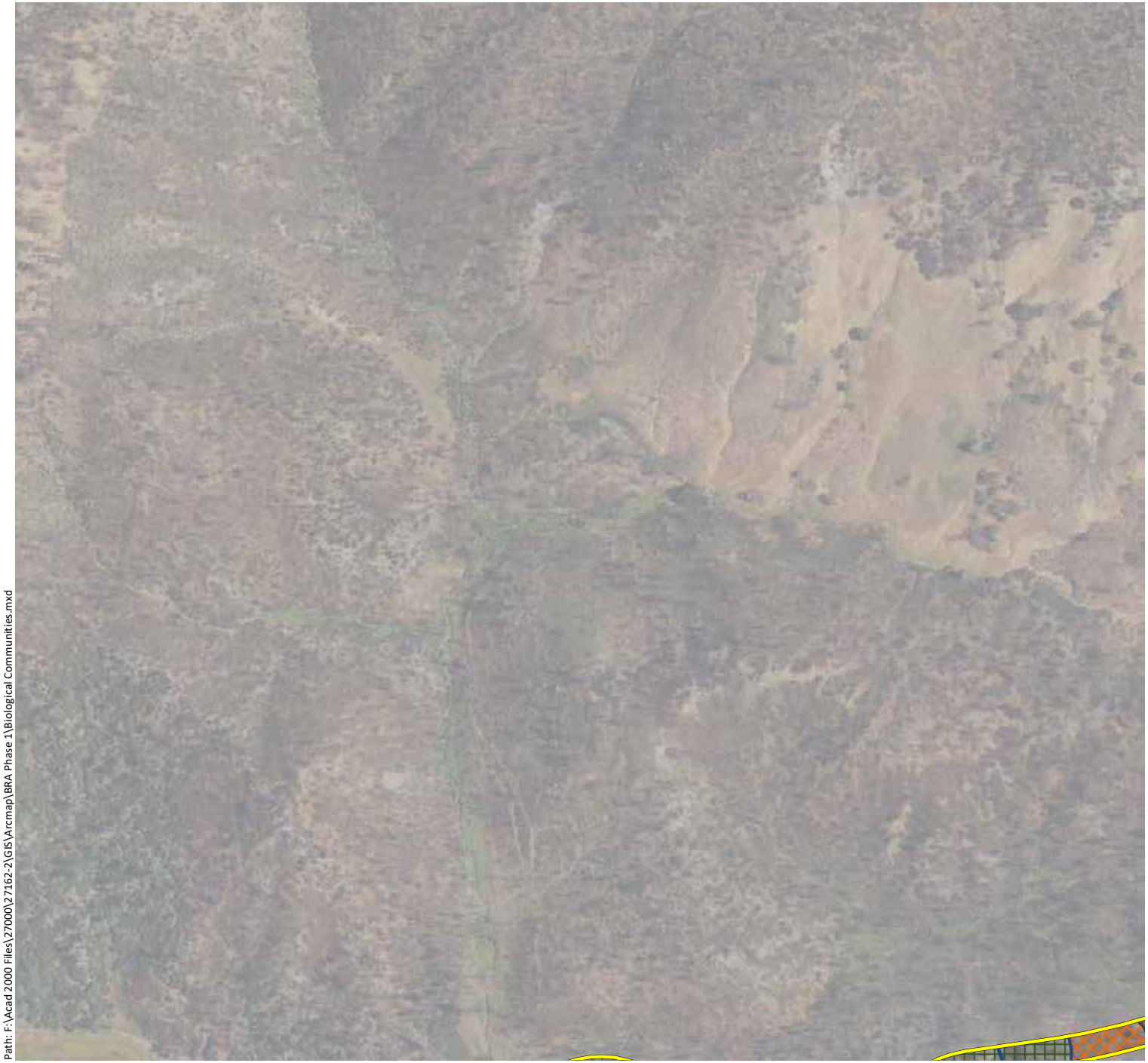
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Biological Communities.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 51)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 52)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 53)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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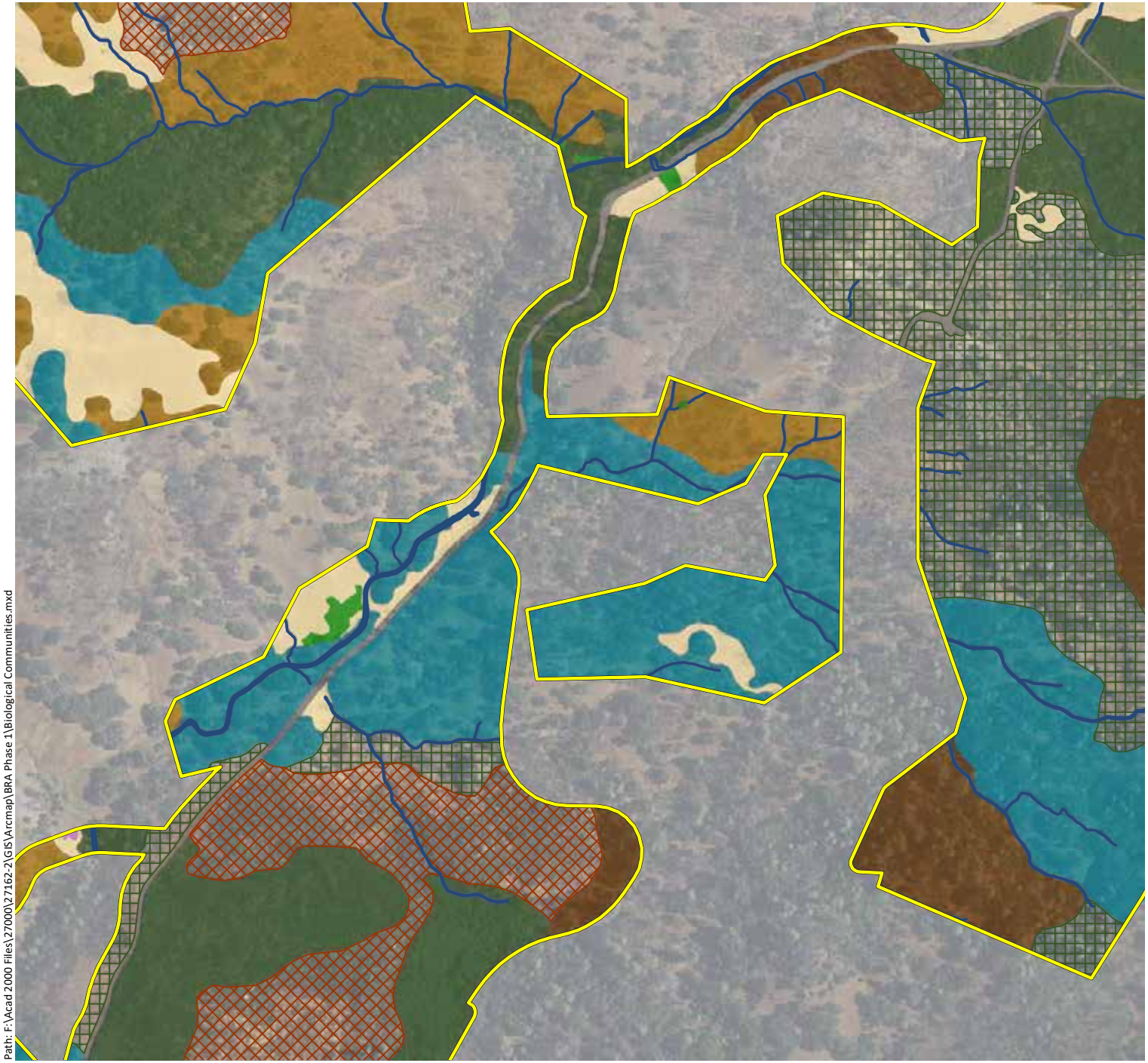
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Biological Communities.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 54)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 55)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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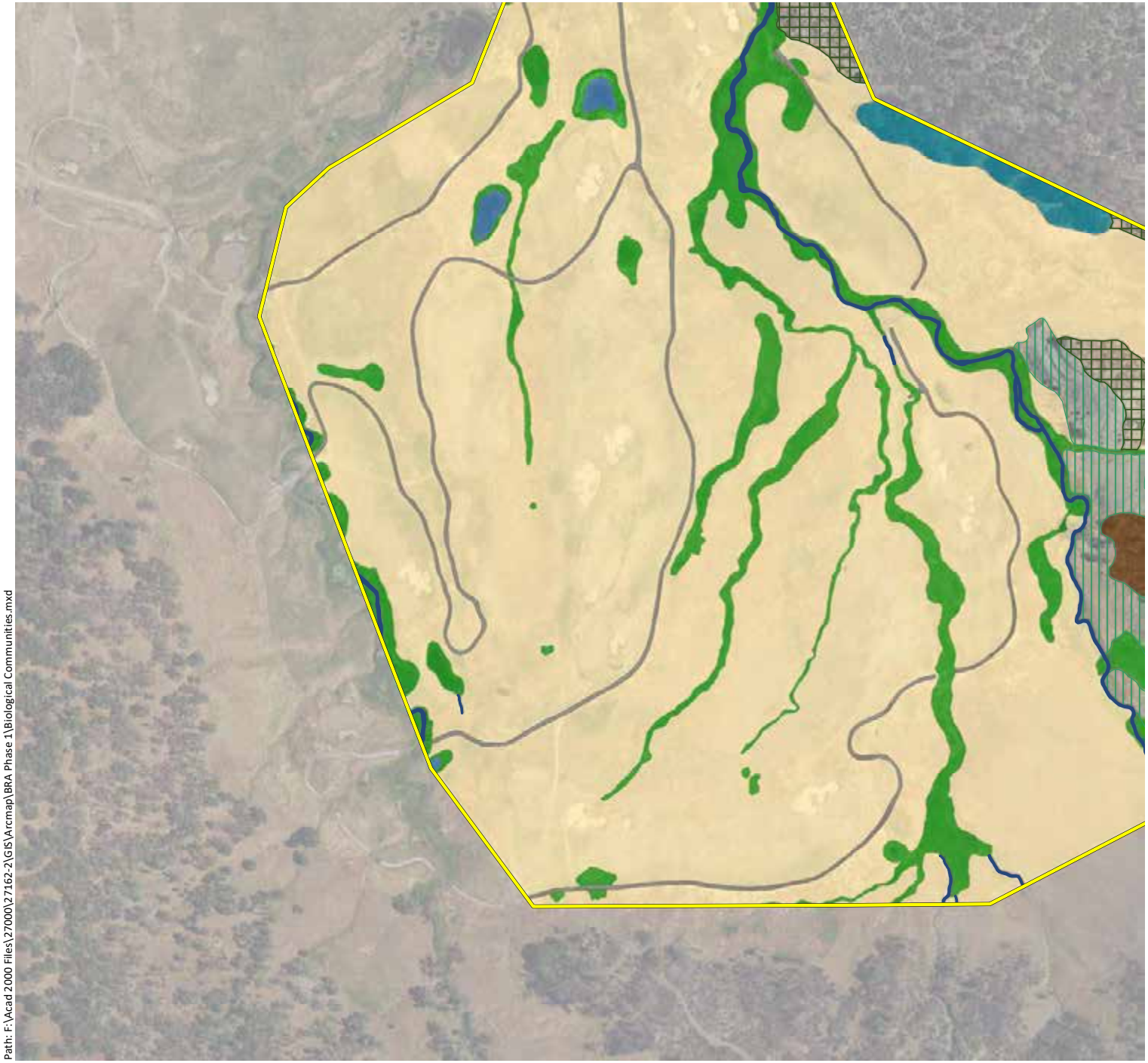
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 56)
Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

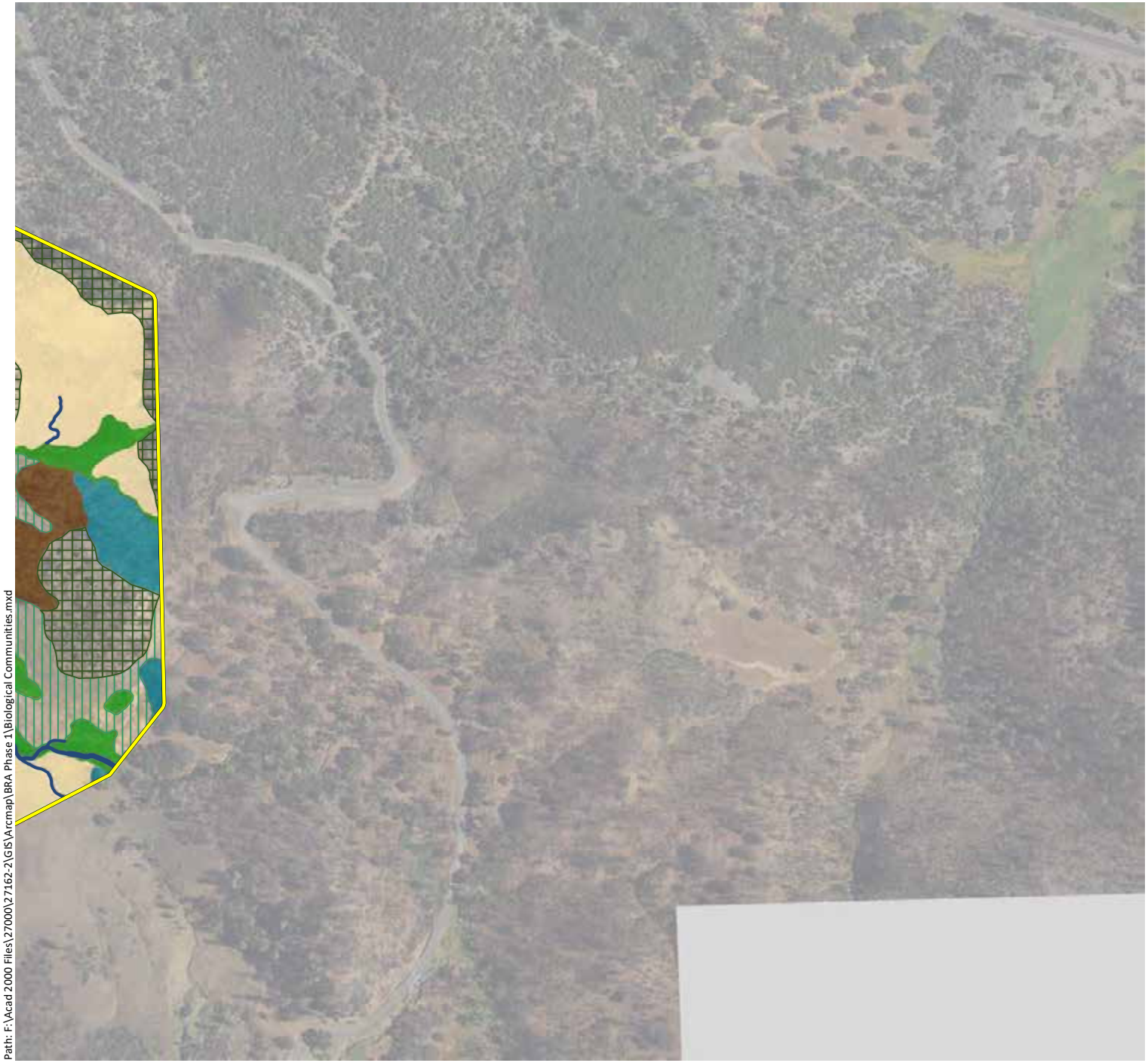
wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Biological Communities.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area (Mapbook Sheet 57)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

wra

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Biological Communities.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area (Mapbook Sheet 58)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

0 500 1,000

Feet

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 59)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

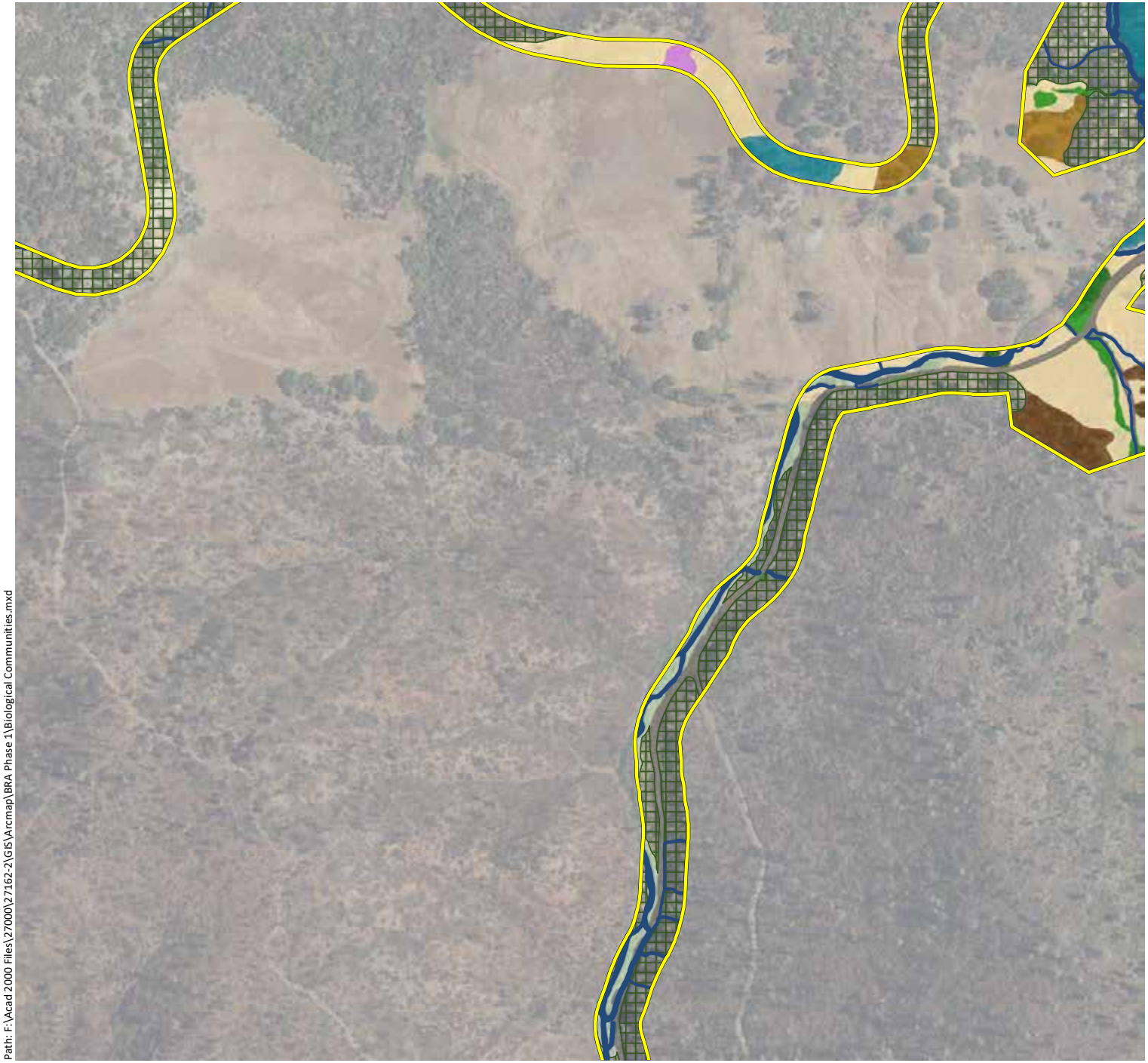
0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Biological Communities.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 60)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

N

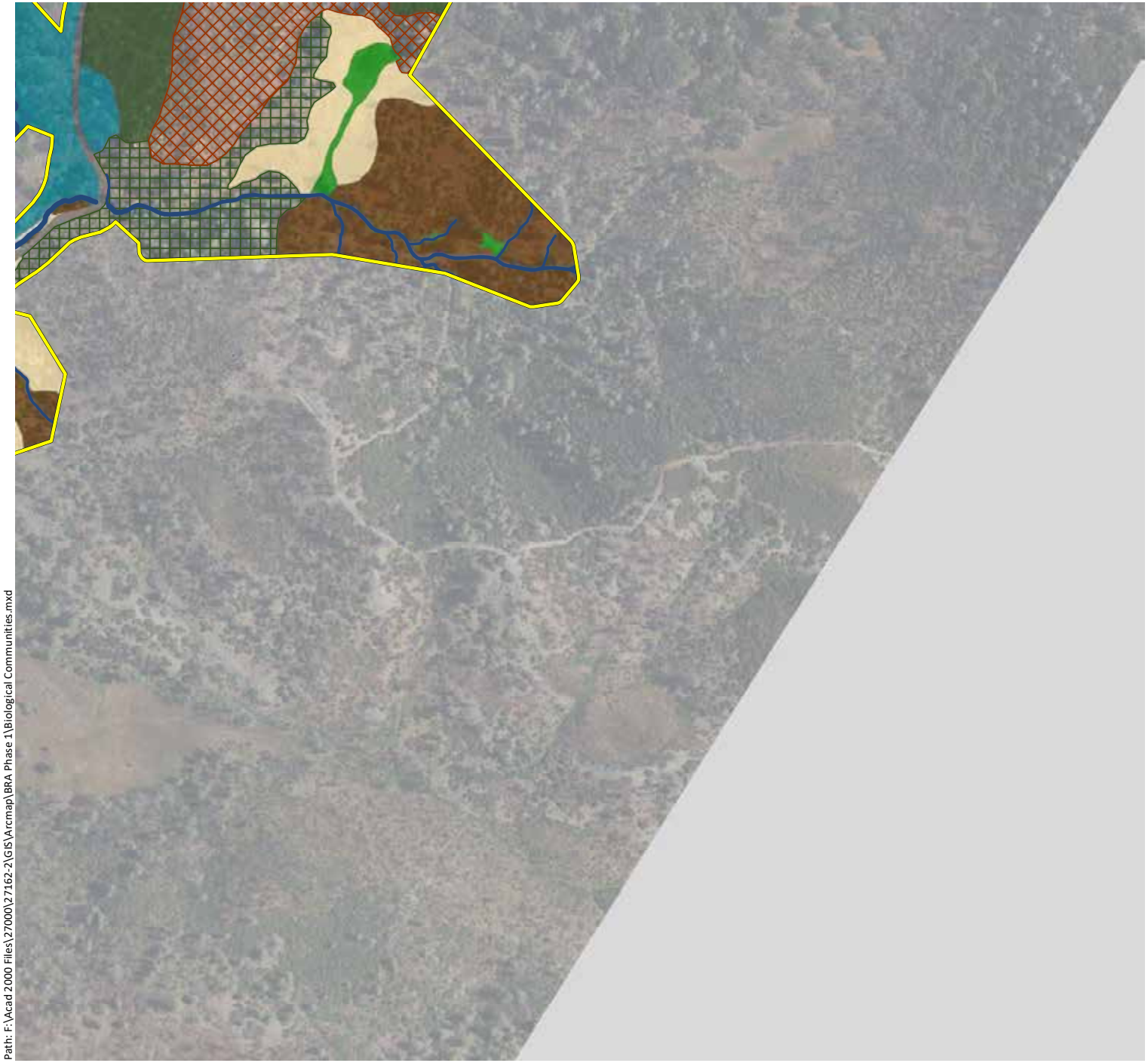
0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Biological Communities.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area (Mapbook Sheet 61)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

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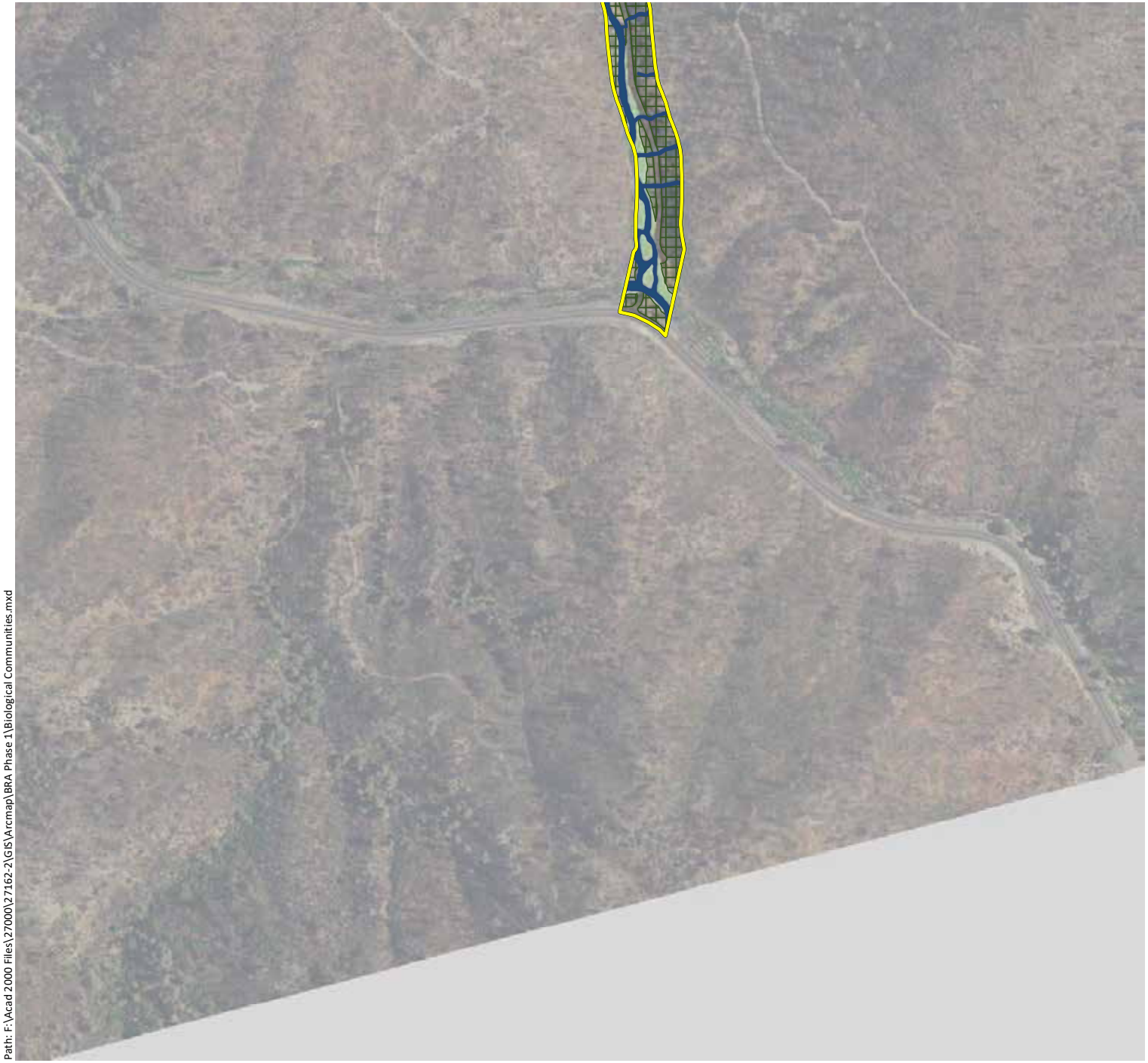
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 1 Study Area
(Mapbook Sheet 62)
Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Sensitive Communities

- Musk Brush Chaparral - 31.1 ac.
- Blue Oak Savanna - 485.9 ac.
- Blue Oak Woodland - 1,041.1 ac.
- Valley Oak Woodland - 42.7 ac.
- Interior Live Oak Woodland - 318.6 ac.
- White Alder Groves - 0.6 ac.
- Brewer Willow Thickets - 2.3 ac.
- Purple Needlegrass Grassland - 10.9 ac.
- Emergent Wetlands - 99.3 ac.
- Ponds and Reservoirs - 32.0 ac.
- Streams - 51.4 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 350.5 ac.
- Deer Weed Scrub - 4.7 ac.
- Chamise Chaparral - 541.3 ac.
- Whiteleaf Manzanita Chaparral - 81.0 ac.
- California Yerba Santa Scrub - 7.7 ac.
- Scrub Oak Chaparral - 40.2 ac.
- Leather Oak Chaparral - 316.3 ac.
- Non-native Annual Grasslands - 910.5 ac.
- Rock Outcrop - 15.2 ac.
- Agriculture - 510.9 ac.
- Developed - 82.9 ac.

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 1/8/2020

APPENDIX B

AQUATIC RESOURCES AND RIPARIAN HABITAT MAPPED WITHIN THE PHASE 1 STUDY AREA

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 1)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

Forested Wetlands - 0.61 ac.
Seasonal Wetland Depressions - 0.94 ac.
Seasonal Wetland Ditches - 0.43 ac.
Seasonal Wetland Pond Fringes - 3.51 ac.
Seasonal Wetland Seeps/Swales - 31.91 ac.
Seasonal Wetland Wet Meadows - 40.17 ac.
Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

Ephemeral Ditches - 0.24 ac. & 6,380 LF
Ephemeral Streams - 18.52 ac. & 271,738 LF
Intermittent Streams - 11.86 ac. & 49,732 LF
Perennial Streams - 20.78 ac. & 15,054 LF
Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 2)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 3)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 4)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

Forested Wetlands - 0.61 ac.
Seasonal Wetland Depressions - 0.94 ac.
Seasonal Wetland Ditches - 0.43 ac.
Seasonal Wetland Pond Fringes - 3.51 ac.
Seasonal Wetland Seeps/Swales - 31.91 ac.
Seasonal Wetland Wet Meadows - 40.17 ac.
Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

Ephemeral Ditches - 0.24 ac. & 6,380 LF
Ephemeral Streams - 18.52 ac. & 271,738 LF
Intermittent Streams - 11.86 ac. & 49,732 LF
Perennial Streams - 20.78 ac. & 15,054 LF
Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 5)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 6)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Riparian Woodland - 42.32 ac.

Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 7)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

Forested Wetlands - 0.61 ac.
Seasonal Wetland Depressions - 0.94 ac.
Seasonal Wetland Ditches - 0.43 ac.
Seasonal Wetland Pond Fringes - 3.51 ac.
Seasonal Wetland Seeps/Swales - 31.91 ac.
Seasonal Wetland Wet Meadows - 40.17 ac.
Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

Ephemeral Ditches - 0.24 ac. & 6,380 LF
Ephemeral Streams - 18.52 ac. & 271,738 LF
Intermittent Streams - 11.86 ac. & 49,732 LF
Perennial Streams - 20.78 ac. & 15,054 LF
Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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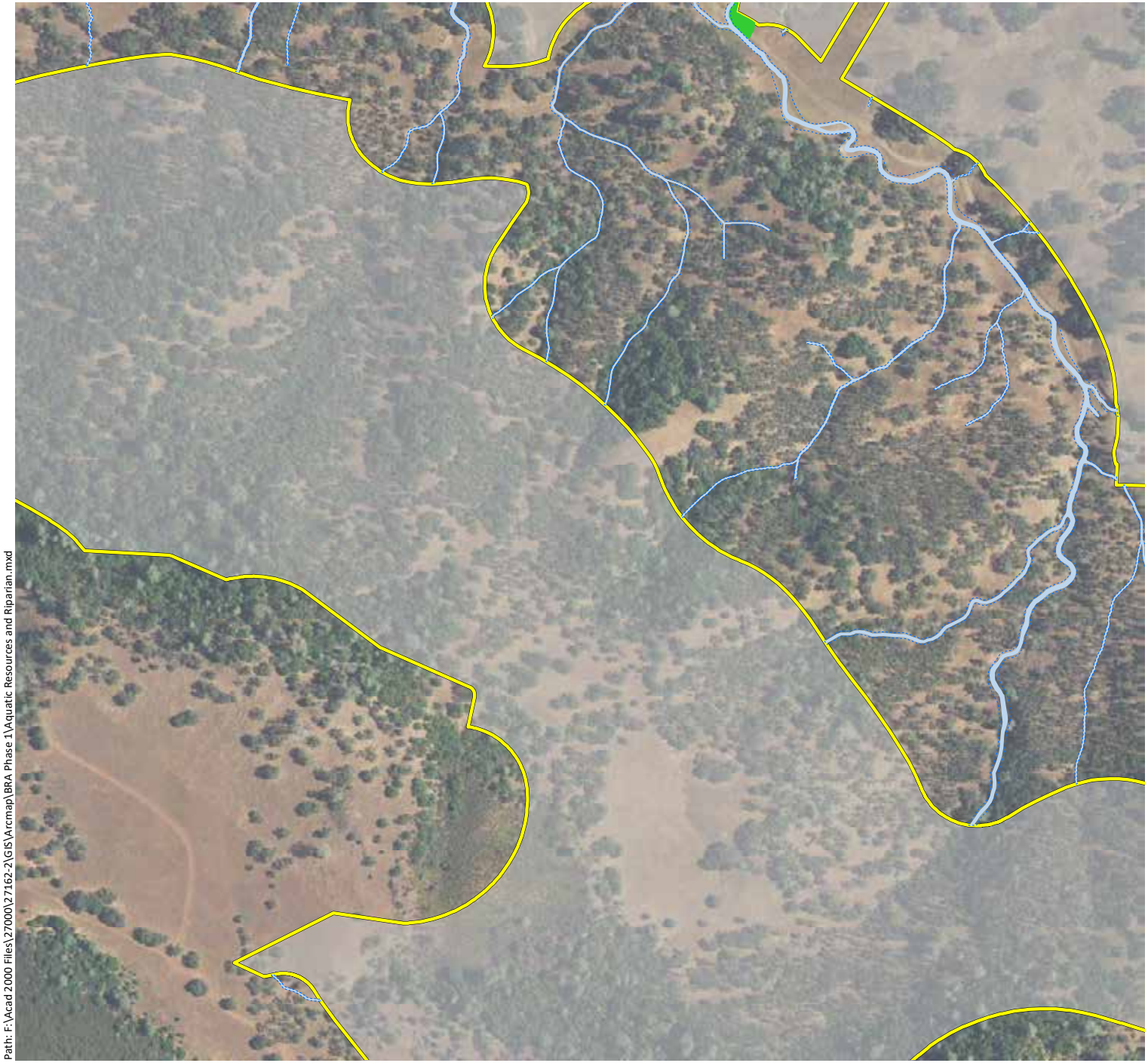
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 8)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 9)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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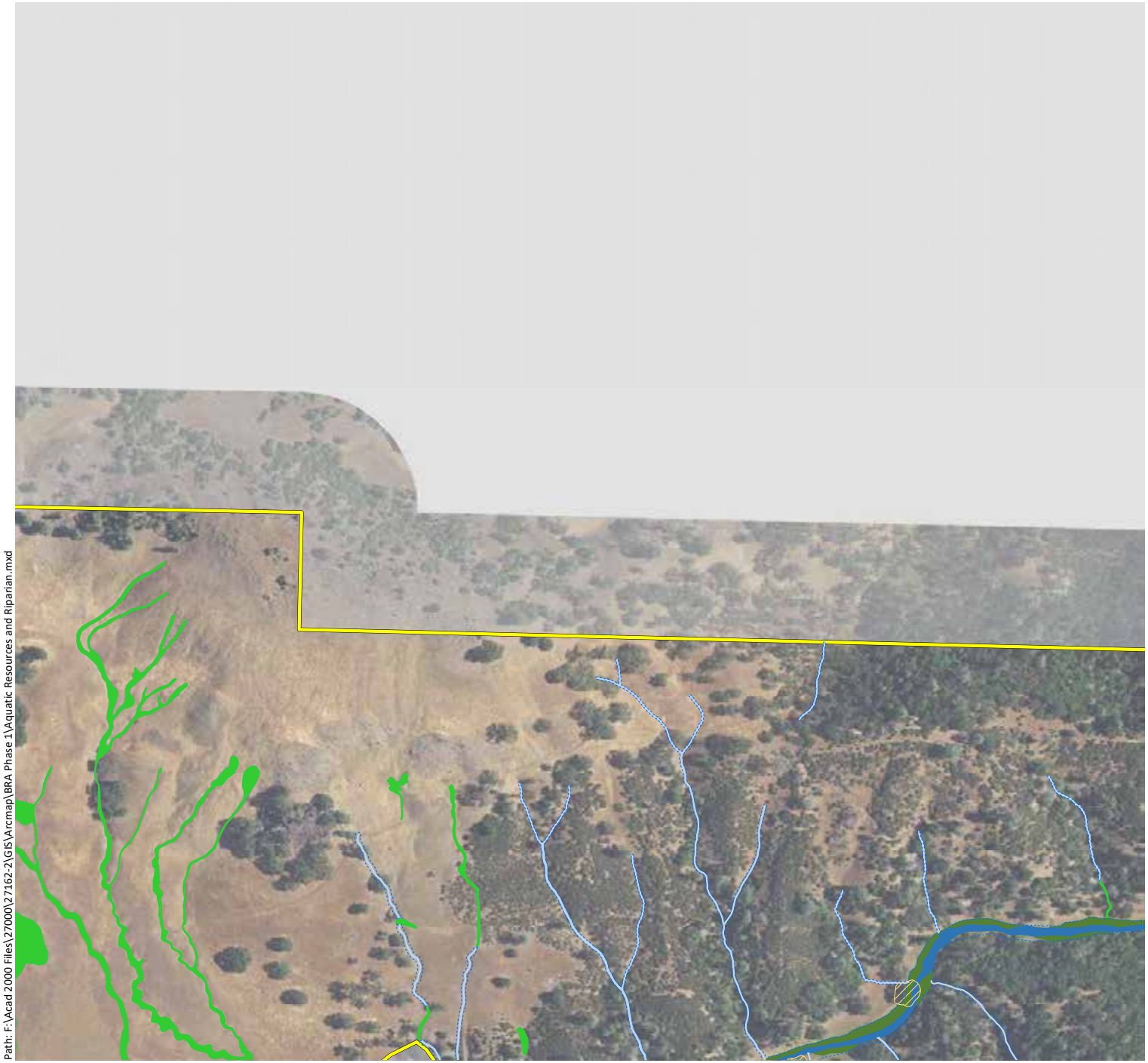
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 10)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

Riparian Woodland - 42.32 ac.

Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 11)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 12)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

Forested Wetlands - 0.61 ac.
Seasonal Wetland Depressions - 0.94 ac.
Seasonal Wetland Ditches - 0.43 ac.
Seasonal Wetland Pond Fringes - 3.51 ac.
Seasonal Wetland Seeps/Swales - 31.91 ac.
Seasonal Wetland Wet Meadows - 40.17 ac.
Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

Ephemeral Ditches - 0.24 ac. & 6,380 LF
Ephemeral Streams - 18.52 ac. & 271,738 LF
Intermittent Streams - 11.86 ac. & 49,732 LF
Perennial Streams - 20.78 ac. & 15,054 LF
Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 13)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Riparian Woodland - 42.32 ac.

Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 14)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 15)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Riparian Woodland - 42.32 ac.

Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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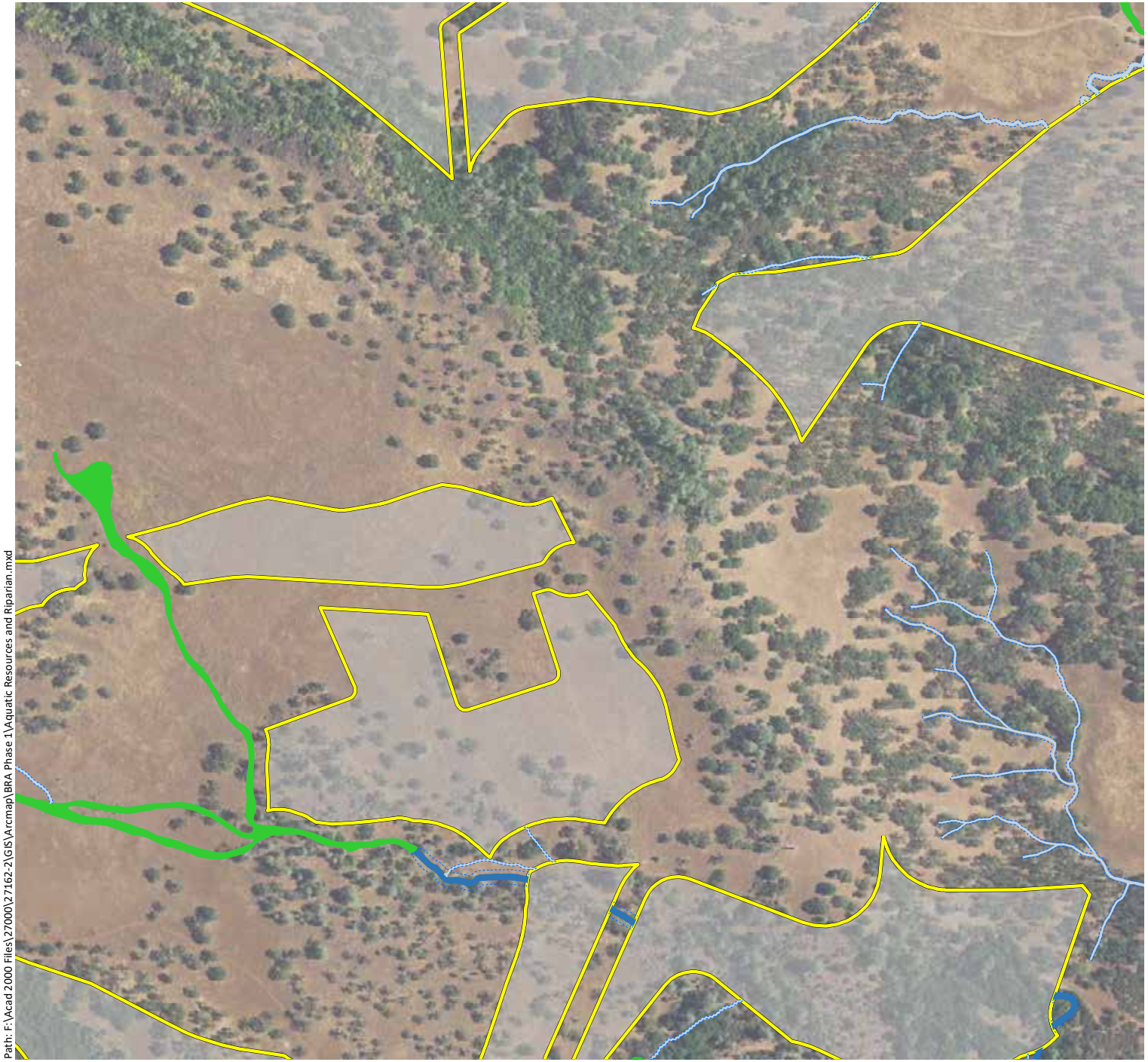
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 16)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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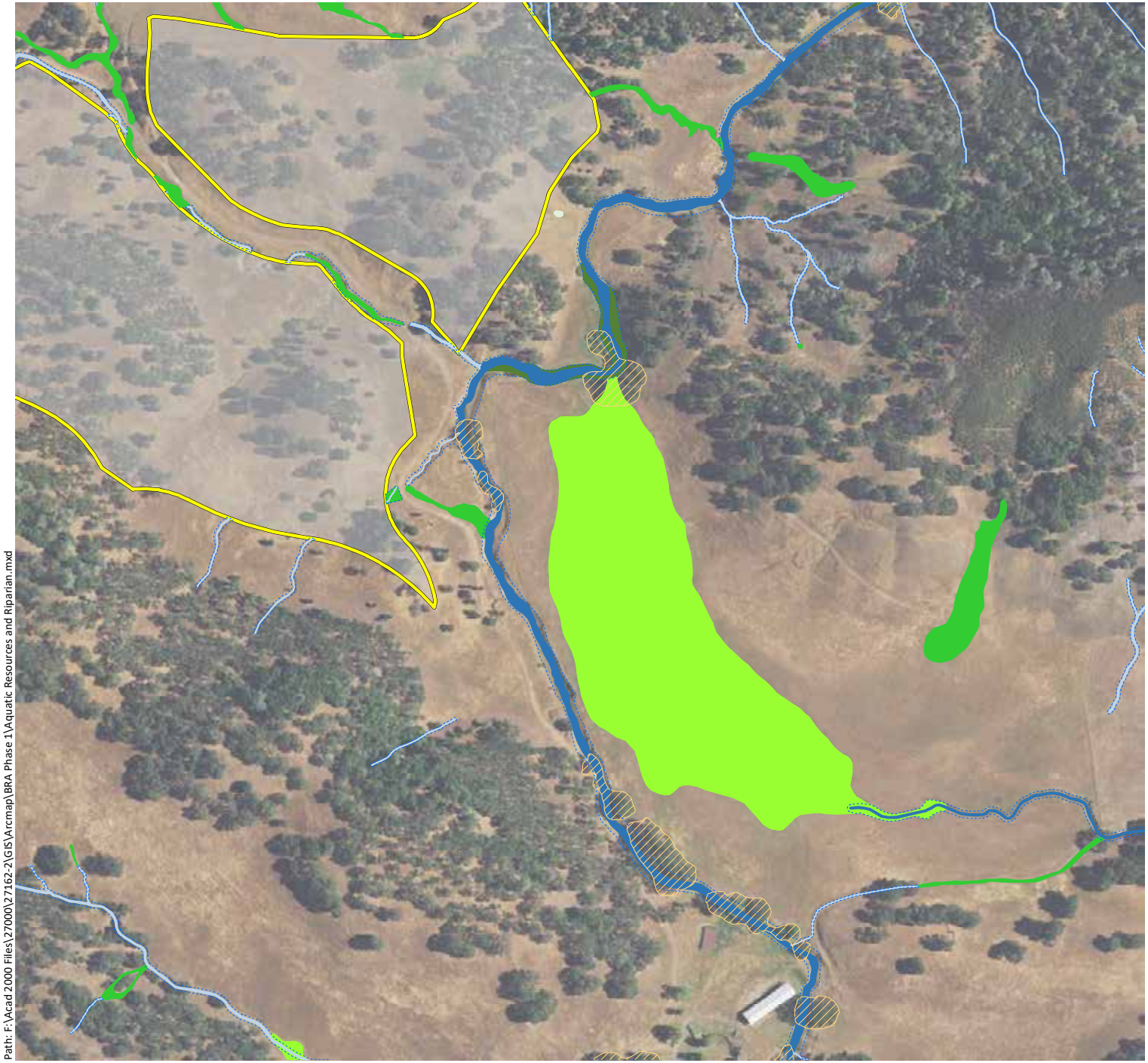
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 17)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

Forested Wetlands - 0.61 ac.
Seasonal Wetland Depressions - 0.94 ac.
Seasonal Wetland Ditches - 0.43 ac.
Seasonal Wetland Pond Fringes - 3.51 ac.
Seasonal Wetland Seeps/Swales - 31.91 ac.
Seasonal Wetland Wet Meadows - 40.17 ac.
Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

Ephemeral Ditches - 0.24 ac. & 6,380 LF
Ephemeral Streams - 18.52 ac. & 271,738 LF
Intermittent Streams - 11.86 ac. & 49,732 LF
Perennial Streams - 20.78 ac. & 15,054 LF
Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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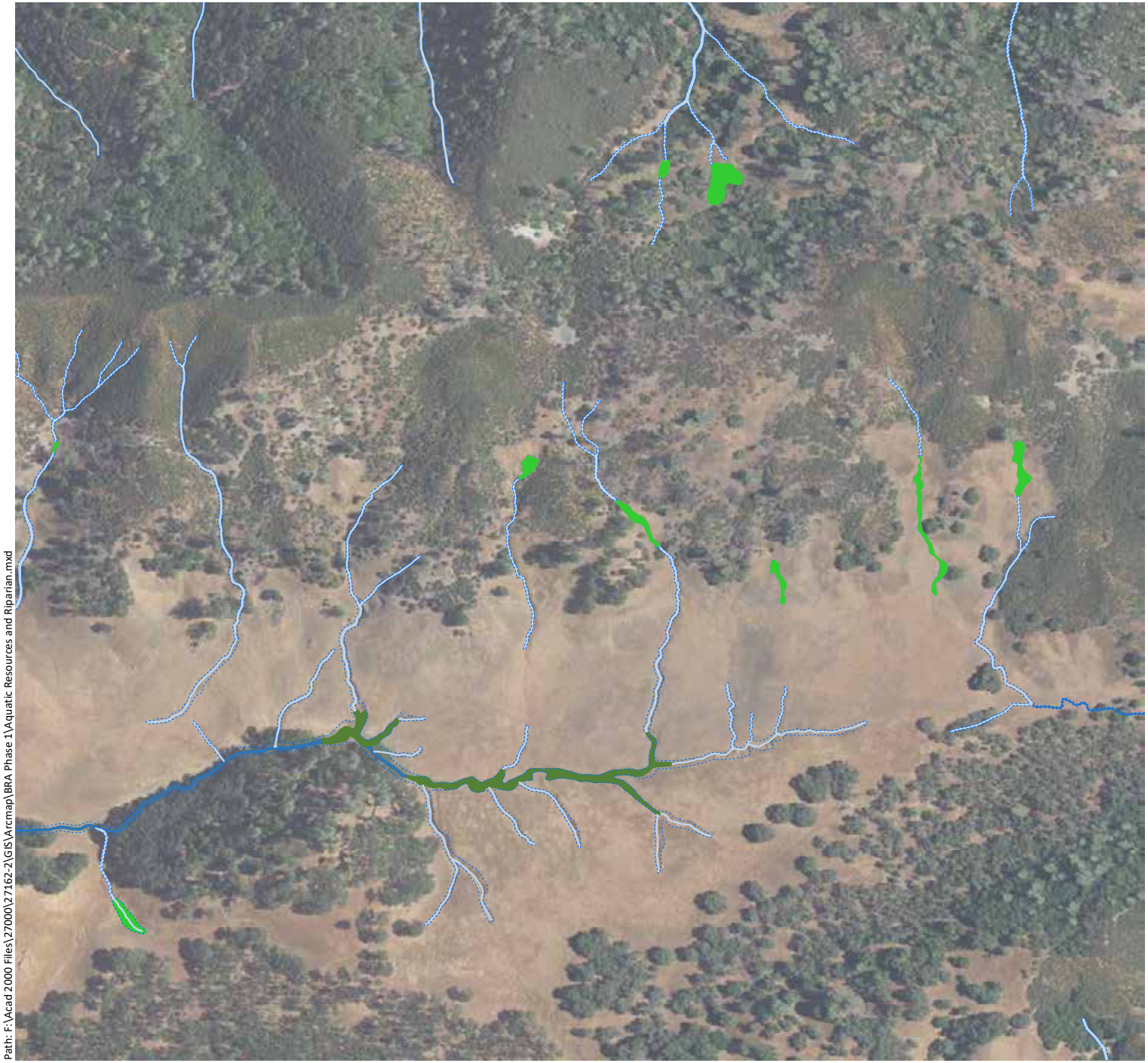
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 18)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 19)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 20)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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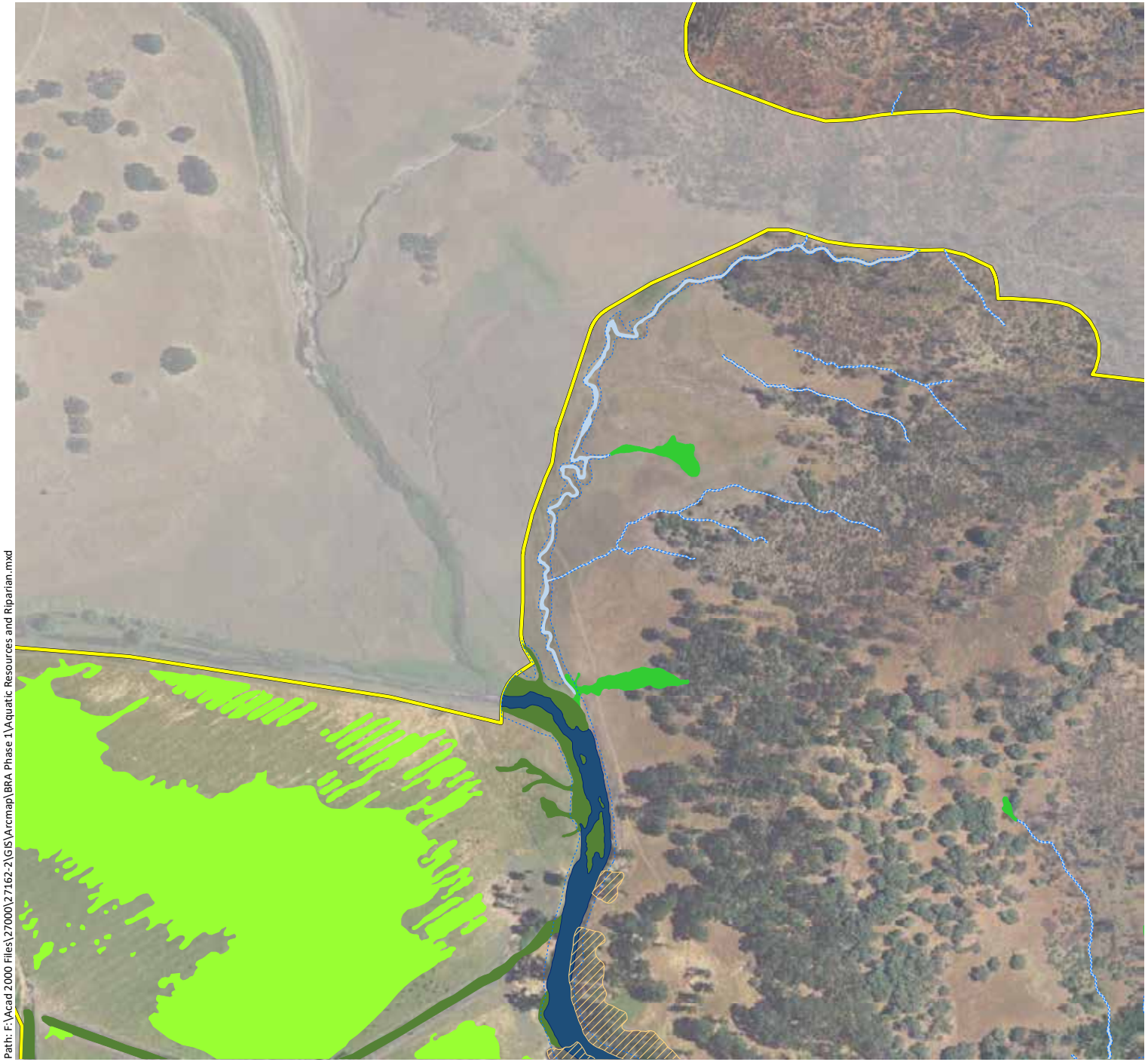
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 21)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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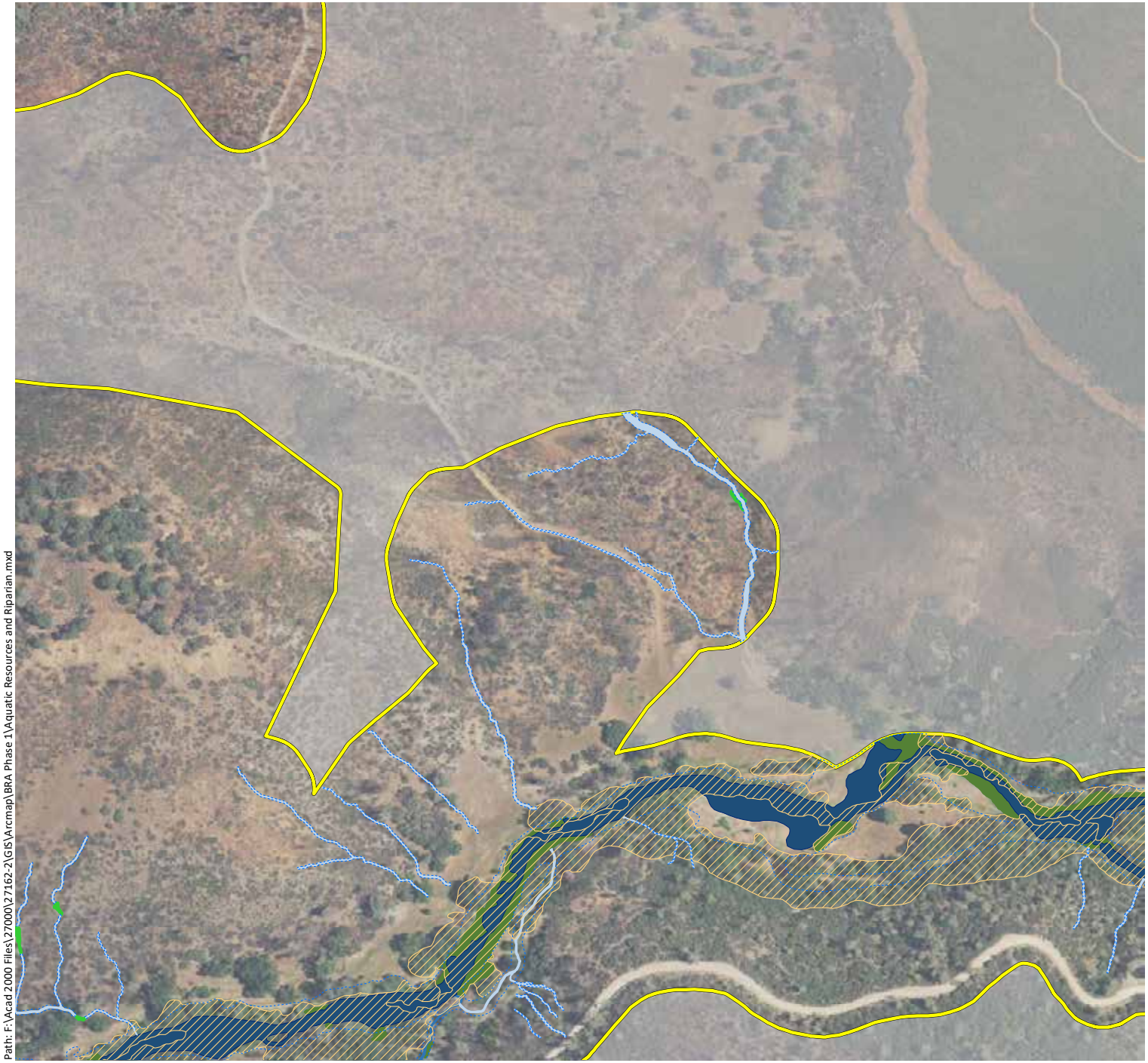
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 22)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 23)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 24)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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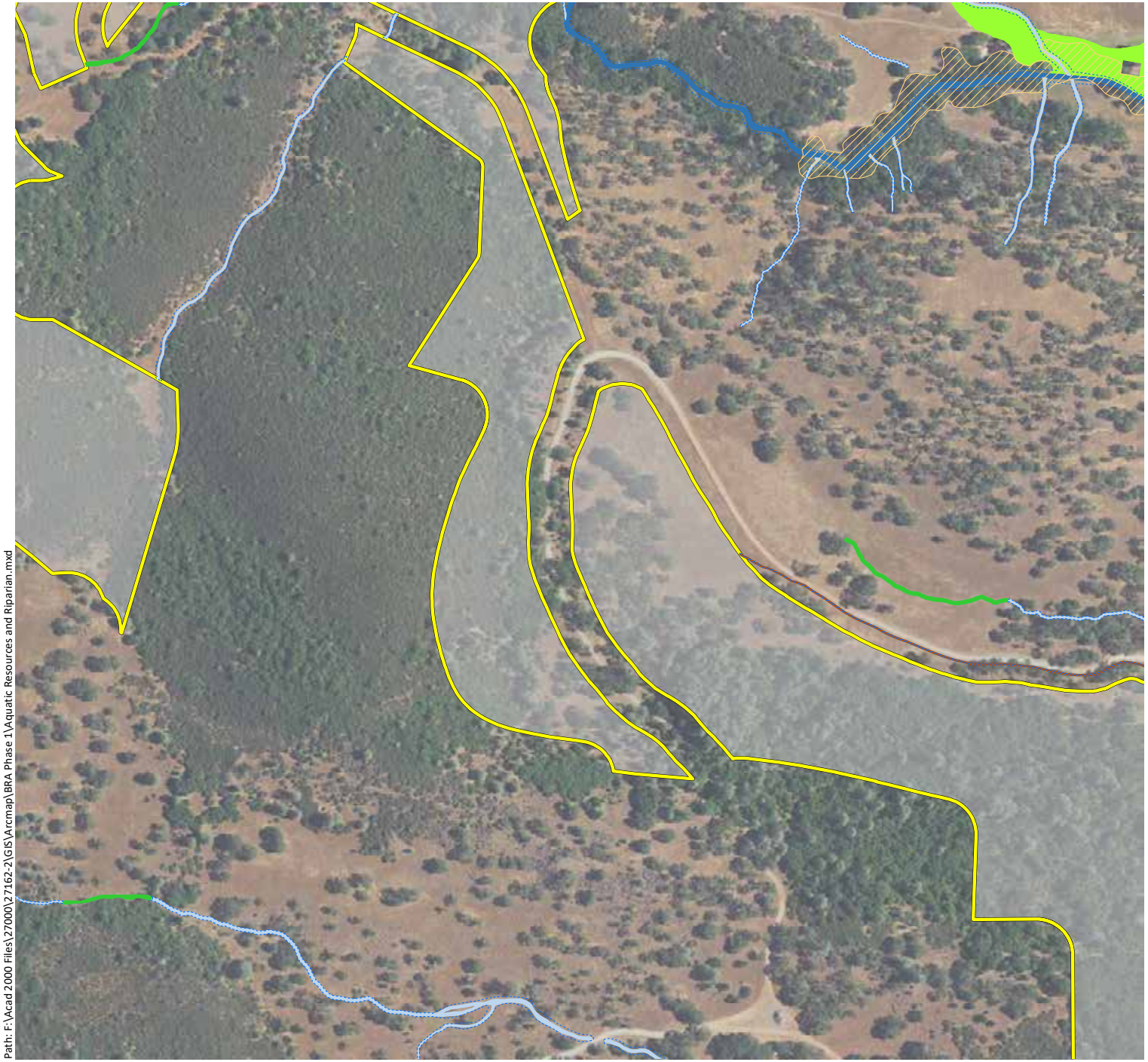
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 25)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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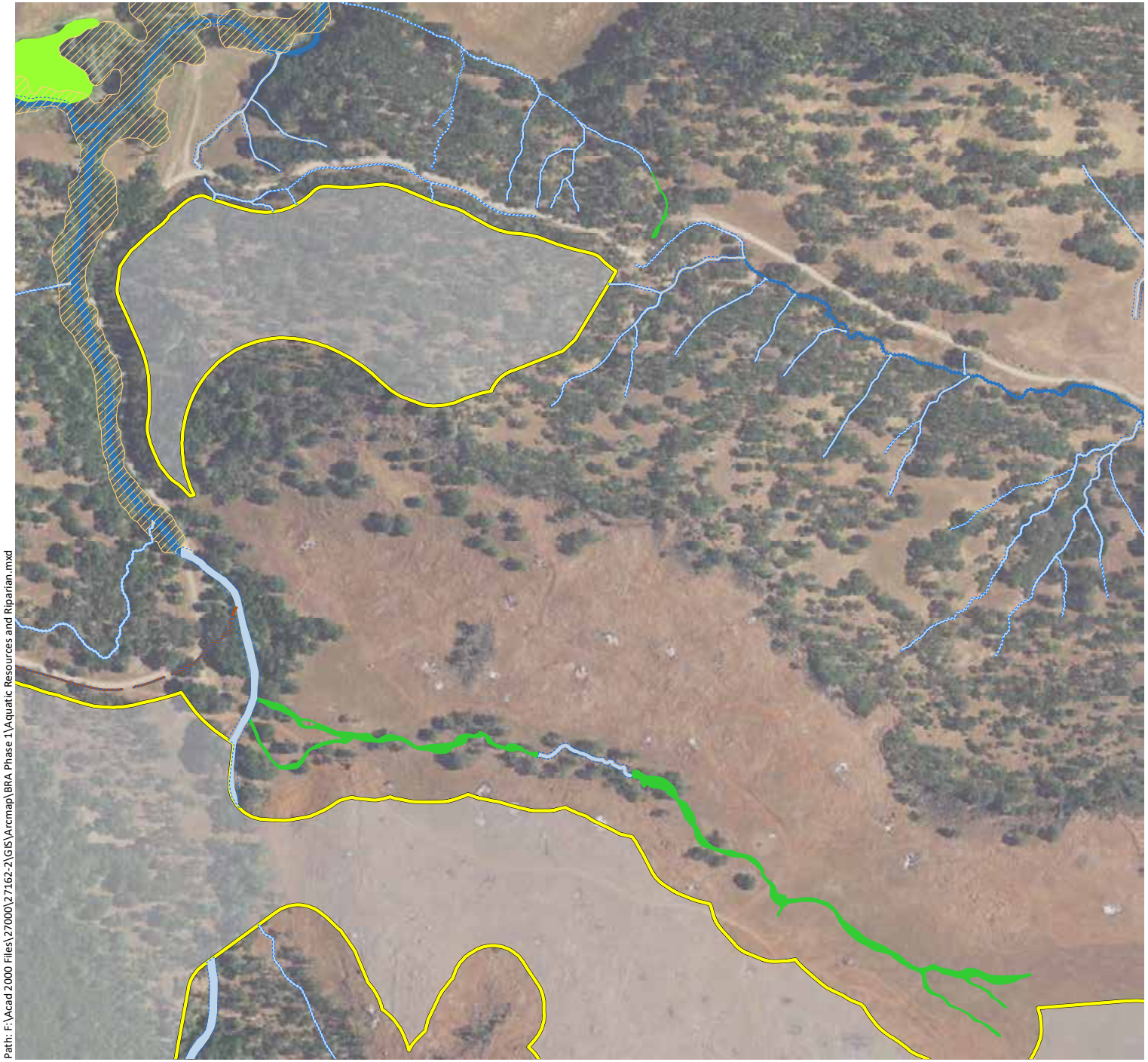
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 26)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 27)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 28)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Riparian Woodland - 42.32 ac.

Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 29)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 30)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 31)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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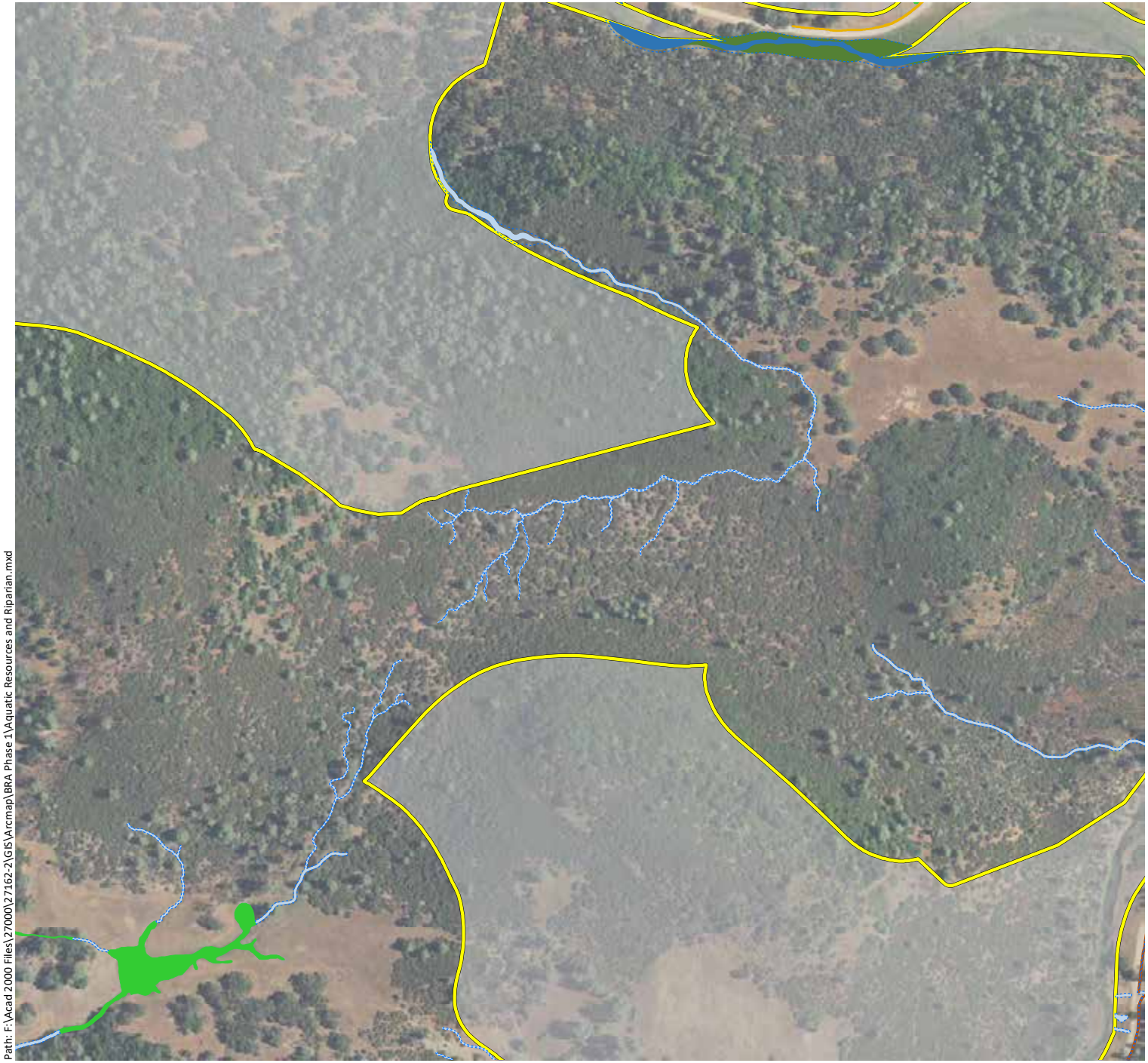
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 32)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 33)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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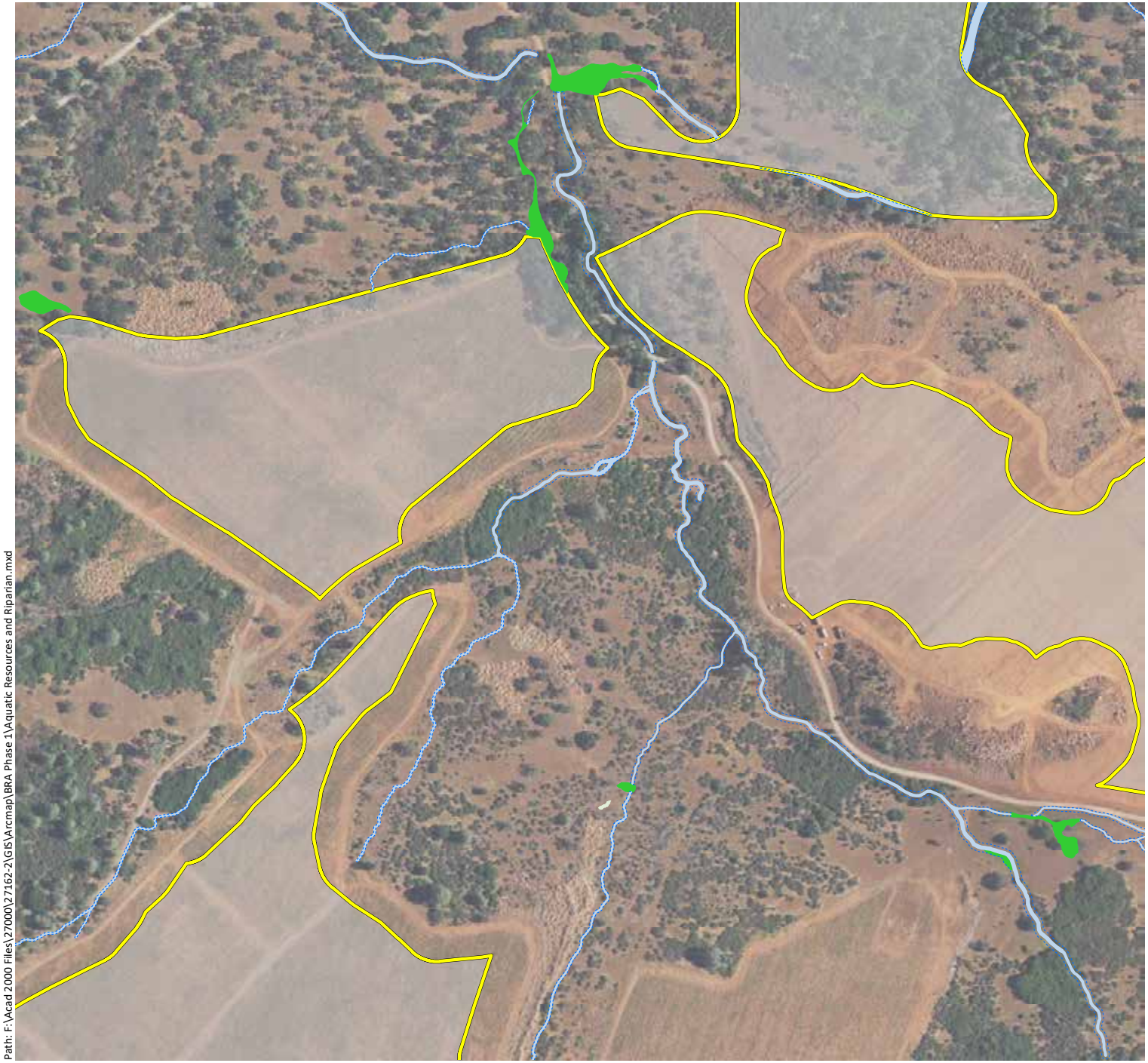
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 34)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 35)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

Forested Wetlands - 0.61 ac.
Seasonal Wetland Depressions - 0.94 ac.
Seasonal Wetland Ditches - 0.43 ac.
Seasonal Wetland Pond Fringes - 3.51 ac.
Seasonal Wetland Seeps/Swales - 31.91 ac.
Seasonal Wetland Wet Meadows - 40.17 ac.
Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

Ephemeral Ditches - 0.24 ac. & 6,380 LF
Ephemeral Streams - 18.52 ac. & 271,738 LF
Intermittent Streams - 11.86 ac. & 49,732 LF
Perennial Streams - 20.78 ac. & 15,054 LF
Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 36)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Riparian Woodland - 42.32 ac.

Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 37)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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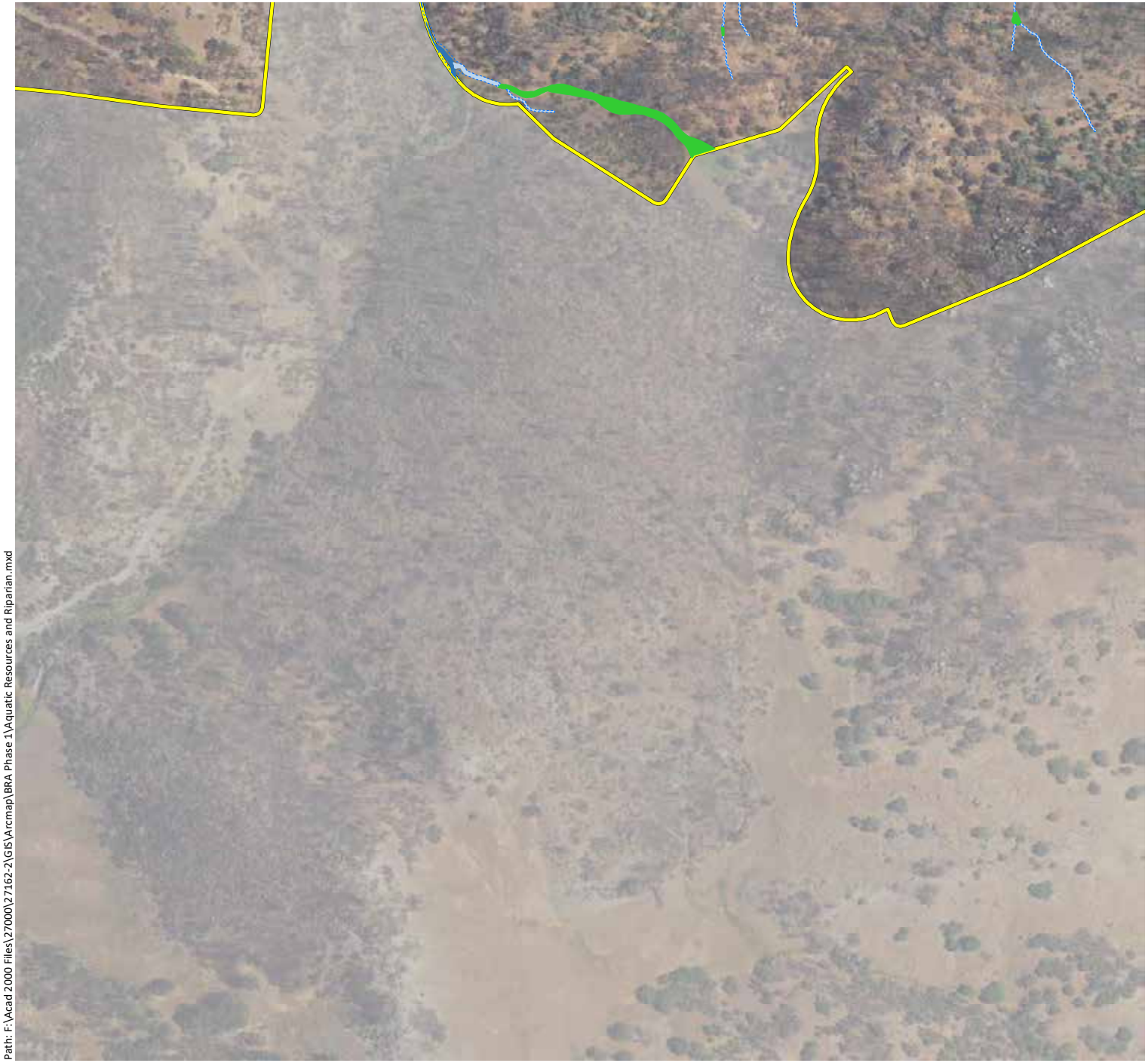
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 38)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 39)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

Forested Wetlands - 0.61 ac.
Seasonal Wetland Depressions - 0.94 ac.
Seasonal Wetland Ditches - 0.43 ac.
Seasonal Wetland Pond Fringes - 3.51 ac.
Seasonal Wetland Seeps/Swales - 31.91 ac.
Seasonal Wetland Wet Meadows - 40.17 ac.
Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

Ephemeral Ditches - 0.24 ac. & 6,380 LF
Ephemeral Streams - 18.52 ac. & 271,738 LF
Intermittent Streams - 11.86 ac. & 49,732 LF
Perennial Streams - 20.78 ac. & 15,054 LF
Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 40)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Riparian Woodland - 42.32 ac.

Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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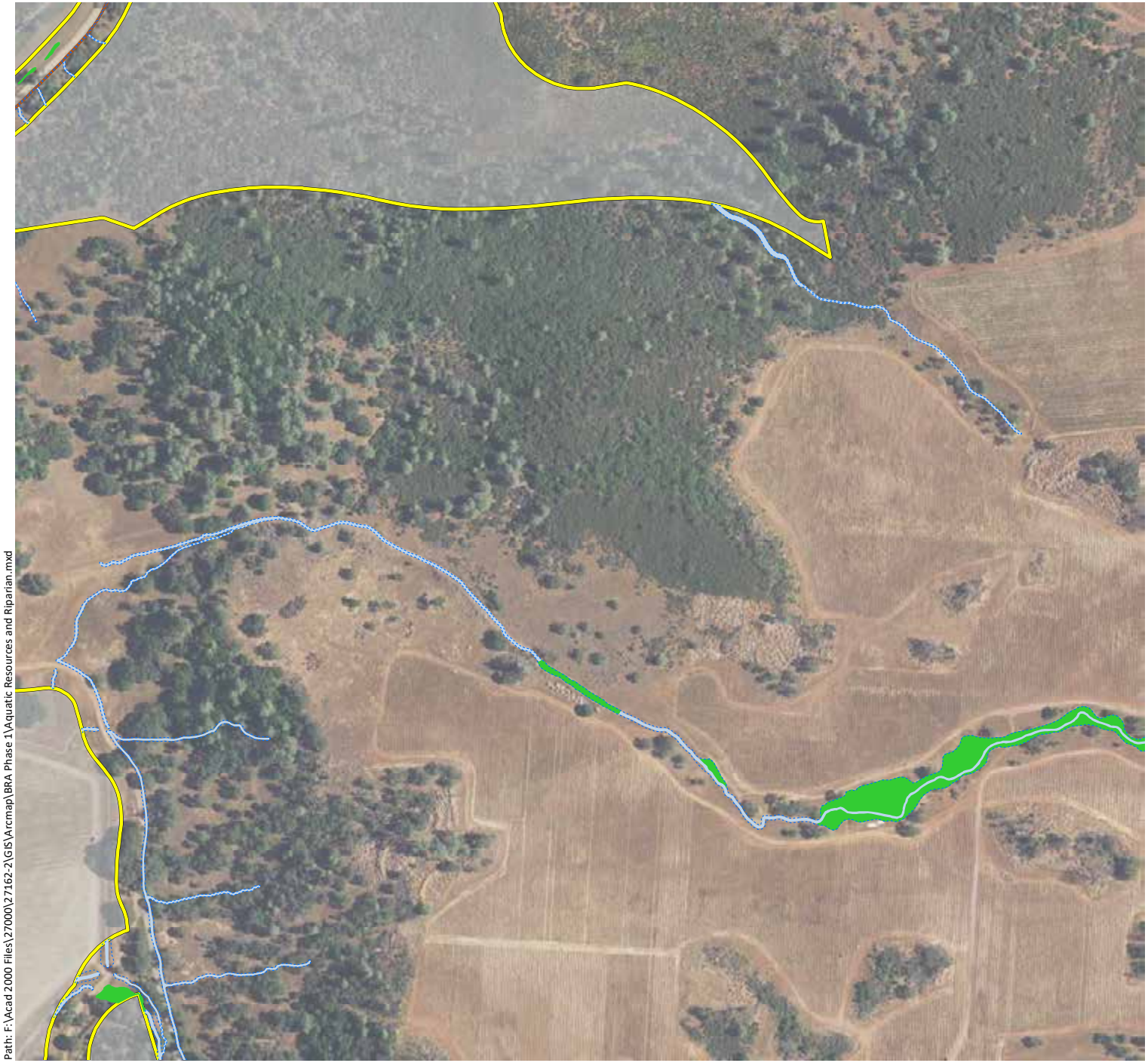
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 41)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

Forested Wetlands - 0.61 ac.
Seasonal Wetland Depressions - 0.94 ac.
Seasonal Wetland Ditches - 0.43 ac.
Seasonal Wetland Pond Fringes - 3.51 ac.
Seasonal Wetland Seeps/Swales - 31.91 ac.
Seasonal Wetland Wet Meadows - 40.17 ac.
Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

Ephemeral Ditches - 0.24 ac. & 6,380 LF
Ephemeral Streams - 18.52 ac. & 271,738 LF
Intermittent Streams - 11.86 ac. & 49,732 LF
Perennial Streams - 20.78 ac. & 15,054 LF
Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 42)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 43)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 44)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

Forested Wetlands - 0.61 ac.
Seasonal Wetland Depressions - 0.94 ac.
Seasonal Wetland Ditches - 0.43 ac.
Seasonal Wetland Pond Fringes - 3.51 ac.
Seasonal Wetland Seeps/Swales - 31.91 ac.
Seasonal Wetland Wet Meadows - 40.17 ac.
Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

Ephemeral Ditches - 0.24 ac. & 6,380 LF
Ephemeral Streams - 18.52 ac. & 271,738 LF
Intermittent Streams - 11.86 ac. & 49,732 LF
Perennial Streams - 20.78 ac. & 15,054 LF
Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 45)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

Forested Wetlands - 0.61 ac.
Seasonal Wetland Depressions - 0.94 ac.
Seasonal Wetland Ditches - 0.43 ac.
Seasonal Wetland Pond Fringes - 3.51 ac.
Seasonal Wetland Seeps/Swales - 31.91 ac.
Seasonal Wetland Wet Meadows - 40.17 ac.
Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

Ephemeral Ditches - 0.24 ac. & 6,380 LF
Ephemeral Streams - 18.52 ac. & 271,738 LF
Intermittent Streams - 11.86 ac. & 49,732 LF
Perennial Streams - 20.78 ac. & 15,054 LF
Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 46)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 47)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 48)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 49)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

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Feet

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 50)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

Forested Wetlands - 0.61 ac.
Seasonal Wetland Depressions - 0.94 ac.
Seasonal Wetland Ditches - 0.43 ac.
Seasonal Wetland Pond Fringes - 3.51 ac.
Seasonal Wetland Seeps/Swales - 31.91 ac.
Seasonal Wetland Wet Meadows - 40.17 ac.
Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

Ephemeral Ditches - 0.24 ac. & 6,380 LF
Ephemeral Streams - 18.52 ac. & 271,738 LF
Intermittent Streams - 11.86 ac. & 49,732 LF
Perennial Streams - 20.78 ac. & 15,054 LF
Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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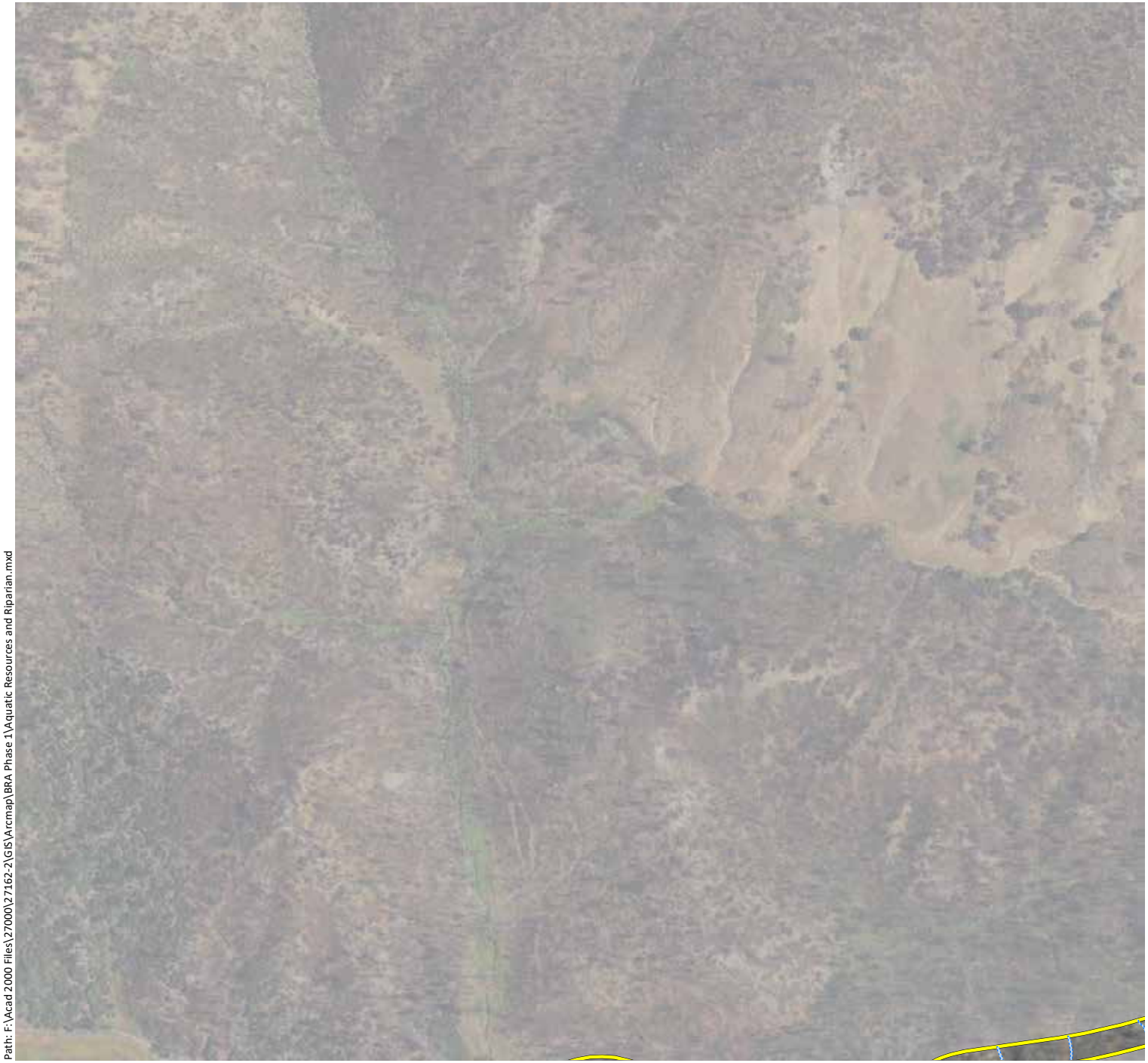
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 51)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 52)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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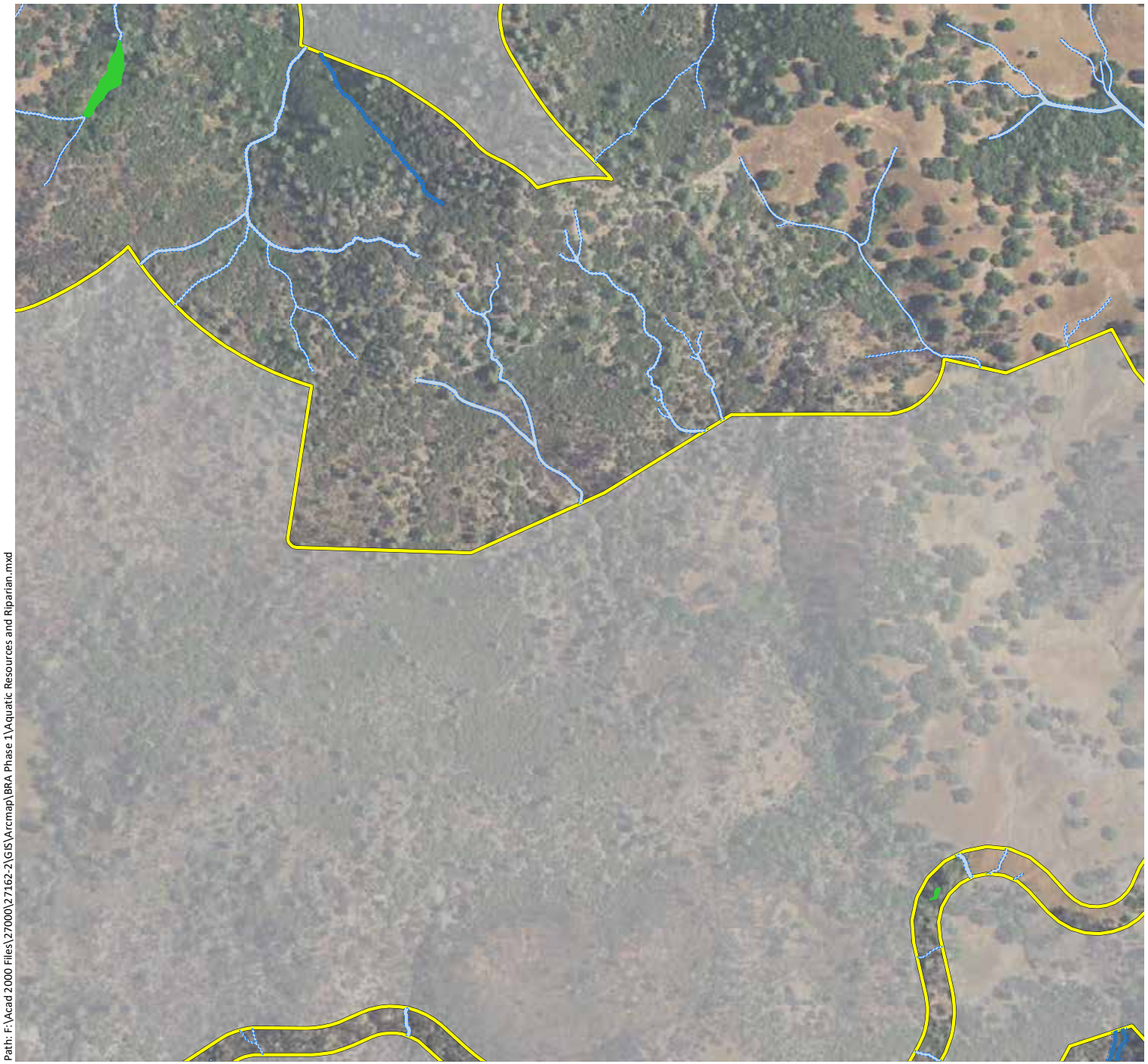
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 53)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.
Riparian Woodland - 42.32 ac.
Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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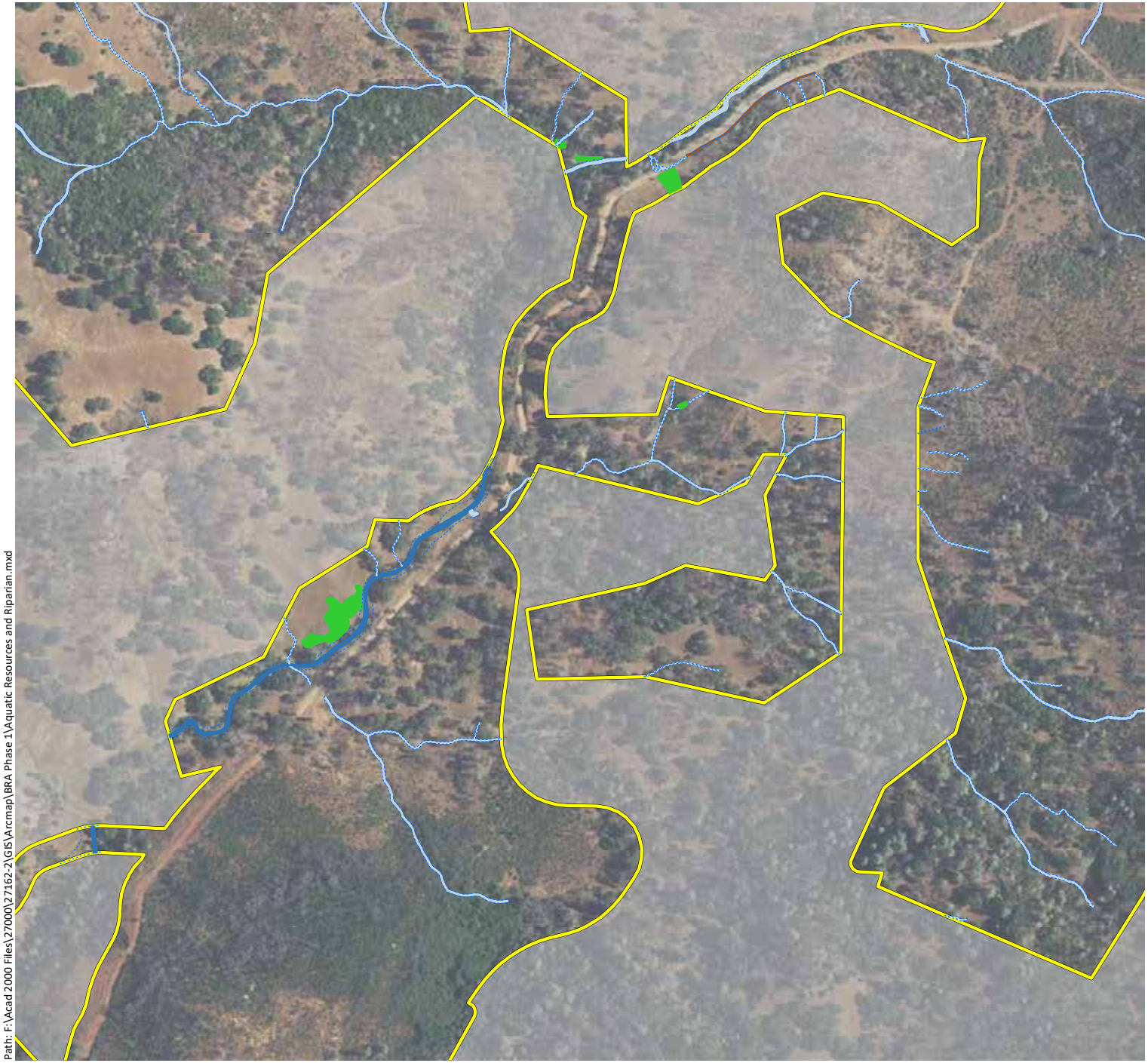
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 54)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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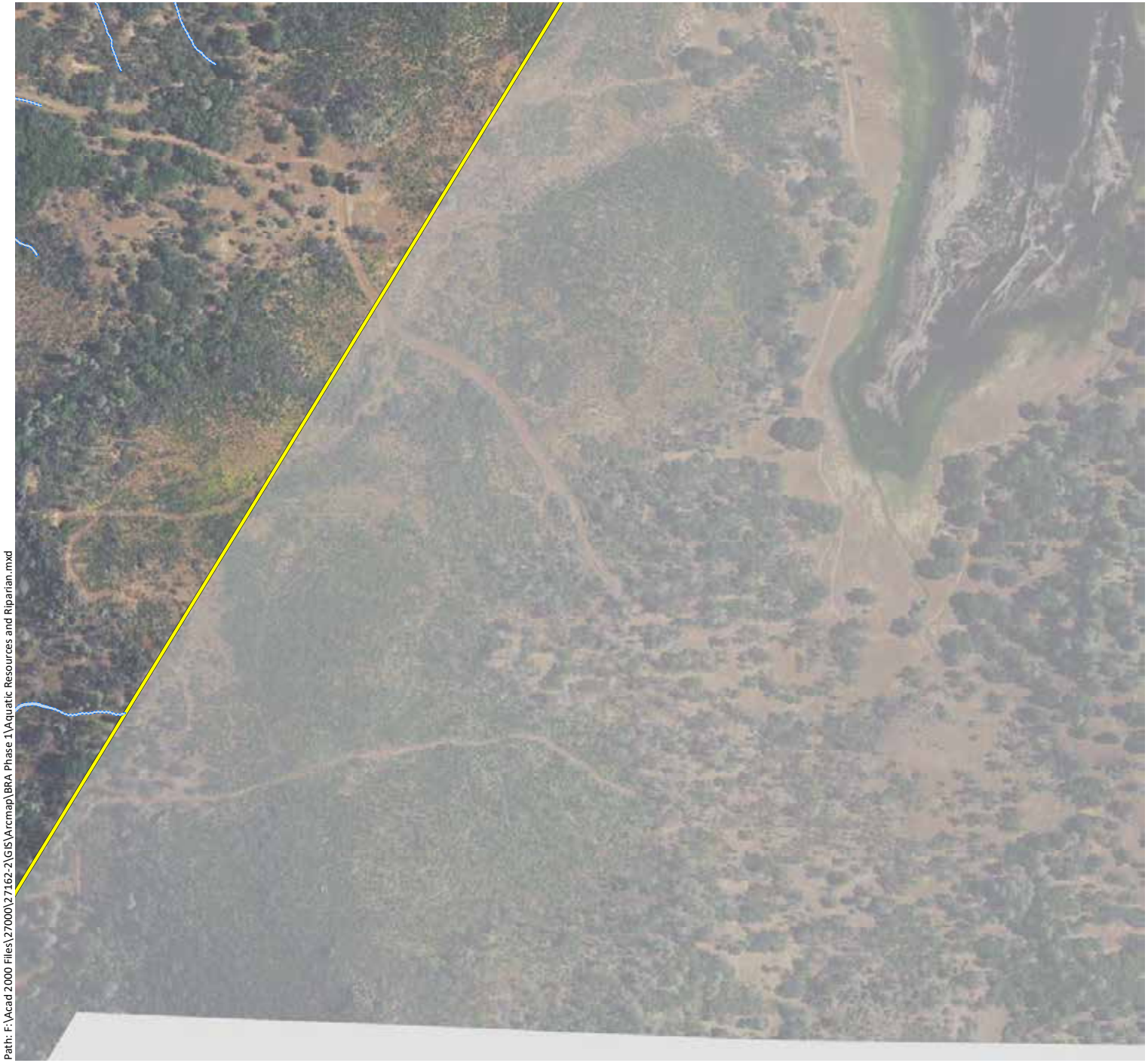
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 55)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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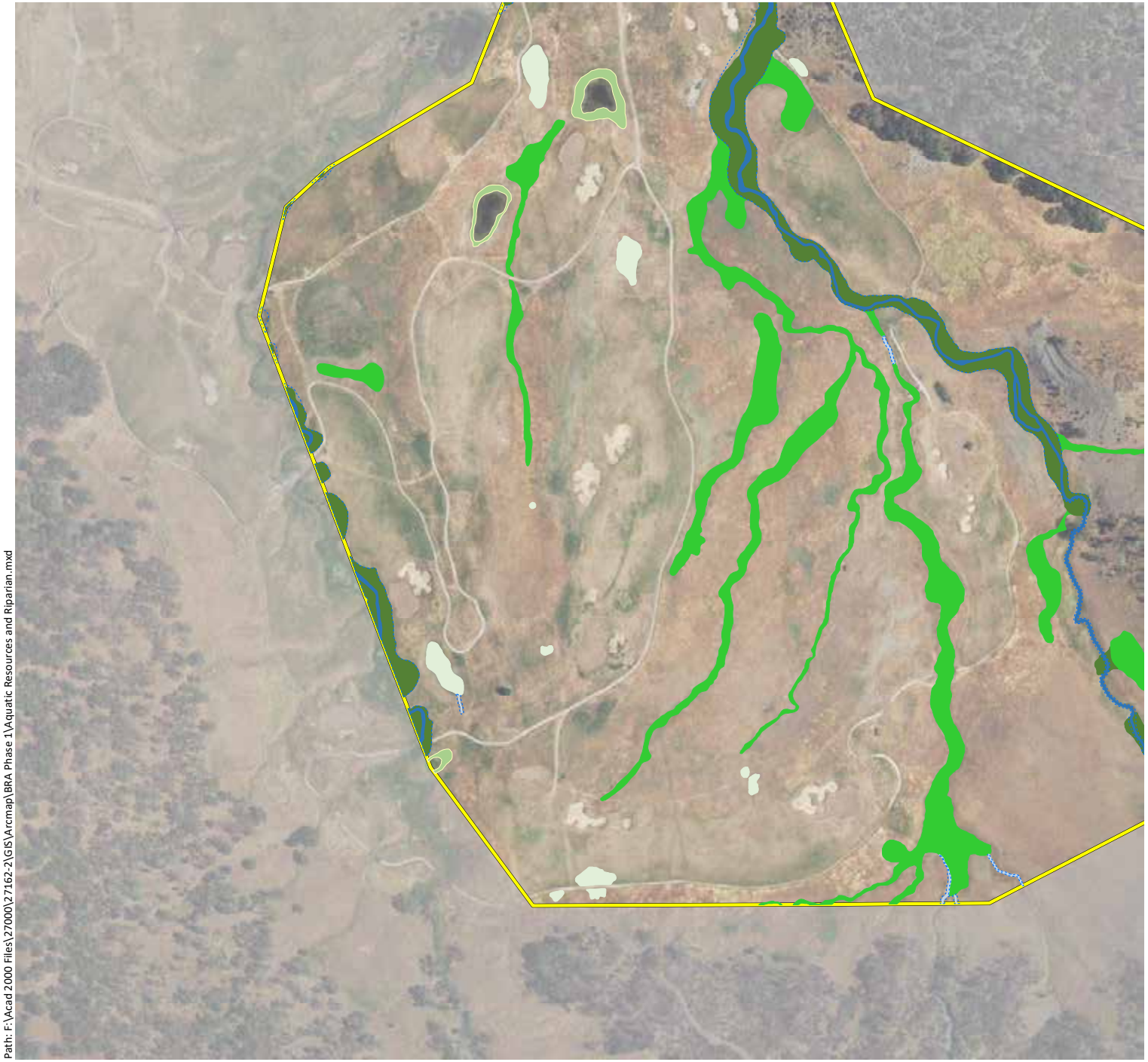
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 56)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 57)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 58)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
- Seasonal Wetland Seeps/Swales - 31.91 ac.
- Seasonal Wetland Wet Meadows - 40.17 ac.
- Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
- Ephemeral Streams - 18.52 ac. & 271,738 LF
- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 59)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

Riparian Woodland - 42.32 ac.

Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

Forested Wetlands - 0.61 ac.

Seasonal Wetland Depressions - 0.94 ac.

Seasonal Wetland Ditches - 0.43 ac.

Seasonal Wetland Pond Fringes - 3.51 ac.

Seasonal Wetland Seeps/Swales - 31.91 ac.

Seasonal Wetland Wet Meadows - 40.17 ac.

Stream Fringe/In-Stream Wetlands - 21.71 ac.

Waters* - 83.39 ac. & 342,904 LF

Ephemeral Ditches - 0.24 ac. & 6,380 LF

Ephemeral Streams - 18.52 ac. & 271,738 LF

Intermittent Streams - 11.86 ac. & 49,732 LF

Perennial Streams - 20.78 ac. & 15,054 LF

Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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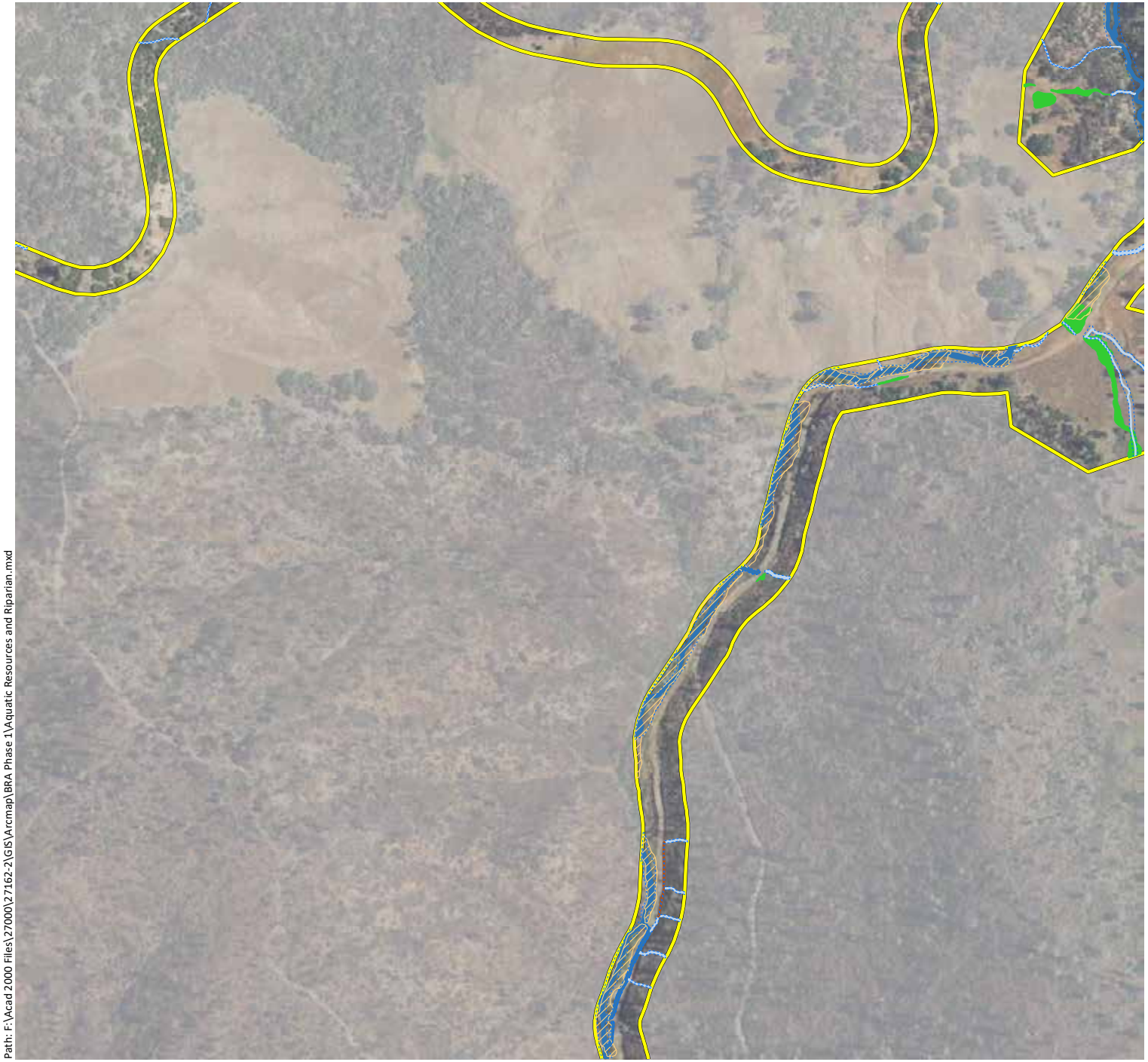
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 60)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

Riparian Woodland - 42.32 ac.

Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
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Waters* - 83.39 ac. & 342,904 LF

- Ephemeral Ditches - 0.24 ac. & 6,380 LF
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- Intermittent Streams - 11.86 ac. & 49,732 LF
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- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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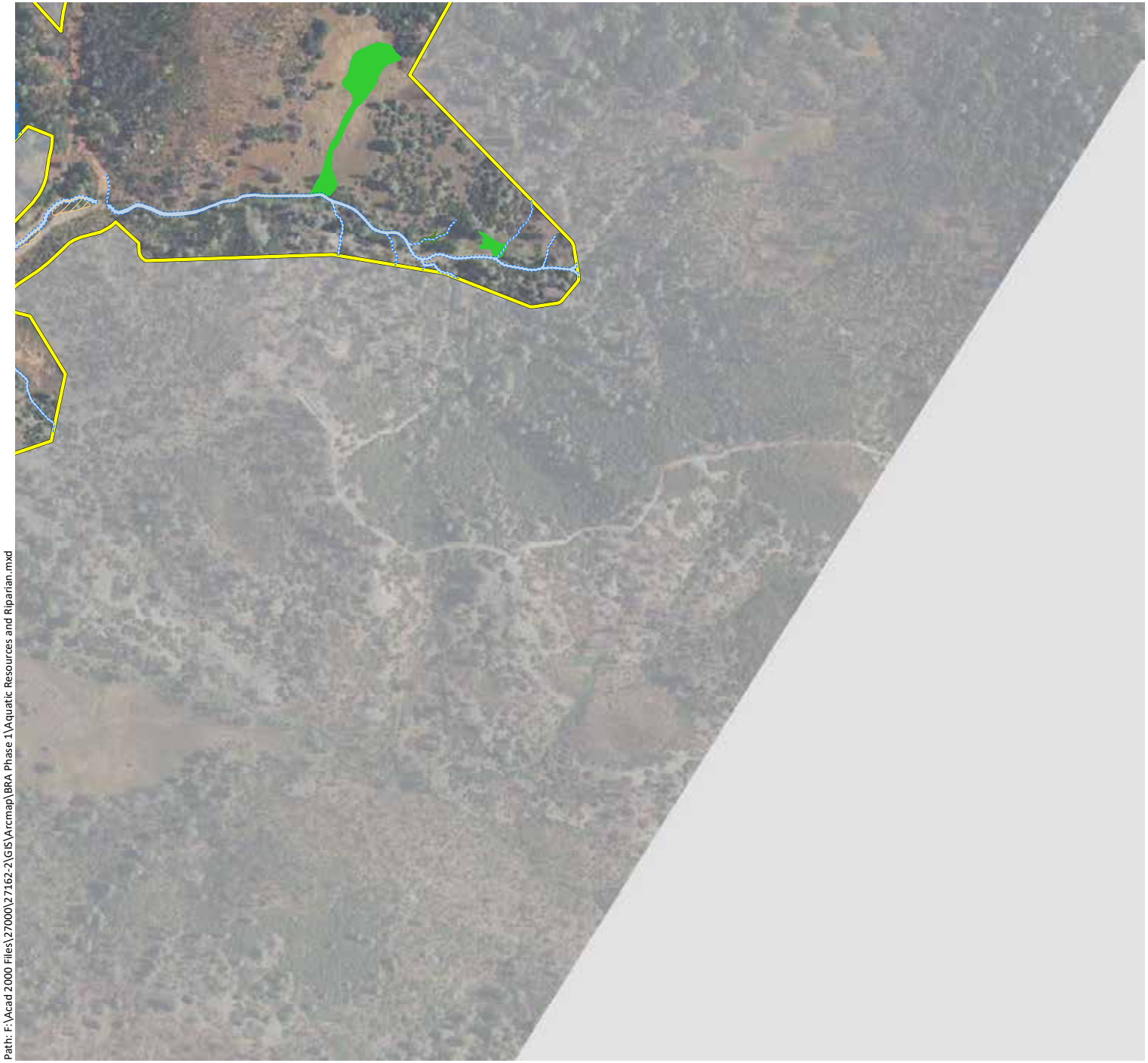
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 61)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
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Waters* - 83.39 ac. & 342,904 LF

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- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

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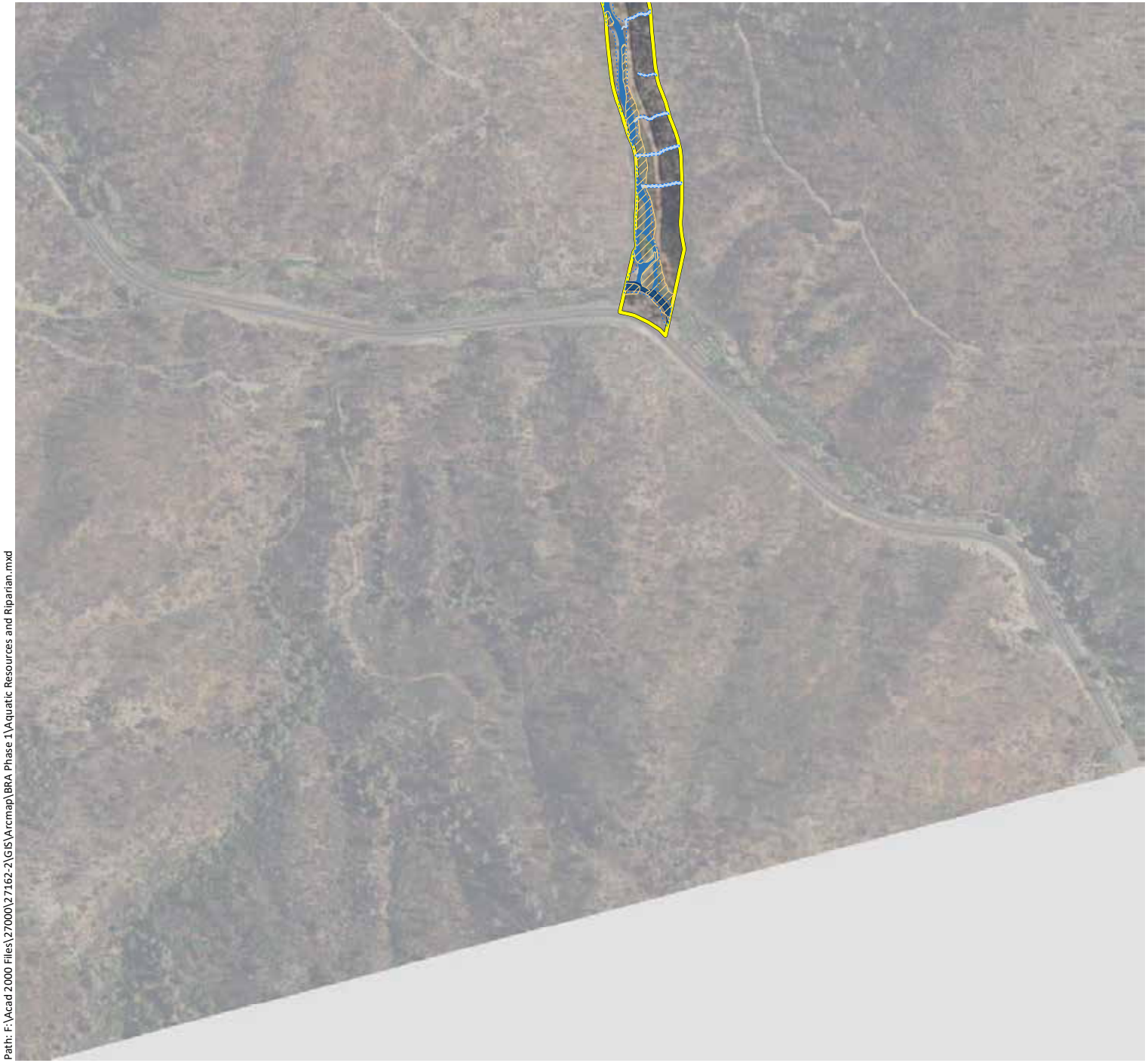
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 1 Study Area (Mapbook Sheet 62)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Riparian Woodland - 42.32 ac.
- Waters (Top of Bank) - 144.40 ac. & 342,904 LF

Wetlands - 99.28 ac.

- Forested Wetlands - 0.61 ac.
- Seasonal Wetland Depressions - 0.94 ac.
- Seasonal Wetland Ditches - 0.43 ac.
- Seasonal Wetland Pond Fringes - 3.51 ac.
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Waters* - 83.39 ac. & 342,904 LF

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- Intermittent Streams - 11.86 ac. & 49,732 LF
- Perennial Streams - 20.78 ac. & 15,054 LF
- Open Waters - 31.99 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

APPENDIX C

LIST OF PLANT SPECIES OBSERVED WITHIN GUENOC RANCH

Appendix C. List of Plant Species Observed within Guenoc Ranch

Surveys were conducted by WRA biologists between 2017 and 2019. Plant nomenclature follows Baldwin et al. (2012) and subsequent revisions by the Jepson Flora Project (2019).

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Acer macrophyllum	Bigleaf maple	native	tree	-	-	FAC	-
Achillea millefolium	Yarrow	native	perennial herb	-	-	FACU	-
Achyrachaena mollis	Blow wives	native	annual herb	-	-	FAC	-
Acmispon americanus var. *americanus*	Spanish lotus	native	annual herb	-	-	UPL	-
Acmispon brachycarpus	Short podded lotus	native	annual herb	-	-	-	-
Acmispon glaber var. *glaber*	Deerweed	native	perennial herb	-	-	-	-
Acmispon parviflorus	Hill lotus	native	annual herb	-	-	-	-
Acmispon wrangelianus	Chilean trefoil	native	annual herb	-	-	-	-
Adenostoma fasciculatum var. *fasciculatum*	Chamise	native	tree, shrub	-	-	-	-
Adiantum jordanii	California maidenhair fern	native	fern	-	-	FAC	-
Aegilops triuncialis	Goatgrass	non-native (invasive)	annual grass	-	High	-	-
Aesculus californica	Buckeye	native	tree	-	-	-	-
Agoseris grandiflora var. *grandiflora*	Giant mountain dandelion	native	perennial herb	-	-	-	-
Agoseris heterophylla var. *cryptopleura*	Mountain dandelion	native	annual herb	-	-	-	-
Agoseris heterophylla var. *heterophylla*	Annual agoseris	native	annual herb	-	-	-	-
Agrostis avenacea	Pacific bentgrass	non-native (invasive)	perennial grass	-	Limited	FACW	-
Agrostis stolonifera	Redtop	non-native (invasive)	perennial grass	-	Limited	FACW	-
Aira caryophyllea	Silvery hairgrass	non-native	annual grass	-	-	FACU	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Alisma lanceolatum	Water plantain	non-native	perennial herb (aquatic)	-	-	OBL	-
Allium amplectens	Narrow leaved onion	native	perennial herb (bulb)	-	-	-	2.3
Allium falcifolium	Sickle leaf onion	native	perennial herb (bulb)	-	-	-	4.2
Allium fimbriatum var. *fimbriatum*	Fringed onion	native	perennial herb (bulb)	-	-	-	-
Allium serra	Jeweled onion	native	perennial herb (bulb)	-	-	-	2.6
Alnus rhombifolia	White alder	native	tree	-	-	FACW	-
Alopecurus pratensis	Meadow foxtail	non-native	perennial grass	-	Watch	FACW	-
Amaranthus retroflexus	Rough pigweed	non-native	annual herb	-	-	FACU	-
Amsinckia intermedia	Common fiddleneck	native	annual herb	-	-	-	-
Amsinckia lycopsoides	Tarweed fiddleneck	native	annual herb	-	-	-	-
Amsinckia menziesii	Fiddleneck	native	annual herb	-	-	-	-
Amsinckia retrorsa	Rigid fiddleneck	native	annual herb	-	-	-	-
Ancistrocarphus filagineus	Woolly fishhooks	native	annual herb	-	-	-	3.3
Angelica californica	California angelica	native	perennial herb	-	-	-	-
Angelica tomentosa	Woolly angelica	native	perennial herb	-	-	-	2.7
Anisocarpus madioides	Woodland madia	native	perennial herb	-	-	-	-
Anthemis cotula	Dog fennel	non-native	annual herb	-	-	FACU	-
Antirrhinum vexillocalyculatum ssp. *vexillocalyculatum*	Wiry snapdragon	native	annual herb	-	-	-	-
Antirrhinum virga	Tall snapdragon	native	perennial herb	Rank 4.3	-	-	2.8
Aphanes occidentalis	Ladie's mantle	native	annual, perennial herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Apiastrum angustifolium	Wild celery	native	annual herb	-	-	UPL	1.5
Aphyllon fasciculatum	Clustered broomrape	native	perennial herb (parasitic)	-	-	-	-
Apocynum cannabinum	Indian hemp	native	perennial herb	-	-	FAC	-
Aquilegia eximia	Serpentine columbine	native	perennial herb	-	-	OBL	4.2
Arbutus menziesii	Madrone	native	tree	-	-	-	-
Arceuthobium campylopodum	Pine dwarf mistletoe	native	perennial herb (parasitic)	-	-	-	-
Arctostaphylos glandulosa ssp. *cushingiana*	Cushing manzanita	native	shrub	-	-	-	-
Arctostaphylos manzanita ssp. *elegans*	Konocti manzanita	native	shrub	Rank 1B.3	-	-	-
Arctostaphylos manzanita ssp. *manzanita*	Common manzanita	native	shrub	-	-	-	-
Arctostaphylos viscida ssp. *pulchella*	White leaf manzanita	native	tree, shrub	-	-	-	5
Arctostaphylos viscida ssp. *viscida*	Smooth white leaf manzanita	native	tree, shrub	-	-	-	2.2
Arnica discoidea	Rayless arnica	native	perennial herb	-	-	-	-
Artemisia douglasiana	California mugwort	native	perennial herb	-	-	FAC	-
Asclepias cordifolia	Purple milkweed	native	perennial herb	-	-	-	-
Asclepias eriocarpa	Indian milkweed	native	perennial herb	-	-	-	-
Asclepias fascicularis	Milkweed	native	perennial herb	-	-	FAC	-
Aspidotis densa	Lace fern	native	fern	-	-	-	3.4
Astragalus breweri	Brewer's milk vetch	native	annual herb	Rank 4.2	-	-	3.2
Astragalus clevelandii	Cleveland's milk vetch	native	perennial herb	Rank 4.3	-	FAC	6.1
Astragalus gambelianus	Gambel's dwarf milk vetch	native	annual herb	-	-	-	-
Astragalus rattanii var. *jepsonianus*	Jepson's milk vetch	native	annual herb	Rank 1B.2	-	-	4.3

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Athyrium filix-femina var. *cyclosorum*	Western lady fern	native	fern	-	-	FAC	-
Athysanus pusillus	Dwarf athysanus	native	annual herb	-	-	-	-
Avena barbata	Slim oat	non-native (invasive)	annual, perennial grass	-	Moderate	-	-
Avena fatua	Wildoats	non-native (invasive)	annual grass	-	Moderate	-	-
Baccharis pilularis ssp. *consanguinea*	Coyote brush	native	shrub	-	-	-	-
Baccharis salicifolia ssp. *salicifolia*	Mule fat	native	shrub	-	-	FAC	-
Balsamorhiza macrolepis	Big scale balsam root	native	perennial herb	Rank 1B.2	-	-	-
Barbarea vulgaris	Yellow rocket	non-native	perennial herb	-	-	FAC	-
Bellardia trixago	Mediterranean lineseed	non-native (invasive)	annual herb	-	Limited	-	-
Brickellia californica	California brickellia	native	perennial herb	-	-	FACU	-
Briza maxima	Rattlesnake grass	non-native (invasive)	annual grass	-	Limited	-	-
Briza minor	Little rattlesnake grass	non-native	annual grass	-	-	FAC	-
Brodiaea elegans ssp. *elegans*	Harvest brodiaea	native	perennial herb	-	-	FACU	-
Brodiaea leptandra	Narrow-anthered brodiaea	native	perennial herb	Rank 1B.2	-	-	-
Bromus carinatus var. *carinatus*	California brome	native	perennial grass	-	-	-	-
Bromus diandrus	Ripgut brome	non-native (invasive)	annual grass	-	Moderate	-	-
Bromus hordeaceus	Soft chess	non-native (invasive)	annual grass	-	Limited	FACU	-
Bromus laevipes	Narrow flowered brome	native	annual, perennial grass	-	-	-	1.7

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Bromus madritensis ssp. *madritensis*	Foxtail chess	non-native	annual grass	-	-	UPL	-
Bromus madritensis ssp. *rubens*	Foxtail brome	non-native (invasive)	annual grass	-	High	UPL	-
Calandrinia menziesii	Red maids	native	annual herb	-	-	FACU	-
Callitriche heterophylla var. *bolanderi*	Bolander's water starwort	native	annual herb	-	-	OBL	-
Calochortus amabilis	Golden fairy lantern	native	perennial herb	-	-	-	-
Calochortus luteus	Yellow mariposa	native	perennial herb	-	-	-	-
Calochortus splendens	Splendid mariposa	native	perennial herb	-	-	-	-
Calochortus tolmiei	Hairy star tulip	native	perennial herb	-	-	-	-
Calochortus uniflorus	Large flowered star tulip	native	perennial herb	Rank 4.2	-	FACW	1.7
Calochortus vestae	Yellow mariposa	native	perennial herb	-	-	-	2
Calycadenia fremontii	Fremont's calycadenia	native	annual herb	-	-	-	-
Calycadenia pauciflora	Small flowered calycadenia	native	annual herb	-	-	-	5.3
Calycanthus occidentalis	Spicebush	native	shrub	-	-	FAC	-
Calystegia collina ssp. *collina*	Hillside morning glory	native	perennial herb	-	-	-	4.7
Calystegia collina ssp. *oxyphylla*	Mt. Saint Helena morning glory	native	perennial herb (rhizomatous)	Rank 4.2	-	-	5.6
Calystegia occidentalis ssp. *occidentalis*	Modoc morning glory	native	perennial herb	-	-	-	-
Calystegia purpurata ssp. *purpurata*	Smooth western morning glory	native	perennial herb	-	-	-	-
Camissoniopsis intermedia	Intermediate sun cups	native	annual herb	-	-	-	-
Campanula angustiflora	Eastwood's harebell	native	annual herb	-	-	-	3.9
Capsella bursa-pastoris	Shepherd's purse	non-native	annual herb	-	-	FACU	-
Cardamine hirsuta	Hairy bitter cress	non-native	annual herb	-	-	FACU	-

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Cardamine oligosperma	Idaho bittercress	native	annual, perennial herb	-	-	FAC	-
Carduus pycnocephalus ssp. *pycnocephalus*	Italian thistle	non-native (invasive)	annual herb	-	Moderate	-	-
Carex barbarae	Valley sedge	native	perennial grasslike herb	-	-	FAC	-
Carex densa	Dense sedge	native	perennial grasslike herb	-	-	OBL	-
Carex multicaulis	Forest sedge	native	perennial grasslike herb	-	-	-	-
Carex nudata	Torrent sedge	native	perennial grasslike herb	-	-	FACW	-
Carex pellita	Woolly sedge	native	perennial grasslike herb	-	-	OBL	-
Carex praegracilis	Field sedge	native	perennial grasslike herb	-	-	FACW	-
Carex serratodens	Bifid sedge	native	perennial grasslike herb	-	-	FACW	4.9
Carex tumulicola	Split awn sedge	native	perennial grasslike herb	-	-	FACU	-
Castilleja affinis ssp. *affinis*	Coast Indian paint brush	native	perennial herb	-	-	-	-
Castilleja applegatei ssp. *martinii*	Martin's paintbrush	native	perennial herb	-	-	-	-
Castilleja attenuata	Narrow leaved owl's clover	native	annual herb	-	-	-	-
Castilleja densiflora ssp. *densiflora*	Dense flower owl's clover	native	annual herb	-	-	-	-
Castilleja exserta ssp. *exserta*	Purple owl's clover	native	annual herb	-	-	-	-
Castilleja foliolosa	Texas paintbrush	native	perennial herb	-	-	-	2.3
Castilleja minor	Little paintbrush	native	annual herb	-	-	OBL	-
Castilleja rubicundula ssp. *lithospermoides*	Cream sacs	native	annual herb	-	-	-	2.4
Caulanthus lasiophyllus	California mustard	native	annual herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Ceanothus cuneatus var. *cuneatus*	Buck brush	native	shrub	-	-	-	1.5
Ceanothus foliosus var. *foliosus*	Wavy leaved ceanothus	native	shrub	-	-	-	-
Ceanothus integerrimus var. *macrothyrsus*	Deerbrush	native	shrub	-	-	-	-
Ceanothus jepsonii	Musk brush	native	shrub	-	-	-	6
Centaurea calcitrapa	Purple star thistle	non-native (invasive)	annual, perennial herb	-	Moderate	-	-
Centaurea melitensis	Tocalote	non-native (invasive)	annual herb	-	Moderate	-	-
Centaurea solstitialis	Yellow starthistle	non-native (invasive)	annual herb	-	High	-	-
Centromadia fitchii	Spikeweed	native	annual herb	-	-	FACU	-
Cephalanthus occidentalis	Common buttonbush	native	shrub	-	-	OBL	-
Cerastium glomeratum	Large mouse ears	non-native	annual herb	-	-	UPL	-
Cercis occidentalis	Western redbud	native	tree, shrub	-	-	-	-
Cercocarpus betuloides var. *betuloides*	Birch leaf mountain mahogany	native	tree, shrub	-	-	-	-
Chaenactis glabriuscula var. *heterocarpha*	Variable fruited yellow chaenactis	native	annual herb	-	-	-	2.5
Chenopodium album	Lambs quarters	non-native	annual herb	-	-	FACU	-
Chlorogalum pomeridianum var. *pomeridianum*	Common soaproot	native	perennial herb	-	-	-	-
Chorizanthe membranacea	Pink spineflower	native	annual herb	-	-	-	-
Chorizanthe polygonoides var. *polygonoides*	Knotweed spineflower	native	annual herb	-	-	-	-
Cichorium intybus	Chicory	non-native	perennial herb	-	-	FACU	-
Cirsium cymosum var. *cymosum*	Peregrine thistle	native	perennial herb	-	-	-	-
Cirsium douglasii	Swamp thistle	native	perennial herb	-	-	OBL	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Cirsium occidentale var. *venustum*	Coulter's thistle	native	perennial herb	-	-	-	-
Cirsium vulgare	Bullthistle	non-native (invasive)	perennial herb	-	Moderate	FACU	-
Clarkia amoena ssp. *huntiana*	Farewell to spring	native	annual herb	-	-	-	-
Clarkia concinna ssp. *concinna*	Red ribbons	native	annual herb	-	-	-	-
Clarkia gracilis ssp. *tracyi*	Tracy's clarkia	native	annual herb	Rank 4.2	-	-	5
Clarkia purpurea ssp. *quadrivulnera*	Purple clarkia	native	annual herb	-	-	-	-
Clarkia rhomboidea	Tongue clarkia	native	annual herb	-	-	-	-
Clarkia unguiculata	Woodland clarkia	native	annual herb	-	-	-	-
Claytonia exigua ssp. *exigua*	Serpentine springbeauty	native	annual herb	-	-	-	3.4
Claytonia parviflora ssp. *parviflora*	Miner'slettuce	native	annual herb	-	-	FACU	-
Claytonia perfoliata ssp. *perfoliata*	Miner's lettuce	native	annual herb	-	-	FAC	-
Clematis lasiantha	Pipestem	native	perennial herb, vine	-	-	-	-
Clematis ligusticifolia	Creek clematis	native	perennial herb, vine	-	-	FAC	-
Collinsia greenei	Greene's collinsia	native	annual herb	-	-	-	5.2
Collinsia heterophylla var. *heterophylla*	Purple chinese houses	native	annual herb	-	-	-	-
Collinsia sparsiflora var. *sparsiflora*	Few flowered collinsia	native	annual herb	-	-	-	-
Collomia diversifolia	Serpentine collomia	native	annual herb	Rank 4.3	-	-	5.6
Collomia heterophylla	Varied leaved collomia	native	annual herb	-	-	-	-
Convolvulus arvensis	Field bindweed	non-native	perennial herb, vine	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Cordylanthus pilosus ssp. *pilosus*	Hairy bird's beak	native	annual herb	-	-	-	-
Cordylanthus tenuis ssp. *brunneus*	Serpentine bird's beak	native	annual herb (hemiparasitic)	Rank 4.3	-	-	5.1
Cornus nuttallii	Mountain dogwood	native	shrub	-	-	FACU	-
Cornus sericea ssp. *occidentalis*	Western dogwood	native	shrub	-	-	FACW	-
Crassula aquatica	Aquatic pygmy weed	native	annual herb	-	-	OBL	-
Crassula connata	Sand pygmy weed	native	annual herb	-	-	FAC	-
Crassula tillaea	Mediterranean pygmy weed	non-native	annual herb	-	-	FACU	-
Crocanthemum scoparium	Peak rush-rose	native	shrub	-	-	-	-
Croton setiger	Turkey-mullein	native	perennial herb	-	-	-	-
Crypsis sp.	Prickle grass	non-native	annual grass	-	-	FACW-OBL-	-
Cryptantha flaccida	Beaked cryptantha	native	annual herb	-	-	-	1.6
Cryptantha hispidula	Napa cryptantha	native	annual herb	-	-	-	6
Cuscuta brachycalyx	San joaquin dodder	native	annual herb, vine (parasitic)	-	-	-	-
Cynodon dactylon	Bermuda grass	non-native (invasive)	perennial grass	-	Moderate	FACU	-
Cynoglossum grande	Houndstongue	native	perennial herb	-	-	-	-
Cynosurus echinatus	Dogtail grass	non-native (invasive)	annual grass	-	Moderate	-	-
Cyperus eragrostis	Tall cyperus	native	perennial grasslike herb	-	-	FACW	-
Cytisus scoparius	Scotch broom	non-native (invasive)	shrub	-	High	-	-
Dactylis glomerata	Orchardgrass	non-native (invasive)	perennial grass	-	Limited	FACU	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Damasonium californicum	California damsonium	native	perennial herb (aquatic)	-	-	OBL	-
Danthonia californica	California oatgrass	native	perennial grass	-	-	FAC	-
Datisca glomerata	Durango root	native	perennial herb	-	-	FACW	-
Datura stramonium	Jimson weed	non-native	annual herb	-	-	-	-
Daucus pusillus	Wild carrot	native	annual herb	-	-	-	-
Delphinium hesperium ssp. *pallescens*	Western larkspur	native	perennial herb	-	-	FAC	-
Delphinium nudicaule	Canyon larkspur	native	perennial herb	-	-	-	-
Delphinium uliginosum	Swamp larkspur	native	perennial herb	Rank 4.2	-	OBL	5.7
Delphinium variegatum ssp. *variegatum*	Royal larkspur	native	perennial herb	-	-	-	-
Dendromecon rigida	Bush poppy	native	shrub	-	-	-	-
Deschampsia cespitosa ssp. *cespitosa*	Tufted hairgrass	native	perennial grass	-	-	FACW	-
Deschampsia danthonioides	Annual hairgrass	native	annual grass	-	-	FACW	-
Dichelostemma capitatum ssp. *capitatum*	Wild hyacinth	native	perennial herb	-	-	FACU	-
Dichelostemma congestum	Fork toothed ookow	native	perennial herb	-	-	-	-
Digitaria sanguinalis	Crabgrass	non-native	annual grass	-	-	FACU	-
Diplacus aurantiacus	Sticky monkeyflower	native	shrub	-	-	FACU	-
Diplacus congdonii	Congdon's monkeyflower	native	annual herb	-	-	FAC	-
Diplacus douglasii	Purple mouse ears	native	annual herb	-	-	FACW	2.7
Diplacus kelloggii	Kellogg's monkeyflower	native	annual herb	-	-	-	-
Diplacus tricolor	Tricolor monkeyflower	native	annual herb	-	-	OBL	-
Downingia concolor var. *concolor*	Spotted throat downingia	native	annual herb	-	-	OBL	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Downingia cuspidata	Toothed downingia	native	annual herb	-	-	OBL	-
Drymocallis glandulosa	Sticky cinquefoil	native	perennial herb	-	-	FAC	-
Dryopteris arguta	Wood fern	native	fern	-	-	-	-
Dudleya cymosa ssp. *cymosa*	Canyon dudleya	native	perennial herb	-	-	-	-
Echinochloa crus-galli	Barnyard grass	non-native	annual grass	-	-	FACW	-
Ehrendorferia chrysantha	Golden eardrops	native	perennial herb	-	-	-	1.1
Eleocharis acicularis	Needle spikerush	native	perennial grasslike herb	-	-	OBL	-
Eleocharis macrostachya	Spike rush	native	perennial grasslike herb	-	-	OBL	-
Elymus caput-medusae	Medusa head	non-native (invasive)	annual grass	-	High	-	-
Elymus elymoides var. *elymoides*	Squirrel tail grass	native	perennial grass	-	-	FACU	-
Elymus glaucus ssp. *glaucus*	Blue wild rye	native	perennial grass	-	-	FACU	-
Elymus multisetus	Big squirreltail grass	native	perennial grass	-	-	-	-
Elymus triticoides	Beardless wild rye	native	perennial grass	-	-	FAC	-
Epilobium brachycarpum	Willow herb	native	annual herb	-	-	-	-
Epilobium campestre	Smooth boisduvalia	native	annual herb	-	-	OBL	-
Epilobium canum ssp. *canum*	California fuchsia	native	perennial herb	-	-	-	-
Epilobium ciliatum	Slender willow herb	native	perennial herb	-	-	FACW	-
Epilobium densiflorum	Willow herb	native	annual herb	-	-	FACW	-
Epilobium minutum	Minute willowherb	native	annual herb	-	-	FACU	2
Epilobium torreyi	Narrow boisduvalia	native	annual herb	-	-	FACW	-
Epipactis gigantea	Stream orchid	native	perennial herb	-	-	OBL	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Equisetum hyemale ssp. *affine*	Giant scouring rush	native	fern	-	-	FACW	-
Equisetum laevigatum	Smooth scouring rush	native	fern	-	-	FACW	-
Ericameria arborescens	Golden fleece	native	shrub	-	-	-	1.3
Erigeron canadensis	Canada horseweed	native	annual herb	-	-	FACU	-
Erigeron greenei	Greene's narrow-leaved daisy	native	perennial herb	Rank 1B.2	-	-	-
Erigeron philadelphicus var. *philadelphicus*	Philadelphia fleabane	native	perennial herb	-	-	FACU	-
Eriodictyon californicum	Yerba santa	native	shrub	-	-	-	-
Eriogonum luteolum var. *luteolum*	Golden buckwheat	native	annual herb	-	-	-	3.8
Eriogonum nudum var. *nudum*	Nude buckwheat	native	shrub	-	-	-	-
Eriophyllum lanatum var. *achilleoides*	Yarrow leaved woolly sunflower	native	perennial herb	-	-	-	-
Erodium botrys	Big heron bill	non-native	annual herb	-	-	FACU	-
Erodium brachycarpum	White stemmed filaree	non-native	annual herb	-	-	-	-
Erodium cicutarium	Red stemmed filaree	non-native (invasive)	annual herb	-	Limited	-	-
Erodium moschatum	Whitestem filaree	non-native	annual herb	-	-	-	-
Eryngium aristulatum var. *aristulatum*	Jepson's button celery	native	perennial herb	-	-	OBL	-
Erythranthe guttata	Seep monkeyflower	native	perennial herb (rhizomatous)	-	-	OBL	-
Erythranthe latidens	Broad toothed monkeyflower	native	annual herb	-	-	OBL	-
Erythranthe microphylla	Seep monkeyflower	native	annual herb	-	-	OBL	-
Erythranthe nudata	Bare monkeyflower	native	annual herb	Rank 4.3	-	OBL	5.6
Erythronium helenae	St. Helena fawn lily	native	perennial herb (bulb)	Rank 4.2	-	-	4.5
Eschscholzia caespitosa	Tufted poppy	native	annual herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Eschscholzia californica	California poppy	native	annual, perennial herb	-	-	-	-
Eucalyptus camaldulensis	Red gum	non-native (invasive)	tree	-	Limited	FAC	-
Euphorbia serpyllifolia	Thyme-leaved spurge	native	annual herb	-	-	-	-
Euphorbia spathulata	Reticulate seeded spurge	native	annual herb	-	-	FAC	-
Eurybia radulina	Roughleaf aster	native	perennial herb				
Euthamia occidentalis	Western goldenrod	native	perennial herb	-	-	FACW	-
Festuca arundinacea	Reed fescue	non-native (invasive)	perennial grass	-	Moderate	FACU	-
Festuca bromoides	Brome fescue	non-native	annual grass	-	-	FACU	-
Festuca californica	California fescue	native	perennial grass	-	-	FACU	2.4
Festuca idahoensis	Blue fescue	native	perennial grass	-	-	FACU	1.3
Festuca microstachys	Small fescue	native	annual grass	-	-	-	-
Festuca myuros	Rattail sixweeks grass	non-native (invasive)	annual grass	-	Moderate	FACU	-
Festuca perennis	Italian rye grass	non-native (invasive)	annual, perennial grass	-	Moderate	FAC	-
Ficus carica	Common fig	non-native (invasive)	tree	-	Moderate	FACU	-
Frangula californica ssp. *tomentella*	Hoary coffeeberry	native	shrub	-	-	-	1.5
Fraxinus dipetala	Two petaled ash	native	tree, shrub	-	-	-	-
Fraxinus latifolia	Oregon ash	native	tree	-	-	FACW	-
Fritillaria affinis	Checker lily	native	perennial herb (bulb)	-	-	-	2
Fritillaria purdyi	Purdy's fritillary	native	perennial herb (bulb)	Rank 4.3	-	-	4.5

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Fritillaria recurva	Scarlet fritillary	native	perennial herb	-	-	-	-
Galium andrewsii ssp. *andrewsii*	Phlox leaved bedstraw	native	perennial herb	-	-	-	3.2
Galium aparine	Cleavers	native	annual herb	-	-	FACU	-
Galium bolanderi	Bolander's bedstraw	native	perennial herb	-	-	-	-
Galium californicum	California bedstraw	native	perennial herb	-	-	-	-
Galium murale	Tiny bedstraw	non-native	annual herb	-	-	-	-
Galium parisiense	Wall bedstraw	non-native	annual herb	-	-	UPL	-
Galium porrigens var. *porrigens*	Graceful bedstraw	native	vine, shrub	-	-	-	-
Galium porrigens var. *tenue*	Graceful bedstraw	native	vine, shrub	-	-	-	-
Garrya congdonii	Silk tassel	native	shrub	-	-	-	5
Gastridium phleoides	Nit grass	non-native	annual grass	-	-	FACU	-
Genista monspessulana	French broom	non-native (invasive)	shrub	-	High	-	-
Geranium dissectum	Wild geranium	non-native (invasive)	annual herb	-	Limited	-	-
Geranium molle	Crane's bill geranium	non-native	annual, perennial herb	-	-	-	-
Gilia capitata ssp. *capitata*	Blue field gilia	native	annual herb	-	-	-	1.6
Gilia clivorum	Purple spot gilia	native	annual herb	-	-	-	-
Gilia tricolor ssp. *diffusa*	Bird's eyes	native	annual herb	-	-	-	-
Githopsis specularioides	Venus' looking glass	native	annual herb	-	-	FACU	-
Glyceria declinata	Waxy mannagrass	non-native (invasive)	perennial grass	-	Moderate	FACW	-
Glycyrrhiza glabra	Licorice	non-native	perennial herb	-	-	-	-
Glycyrrhiza lepidota	American licorice	native	perennial herb	-	-	FAC	-
Gnaphalium palustre	Lowland cudweed	native	annual herb	-	-	FACW	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Gratiola ebracteata	Common hedge hyssop	native	annual herb	-	-	OBL	-
Grindelia hirsutula	Gumweed	native	perennial herb	-	-	FACW	1.4
Helenium bigelovii	Bigelow's sneezeweed	native	perennial herb	-	-	FACW	2.9
Helenium puberulum	Sneezeweed	native	perennial herb	-	-	FACW	-
Helianthella californica var. *californica*	California helianthella	native	perennial herb	-	-	-	-
Helianthus exilis	Serpentine sunflower	native	annual herb	Rank 4.2	-	FACU	5.7
Heliotropium curassavicum var. *oculatum*	Seaside heliotrope	native	perennial herb	-	-	FACU	-
Helminthotheca echioides	Bristly ox-tongue	non-native (invasive)	annual, perennial herb	-	Limited	FAC	-
Hemizonia congesta ssp. *clevelandii*	Cleveland's tarweed	native	annual herb	-	-	-	-
Hesperevax sparsiflora var. *sparsiflora*	Few flowered evax	native	annual herb	-	-	FACU	1.8
Hesperocyparis sargentii	Sargent cypress	native	tree, shrub	-	-	-	4.9
Hesperolinon bicarpellatum	Two carpellate western flax	native	annual herb	Rank 1B.2	-	-	6.2
Hesperolinon californicum	California western flax	native	annual herb	-	-	-	2.8
Hesperolinon didymocarpum	Lake County western flax	native	annual herb	SE, Rank 1B.2	-	-	6.2
Hesperolinon disjunctum	Coast range western flax	native	annual herb	-	-	-	6
Hesperolinon micranthum	Small flower western flax	native	annual herb	-	-	-	2.4
Hesperolinon spergulinum	Slender western flax	native	annual herb	-	-	-	4.7
Heterocodon rariflorum	Heterocodon	native	annual herb	-	-	FACW	-
Heteromeles arbutifolia	Toyon	native	shrub	-	-	-	-
Heterotheca oregona	Oregon golden aster	native	perennial herb	-	-	FACU	-
Hirschfeldia incana	Short-podded mustard	non-native (invasive)	perennial herb	-	Moderate	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Hoita macrostachya	California hemp	native	perennial herb	-	-	OBL	-
Holocarpha virgata ssp. *virgata*	Narrow tarplant	native	annual herb	-	-	-	-
Hordeum brachyantherum ssp. *brachyantherum*	Meadow barley	native	perennial grass	-	-	FACW	-
Hordeum brachyantherum ssp. *californicum*	Meadow barley	native	perennial grass	-	-	FACW	3.1
Hordeum marinum ssp. *gussoneanum*	Mediterranean barley	non-native (invasive)	annual grass	-	Moderate	FAC	-
Hordeum murinum ssp. *glaucum*	Foxtail	non-native (invasive)	annual grass	-	Moderate	FACU	-
Hordeum murinum ssp. *leporinum*	Farmer's foxtail	non-native (invasive)	annual grass	-	Moderate	FACU	-
Hypericum concinnum	Gold wire	native	perennial herb	-	-	-	-
Hypericum perforatum ssp. *perforatum*	Klamathweed	non-native	perennial herb	-	Moderate	FACU	-
Hypochaeris glabra	Smooth cats ear	non-native (invasive)	annual herb	-	Limited	-	-
Hypochaeris radicata	Hairy cats ear	non-native (invasive)	perennial herb	-	Moderate	FACU	-
Iris fernaldii	Fernald's iris	native	perennial herb	-	-	-	-
Iris macrosiphon	Ground iris	native	perennial herb	-	-	-	1.1
Juglans hindsii	Northern California black walnut	native	tree	Rank 1B.1	-	FAC	-
Juncus balticus ssp. *ater*	Baltic rush	native	perennial grasslike herb	-	-	FACW	-
Juncus bufonius	Common toad rush	native	annual grasslike herb	-	-	FACW	-
Juncus effusus ssp. *pacificus*	Pacific rush	native	perennial grasslike herb	-	-	FACW	-
Juncus mexicanus	Mexican rush	native	perennial grasslike herb	-	-	FACW	-
Juncus occidentalis	Western rush	native	perennial grasslike herb	-	-	FACW	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Juncus patens	Common rush	native	perennial grasslike herb	-	-	FACW	-
Juncus phaeocephalus var. *phaeocephalus*	Brown headed rush	native	perennial grasslike herb	-	-	FACW	-
Juncus tenuis	Slender rush	native	perennial grasslike herb	-	-	FACW	-
Juncus xiphioides	Iris leaved rush	native	perennial grasslike herb	-	-	OBL	-
Keckiella breviflora var. *glabrisepala*	Hairless gaping keckiella	native	shrub	-	-	-	-
Kickxia elatine	Sharp point fluellin	non-native	perennial herb	-	-	UPL	-
Koeleria macrantha	June grass	native	perennial grass	-	-	-	-
Lactuca saligna	Willow lettuce	non-native	annual herb	-	-	UPL	-
Lactuca serriola	Prickly lettuce	non-native	annual herb	-	-	FACU	-
Lagophylla minor	Little hareleaf	native	annual herb	-	-	-	4.7
Lagophylla ramosissima	Common hareleaf	native	annual herb	-	-	-	-
Lamium amplexicaule	Henbit	non-native	annual herb	-	-	-	-
Lasthenia californica ssp. *californica*	California goldfields	native	annual herb	-	-	FACU	-
Lasthenia glaberrima	Smooth goldfields	native	annual herb	-	-	OBL	-
Lasthenia glabrata ssp. *glabrata*	Yellow rayed goldfields	native	annual herb	-	-	FACW	-
Lasthenia gracilis	Needle goldfields	native	annual herb	-	-	-	-
Lathyrus cicera	Red peavine	non-native	annual herb	-	-	-	-
Lathyrus hirsutus	Caley pea	non-native	annual herb	-	-	FAC	-
Lathyrus tingitanus	Tangier pea	non-native	annual herb	-	-	-	-
Lathyrus vestitus var. *vestitus*	Hillside pea	native	perennial herb	-	-	-	1.8
Layia chrysanthemoides	Smooth tidy tips	native	annual herb	-	-	FACW	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Layia septentrionalis	Colusa layia	native	annual herb	Rank 1B.2	-	-	3.2
Leontodon saxatilis ssp. *longirostris*	Hawkbit	non-native	annual herb	-	-	FACU	-
Lepechinia calycina	Pitcher sage	native	shrub	-	-	-	-
Lepidium latifolium	Perennial pepperweed	non-native (invasive)	perennial herb	-	High	FAC	-
Lepidium nitidum	Shining pepper grass	native	annual herb	-	-	FAC	-
Lepidium strictum	Peppergrass	native	annual herb	-	-	-	-
Leptosiphon bicolor	True babystars	native	annual herb	-	-	UPL	-
Leptosiphon ciliatus	Whiskerbrush	native	annual herb	-	-	-	-
Leptosiphon parviflorus	Variable linanthus	native	annual herb	-	-	-	-
Lessingia ramulosa	Sonoma lessingia	native	annual herb	-	-	-	5.4
Lewisia rediviva var. *rediviva*	Bitter root	native	perennial herb	-	-	-	-
Limnanthes douglasii ssp. *nivea*	Douglas' meadowfoam	native	annual herb	-	-	OBL	-
Linanthus dichotomus ssp. *meridianus*	Evening snow	native	annual herb	-	-	-	-
Lithophragma affine	Common woodland star	native	perennial herb	-	-	-	-
Lithophragma heterophyllum	Woodland star	native	perennial herb	-	-	-	-
Logfia filaginoides	California cottonrose	native	annual herb	-	-	-	-
Logfia gallica	Narrowleaf cottonrose	non-native	annual herb	-	-	-	-
Lomatium californicum	Celery weed	native	perennial herb	-	-	-	-
Lomatium dasycarpum ssp. *tomentosum*	Woolly fruited lomatium	native	perennial herb	-	-	-	-
Lomatium hooveri	Hoover's lomatium	native	perennial herb	Rank 4.3	-	-	5.9
Lomatium marginatum var. *marginatum*	Hartweg's lomatium	native	perennial herb	-	-	-	-
Lomatium marginatum var. *purpureum*	Jepson's lomatium	native	perennial herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Lomatium utriculatum	Hog fennel	native	perennial herb	-	-	-	1.7
Lonicera hispidula	Pink honeysuckle	native	vine, shrub	-	-	FACU	-
Lonicera interrupta	Chaparral honeysuckle	native	vine, shrub	-	-	-	-
Lotus corniculatus	Bird's foot trefoil	non-native	perennial herb	-	-	FAC	-
Lotus tenuis	Narrow-leaf bird’s foot trefoil	non-native	perennial herb	-	-	FACU	-
Lupinus albifrons var. *albifrons*	Silver bush lupine	native	shrub	-	-	-	-
Lupinus albifrons var. *collinus*	Silver bush lupine	native	shrub	-	-	-	-
Lupinus bicolor	Miniature lupine	native	annual, perennial herb	-	-	-	-
Lupinus latifolius var. *latifolius*	Broad leaf lupine	native	perennial herb	-	-	FACW	-
Lupinus microcarpus var. *densiflorus*	Dense-flowered chick lupine	native	annual herb	-	-	-	-
Lupinus microcarpus var. *microcarpus*	Chick lupine	native	annual herb	-	-	-	-
Lupinus nanus	Sky lupine	native	annual herb	-	-	-	-
Lupinus succulentus	Arroyo lupine	native	annual herb	-	-	-	-
Luzula comosa var. *comosa*	Hairy wood rush	native	perennial grasslike herb	-	-	FAC	-
Lysimachia arvensis	Scarlet pimpernel	non-native	annual herb	-	-	FAC	-
Lysimachia latifolia	Pacific starflower	native	perennial herb	-	-	FAC	-
Lythrum hyssopifolia	Hyssop loosestrife	non-native (invasive)	annual, perennial herb	-	Limited	OBL	-
Madia elegans	Common madia	native	annual herb	-	-	-	-
Madia exigua	Small tarweed	native	annual herb	-	-	-	1.8
Madia gracilis	Gumweed	native	annual herb	-	-	-	-
Malacothrix floccifera	Woolly malacothrix	native	annual herb	-	-	-	2.1
Malva nicaeensis	Bull mallow	non-native	annual herb	-	-	-	-

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Malva parviflora	Cheeseweed	non-native	annual herb	-	-	-	-
Malvella leprosa	Alkali mallow	native	perennial herb	-	-	FACU	-
Marah watsonii	Watson's wild cucumber	native	perennial herb, vine	-	-	-	-
Marrubium vulgare	White horehound	non-native (invasive)	perennial herb	-	Limited	FACU	-
Marsilea vestita ssp. *vestita*	Hairy pepperwort	native	fern	-	-	OBL	-
Matricaria discoidea	Pineapple weed	native	annual herb	-	-	FACU	-
Medicago polymorpha	California burclover	non-native (invasive)	annual herb	-	Limited	FACU	-
Melica californica	California melic	native	perennial grass	-	-	-	-
Melica torreyana	Torrey's melica	native	perennial grass	-	-	-	-
Melilotus albus	White sweetclover	non-native	annual, biennial herb	-	-	-	-
Melilotus indicus	Annual yellow sweetclover	non-native	annual herb	-	-	FACU	-
Mentha pulegium	Pennyroyal	non-native (invasive)	perennial herb	-	Moderate	OBL	-
Micranthes integrifolia	Smooth leaf saxifrage	native	perennial herb	-	-	FACW	-
Micropus californicus var. *californicus*	Slender cottonweed	native	annual herb	-	-	FACU	-
Microseris douglasii ssp. *douglasii*	Douglas' microseris	native	annual herb	-	-	FACU	-
Microseris elegans	Elegant silverpuffs	native	annual herb	-	-	-	-
Mimetanthe pilosa	Snouted monkey flower	native	annual herb	-	-	FACW	-
Minuartia californica	Sandwort	native	annual herb	-	-	FACU	1.7
Minuartia douglasii	Douglas' sandwort	native	annual herb	-	-	-	3
Monardella villosa ssp. *villosa*	Coyote mint	native	perennial herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Monardella viridis	Green monardella	native	perennial herb	Rank 4.3	-	-	1
Montia fontana	Water montia	native	annual herb	-	-	OBL	-
Morus alba	Mulberry	non-native	tree	-	-	FACU	-
Muhlenbergia rigens	Deergrass	native	perennial grass	-	-	FAC	-
Myriophyllum sp.	Water-milfoil	non-native	perennial herb	-	-	OBL	-
Myriopteris covillei	Coville's lip fern	native	fern	-	-	-	-
Narcissus pseudonarcissus	Daffodil	non-native	perennial herb (bulb)	-	-	-	-
Navarretia atractyloides	Holly leaf navarretia	native	annual herb	-	-	-	-
Navarretia cotulifolia	Cotula navarretia	native	annual herb	Rank 4.2	-	OBL	-
Navarretia intertexta	Interwoven navarretia	native	annual herb	-	-	FACW	-
Navarretia jepsonii	Jepson's navarretia	native	annual herb	Rank 4.3	-	FACW	5.6
Navarretia leucocephala ssp. *leucocephala*	White headed navarretia	native	annual herb	-	-	OBL	-
Navarretia mellita	Skunk navarretia	native	annual herb	-	-	FAC	-
Navarretia pubescens	Purple navarretia	native	annual herb	-	-	-	2
Navarretia squarrosa	Skunkweed	native	annual herb	-	-	FACU	-
Nemacladus montanus	Mountain nemacladus	native	annual herb	-	-	-	6
Nemophila heterophylla	Canyon nemophila	native	annual herb	-	-	-	-
Nemophila menziesii var. *atomaria*	Baby blue eyes	native	annual herb	-	-	-	-
Nemophila menziesii var. *menziesii*	Baby blue eyes	native	annual herb	-	-	-	-
Nemophila parviflora var. *parviflora*	Small flowered nemophila	native	annual herb	-	-	-	-
Nicotiana acuminata var. *multiflora*	Many flowered tobacco	non-native	annual herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Oemleria cerasiformis	Oso berry	native	shrub	-	-	FACU	-
Packera eurycephala var. *eurycephala*	Widehead groundsel	native	perennial herb	-	-	-	-
Packera greenei	Flame ragwort	native	perennial herb	-	-	-	-
Parentucellia viscosa	Yellow glandweed	non-native (invasive)	annual herb	-	Limited	FAC	-
Paspalum dilatatum	Dallis grass	non-native	perennial grass	-	-	FAC	-
Pectocarya pusilla	Little pectocarya	native	annual herb	-	-	-	1.3
Pedicularis densiflora	Indian warrior	native	perennial herb	-	-	-	-
Pellaea andromedifolia	Coffee fern	native	fern	-	-	-	-
Pellaea mucronata var. *mucronata*	Bird's foot fern	native	fern	-	-	-	-
Penstemon heterophyllus var. *heterophyllus*	Foothill penstemon	native	perennial herb	-	-	-	-
Penstemon heterophyllus var. *purdyi*	Purdy's foothill penstemon	native	perennial herb	-	-	-	-
Pentagramma triangularis	Gold back fern	native	fern	-	-	-	-
Perideridia gairdneri ssp. *borealis*	Northern Gairdner's yampah	native	perennial herb	-	-	FAC	-
Perideridia kelloggii	Kellogg's yampah	native	perennial herb	-	-	-	2.1
Persicaria amphibia	Water smartweed	native	perennial herb (aquatic)	-	-	OBL	-
Persicaria maculosa	Spotted ladysthumb	non-native	annual herb	-	-	FACW	-
Persicaria punctata	Dotted smartweed	native	perennial herb	-	-	OBL	-
Petrorhagia dubia	Windmill pink	non-native	annual herb	-	-	-	-
Phacelia distans	Common phacelia	native	annual herb	-	-	OBL	1.1
Phacelia imbricata var. *imbricata*	Imbricate phacelia	native	annual herb	-	-	-	-

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Phalaris aquatica	Harding grass	non-native (invasive)	perennial grass	-	Moderate	FACU	-
Phalaris lemmonii	Lemmon's canarygrass	native	annual grass	-	-	FACW	-
Phalaris minor	Mediterranean canarygrass	non-native	annual grass	-	-	-	-
Phalaris paradoxa	Hood canarygrass	non-native	annual grass	-	-	FAC	-
Phoradendron bolleanum	Bollean mistletoe	native	shrub (parasitic)	-	-	-	-
Phoradendron leucarpum ssp. *tomentosum*	Mistletoe	native	shrub (parasitic)	-	-	-	-
Phyla nodiflora	Common lippia	native	perennial herb	-	-	FACW	-
Physalis lanceifolia	Narrow leaf tomatillo	non-native	annual herb	-	-	UPL	-
Pickeringia montana var. *montana*	Chaparral pea	native	shrub	-	-	-	-
Pinus attenuata	Knobcone pine	native	tree	-	-	-	2.5
Pinus ponderosa var. *pacifica*	Pacific ponderosa pine	native	tree	-	-	FACU	-
Pinus sabiniana	Bull pine	native	tree	-	-	-	1.4
Piperia transversa	Mountain piperia	native	perennial herb	-	-	-	-
Plagiobothrys bracteatus	Bracted allocarya	native	annual herb	-	-	FACW	-
Plagiobothrys fulvus var. *campestris*	Tawny popcorn flower	native	annual herb	-	-	-	-
Plagiobothrys glyptocarpus var. *glyptocarpus*	Sculptured allocarya	native	annual herb	-	-	FACW	-
Plagiobothrys greenei	Greene's allocarya	native	annual herb	-	-	FACW	-
Plagiobothrys nothofulvus	Rusty haired popcorn flower	native	annual herb	-	-	FAC	-
Plagiobothrys stipitatus var. *micranthus*	Common vernal pool allocarya	native	annual herb	-	-	FACW	-
Plantago coronopus	Cut leaf plantain	non-native	annual herb	-	-	FAC	-
Plantago erecta	California plantain	native	annual herb	-	-	-	1

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Plantago lanceolata	Ribwort	non-native (invasive)	perennial herb	-	Limited	FAC	-
Plantago patagonica	Patagonia plantain	native	annual herb	-	-	-	-
Platanus ×hispanica	London plane tree	non-native	tree	-	-	-	-
Platystemon californicus	Cream cups	native	annual herb	-	-	-	1.7
Plectritis ciliosa	Long spurred plectritis	native	annual herb	-	-	FACU	-
Plectritis macrocera	Plectritis	native	annual herb	-	-	FACU	-
Pleuropogon californicus var. *californicus*	Annual semaphoregrass	native	annual grass	-	-	OBL	-
Poa annua	Annual blue grass	non-native	annual grass	-	-	FAC	-
Poa bulbosa ssp. *bulbosa*	Bulbous blue grass	non-native	perennial grass	-	-	FACU	-
Poa pratensis ssp. *pratensis*	Kentucky blue grass	non-native (invasive)	perennial grass	-	Limited	FAC	-
Poa secunda ssp. *secunda*	Sandberg's bluegrass	native	perennial grass	-	-	FACU	-
Pogogyne douglasii	Douglas' pogogyne	native	annual herb	-	-	OBL	-
Pogogyne zizyphoroides	Sacramento mint	native	annual herb	-	-	OBL	-
Polygala californica	Milkwort	native	perennial herb	-	-	-	-
Polygonum aviculare ssp. *aviculare*	Prostrate knotweed	non-native	annual, perennial herb	-	-	FACW	-
Polypodium californicum	California polypody	native	fern	-	-	-	-
Polypodium calirhiza	Licorice fern	native	fern	-	-	-	-
Polypogon interruptus	Ditch beard grass	non-native	perennial grass	-	-	FACW	-
Polypogon maritimus	Mediterranean beard grass	non-native	annual grass	-	-	OBL	-
Polypogon monspeliensis	Annual beard grass	non-native (invasive)	annual grass	-	Limited	FACW	-
Populus fremontii ssp. *fremontii*	Cottonwood	native	tree	-	-	FAC	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Portulaca oleracea	Common purslane	non-native	annual herb	-	-	FAC	-
Primula hendersonii	Mosquito bill	native	perennial herb	-	-	-	-
Prunus cerasifera	Cherry plum	non-native (invasive)	tree	-	Limited	-	-
Pseudognaphalium californicum	Ladies' tobacco	native	annual, perennial herb	-	-	-	-
Pseudognaphalium luteoalbum	Jersey cudweed	non-native	annual herb	-	-	FAC	-
Pseudotsuga menziesii var. *menziesii*	Douglas fir	native	tree	-	-	FACU	-
Psilocarphus brevissimus var. *brevissimus*	Woolly heads	native	annual herb	-	-	FACW	-
Psilocarphus chilensis	Round woolly marbles	native	annual herb	-	-	FACW	-
Pteridium aquilinum var. *pubescens*	Western bracken fern	native	fern	-	-	FACU	-
Pterostegia drymarioides	Fairy mist	native	annual herb	-	-	-	-
Quercus ×morehus	Oracle oak	native	tree	-	-	-	-
Quercus berberidifolia	Inland scrub oak	native	tree	-	-	-	-
Quercus chrysolepis	Gold cup live oak	native	tree	-	-	-	-
Quercus douglasii	Blue oak	native	tree	-	-	-	-
Quercus durata var. *durata*	Leather oak	native	shrub	-	-	-	5.8
Quercus kelloggii	California black oak	native	tree	-	-	-	-
Quercus lobata	Valley oak	native	tree	-	-	FACU	-
Quercus wislizeni var. *wislizeni*	Interior live oak	native	tree, shrub	-	-	-	-
Rafinesquia californica	California chicory	native	annual herb	-	-	-	-
Ranunculus aquatilis var. *aquatilis*	Whitewater crowfoot	native	perennial herb (aquatic)	-	-	OBL	-
Ranunculus californicus var. *californicus*	Common buttercup	native	perennial herb	-	-	FACU	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Ranunculus hebecarpus	Pubescent fruited buttercup	native	annual herb	-	-	-	-
Ranunculus muricatus	Buttercup	non-native	annual, perennial herb	-	-	FACW	-
Ranunculus occidentalis var. *occidentalis*	Western buttercup	native	perennial herb	-	-	FAC	-
Raphanus raphanistrum	Jointed charlock	non-native	annual, perennial herb	-	-	-	-
Raphanus sativus	Wild radish	non-native (invasive)	annual, biennial herb	-	Limited	-	-
Rhamnus ilicifolia	Evergreen buckthorn	native	shrub	-	-	-	-
Rhododendron occidentale	Western azalea	native	tree, shrub	-	-	FAC	-
Rhus aromatica	Fragrant sumac	native	shrub	-	-	FACU	-
Ribes malvaceum var. *malvaceum*	Chaparral currant	native	shrub	-	-	-	-
Rigiopappus leptocladus	Wire weed	native	annual herb	-	-	-	1.9
Robinia pseudoacacia	Black locust	non-native (invasive)	tree	-	Limited	FACU	-
Rosa californica	California wild rose	native	shrub	-	-	FAC	-
Rubus armeniacus	Himalayan blackberry	non-native (invasive)	shrub	-	High	FAC	-
Rumex crispus	Curly dock	non-native (invasive)	perennial herb	-	Limited	FAC	-
Rumex pulcher	Fiddleleaf dock	non-native	perennial herb	-	-	FAC	-
Salix breweri	Serpentine willow	native	shrub	-	-	FAC	6
Salix exigua var. *hindsiana*	Sandbar willow	native	tree, shrub	-	-	FACW	-
Salix gooddingii	Gooding's willow	native	tree	-	-	FACW	-
Salix laevigata	Polished willow	native	tree	-	-	FACW	-
Salix lasiolepis	Arroyo willow	native	tree, shrub	-	-	FACW	-
Salsola sp.	Russian thistle	non-native	annual herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Salvia columbariae	Chia sage	native	annual herb	-	-	-	-
Salvia sonomensis	Sonoma sage	native	perennial herb	-	-	-	1.6
Sambucus nigra ssp. *caerulea*	Blue elderberry	native	shrub	-	-	FAC	-
Sanicula bipinnata	Poison sanicle	native	perennial herb	-	-	-	-
Sanicula bipinnatifida	Purple sanicle	native	perennial herb	-	-	-	1.8
Sanicula crassicaulis	Pacific sanicle	native	perennial herb	-	-	-	-
Sanicula tuberosa	Turkey pea	native	perennial herb	-	-	-	1.3
Schoenoplectus acutus var. *occidentalis*	Tule	native	perennial grasslike herb	-	-	OBL	-
Schoenoplectus tabernaemontani	Softstem bulrush	native	perennial grasslike herb	-	-	OBL	-
Scleranthus annuus ssp. *annuus*	German knotgrass	non-native	annual herb	-	-	FACU	-
Scrophularia californica	California bee plant	native	perennial herb	-	-	FAC	-
Scutellaria antirrhinoides	Snapdragon skullcap	native	perennial herb	-	-	-	2.3
Scutellaria californica	California skullcap	native	perennial herb	-	-	-	-
Scutellaria siphocampyloides	Gray leaved skullcap	native	perennial herb	-	-	FACU	-
Scutellaria tuberosa	Dannie's skullcap	native	perennial herb	-	-	-	-
Senecio aronicoides	Butterweed	native	perennial herb	-	-	-	-
Senecio clevelandii var. *clevelandii*	Cleveland's ragwort	native	perennial herb	Rank 4.3	-	-	-
Senecio vulgaris	Common groundsel	non-native	annual herb	-	-	FACU	-
Sherardia arvensis	Field madder	non-native	annual herb	-	-	-	-
Sidalcea diploscypha	Fringed checker mallow	native	annual herb	-	-	-	2.6
Sidalcea hartwegii	Hartweg's checkerbloom	native	annual herb	-	-	-	1.6
Sidalcea hirsuta	Hairy checkerbloom	native	annual herb	-	-	OBL	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Sidalcea keckii	Keck's checkerbloom	native	annual herb	FE, Rank 1B.1	-	-	3
Silene gallica	Common catchfly	non-native	annual herb	-	-	-	-
Silene laciniata ssp. *californica*	California indian pink	native	perennial herb	-	-	-	-
Silybum marianum	Milk thistle	non-native (invasive)	annual, perennial herb	-	Limited	-	-
Sisymbrium irio	London rocket	non-native (invasive)	annual herb	-	Moderate	-	-
Sisymbrium officinale	Hedge mustard	non-native	annual herb	-	-	-	-
Sisyrinchium bellum	Blue eyed grass	native	perennial herb	-	-	FACW	-
Solanum parishii	Parish's purple nightshade	native	shrub	-	-	-	-
Solanum xanti	Nightshade	native	perennial herb, shrub	-	-	-	-
Solidago elongata	West coast canada goldenrod	native	perennial herb	-	-	FACU	-
Soliva sessilis	South american soliva	non-native	annual herb	-	-	FACU	-
Sonchus asper ssp. *asper*	Prickly sow thistle	non-native	annual herb	-	-	FAC	-
Sonchus oleraceus	Common sow thistle	non-native	annual herb	-	-	UPL	-
Sorghum halepense	Johnsongrass	non-native	perennial grass	-	-	FACU	-
Spartium junceum	Spanish broom	non-native (invasive)	shrub	-	High	-	-
Spergularia rubra	Purple sand spurry	non-native	annual, perennial herb	-	-	FAC	-
Spiranthes porrifolia	Western ladies tresses	native	perennial herb	-	-	FACW	-
Stachys albens	Cobwebby hedge nettle	native	perennial herb	-	-	OBL	-
Stachys rigida var. *quercetorum*	Rough hedgenettle	native	perennial herb	-	-	FACW	-
Stebbinsoseris heterocarpa	Grassland stebbinsoseris	native	annual herb	-	-	-	-
Stellaria media	Chickweed	non-native	annual herb	-	-	FACU	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Stephanomeria virgata ssp. *pleurocarpa*	Tall stephanomeria	native	annual herb	-	-	-	-
Stipa cernua	Nodding needle grass	native	perennial grass	-	-	-	-
Stipa lepida	Foothill needle grass	native	perennial grass	-	-	-	-
Stipa miliacea var. *miliacea*	Smilo grass	non-native (invasive)	perennial grass	-	Limited	-	-
Stipa pulchra	Purple needle grass	native	perennial grass	-	-	-	-
Streptanthus breweri	Brewer's jewelflower	native	annual herb	-	-	-	5.7
Streptanthus glandulosus ssp. *glandulosus*	Jewelflower	native	annual herb	-	-	-	-
Streptanthus hesperidis	Green jewel-flower	native	annual herb	Rank 1B.2	-	-	-
Streptanthus morrisonii	Morrison's jewelflower	native	perennial herb	Rank 1B.2	-	-	6.1
Symphoricarpos albus var. *laevigatus*	Common snowberry	native	shrub	-	-	FACU	-
Symphoricarpos mollis	Creeping snowberry	native	shrub	-	-	FACU	-
Tamarix parviflora	Tamarisk	non-native (invasive)	tree, shrub	-	High	FAC	-
Taraxacum officinale	Red seeded dandelion	non-native	perennial herb	-	-	FACU	-
Taraxia ovata	Sun cup	native	perennial herb	-	-	-	-
Tetrapteron graciliflorum	Hill sun cup	native	annual herb	-	-	-	-
Thalictrum fendleri var. *polycarpum*	Torrey's meadow rue	native	perennial herb	-	-	FAC	-
Thermopsis californica var. *californica*	California goldenbanner	native	perennial herb (rhizomatous)	-	-	-	-
Thysanocarpus curvipes ssp. *curvipes*	Fringe pod	native	annual herb	-	-	-	-
Torilis arvensis	Field hedge parsley	non-native (invasive)	annual herb	-	Moderate	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Torilis nodosa	Wild parsley	non-native	annual herb	-	-	-	-
Toxicodendron diversilobum	Poison oak	native	vine, shrub	-	-	FACU	-
Toxicoscordion fontanum	Marsh zigadenus	native	perennial herb	Rank 4.2	-	OBL	-
Toxicoscordion fremontii	Fremont's star lily	native	perennial herb	-	-	-	-
Toxicoscordion micranthum	Small flowered star lily	native	perennial herb	-	-	OBL	-
Tragopogon porrifolius	Salsify	non-native	perennial herb	-	-	-	-
Tribulus terrestris	Puncture vine	non-native (invasive)	annual herb	-	Limited	-	-
Trichostema lanceolatum	Vinegarweed	native	annual herb	-	-	FACU	-
Trichostema laxum	Turpentine weed	native	annual herb	-	-	-	4
Trifolium albopurpureum	Indian clover	native	annual herb	-	-	FACU	-
Trifolium bifidum var. *bifidum*	Pinole clover	native	annual herb	-	-	-	-
Trifolium campestre	Hop clover	non-native	annual herb	-	-	-	-
Trifolium ciliolatum	Tree clover	native	annual herb	-	-	-	-
Trifolium depauperatum var. *depauperatum*	Dwarf sack clover	native	annual herb	-	-	FAC	-
Trifolium depauperatum var. *truncatum*	Dwarf sack clover	native	annual herb	-	-	FAC	-
Trifolium dichotomum	Branched indian clover	native	annual herb	-	-	-	-
Trifolium dubium	Shamrock	non-native	annual herb	-	-	UPL	-
Trifolium fucatum	Bull clover	native	annual herb	-	-	FACU	1.3
Trifolium glomeratum	Clustered clover	non-native	annual herb	-	-	-	-
Trifolium gracilentum	Pin point clover	native	annual herb	-	-	-	1
Trifolium hirtum	Rose clover	non-native (invasive)	annual herb	-	Limited	-	-
Trifolium incarnatum	Crimson clover	non-native	annual herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Trifolium microcephalum	Small head clover	native	annual herb	-	-	FAC	1.4
Trifolium microdon	Valparaiso clover	native	annual herb	-	-	-	-
Trifolium pratense	Red clover	non-native	perennial herb	-	-	FACU	-
Trifolium subterraneum	Subterranean clover	non-native	annual herb	-	-	-	-
Trifolium tomentosum	Woolly clover	non-native	annual herb	-	-	-	-
Trifolium variegatum var. *geminiflorum*	Small-flowered variegated clover	native	annual herb	-	-	FAC	-
Trifolium variegatum var. *major*	Large variegated clover	native	annual herb	-	-	FAC	-
Trifolium variegatum var. *variegatum*	Variegated clover	native	annual herb	-	-	FAC	-
Trifolium willdenovii	Tomcat clover	native	annual herb	-	-	FACW	1.3
Triglochin scilloides	Flowering-quillwort	native	annual herb (aquatic)	-	-	OBL	-
Triphysaria eriantha ssp. *eriantha*	Butter 'n' eggs	native	annual herb	-	-	-	-
Triphysaria pusilla	Little owl's clover	native	annual herb	-	-	-	-
Triphysaria versicolor ssp. *faucibarbata*	Yellow owl's clover	native	annual herb	-	-	-	-
Triteleia hyacinthina	Wild hyacinth	native	perennial herb	-	-	FAC	-
Triteleia laxa	Ithuriel's spear	native	perennial herb	-	-	-	-
Triteleia lugens	Dark-mouthed triteleia	native	perennial herb	Rank 4.3	-	-	-
Triteleia peduncularis	Marsh triteleia	native	perennial herb	-	-	FACW	3.8
Typha angustifolia	Narrow leaf cattail	non-native	perennial herb (aquatic)	-	-	OBL	-
Typha latifolia	Broadleaf cattail	native	perennial herb (aquatic)	-	-	OBL	-
Ulmus pumila	Siberian elm	non-native	tree	-	-	UPL	-
Umbellularia californica	California bay	native	tree	-	-	FAC	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Uropappus lindleyi	Silver puffs	native	annual herb	-	-	-	-
Urtica dioica ssp. *holosericea*	Stinging nettle	native	perennial herb	-	-	FAC	-
Velezia rigida	Velezia	non-native	annual herb	-	-	-	-
Verbascum blattaria	Moth mullein	non-native	perennial herb	-	-	UPL	-
Verbascum thapsus	Woolly mullein	non-native (invasive)	perennial herb	-	Limited	FACU	-
Verbena lasiostachys var. *scabrida*	Robust vervain	native	perennial herb	-	-	FAC	-
Veronica anagallis-aquatica	Water speedwell	non-native	perennial herb	-	-	OBL	-
Veronica peregrina ssp. *xalapensis*	Speedwell	native	annual herb	-	-	FAC	-
Vicia benghalensis	Purple vetch	non-native	annual herb, vine	-	-	-	-
Vicia sativa ssp. *nigra*	Smaller common vetch	non-native	annual herb, vine	-	-	FACU	-
Vicia sativa ssp. *sativa*	Common vetch	non-native	annual herb, vine	-	-	FACU	-
Vicia villosa ssp. *varia*	Smooth vetch	non-native	annual herb, vine	-	-	-	-
Vicia villosa ssp. *villosa*	Hairy vetch	non-native	annual herb, vine	-	-	-	-
Viola douglasii	Douglas' violet	native	perennial herb	-	-	-	2.8
Viola purpurea ssp. *quercetorum*	Goosefoot yellow violet	native	perennial herb	-	-	-	-
Vitis californica	California wild grape	native	vine, shrub	-	-	FACU	-
Vitis vinifera	Cultivated grape	non-native	vine, shrub	-	-	-	-
Whipplea modesta	Modesty	native	vine, shrub	-	-	-	-
Woodwardia fimbriata	Western chain fern	native	fern	-	-	OBL	-
Wyethia angustifolia	Narrow leaved mule ears	native	perennial herb	-	-	FACU	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Wyethia glabra	Smooth mule ears	native	perennial herb	-	-	-	-
Wyethia helenioides	Gray mule ears	native	perennial herb	-	-	-	-
Xanthium strumarium	Cocklebur	native	annual herb	-	-	FAC	-
Zannichellia palustris	Horned pondweed	native	perennial herb	-	-	OBL	-
Zeltnera muehlenbergii	Muehlenberg's centaury	native	annual herb	-	-	FAC	-
Zeltnera trichantha	Alkali centaury	native	annual herb	-	-	FAC	-

[1]Key to Conservation Status (CNPS 2019a):

FE	Federal Endangered
FT	Federal Threatened
SE	State Endangered
ST	State Threatened
Rank 1A	CNPS Rank 1A: Presumed extirpated in California and either rare or extinct elsewhere
Rank 1B.1	CNPS Rank 1B.1: Rare, threatened, or endangered in California and elsewhere (seriously threatened in California)
Rank 1B.2	CNPS Rank 1B.2: Rare, threatened, or endangered in California and elsewhere (moderately threatened in California)
Rank 1B.3	CNPS Rank 1B.3: Rare, threatened, or endangered in California and elsewhere (not very threatened in California)
Rank 2A	CNPS Rank 2A: Presumed extirpated in California, but more common elsewhere
Rank 2B.1	CNPS Rank 2B.1: Rare, threatened, or endangered in California, but more common elsewhere (seriously threatened in California)
Rank 2B.2	CNPS Rank 2B.2: Rare, threatened, or endangered in California, but more common elsewhere (moderately threatened in California)
Rank 2B.3	CNPS Rank 2B.3: Rare, threatened, or endangered in California, but more common elsewhere (not very threatened in California)
Rank 3.1	CNPS Rank 3.1: Plants about which more information is needed - A review list (seriously threatened in California)
Rank 3.2	CNPS Rank 3.2: Plants about which more information is needed - A review list (moderately threatened in California)
Rank 3.3	CNPS Rank 3.3: Plants about which more information is needed - A review list (not very threatened in California)
Rank 4.1	CNPS Rank 4.1: Plants of limited distribution - A watch list (seriously threatened in California)
Rank 4.2	CNPS Rank 4.2: Plants of limited distribution - A watch list (moderately threatened in California)
Rank 4.3	CNPS Rank 4.3: Plants of limited distribution - A watch list (not very threatened in California)

[2]Key to Cal-IPC Status (Cal-IPC 2019):

High: These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

Moderate: These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited: These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

[3]Key to Wetland Status (Lichvar et al. 2016):

OBL Obligate plant; almost always occurs in wetlands.
FACW Facultative wetland plant; usually occurs in wetlands, but may occur in non-wetlands.
FAC Facultative plant; occurs in wetlands and nonwetlands.
FACU Facultative upland plant; usually occurs in non-wetlands, but may occur in wetlands.
UPL Upland plant; almost never occur in wetlands.

[4]Key to Serpentine Affinity (Safford et al. 2005):

6 95–100% of records occur on ultramafics
5 85–94% of records occur on ultramafics
4 75–84% of records occur on ultramafics
3 65–74% of records occur on ultramafics
2 55–64% of records occur on ultramafics
1 45–54% of records occur on ultramafics
0.75 35–44% of records occur on ultramafics
0.5 25–34% of records occur on ultramafics
0.25 15–24% of records occur on ultramafics
0.1 0–14% of records occur on ultramafics
0 0% of records occur on ultramafics

APPENDIX D

POTENTIAL FOR SPECIAL-STATUS PLANT SPECIES TO OCCUR WITHIN THE PHASE 1 STUDY AREA

Appendix D. Potential for Special-Status Plant Species to Occur within the Phase 1 Study Area

List compiled from database searches focused on the following 7.5-minute USGS quadrangles: Aetna Springs, Calistoga, Chiles Valley, Clearlake Highlands, Detert Reservoir, Glascock Mountain, Jericho Valley, Knoxville, Lower Lake, Mark West Springs, Middletown, Mount Saint Helena, Saint Helena, Walter Springs, Whispering Pines, and Wilson Valley (CNPS 2019a, CDFW 2019).

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Purdy's onion *Allium fimbriatum var. purdyi*	Rank 4.3	Chaparral, cismontane woodland. Elevation ranges from 980 to 1970 feet (300 to 600 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable rocky, serpentine substrate in chaparral, foothill pine woodland, and Sargent cypress woodland habitats exists within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Napa false indigo *Amorpha californica var. napensis*	Rank 1B.2	Broadleaved upland forest (openings), chaparral, cismontane woodland. Elevation ranges from 390 to 6560 feet (120 to 2000 meters). Blooms Apr-Jul.	**Moderate Potential.** Potentially suitable, cool, forested habitat on north-facing slopes and/or along draws exists within the Phase 1 Study Area, and the species is known from a nearby occurrence.	No further actions are recommended for this species.
bent-flowered fiddleneck *Amsinckia lunaris*	Rank 1B.2	Coastal bluff scrub, cismontane woodland, valley and foothill grassland. Elevation ranges from 5 to 1640 feet (3 to 500 meters). Blooms Mar-Jun.	**Moderate Potential.** Potentially suitable grassland, chaparral, and scrub habitats exist within the Phase 1 Study Area, and the species is known from nearby occurrences.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
dimorphic snapdragon *Antirrhinum subcordatum*	Rank 4.3	Chaparral, lower montane coniferous forest. Elevation ranges from 605 to 2625 feet (185 to 800 meters). Blooms Apr-Jul.	**Moderate Potential.** Potentially suitable chaparral, foothill pine woodland, and blue oak woodland on serpentine substrate exists within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
twig-like snapdragon *Antirrhinum virga*	Rank 4.3	Chaparral, lower montane coniferous forest. Elevation ranges from 325 to 6610 feet (100 to 2015 meters). Blooms Jun-Jul.	**Present.** This species was observed in one location within the Phase 1 Study Area on sandstone substrate in deer weed scrub habitat. It has also been observed on the Guenoc Ranch property outside of the Phase 1 Study Area on rhyolite substrate in chaparral habitat.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.
modest rockcress *Arabis modesta*	Rank 4.3	Chaparral, lower montane coniferous forest. Elevation ranges from 390 to 2625 feet (120 to 800 meters). Blooms Mar-Jul.	**Moderate Potential.** Potentially suitable rocky chaparral, Sargent cypress, and Douglas fir forest habitats exist within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Oregon rockcress *Arabis oregana*	Rank 4.3	Chaparral, lower montane coniferous forest. Elevation ranges from 1965 to 6005 feet (600 to 1830 meters). Blooms May.	**Moderate Potential.** Potentially suitable rocky chaparral, Sargent cypress, and Douglas fir forest habitats exist within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Konocti manzanita *Arctostaphylos manzanita ssp. elegans*	Rank 1B.3	Chaparral, cismontane woodland, lower montane coniferous forest. Elevation ranges from 1295 to 5300 feet (395 to 1615 meters). Blooms (Jan)Mar-May(Jul).	**High Potential.** This species was observed in two locations on the Guenoc Ranch property outside of the Phase 1 Study Area, in blue oak woodland. Similar suitable habitat exists in the Phase 1 Study Area.	Although this species was not observed in the Phase 1 Study Area, it was observed in other parts of the property and was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Rincon Ridge manzanita *Arctostaphylos stanfordiana ssp. decumbens*	Rank 1B.1	Chaparral (rhyolitic), cismontane woodland. Elevation ranges from 245 to 1215 feet (75 to 370 meters). Blooms Feb-Apr(May).	**Unlikely.** The species is limited to volcanic mudflows in the Mayacama Mountains, which is located outside of the Phase 1 Study Area.	No further actions are recommended for this species.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Raiche's manzanita *Arctostaphylos stanfordiana ssp. raichei*	Rank 1B.1	Chaparral, lower montane coniferous forest (openings). Elevation ranges from 1475 to 3395 feet (450 to 1035 meters). Blooms Feb-Apr.	**Unlikely.** The Phase 1 Study Area is well outside of the known range of this species, which is known only from near the Lake/Mendocino County boundary west of Clear Lake and from far northern Mendocino County. The nearest known occurrence is approximately 15 miles northwest of the Phase 1 Study Area.	No further actions are recommended for this species.
serpentine milkweed *Asclepias solanoana*	Rank 4.2	Chaparral, cismontane woodland, lower montane coniferous forest. Elevation ranges from 750 to 6100 feet (230 to 1860 meters). Blooms May-Jul(Aug).	**Moderate Potential.** Potentially suitable rocky, serpentine barrens exist within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Brewer's milk-vetch *Astragalus breweri*	Rank 4.2	Chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland (open, often gravelly). Elevation ranges from 295 to 2395 feet (90 to 730 meters). Blooms Apr-Jun.	**Present.** This species was observed in a small number of locations in the central portion of the Phase 1 Study Area on rocky and fine-textured serpentine substrates in chaparral and grassland habitats.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.
Clara Hunt's milk-vetch *Astragalus claranus*	FE, ST, Rank 1B.1	Chaparral (openings), cismontane woodland, valley and foothill grassland. Elevation ranges from 245 to 900 feet (75 to 275 meters). Blooms Mar-May.	**Moderate Potential.** Potentially suitable thin, volcanic, seasonally moist clay soils exist within the Phase 1 Study Area, and this species is known from within the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Cleveland's milk-vetch *Astragalus clevelandii*	Rank 4.3	Chaparral, cismontane woodland, riparian forest. Elevation ranges from 655 to 4920 feet (200 to 1500 meters). Blooms Jun-Sep.	**Present.** This species was observed in numerous locations within the Phase 1 Study Area in and along ephemeral to intermittent streams on serpentine substrate.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Jepson's milk-vetch *Astragalus rattanii var. jepsonianus*	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 965 to 2295 feet (295 to 700 meters). Blooms Mar-Jun.	**Present.** This taxon was observed within the Phase 1 Study Area on gravelly serpentine berms along an intermittent stream at the intersection of Butts Canyon Road and Tephra Road.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.
big-scale balsamroot *Balsamorhiza macrolepis*	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 145 to 5100 feet (45 to 1555 meters). Blooms Mar-Jun.	**Present.** This species was observed in one location in the far northern portion of the Phase 1 Study Area in blue oak woodland.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.
watershield *Brasenia schreberi*	Rank 2B.3	Marshes and swamps (freshwater). Elevation ranges from 95 to 7220 feet (30 to 2200 meters). Blooms Jun-Sep.	**Moderate Potential.** Potentially suitable lake and reservoir habitat exists within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
narrow-anthered brodiaea *Brodiaea leptandra*	Rank 1B.2	Broadleaved upland forest, chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 360 to 3000 feet (110 to 915 meters). Blooms May-Jul.	**High Potential.** This species was observed in one location within the Guenoc Ranch property outside of the Phase 1 Study Area, and potentially suitable chaparral, rocky grassland, and rocky openings in woodland habitats on volcanic substrate exist within the Phase 1 Study Area**.**	Although this species was not observed within the Phase 1 Study Area, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Indian Valley brodiaea *Brodiaea rosea ssp. rosea*	SE, Rank 3.1	Closed-cone coniferous forest, chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 1095 to 4755 feet (335 to 1450 meters). Blooms May-Jun.	**Unlikely.** The Phase 1 Study Area is well outside of the known range of this species. Although the Phase 1 Study Area contains serpentine substrate, the nearest documented occurrence is approximately 16 miles north-northwest of the Phase 1 Study Area.	No further actions are recommended for this species.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
serpentine reed grass *Calamagrostis ophitidis*	Rank 4.3	Chaparral (open, often north-facing slopes), lower montane coniferous forest, meadows and seeps, valley and foothill grassland. Elevation ranges from 295 to 3495 feet (90 to 1065 meters). Blooms Apr-Jul.	**Moderate Potential.** Potentially suitable rocky, serpentine habitat exists within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
pink star-tulip *Calochortus uniflorus*	Rank 4.2	Coastal prairie, coastal scrub, meadows and seeps, north coast coniferous forest. Elevation ranges from 30 to 3510 feet (10 to 1070 meters). Blooms Apr-Jun.	**Present.** This species was observed in three locations in the central and western portions of the Phase 1 Study Area in seasonally wet areas on serpentine substrate.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.
four-petaled pussypaws *Calyptridium quadripetalum*	Rank 4.3	Chaparral, lower montane coniferous forest. Elevation ranges from 1030 to 6695 feet (315 to 2040 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable sandy or gravelly serpentine substrate exists within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Mt. Saint Helena morning-glory *Calystegia collina ssp. oxyphylla*	Rank 4.2	Chaparral, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 915 to 3315 feet (279 to 1010 meters). Blooms Apr-Jun.	**Present.** This taxon has been observed in numerous locations within the Phase 1 Study Area on rocky, serpentine substrate.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.
South Coast Range morning-glory *Calystegia collina ssp. venusta*	Rank 4.3	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 1390 to 4890 feet (425 to 1490 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable rocky, serpentine areas exist within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
northern meadow sedge *Carex praticola*	Rank 2B.2	Meadows and seeps (mesic). Elevation ranges from 0 to 10500 feet (0 to 3200 meters). Blooms May-Jul.	**Unlikely.** Although the Phase 1 Study Area contains meadows and seeps, there is only one documented occurrence of this species in the region (approximately 6 miles west of the Phase 1 Study Area), and the identity of this occurrence is uncertain. The Phase 1 Study Area is otherwise well outside the known region of the species.	No further actions are recommended for this species.
johnny-nip *Castilleja ambigua var. ambigua*	Rank 4.2	Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, vernal pools margins. Elevation ranges from 0 to 1425 feet (0 to 435 meters). Blooms Mar-Aug.	**Unlikely.** The Phase 1 Study Area lacks potentially suitable mesic grassland habitat with coastal influence required for this species.	No further actions are recommended for this species.
pink creamsacs *Castilleja rubicundula var. rubicundula*	Rank 1B.2	Chaparral (openings), cismontane woodland, meadows and seeps, valley and foothill grassland. Elevation ranges from 65 to 2985 feet (20 to 910 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable mesic, open areas on serpentine substrate in chaparral and grassland habitats exist within the Phase 1 Study Area, and the species is known from nearby occurrences.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Rincon Ridge ceanothus *Ceanothus confusus*	Rank 1B.1	Closed-cone coniferous forest, chaparral, cismontane woodland. Elevation ranges from 245 to 3495 feet (75 to 1065 meters). Blooms Feb-Jun.	**Moderate Potential.** Potentially suitable volcanic and serpentine substrate in Sargent cypress forest and chaparral habitats exist within the Phase 1 Study Area, and the species is known from nearby occurrences.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Calistoga ceanothus *Ceanothus divergens*	Rank 1B.2	Chaparral (serpentine or volcanic, rocky). Elevation ranges from 555 to 3115 feet (170 to 950 meters). Blooms Feb-Apr.	**Moderate Potential.** Potentially suitable chaparral habitat on rocky volcanic and serpentine substrates exists within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
holly-leaved ceanothus *Ceanothus purpureus*	Rank 1B.2	Chaparral, cismontane woodland. Elevation ranges from 390 to 2100 feet (120 to 640 meters). Blooms Feb-Jun.	**Moderate Potential.** Potentially suitable chaparral and oak woodland edge habitats on rocky volcanic slopes exist within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Sonoma ceanothus *Ceanothus sonomensis*	Rank 1B.2	Chaparral (sandy, serpentine or volcanic). Elevation ranges from 705 to 2625 feet (215 to 800 meters). Blooms Feb-Apr.	**Moderate Potential.** Potentially suitable chaparral habitat on volcanic substrate exists within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
pappose tarplant *Centromadia parryi ssp. parryi*	Rank 1B.2	Chaparral, coastal prairie, meadows and seeps, marshes and swamps (coastal salt), valley and foothill grassland (vernally mesic). Elevation ranges from 0 to 1380 feet (0 to 420 meters). Blooms May-Nov.	**Unlikely.** This species is known from alkaline substrate, which is not present within the Phase 1 Study Area.	No further actions are recommended for this species.
dwarf soaproot *Chlorogalum pomeridianum var. minus*	Rank 1B.2	Chaparral (serpentine). Elevation ranges from 1000 to 3280 feet (305 to 1000 meters). Blooms May-Aug.	**Moderate Potential.** Potentially suitable chaparral habitat on serpentine substrate exists within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Brewer's clarkia *Clarkia breweri*	Rank 4.2	Chaparral, cismontane woodland, coastal scrub. Elevation ranges from 705 to 3660 feet (215 to 1115 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable chaparral and oak woodland habitats on serpentine substrate exists within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Tracy's clarkia *Clarkia gracilis ssp. tracyi*	Rank 4.2	Chaparral (openings, usually serpentine). Elevation ranges from 210 to 2135 feet (65 to 650 meters). Blooms Apr-Jul.	**Present.** This species was observed in several locations within the Phase 1 Study Area in chaparral habitat on serpentine substrate.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.
serpentine collomia *Collomia diversifolia*	Rank 4.3	Chaparral, cismontane woodland. Elevation ranges from 655 to 1970 feet (200 to 600 meters). Blooms May-Jun.	**Present.** This species was observed in several locations within the Phase 1 Study Area in chaparral habitat on serpentine substrate.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.
serpentine bird's-beak *Cordylanthus tenuis ssp. brunneus*	Rank 4.3	Closed-cone coniferous forest, chaparral, cismontane woodland. Elevation ranges from 1000 to 3000 feet (305 to 915 meters). Blooms Jul-Aug.	**High Potential.** Potentially suitable chaparral, foothill pine woodland, and Sargent cypress woodland habitats on rocky, serpentine substrate exists within the Phase 1 Study Area. This species was observed within the Guenoc Ranch property, outside of the Phase 1 Study Area, in leather oak chaparral and foothill pine woodland.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
serpentine cryptantha *Cryptantha dissita*	Rank 1B.2	Chaparral (serpentine). Elevation ranges from 1295 to 1905 feet (395 to 580 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable chaparral habitat on serpentine substrate exists within the Phase 1 Study Area, and the species is known from nearby occurrences.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
deep-scarred cryptantha *Cryptantha excavata*	Rank 1B.1	Cismontane woodland (sandy or gravelly). Elevation ranges from 325 to 1640 feet (100 to 500 meters). Blooms Apr-May.	**Moderate Potential.** Potentially suitable sandy, gravelly, dry streambank habitat is present within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
red-stemmed cryptantha *Cryptantha rostellata*	Rank 4.2	Cismontane woodland, valley and foothill grassland. Elevation ranges from 130 to 2625 feet (40 to 800 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable open, rocky, dry sites in grassland, chaparral, and oak and pine woodland habitats exist within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
mountain lady's-slipper *Cypripedium montanum*	Rank 4.2	Broadleaved upland forest, cismontane woodland, lower montane coniferous forest, north coast coniferous forest. Elevation ranges from 605 to 7300 feet (185 to 2225 meters). Blooms Mar-Aug.	**Unlikely.** The Phase 1 Study Area lacks potentially suitable habitat for this species which prefers cooler/mesic coniferous forest with partial to closed canopy, often near streams and wetlands.	No further actions are recommended for this species.
swamp larkspur *Delphinium uliginosum*	Rank 4.2	Chaparral, valley and foothill grassland. Elevation ranges from 1115 to 2000 feet (340 to 610 meters). Blooms May-Jun.	**Present.** This species has been observed in numerous locations within the Phase 1 Study Area in seeps, wet meadows, and along streams on serpentine substrate.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.
Cascade downingia *Downingia willamettensis*	Rank 2B.2	Cismontane woodland (lake margins), valley and foothill grassland (lake margins), vernal pools. Elevation ranges from 45 to 3640 feet (15 to 1110 meters). Blooms Jun-Jul(Sep).	**Moderate Potential.** Potentially suitable lake margin habitat is present within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
marsh horsetail *Equisetum palustre*	Rank 3	Marshes and swamps. Elevation ranges from 145 to 3280 feet (45 to 1000 meters). Blooms unk.	**Unlikely.** The nearest known occurrences are in the immediate San Francisco Bay area; occurrences in Lake County are dubious (documented from a second source, not based on voucher specimen or direct observation).	No further actions are recommended for this species.
Brandegee's eriastrum *Eriastrum brandegeeae*	Rank 1B.1	Chaparral, cismontane woodland. Elevation ranges from 1390 to 2755 feet (425 to 840 meters). Blooms Apr-Aug.	**Moderate Potential.** Potentially suitable barren, volcanic substrate is present within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
streamside daisy *Erigeron biolettii*	Rank 3	Broadleaved upland forest, cismontane woodland, north coast coniferous forest. Elevation ranges from 95 to 3610 feet (30 to 1100 meters). Blooms Jun-Oct.	**Moderate Potential.** Potentially suitable rocky volcanic and serpentine substrates exist within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Greene's narrow-leaved daisy *Erigeron greenei*	Rank 1B.2	Chaparral (serpentine or volcanic). Elevation ranges from 260 to 3295 feet (80 to 1005 meters). Blooms May-Sep.	**Present.** This species was observed in numerous locations within the Phase 1 Study Area in rocky, chaparral habitat, usually on serpentine substrate.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.
Snow Mountain buckwheat *Eriogonum nervulosum*	Rank 1B.2	Chaparral (serpentine). Elevation ranges from 980 to 6905 feet (300 to 2105 meters). Blooms Jun-Sep.	**Moderate Potential.** Potentially suitable chaparral habitat on rocky, serpentine substrate exists within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
bay buckwheat *Eriogonum umbellatum var. bahiiforme*	Rank 4.2	Cismontane woodland, lower montane coniferous forest. Elevation ranges from 2295 to 7220 feet (700 to 2200 meters). Blooms Jul-Sep.	**Moderate Potential.** Potentially suitable chaparral and oak and foothill pine woodland habitats on rocky, serpentine and volcanic substrates exists within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Loch Lomond button-celery *Eryngium constancei*	FE, SE, Rank 1B.1	Vernal pools. Elevation ranges from 1505 to 2805 feet (460 to 855 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable vernal wetland habitat exists within the Phase 1 Study Area at waterbodies such as Wildcat Lake, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Jepson's coyote thistle *Eryngium jepsonii*	Rank 1B.2	Valley and foothill grassland, vernal pools. Elevation ranges from 5 to 985 feet (3 to 300 meters). Blooms Apr-Aug.	**Moderate Potential.** Potentially suitable seasonal wetlands on clay substrate are present within the Phase 1 Study Area.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
bare monkeyflower *Erythranthe nudata*	Rank 4.3	Chaparral, cismontane woodland. Elevation ranges from 655 to 2295 feet (200 to 700 meters). Blooms May-Jun.	**Present.** This species has been observed in numerous locations within the Phase 1 Study Area in mesic areas, seeps, and along streams on serpentine substrate.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.
St. Helena fawn lily *Erythronium helenae*	Rank 4.2	Chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 1145 to 4005 feet (350 to 1220 meters). Blooms Mar-May.	**Present.** This species has been observed in multiple locations within the Phase 1 Study Area on north-facing slopes in rocky, chaparral habitat on serpentine substrate.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.
San Joaquin spearscale *Extriplex joaquinana*	Rank 1B.2	Chenopod scrub, meadows and seeps, playas, valley and foothill grassland. Elevation ranges from 0 to 2740 feet (1 to 835 meters). Blooms Apr-Oct.	**Unlikely.** The Phase 1 Study Area lacks potentially suitable alkaline habitat for this species.	No further actions are recommended for this species.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
adobe-lily *Fritillaria pluriflora*	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 195 to 2315 feet (60 to 705 meters). Blooms Feb-Apr.	**Moderate Potential.** Potentially suitable heavy soils in chaparral and grassland habitats exists within the Phase 1 Study Area, and several occurrences of this species have been documented surrounding and within the larger Guenoc Ranch property.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Purdy's fritillary *Fritillaria purdyi*	Rank 4.3	Chaparral, cismontane woodland, lower montane coniferous forest. Elevation ranges from 570 to 7400 feet (175 to 2255 meters). Blooms Mar-Jun.	**Present.** This species has been documented in multiple locations within the Phase 1 Study Area on rocky, serpentine substrate in chaparral and foothill pine woodland habitats, and similar habitat exists elsewhere within the Phase 1 Study Area.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.
Boggs Lake hedge-hyssop *Gratiola heterosepala*	SE, Rank 1B.2	Marshes and swamps (lake margins), vernal pools. Elevation ranges from 30 to 7790 feet (10 to 2375 meters). Blooms Apr-Aug.	**Moderate Potential.** Potentially suitable habitat exists along and within Wildcat Lake and Blacktail Lake.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Hall's harmonia *Harmonia hallii*	Rank 1B.2	Chaparral (serpentine). Elevation ranges from 1000 to 3200 feet (305 to 975 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable chaparral habitat on rocky, serpentine substrate exists within the Phase 1 Study Area, and the species is known from nearby occurrences.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
nodding harmonia *Harmonia nutans*	Rank 4.3	Chaparral, cismontane woodland. Elevation ranges from 245 to 3200 feet (75 to 975 meters). Blooms Mar-May.	**Moderate Potential.** Potentially suitable chaparral and foothill pine woodland habitats on rocky, volcanic substrate exists within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
serpentine sunflower *Helianthus exilis*	Rank 4.2	Chaparral, cismontane woodland. Elevation ranges from 490 to 5005 feet (150 to 1525 meters). Blooms Jun-Nov.	**Present.** This species has been observed in numerous locations within the Phase 1 Study Area on serpentine substrate in seasonally wet areas on such as seeps, meadows, and along streams.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.
congested-headed hayfield tarplant *Hemizonia congesta ssp. congesta*	Rank 1B.2	Valley and foothill grassland. Elevation ranges from 65 to 1835 feet (20 to 560 meters). Blooms Apr-Nov.	**Moderate Potential.** Potentially suitable grassland habitat exists within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
glandular western flax *Hesperolinon adenophyllum*	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 490 to 4315 feet (150 to 1315 meters). Blooms May-Aug.	**Moderate Potential.** Potentially suitable chaparral and foothill pine woodland habitat on rocky, serpentine substrate exists within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
two-carpellate western flax *Hesperolinon bicarpellatum*	Rank 1B.2	Chaparral (serpentine). Elevation ranges from 195 to 3295 feet (60 to 1005 meters). Blooms May-Jul.	**Present.** This species has been observed in several locations in chaparral, foothill pine woodland, and Sargent cypress woodland habitats on rocky serpentine and volcanic substrates.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.
Lake County western flax *Hesperolinon didymocarpum*	SE, Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 1080 to 1200 feet (330 to 365 meters). Blooms May-Jul.	**Present.** This species has been observed in multiple locations in the central and southern portions of the Phase 1 Study Area in chaparral habitat on rocky, serpentine substrate.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.
drymaria-like western flax *Hesperolinon drymarioides*	Rank 1B.2	Closed-cone coniferous forest, chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 325 to 3705 feet (100 to 1130 meters). Blooms May-Aug.	**Moderate Potential.** Potentially suitable chaparral, foothill pine woodland, and Sargent cypress woodland habitats on rocky, serpentine substrate exist within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Sharsmith's western flax *Hesperolinon sharsmithiae*	Rank 1B.2	Chaparral. Elevation ranges from 885 to 985 feet (270 to 300 meters). Blooms May-Jul.	**Moderate Potential.** Potentially suitable chaparral habitat on serpentine substrate exists within the Phase 1 Study Area, and the species is known from nearby occurrences.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Bolander's horkelia *Horkelia bolanderi*	Rank 1B.2	Chaparral, lower montane coniferous forest, meadows and seeps, valley and foothill grassland. Elevation ranges from 1475 to 3610 feet (450 to 1100 meters). Blooms (May)Jun-Aug.	**Moderate Potential.** Potentially suitable habitat exists within the Phase 2/Open Space Study Area and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
California satintail *Imperata brevifolia*	Rank 2B.1	Chaparral, coastal scrub, Mojavean desert scrub, meadows and seeps (often alkali), riparian scrub. Elevation ranges from 0 to 3985 feet (0 to 1215 meters). Blooms Sep-May.	**Unlikely.** This species is only known in the region from a single, historic (1928) occurrence located approximately 11 miles northwest of the Phase 1 Study Area. The native status of the single plant observed is also in doubt. In addition, the Phase 1 Study Area lacks alkaline substrate.	No further actions are recommended for this species.
Northern California black walnut *Juglans hindsii*	Rank 1B.1[3]	Riparian forest, riparian woodland. Elevation ranges from 0 to 1445 feet (0 to 440 meters). Blooms Apr-May.	**Present.** This species was observed in low numbers associated with old home sites, barns, and similar sites across the Phase 1 Study Area. Occurrences of this species within the Phase 1 Study Area have been planted or are offspring of planted individuals and should not be considered special-status (Potter et al. 2018).	Although this species was observed within multiple locations across the Phase 1 Study Area, it is associated with old home sites, barns, and similar areas and represents planted specimens that should not be considered special-status and is therefore not addressed in this report. No additional actions are recommended for this species.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Santa Lucia dwarf rush *Juncus luciensis*	Rank 1B.2	Chaparral, great basin scrub, lower montane coniferous forest, meadows and seeps, vernal pools. Elevation ranges from 980 to 6695 feet (300 to 2040 meters). Blooms Apr-Jul.	**Moderate Potential.** Potentially suitable wetland habitat exists within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Burke's goldfields *Lasthenia burkei*	FE, SE, Rank 1B.1	Meadows and seeps (mesic), vernal pools. Elevation ranges from 45 to 1970 feet (15 to 600 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable vernal wetland habitat exists within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Contra Costa goldfields *Lasthenia conjugens*	FE, Rank 1B.1	Cismontane woodland, playas (alkaline), valley and foothill grassland, vernal pools. Elevation ranges from 0 to 1540 feet (0 to 470 meters). Blooms Mar-Jun.	**Unlikely.** The Phase 1 Study Area lacks potentially suitable alkaline habitat required for this species.	No further actions are recommended for this species.
Colusa layia *Layia septentrionalis*	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 325 to 3595 feet (100 to 1095 meters). Blooms Apr-May.	**Present.** This species was observed in numerous locations within the Phase 1 Study Area, always in association with blue oak woodland.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.
legenere *Legenere limosa*	Rank 1B.1	Vernal pools. Elevation ranges from 0 to 2885 feet (1 to 880 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable vernal wetland habitat exists within the Phase 1 Study Area in along and within Wildcat Lake and Blacktail Lake, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
bristly leptosiphon *Leptosiphon acicularis*	Rank 4.2	Chaparral, cismontane woodland, coastal prairie, valley and foothill grassland. Elevation ranges from 180 to 4920 feet (55 to 1500 meters). Blooms Apr-Jul.	**Moderate Potential.** Potentially suitable grassland and grassy openings in oak woodland, foothill pine woodland, scrub, and chaparral habitats exist within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Jepson's leptosiphon *Leptosiphon jepsonii*	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 325 to 1640 feet (100 to 500 meters). Blooms Mar-May.	**Moderate Potential.** Potentially suitable grassland and grassy openings in chaparral, oak woodland, and foothill pine woodland on volcanic and serpentine substrates exists within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
broad-lobed leptosiphon *Leptosiphon latisectus*	Rank 4.3	Broadleaved upland forest, cismontane woodland. Elevation ranges from 555 to 4920 feet (170 to 1500 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable grassland and grassy openings in woodland exist within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
woolly-headed lessingia *Lessingia hololeuca*	Rank 3	Broadleaved upland forest, coastal scrub, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 45 to 1000 feet (15 to 305 meters). Blooms Jun-Oct.	**Moderate Potential.** Potentially suitable clay and serpentine substrate exists within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Bolander's lily *Lilium bolanderi*	Rank 4.2	Chaparral, lower montane coniferous forest. Elevation ranges from 95 to 5250 feet (30 to 1600 meters). Blooms Jun-Jul.	**Unlikely.** Although potentially suitable open, clay, serpentine substrate is present, the bulk of known occurrences of this plant are located in Del Norte, Humboldt, and Siskiyou counties.	No further actions are recommended for this species.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
redwood lily *Lilium rubescens*	Rank 4.2	Broadleaved upland forest, chaparral, lower montane coniferous forest, north coast coniferous forest, upper montane coniferous forest. Elevation ranges from 95 to 6265 feet (30 to 1910 meters). Blooms Apr-Aug(Sep).	**Moderate Potential.** Potentially suitable chaparral habitat exists within the Phase 1 Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
woolly meadowfoam *Limnanthes floccosa ssp. floccosa*	Rank 4.2	Chaparral, cismontane woodland, valley and foothill grassland, vernal pools. Elevation ranges from 195 to 4380 feet (60 to 1335 meters). Blooms Mar-May(Jun).	**Moderate Potential.** Potentially suitable vernally wet areas and pond/lake margins exist within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Sebastopol meadowfoam *Limnanthes vinculans*	FE, SE, Rank 1B.1	Meadows and seeps, valley and foothill grassland, vernal pools. Elevation ranges from 45 to 1000 feet (15 to 305 meters). Blooms Apr-May.	**Moderate Potential.** Potentially suitable vernally wet areas in grassland and oak woodland exist within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Hoover's lomatium *Lomatium hooveri*	Rank 4.3	Chaparral, cismontane woodland. Elevation ranges from 980 to 2905 feet (300 to 885 meters). Blooms Apr-Jul.	**Present.** This species was observed in several locations within the Phase 1 Study Area in shady draws in blue oak woodland and in rocky chaparral habitat.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.
Napa lomatium *Lomatium repostum*	Rank 4.3	Chaparral, cismontane woodland. Elevation ranges from 295 to 2725 feet (90 to 830 meters). Blooms Mar-Jun.	**Moderate Potential.** Potentially suitable rocky, volcanic and serpentine substrate in chaparral, foothill pine woodland and Sargent cypress woodland exist within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Cobb Mountain lupine *Lupinus sericatus*	Rank 1B.2	Broadleaved upland forest, chaparral, cismontane woodland, lower montane coniferous forest. Elevation ranges from 900 to 5005 feet (275 to 1525 meters). Blooms Mar-Jun.	**Moderate Potential.** Potentially suitable gravelly substrate in chaparral, foothill pine woodland, Sargent cypress woodland, and oak woodland habitats exist within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Heller's bush-mallow *Malacothamnus helleri*	Rank 3.3	Chaparral (sandstone), riparian woodland (gravel). Elevation ranges from 1000 to 2085 feet (305 to 635 meters). Blooms May-Jul.	**Moderate Potential.** Potentially suitable chaparral habitat on sandstone substrate and gravelly riparian habitat exists within the Phase 1 Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Mt. Diablo cottonweed *Micropus amphibolus*	Rank 3.2	Broadleaved upland forest, chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 145 to 2705 feet (45 to 825 meters). Blooms Mar-May.	**Moderate Potential.** Potentially suitable sparsely vegetated oak woodland, foothill pine woodland, chaparral, scrub, and grassland habitats exist within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
marsh microseris *Microseris paludosa*	Rank 1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland. Elevation ranges from 15 to 1165 feet (5 to 355 meters). Blooms Apr-Jun(Jul).	**Moderate Potential.** Potentially suitable grassland and openings in oak woodland, foothill pine woodland, chaparral, and scrub on fine-textured substrate exist within the Phase 1 Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
sylvan microseris *Microseris sylvatica*	Rank 4.2	Chaparral, cismontane woodland, great basin scrub, pinyon and juniper woodland, valley and foothill grassland (serpentine). Elevation ranges from 145 to 4920 feet (45 to 1500 meters). Blooms Mar-Jun.	**Moderate Potential.** Potentially suitable grassland and grassy openings in oak and foothill pine woodlands exists within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
green monardella *Monardella viridis*	Rank 4.3	Broadleaved upland forest, chaparral, cismontane woodland. Elevation ranges from 325 to 3315 feet (100 to 1010 meters). Blooms Jun-Sep.	**Present.** This species was observed in abundance within the Phase 1 Study Area in rocky, chaparral habitat on serpentine and volcanic substrates.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.
little mousetail *Myosurus minimus ssp. apus*	Rank 3.1	Valley and foothill grassland, vernal pools (alkaline). Elevation ranges from 65 to 2100 feet (20 to 640 meters). Blooms Mar-Jun.	**Unlikely.** Alkaline soils are not present within the Phase 1 Study Area.	No further actions are recommended for this species.
cotula navarretia *Navarretia cotulifolia*	Rank 4.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 10 to 6005 feet (4 to 1830 meters). Blooms May-Jun.	**Present.** This species was observed at three locations within the Phase 1 Study Area on heavy, serpentine soils in mesic grassland.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.
Jepson's navarretia *Navarretia jepsonii*	Rank 4.3	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 570 to 2805 feet (175 to 855 meters). Blooms Apr-Jun.	**Present.** This species was observed at numerous locations throughout the Phase 1 Study Area in grassland or grassy openings in chaparral and foothill pine woodland habitats on serpentine and volcanic clay soils.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.
Baker's navarretia *Navarretia leucocephala ssp. bakeri*	Rank 1B.1	Cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, vernal pools. Elevation ranges from 15 to 5710 feet (5 to 1740 meters). Blooms Apr-Jul.	**Moderate Potential.** Potentially suitable vernal wetlands on clay soils are present within the Phase 1 Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
few-flowered navarretia *Navarretia leucocephala ssp. pauciflora*	FE, ST, Rank 1B.1	Vernal pools (volcanic ash flow). Elevation ranges from 1310 to 2805 feet (400 to 855 meters). Blooms May-Jun.	**Unlikely.** The Phase 1 Study Area lacks potentially suitable vernal pool habitat with volcanic ash flow substrate required for this species.	No further actions are recommended for this species.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
many-flowered navarretia *Navarretia leucocephala ssp. plieantha*	FE, SE, Rank 1B.2	Vernal pools (volcanic ash flow). Elevation ranges from 95 to 3115 feet (30 to 950 meters). Blooms May-Jun.	**Unlikely.** The Phase 1 Study Area lacks potentially suitable vernal pool habitat with volcanic ash flow substrate required for this species.	No further actions are recommended for this species.
small pincushion navarretia *Navarretia myersii ssp. deminuta*	Rank 1B.1	Vernal pools (clay loam). Elevation ranges from 1160 to 1165 feet (355 to 355 meters). Blooms Apr-May.	**Moderate Potential.** Potentially suitable vernal wetland habitat exists within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
adobe navarretia *Navarretia nigelliformis ssp. nigelliformis*	Rank 4.2	Valley and foothill grassland vernally mesic, vernal pools sometimes. Elevation ranges from 325 to 3280 feet (100 to 1000 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable, vernally mesic clay substrate in grassland habitat exists within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Porter's navarretia *Navarretia paradoxinota*	Rank 1B.3	Meadows and seeps. Elevation ranges from 540 to 2755 feet (165 to 840 meters). Blooms May-Jun(Jul).	**Moderate Potential.** Potentially suitable, vernally mesic openings on serpentine substrate exist within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Marin County navarretia *Navarretia rosulata*	Rank 1B.2	Closed-cone coniferous forest, chaparral. Elevation ranges from 655 to 2085 feet (200 to 635 meters). Blooms May-Jul.	**Moderate Potential.** Potentially suitable, dry, rocky substrate in Sargent cypress woodland, chaparral, and scrub habitats exists within the Phase 1 Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
slender Orcutt grass *Orcuttia tenuis*	FT, SE, Rank 1B.1	Vernal pools. Elevation ranges from 110 to 5775 feet (35 to 1760 meters). Blooms May-Sep(Oct).	**Moderate Potential.** Potentially suitable vernal wetland habitat exists within the Phase 1 Study Area in Blacktail Lake, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Howell's broomrape *Orobanche valida ssp. howellii*	Rank 4.3	Chaparral (serpentine or volcanic). Elevation ranges from 590 to 5710 feet (180 to 1740 meters). Blooms Jun-Sep.	**Moderate Potential.** Potentially suitable chaparral habitat in rocky, volcanic and serpentine substrates exists within the Phase 1 Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Geysers panicum *Panicum acuminatum var. thermale*	SE, Rank 1B.2	Closed-cone coniferous forest, riparian forest, valley and foothill grassland. Elevation ranges from 1000 to 8105 feet (305 to 2470 meters). Blooms Jun-Aug.	**Unlikely.** This species is associated with hot springs, and such habitat is not present within the Phase 1 Study Area. The nearest occurrence of this species is approximately 10 miles west of the Phase 1 Study Area.	No further actions are recommended for this species.
Sonoma beardtongue *Penstemon newberryi var. sonomensis*	Rank 1B.3	Chaparral (rocky). Elevation ranges from 2295 to 4495 feet (700 to 1370 meters). Blooms Apr-Aug.	**Moderate Potential.** Potentially suitable rock outcrops in chaparral habitat exist within the Phase 1 Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Michael's rein orchid *Piperia michaelii*	Rank 4.2	Coastal bluff scrub, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest. Elevation ranges from 5 to 3000 feet (3 to 915 meters). Blooms Apr-Aug.	**Unlikely.** This species is typically associated with substrates comprised of mudstone and humus, which are not present within the Phase 1 Study Area.	No further actions are recommended for this species.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
bearded popcornflower *Plagiobothrys hystriculus*	Rank 1B.1	Valley and foothill grassland (mesic), vernal pools margins. Elevation ranges from 0 to 900 feet (0 to 274 meters). Blooms Apr-May.	**Moderate Potential.** Potentially suitable vernally mesic areas in grassland habitat are present within the Phase 1 Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Calistoga popcornflower *Plagiobothrys strictus*	FE, ST, Rank 1B.1	Meadows and seeps, valley and foothill grassland, vernal pools. Elevation ranges from 295 to 525 feet (90 to 160 meters). Blooms Mar-Jun.	**Unlikely.** The Phase 1 Study Area lacks alkaline sites suitable for this species.	No further actions are recommended for this species.
Napa blue grass *Poa napensis*	FE, SE, Rank 1B.1	Meadows and seeps, valley and foothill grassland. Elevation ranges from 325 to 655 feet (100 to 200 meters). Blooms May-Aug.	**Unlikely.** The Phase 1 Study Area lacks alkaline sites suitable for this species.	No further actions are recommended for this species.
eel-grass pondweed *Potamogeton zosteriformis*	Rank 2B.2	Marshes and swamps (assorted freshwater). Elevation ranges from 0 to 6100 feet (0 to 1860 meters). Blooms Jun-Jul.	**Moderate Potential.** Potentially suitable lake and reservoir habitats are present within the Phase 1 Study Area and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
California alkali grass *Puccinellia simplex*	Rank 1B.2	Chenopod scrub, meadows and seeps, valley and foothill grassland, vernal pools. Elevation ranges from 5 to 3050 feet (2 to 930 meters). Blooms Mar-May.	**Unlikely.** The Phase 1 Study Area lacks alkaline sites suitable for this species.	No further actions are recommended for this species.
Lobb's aquatic buttercup *Ranunculus lobbii*	Rank 4.2	Cismontane woodland, north coast coniferous forest, valley and foothill grassland, vernal pools. Elevation ranges from 45 to 1540 feet (15 to 470 meters). Blooms Feb-May.	**Moderate Potential.** Potentially suitable seasonally ponded sites exist within the Phase 1 Study Area	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Lake County stonecrop *Sedella leiocarpa*	FE, SE, Rank 1B.1	Cismontane woodland, valley and foothill grassland, vernal pools. Elevation ranges from 1195 to 2590 feet (365 to 790 meters). Blooms Apr-May.	**Moderate Potential.** Potentially suitable vernally wet areas in oak woodland and grassland habitats and volcanic substrate exist within the Phase 1 Study Area.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Cleveland's ragwort *Senecio clevelandii var. clevelandii*	Rank 4.3	Chaparral (serpentine seeps). Elevation ranges from 1195 to 2955 feet (365 to 900 meters). Blooms Jun-Jul.	**Present.** This species was observed in multiple locations within the Phase 1 Study Area and from within multiple locations on Guenoc Ranch outside of the Phase 1 Study Area.	Recommendations for this species can be found in Section 6.3.
Napa checkerbloom *Sidalcea hickmanii ssp. napensis*	Rank 1B.1	Chaparral. Elevation ranges from 1360 to 2000 feet (415 to 610 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable chaparral habitat on rhyolitic substrates exists within the Phase 1 Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Keck's checkerbloom *Sidalcea keckii*	FE, Rank 1B.1	Cismontane woodland, valley and foothill grassland. Elevation ranges from 245 to 2135 feet (75 to 650 meters). Blooms Apr-May(Jun).	**Present.** This species was observed in several locations, primarily in the northern portion of the Phase 1 Study Area on serpentine clay substrate in annual grassland or in grassy openings within chaparral and blue oak woodland.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.
marsh checkerbloom *Sidalcea oregana ssp. hydrophila*	Rank 1B.2	Meadows and seeps, riparian forest. Elevation ranges from 3605 to 7545 feet (1100 to 2300 meters). Blooms (Jun)Jul-Aug.	**Moderate Potential.** Potentially suitable streambank and wetland meadow habitat exists within the Phase 1 Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Kenwood Marsh checkerbloom *Sidalcea oregana ssp. valida*	FE, SE, Rank 1B.1	Marshes and swamps (freshwater). Elevation ranges from 375 to 490 feet (115 to 150 meters). Blooms Jun-Sep.	**Unlikely.** This species is highly restricted to two known locations, the nearest of which is approximately 12 miles southwest of the Phase 1 Study Area.	No further actions are recommended for this species.
long-styled sand-spurrey *Spergularia macrotheca var. longistyla*	Rank 1B.2	Meadows and seeps, marshes and swamps. Elevation ranges from 0 to 835 feet (0 to 255 meters). Blooms Feb-May.	**Unlikely.** The Phase 1 Study Area lacks alkaline sites suitable for this species.	No further actions are recommended for this species.
Tamalpais jewelflower *Streptanthus batrachopus*	Rank 1B.3	Closed-cone coniferous forest, chaparral. Elevation ranges from 1000 to 2135 feet (305 to 650 meters). Blooms Apr-Jul.	**Unlikely.** Potentially suitable habitat but the Phase 1 Study Area is greatly removed from the nearest known occurrence of this species, which is highly restricted to the vicinity of Mt. Tamalpais in Marin County.	No further actions are recommended for this species.
Socrates Mine jewelflower *Streptanthus brachiatus ssp. brachiatus*	Rank 1B.2	Closed-cone coniferous forest, chaparral. Elevation ranges from 1785 to 3280 feet (545 to 1000 meters). Blooms May-Jun.	**Moderate Potential.** Potentially suitable Sargent cypress woodland, foothill pine woodland, and chaparral habitats on serpentine substrate exist within the Phase 1 Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Freed's jewelflower *Streptanthus brachiatus ssp. hoffmanii*	Rank 1B.2	Chaparral, cismontane woodland. Elevation ranges from 1605 to 4005 feet (490 to 1220 meters). Blooms May-Jul.	**Moderate Potential.** Potentially suitable Sargent cypress woodland, foothill pine woodland, and chaparral habitats on serpentine substrate exist within the Phase 1 Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
green jewelflower *Streptanthus hesperidis*	Rank 1B.2	Chaparral (openings), cismontane woodland. Elevation ranges from 425 to 2495 feet (130 to 760 meters). Blooms May-Jul.	**Present.** This species was observed at numerous locations throughout the Phase 1 Study Area in chaparral and foothill pine woodland habitats on rocky, serpentine substrates.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Three Peaks jewelflower *Streptanthus morrisonii ssp. elatus*	Rank 1B.2	Chaparral (serpentine). Elevation ranges from 295 to 2675 feet (90 to 815 meters). Blooms Jun-Sep.	**High Potential.** Potentially suitable rocky, serpentine outcrops in Sargent cypress woodland, foothill pine woodland, and chaparral habitats exist within the Phase 1 Study Area. This taxon is known from nearby occurrences, and plants that were intermediate between ssp. *elatus* and ssp. *hirtiflorus* were observed within the Guenoc Ranch property, outside of the Phase 1 Study Area.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Kruckeberg's jewelflower *Streptanthus morrisonii ssp. kruckebergii*	Rank 1B.2	Cismontane woodland (serpentine). Elevation ranges from 705 to 3395 feet (215 to 1035 meters). Blooms Apr-Jul.	**Moderate Potential.** Potentially suitable rocky, serpentine outcrops in Sargent cypress woodland, foothill pine woodland, and chaparral habitats exist within the Phase 1 Study Area, and this species is known from nearby occurrences.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
early jewelflower *Streptanthus vernalis*	Rank 1B.2	Closed-cone coniferous forest, chaparral. Elevation ranges from 2000 to 2000 feet (610 to 610 meters). Blooms Mar-May.	**Moderate Potential.** Potentially suitable Sargent cypress woodland, foothill pine woodland, and chaparral habitats on serpentine substrate exist within the Phase 1 Study Area, and this species is known from nearby occurrences.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
slender-leaved pondweed *Stuckenia filiformis ssp. alpina*	Rank 2B.2	Marshes and swamps (assorted shallow freshwater). Elevation ranges from 980 to 7055 feet (300 to 2150 meters). Blooms May-Jul.	**Moderate Potential.** Potentially suitable pond and reservoir habitats exist within the Phase 1 Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
short-podded thelypodium *Thelypodium brachycarpum*	Rank 4.2	Chaparral, lower montane coniferous forest, meadows and seeps. Elevation ranges from 2195 to 8400 feet (670 to 2560 meters). Blooms May-Aug.	**Moderate Potential.** Potentially suitable chaparral, foothill pine woodland, and Sargent cypress woodland on serpentine substrates exist within the Phase 1 Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
marsh zigadenus *Toxicoscordion fontanum*	Rank 4.2	Chaparral, cismontane woodland, lower montane coniferous forest, meadows and seeps, marshes and swamps. Elevation ranges from 45 to 3280 feet (15 to 1000 meters). Blooms Apr-Jul.	**Present.** This species has been observed in numerous locations within the Phase 1 Study Area in seeps, wet meadows, and along streams on serpentine substrate.	This species was observed in one or more locations within the Phase 1 Study Area. Recommendations for this species can be found in Section 6.3.
Napa bluecurls *Trichostema ruygtii*	Rank 1B.2	Chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland, vernal pools. Elevation ranges from 95 to 2230 feet (30 to 680 meters). Blooms Jun-Oct.	**Moderate Potential.** Potentially suitable mesic areas on volcanic substrate in chaparral, blue oak woodland, foothill pine woodland, and grassland habitats exist within the Phase 1 Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
saline clover *Trifolium hydrophilum*	Rank 1B.2	Marshes and swamps, valley and foothill grassland (mesic, alkaline), vernal pools. Elevation ranges from 0 to 985 feet (0 to 300 meters). Blooms Apr-Jun.	**Unlikely.** The Phase 1 Study Area lacks alkaline sites suitable for this species.	No further actions are recommended for this species.
Dark-mouth triteleia *Triteleia lugens*	Rank 4.3	Broadleaved upland forest, chaparral, coastal scrub, lower montane coniferous forest. Elevation ranges from 328 to 3280 feet (100 to1000 meters). Blooms Apr-Jun	**High Potential.** Potentially suitable chaparral and foothill pine woodland habitats on volcanic substrate exist within the Phase 1 Study Area. This species was observed within the Guenoc Ranch property, outside of the Phase 1 Study Area, on rocky, volcanic substrate.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
oval-leaved viburnum *Viburnum ellipticum*	Rank 2B.3	Chaparral, cismontane woodland, lower montane coniferous forest. Elevation ranges from 705 to 4595 feet (215 to 1400 meters). Blooms May-Jun.	**Moderate Potential.** Potentially suitable chaparral, foothill pine woodland, and oak woodland habitats are present within the Phase 1 Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 1 Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

[1]Key to Conservation Status:

FE	Federal Endangered
FT	Federal Threatened
SE	State Endangered
ST	State Threatened
Rank 1B.1	CNPS Rank 1B.1: Rare, threatened, or endangered in California and elsewhere (seriously threatened in California)
Rank 1B.2	CNPS Rank 1B.2: Rare, threatened, or endangered in California and elsewhere (moderately threatened in California)
Rank 1B.3	CNPS Rank 1B.3: Rare, threatened, or endangered in California and elsewhere (not very threatened in California)
Rank 2B.1	CNPS Rank 2B.1: Rare, threatened, or endangered in California, but more common elsewhere (seriously threatened in California)
Rank 2B.2	CNPS Rank 2B.2: Rare, threatened, or endangered in California, but more common elsewhere (moderately threatened in California)
Rank 2B.3	CNPS Rank 2B.3: Rare, threatened, or endangered in California, but more common elsewhere (not very threatened in California)
Rank 3.1	CNPS Rank 3.1: Plants about which more information is needed - A review list (seriously threatened in California)
Rank 3.2	CNPS Rank 3.2: Plants about which more information is needed - A review list (moderately threatened in California)
Rank 3.3	CNPS Rank 3.3: Plants about which more information is needed - A review list (not very threatened in California)
Rank 4.2	CNPS Rank 4.2: Plants of limited distribution - A watch list (moderately threatened in California)
Rank 4.3	CNPS Rank 4.3: Plants of limited distribution - A watch list (not very threatened in California)

[2]Key to Potential for Occurrence:

No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).

Unlikely. Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.

Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.

High Potential. All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

Present. Species was observed on the site or has been recorded (i.e. CNDDB, other reports) on the site recently.

[3]Although this species is listed as Rank 1B.1, recent data suggests that this species should not be considered special-status (Potter et al. 2018)

APPENDIX E

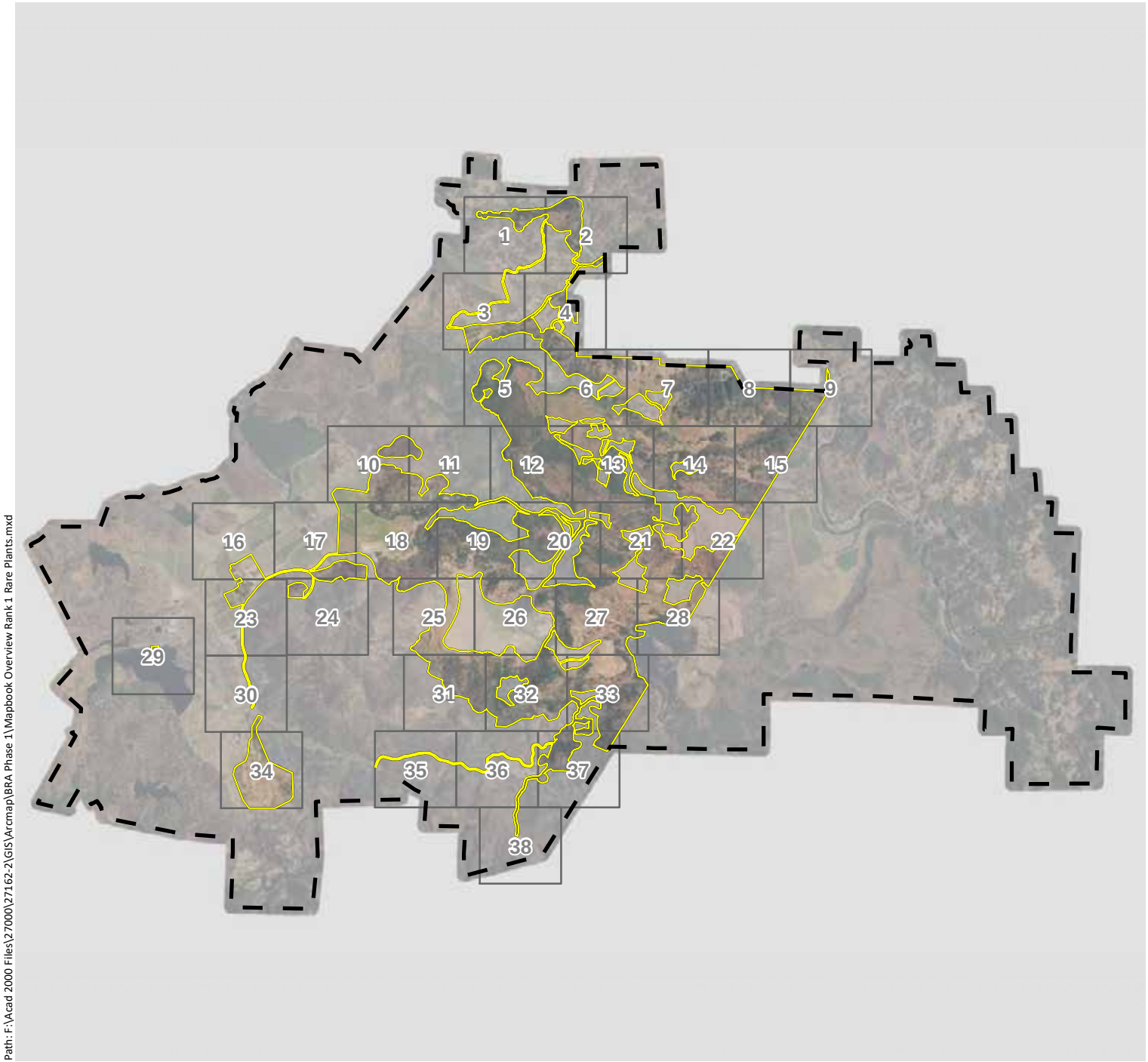
SPECIAL-STATUS PLANT SPECIES OBSERVED WITHIN THE PHASE 1 STUDY AREA

APPENDIX E1

FEDERAL, STATE, AND CNPS RANK 1 SPECIAL-STATUS PLANT SPECIES OBSERVED WITHIN THE PHASE 1 STUDY AREA

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Overview)

Maha Resort and Guenoc Valley Development, Phase 1



Property Boundary

Phase 1 Study Area

Mapbook Grid

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Miles

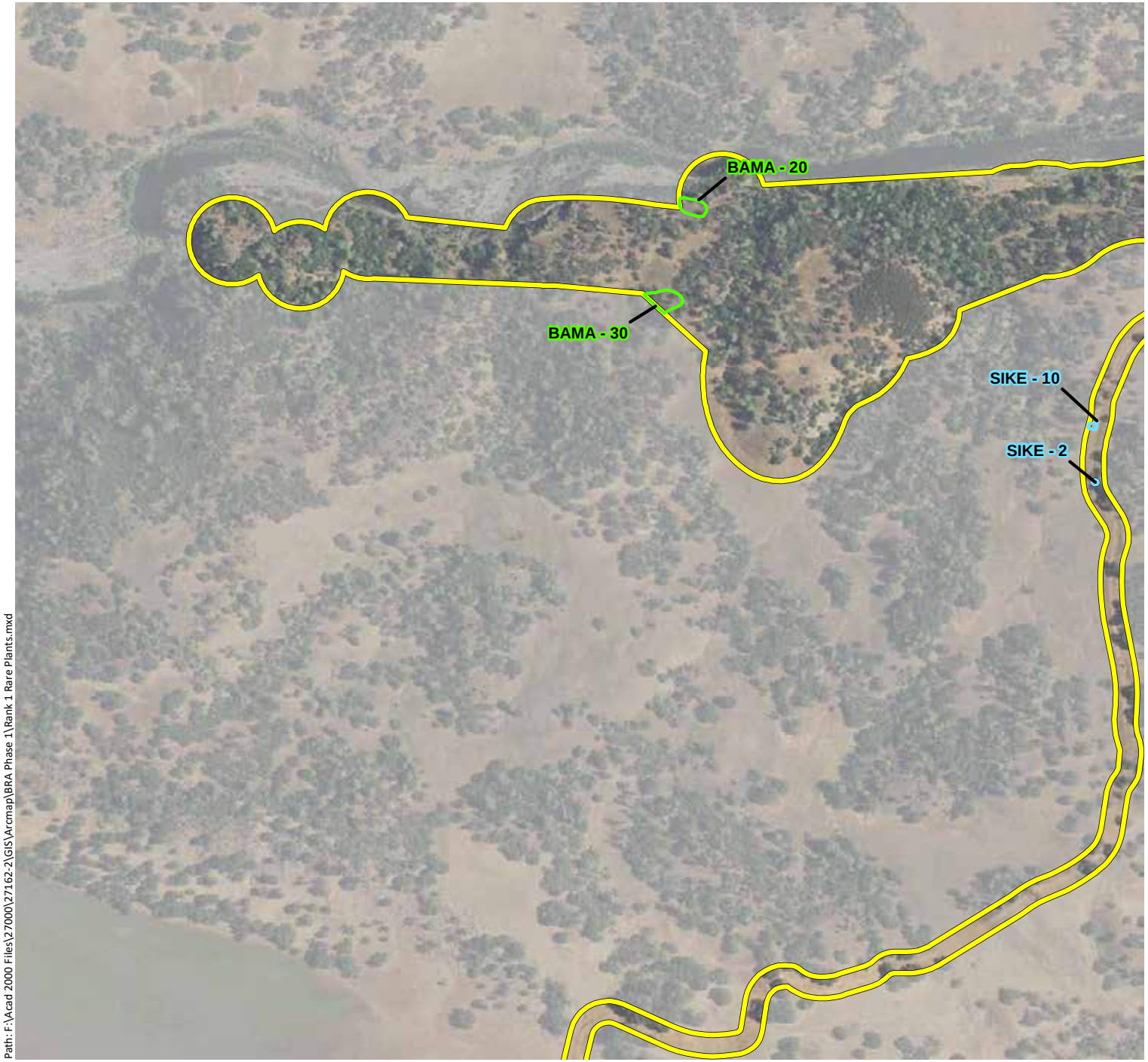
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Mapbook Overview Rank 1 Rare Plants.mxd

Sources: Hexagon 2016 Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 1)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.
Federally-Endangered Plants
State-Endangered Plants
CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

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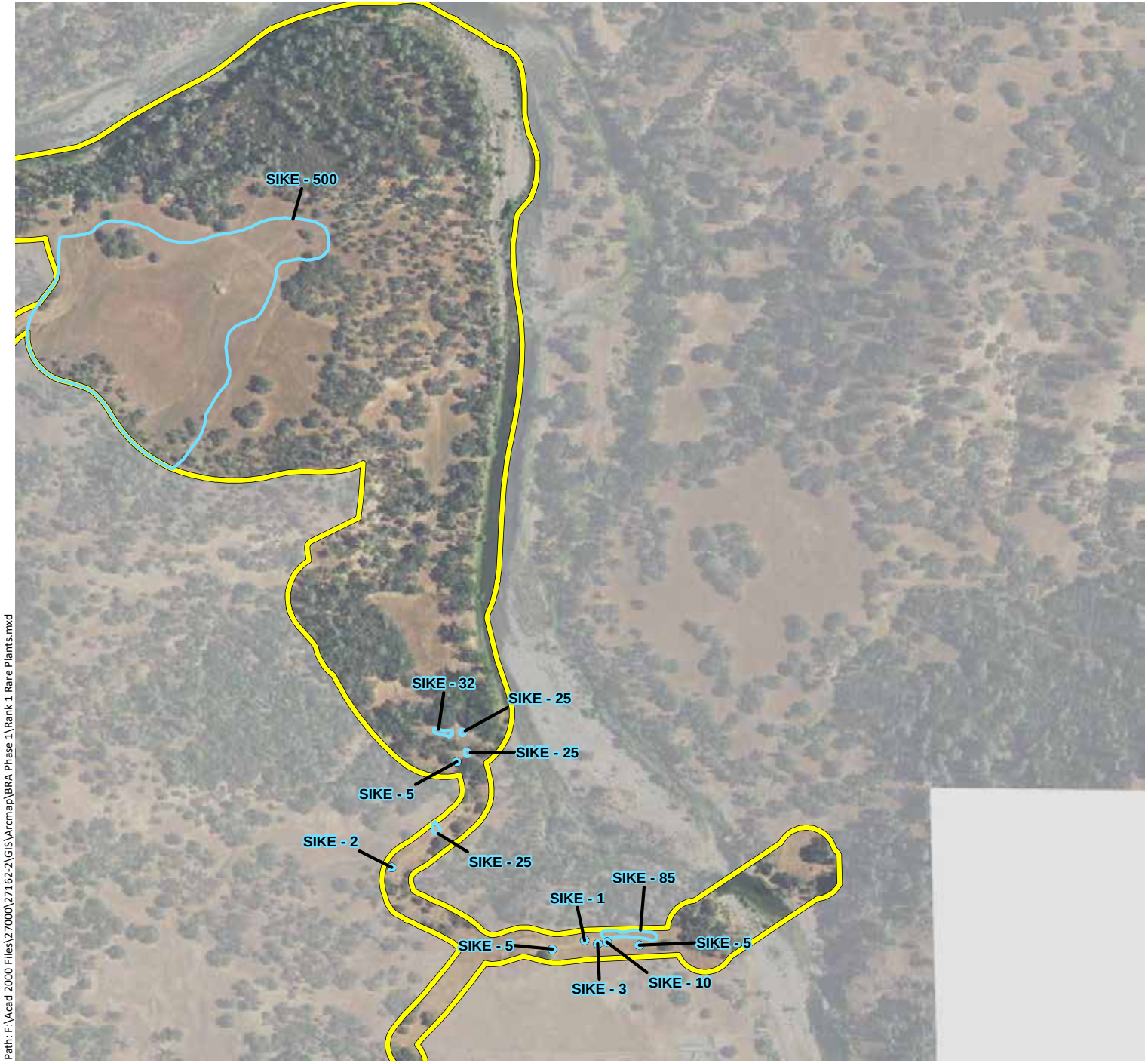
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 2)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.
Federally-Endangered Plants
State-Endangered Plants
CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 3)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

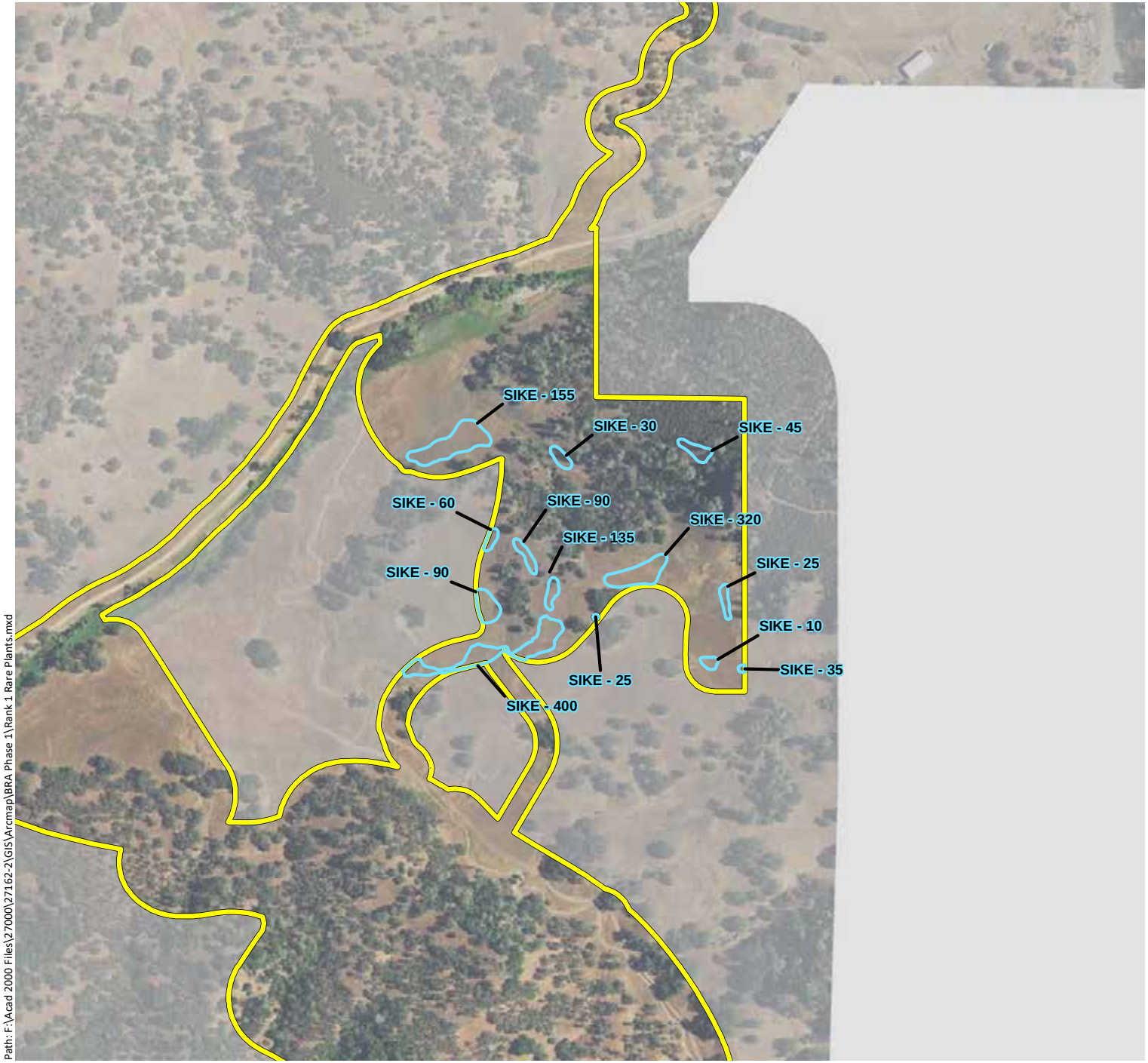
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019



Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 4)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

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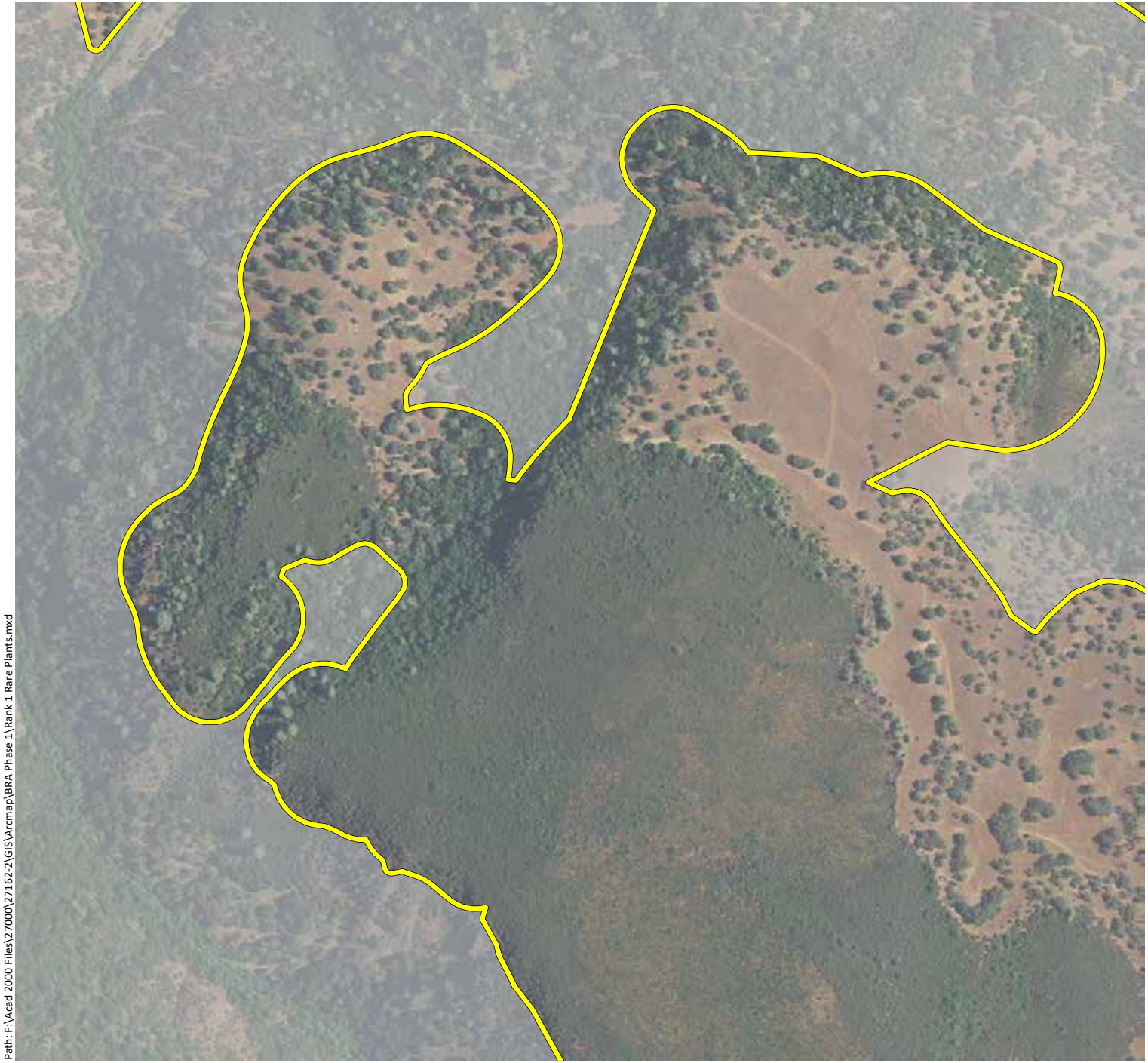
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019



Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 5)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

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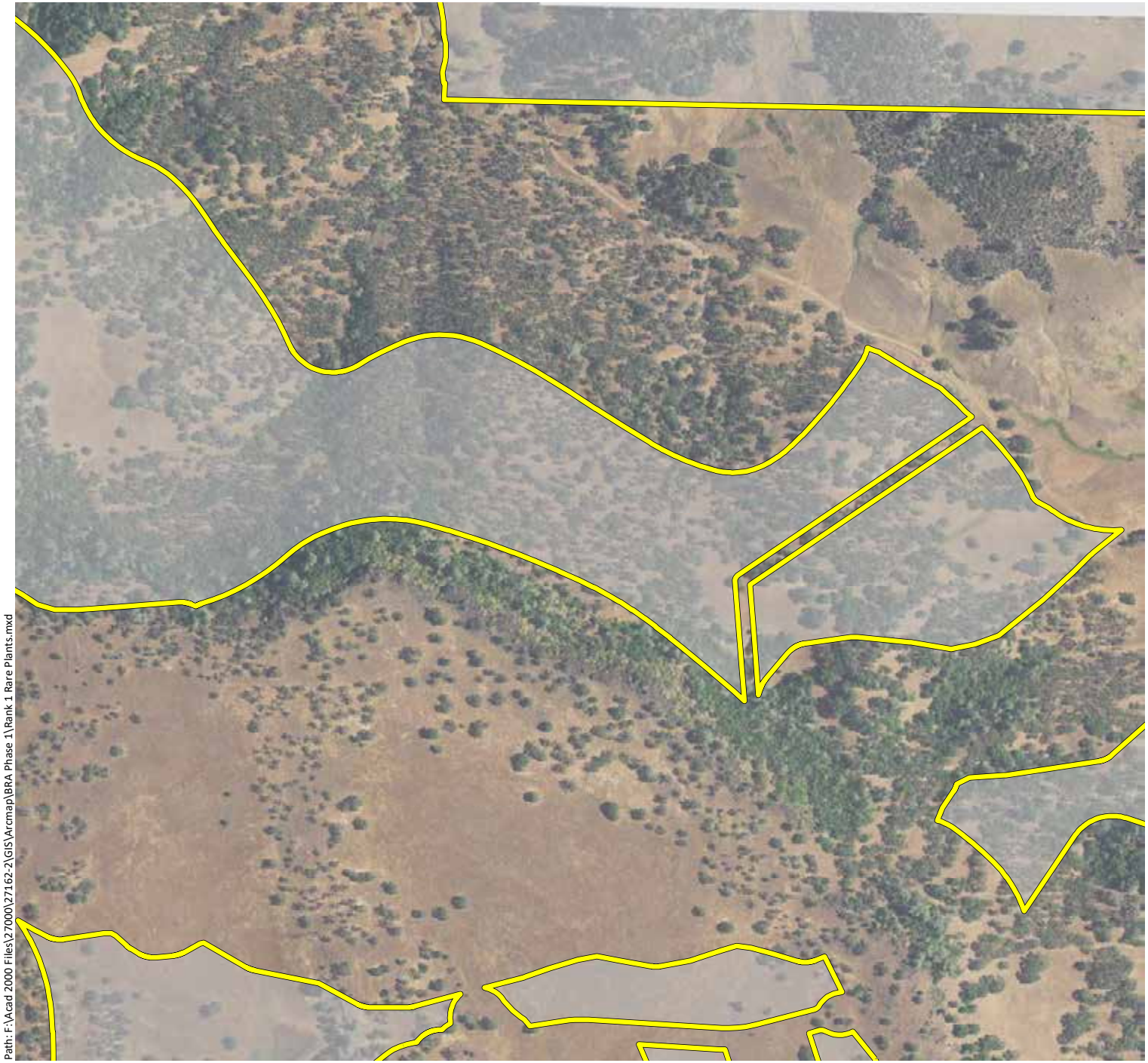
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019



Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 6)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

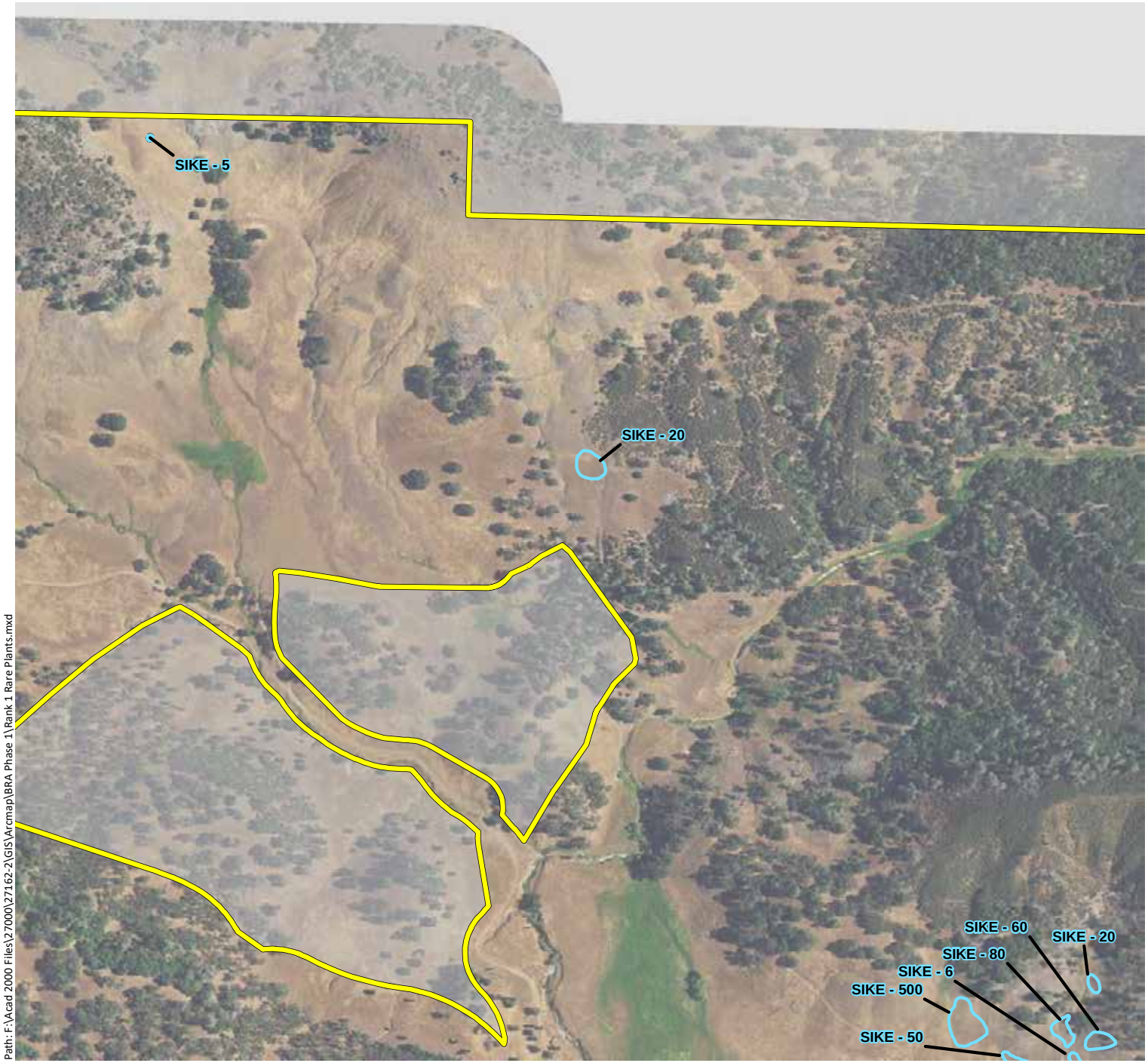
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 7)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.
Federally-Endangered Plants
State-Endangered Plants
CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 8)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Federally-Endangered Plants
State-Endangered Plants
CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

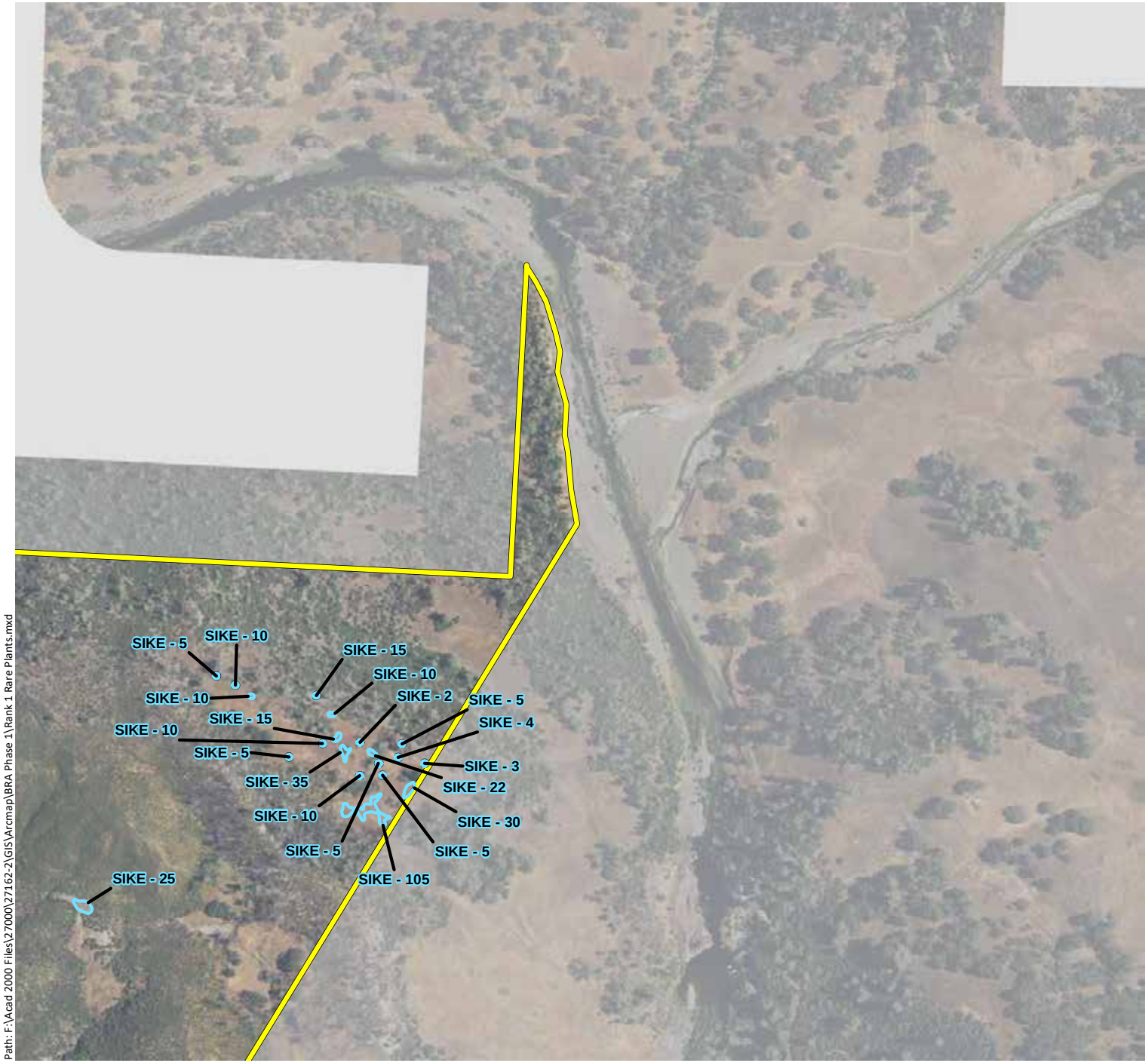
wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 9)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

Federally-Endangered Plants

State-Endangered Plants

CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

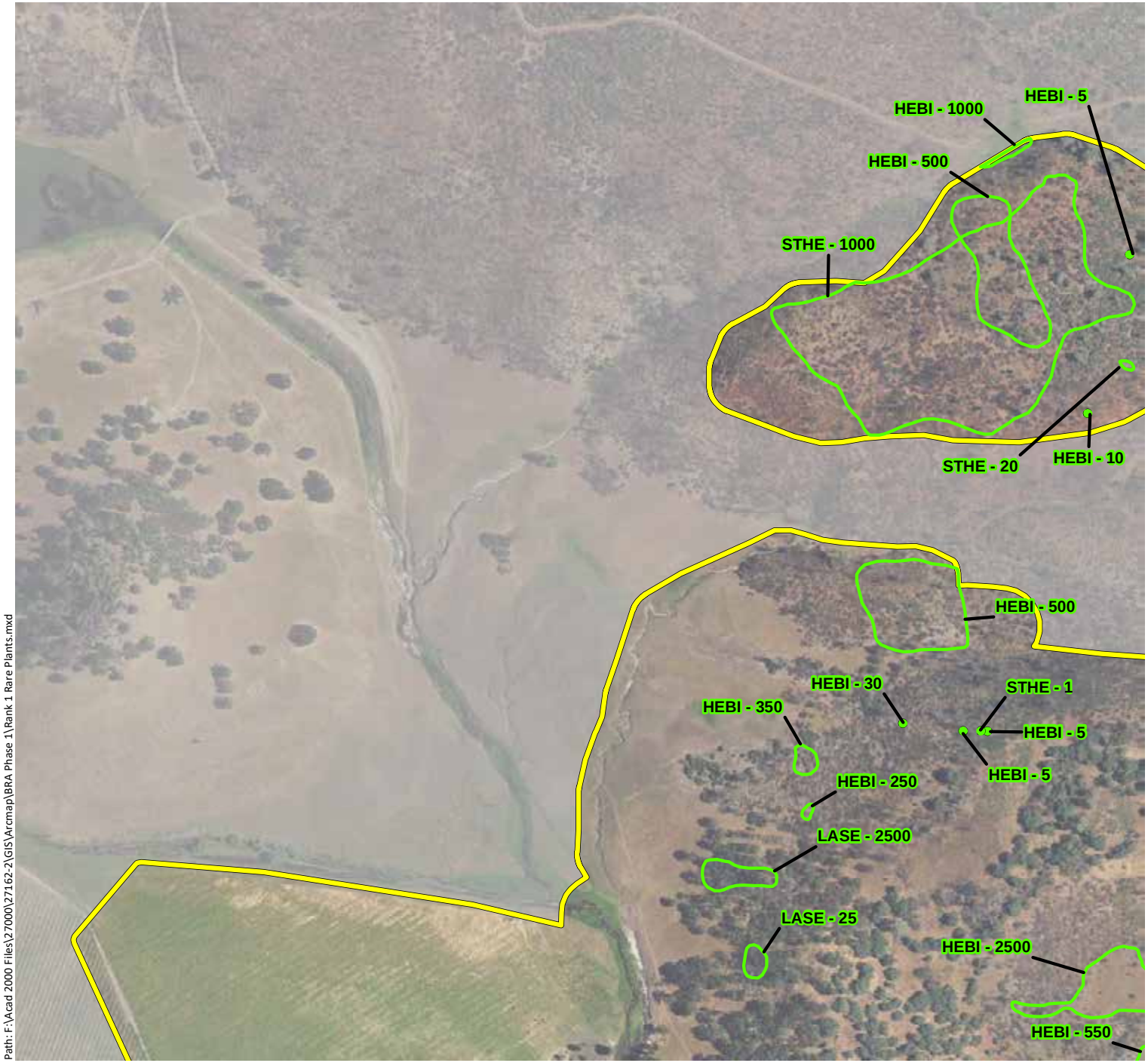
0 500 1,000

Feet

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019



Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 10)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Federally-Endangered Plants
State-Endangered Plants
CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch
BAMA: Big-scale balsamroot
BRLE: Narrow-flowered California brodiaea
ERGR: Greene's narrow-leaved fleabane
HEBI: Two carpellate western flax
LASE: Colusa layia
STHE: Green jewelflower
STMO: Morrison's jewelflower

N

0 500 1,000

Feet

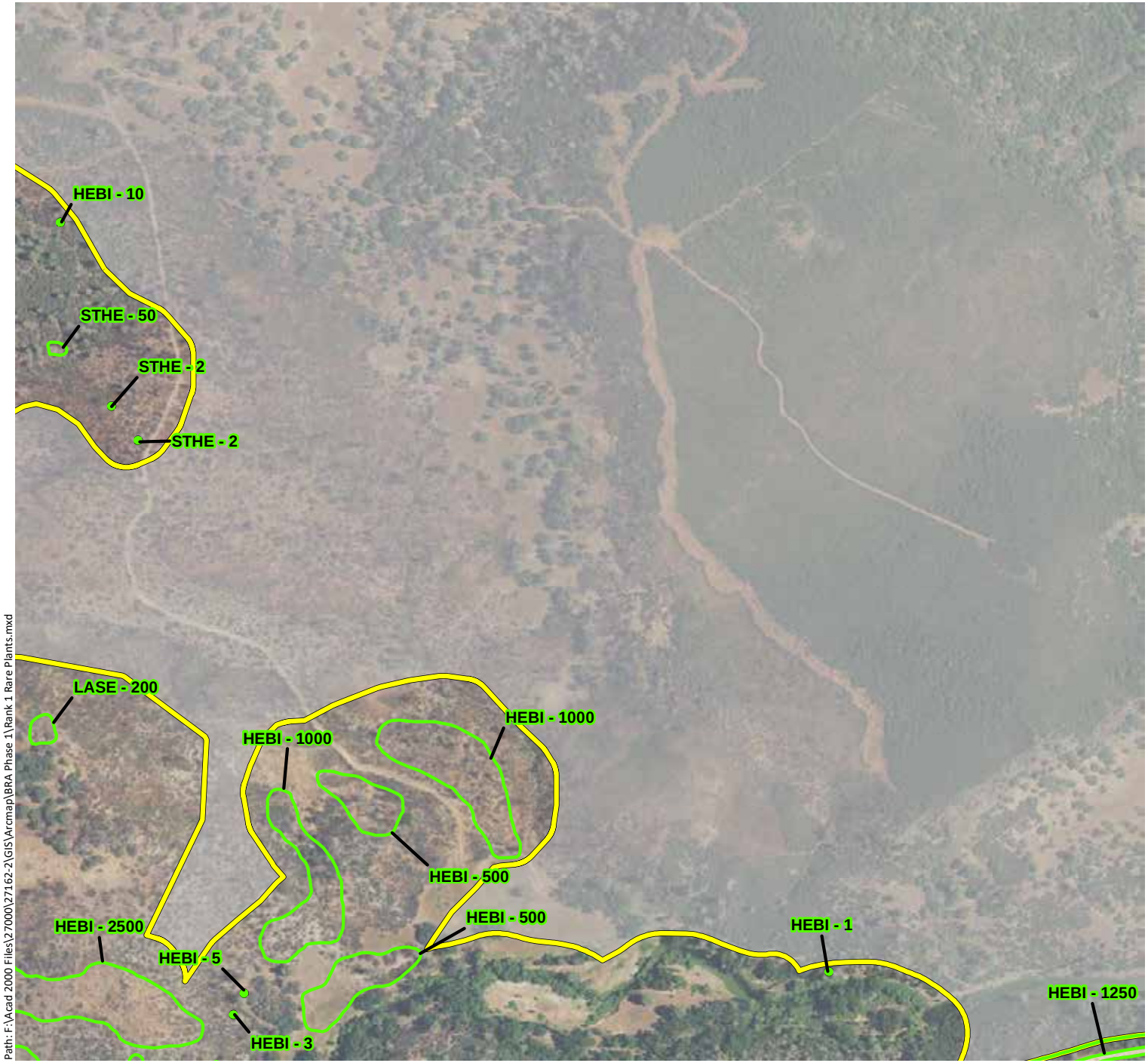
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 11)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

Federally-Endangered Plants

State-Endangered Plants

CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 12)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Federally-Endangered Plants
State-Endangered Plants
CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

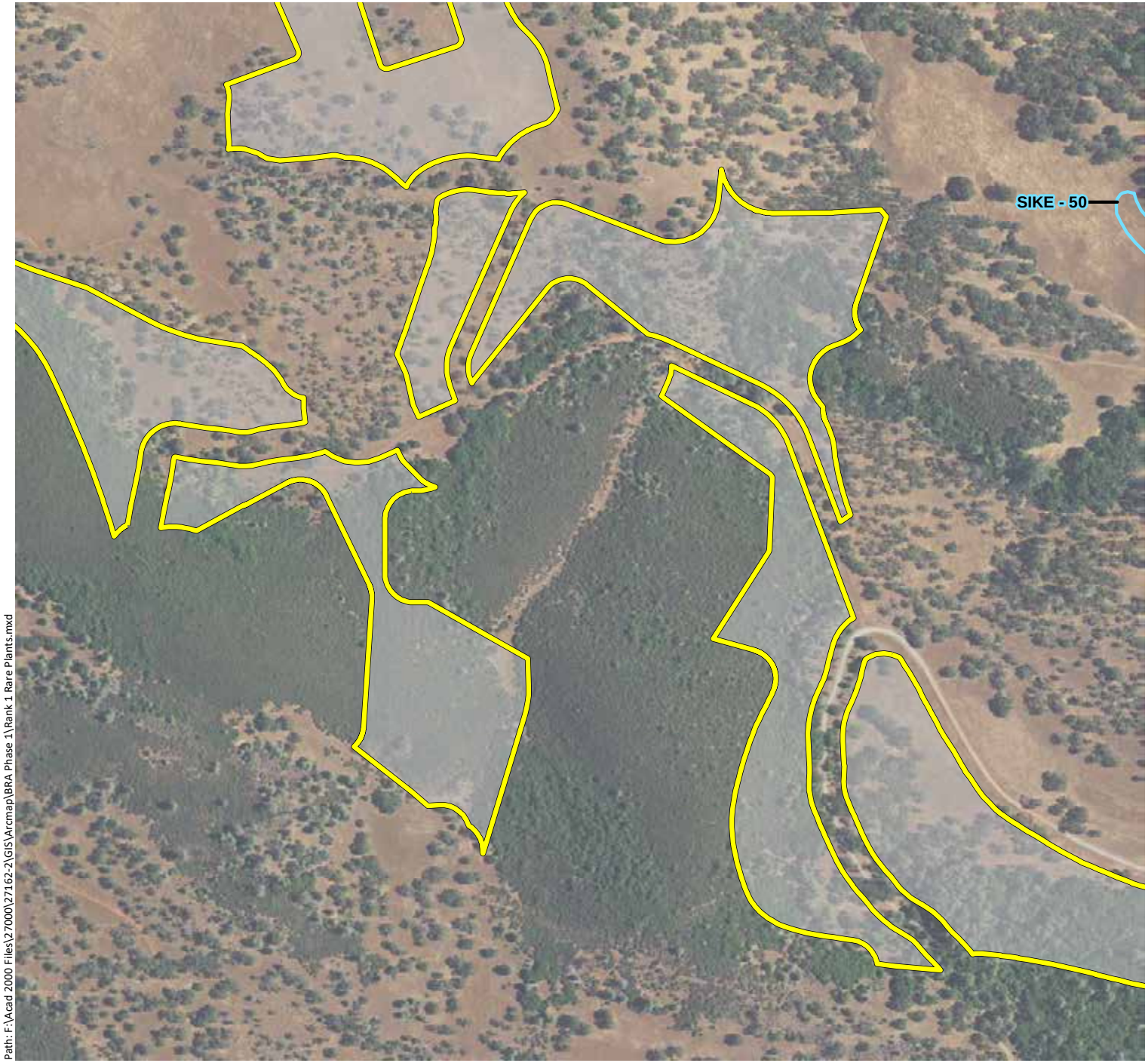
0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019



Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 13)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

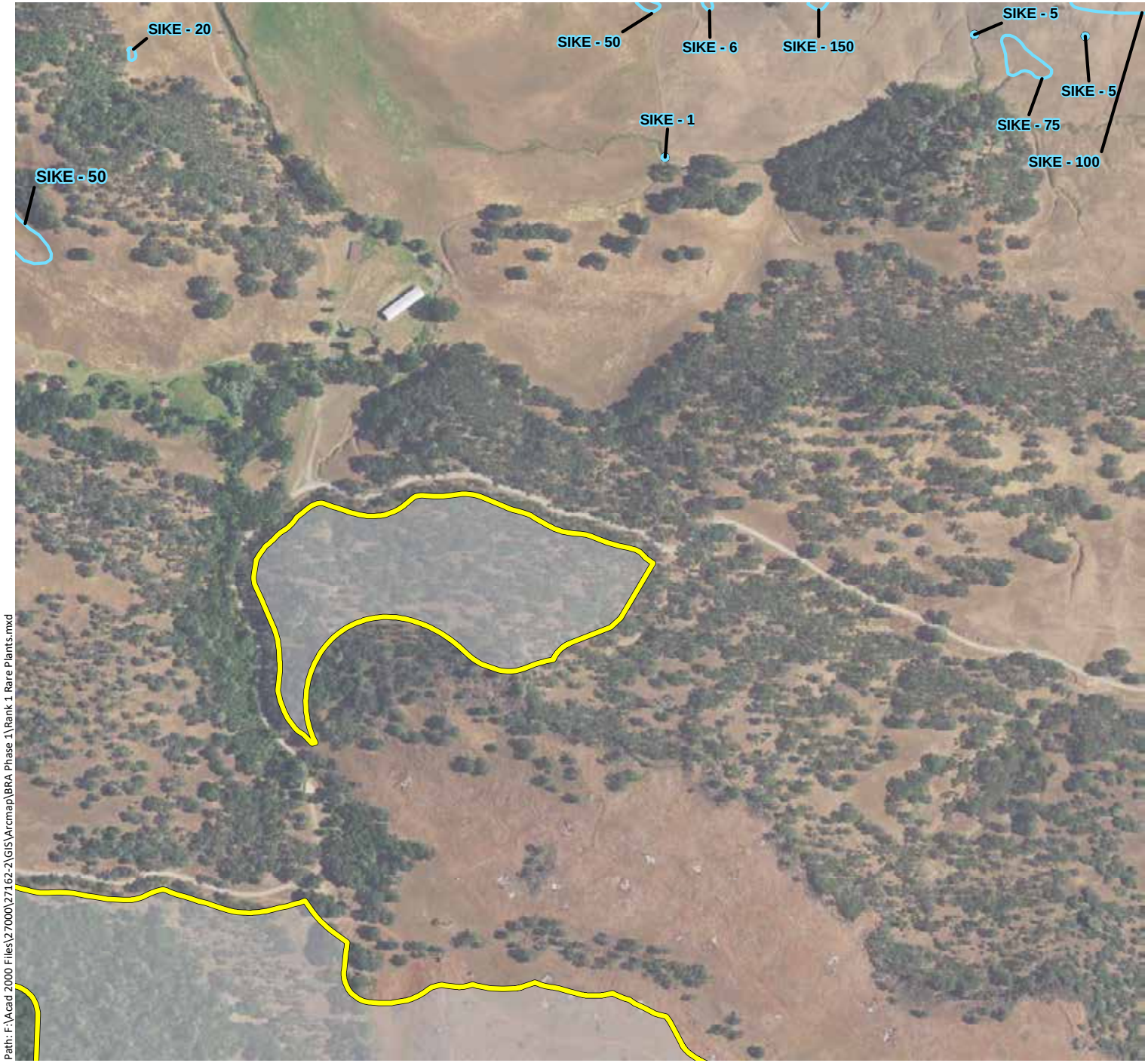
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019



Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 14)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 15)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 16)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 17)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Federally-Endangered Plants
State-Endangered Plants
CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch
BAMA: Big-scale balsamroot
BRLE: Narrow-flowered California brodiaea
ERGR: Greene's narrow-leaved fleabane
HEBI: Two carpellate western flax
LASE: Colusa layia
STHE: Green jewelflower
STMO: Morrison's jewelflower

N

0 500 1,000

Feet

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 18)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

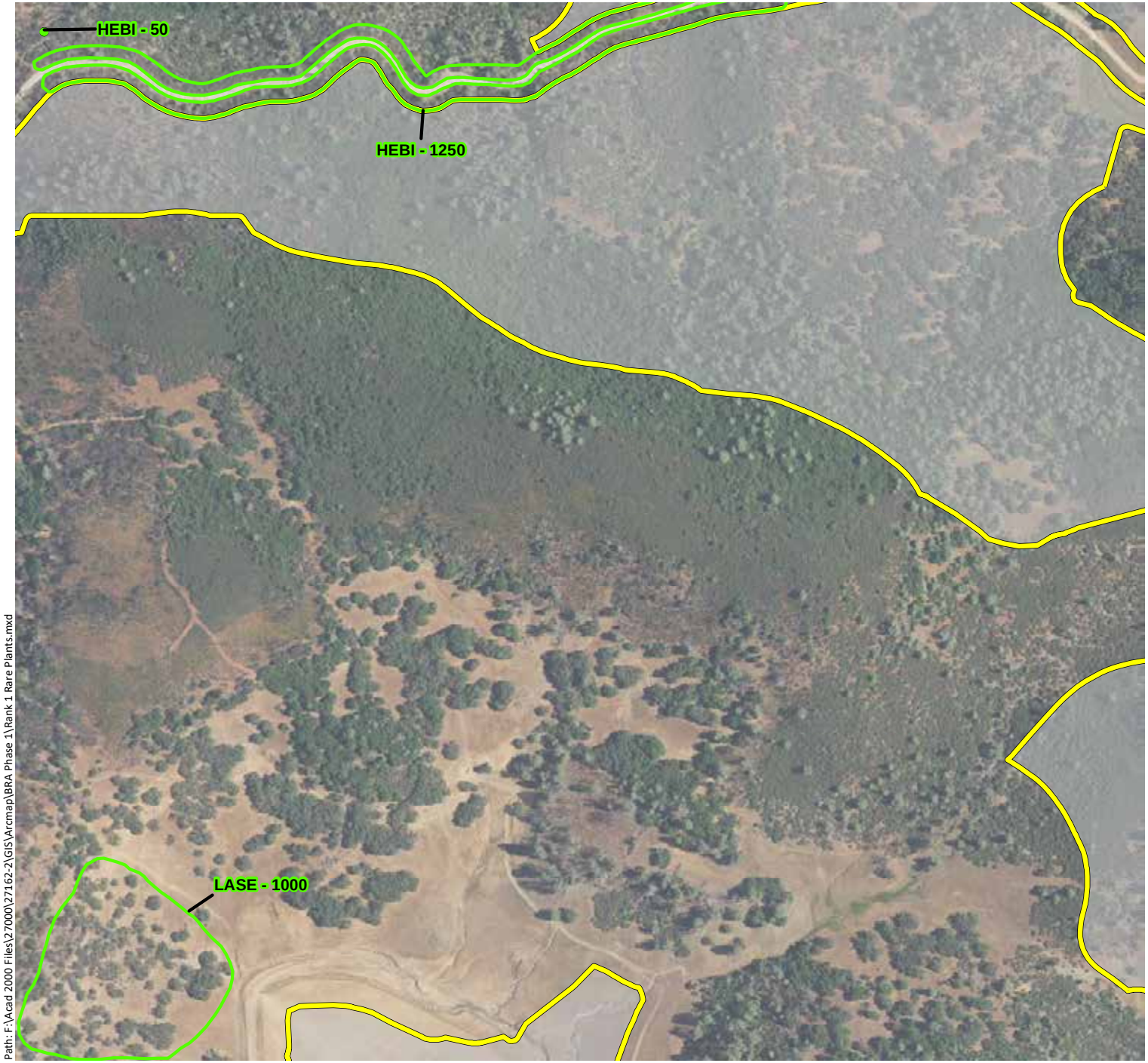
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019



Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 19)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 20)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Federally-Endangered Plants
State-Endangered Plants
CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 21)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

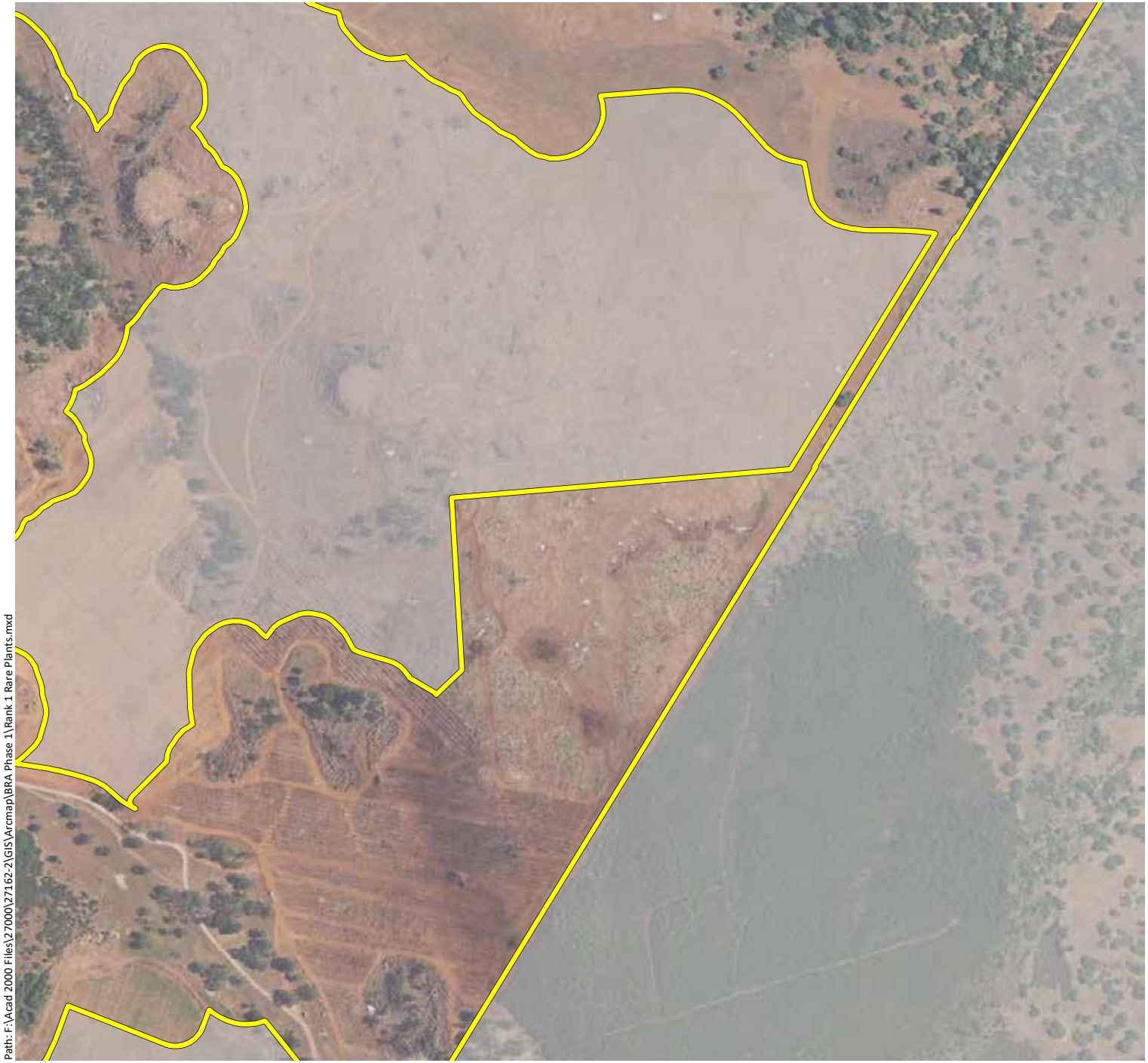
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019



Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 22)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 23)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

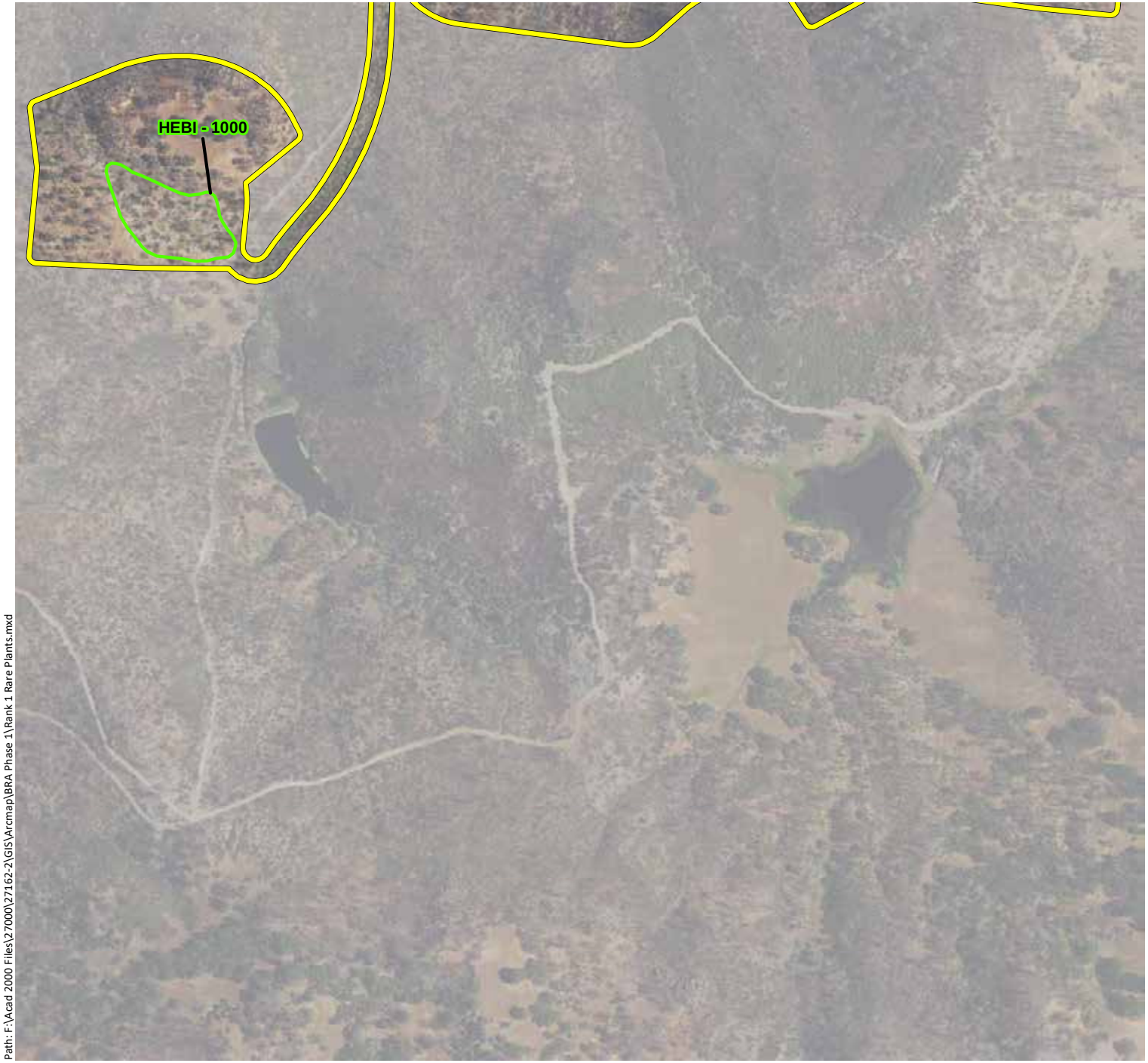
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019



Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 24)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

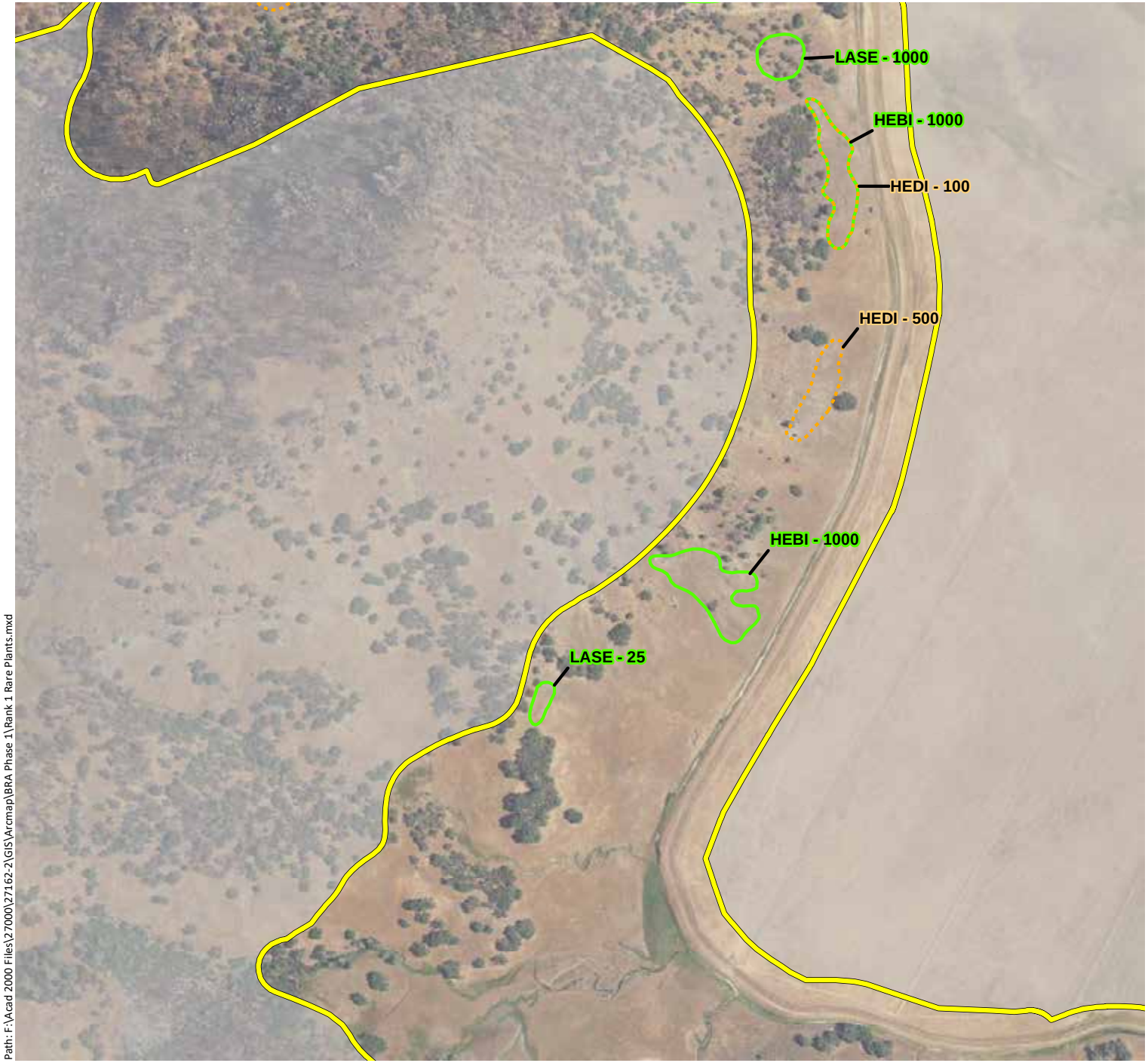
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019



Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 25)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

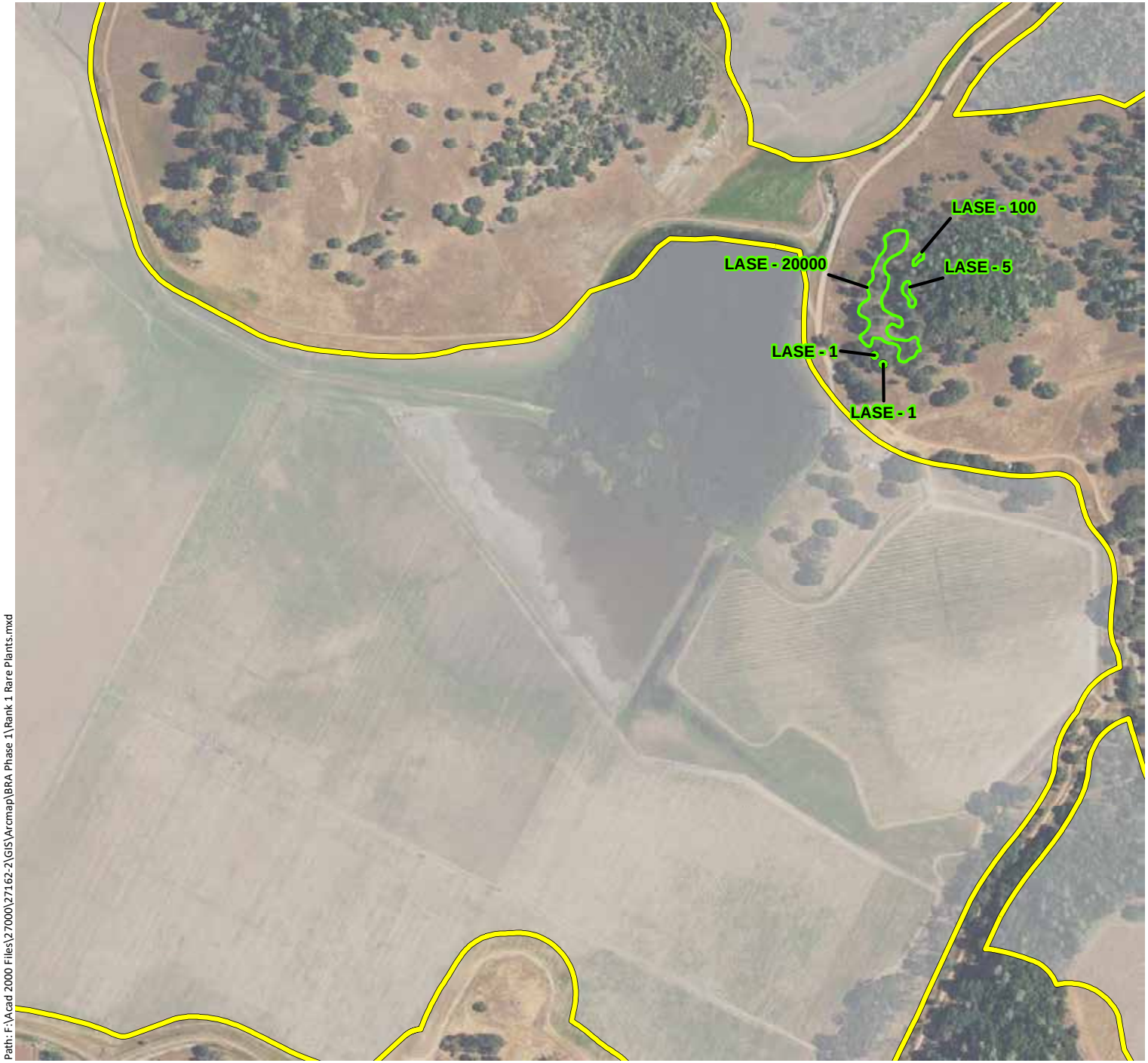
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 26)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.
Federally-Endangered Plants
State-Endangered Plants
CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch
BAMA: Big-scale balsamroot
BRLE: Narrow-flowered California brodiaea
ERGR: Greene's narrow-leaved fleabane
HEBI: Two carpellate western flax
LASE: Colusa layia
STHE: Green jewelflower
STMO: Morrison's jewelflower

N

0 500 1,000

Feet

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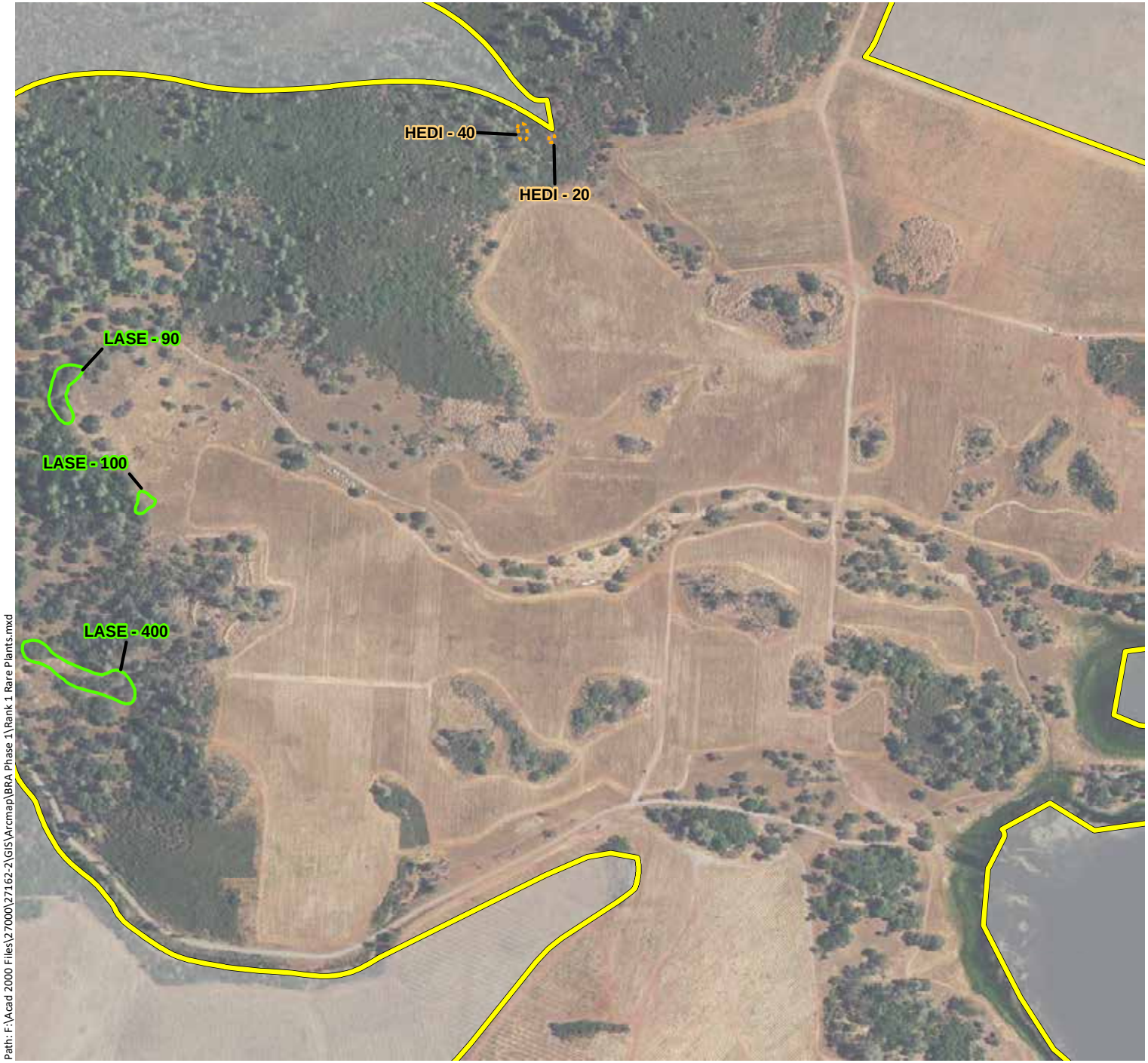
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019



Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 27)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 28)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

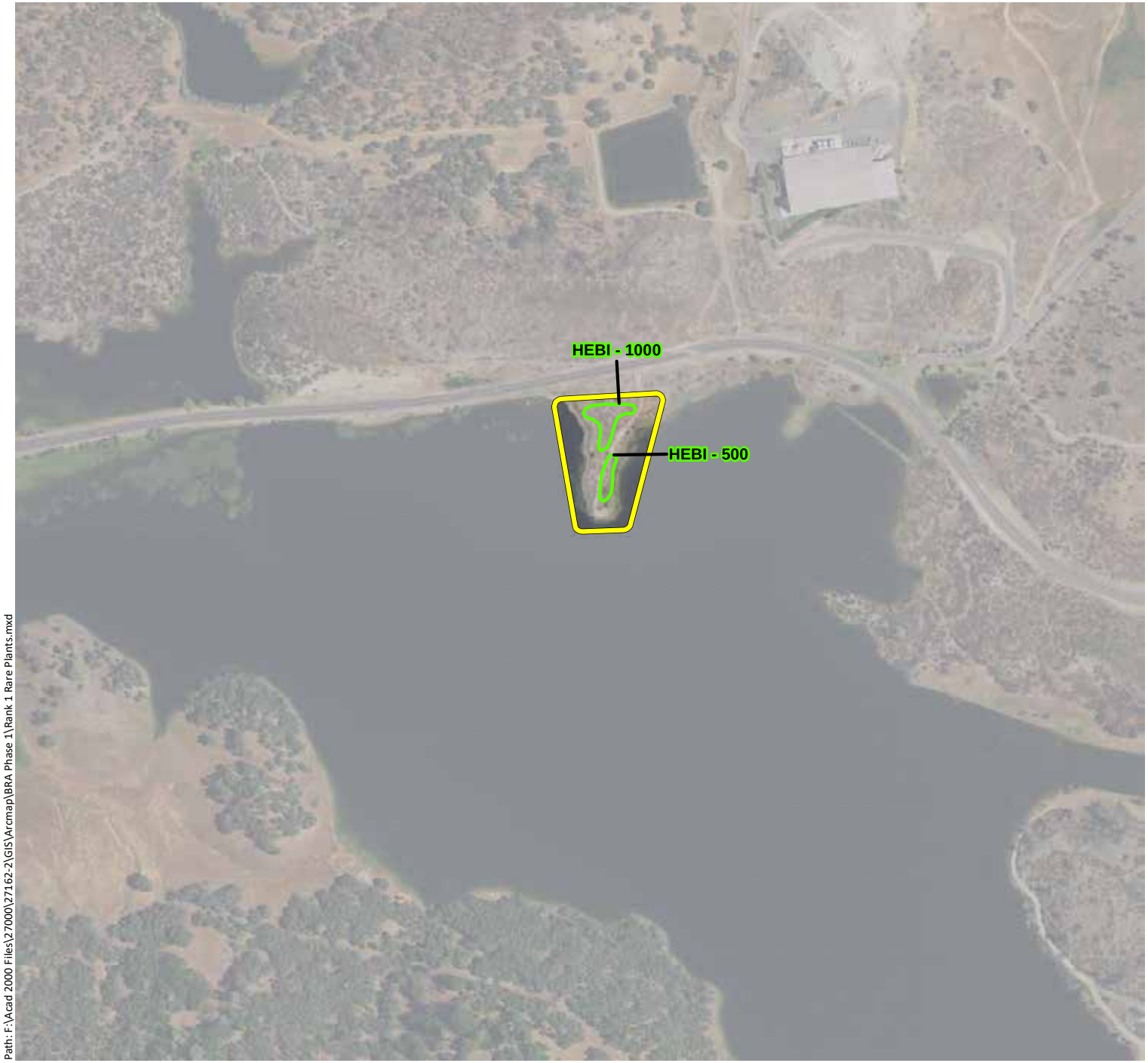
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 29)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.
Federally-Endangered Plants
State-Endangered Plants
CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 30)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Federally-Endangered Plants
State-Endangered Plants
CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch
BAMA: Big-scale balsamroot
BRLE: Narrow-flowered California brodiaea
ERGR: Greene's narrow-leaved fleabane
HEBI: Two carpellate western flax
LASE: Colusa layia
STHE: Green jewelflower
STMO: Morrison's jewelflower

N

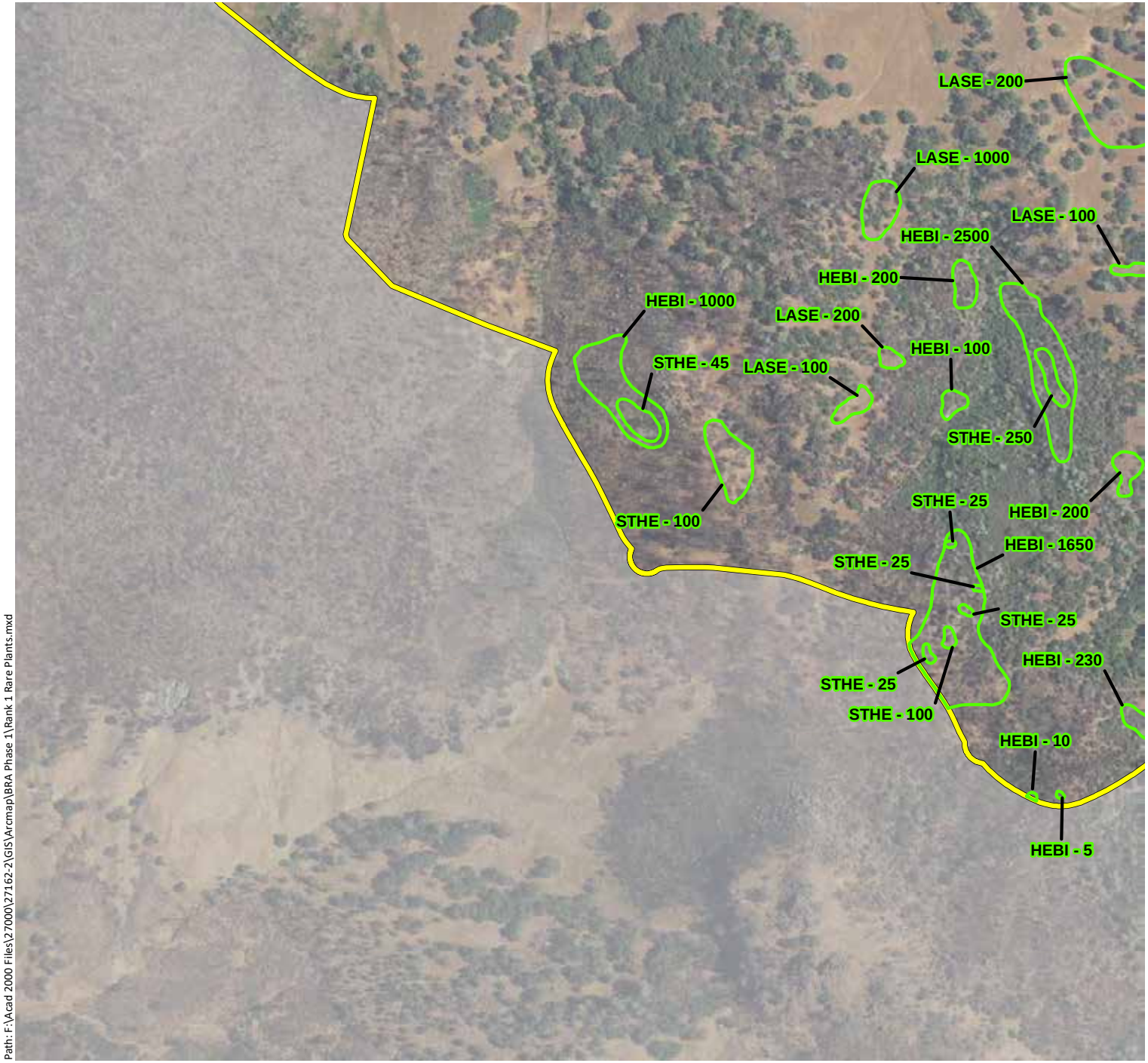
0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019



Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 31)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

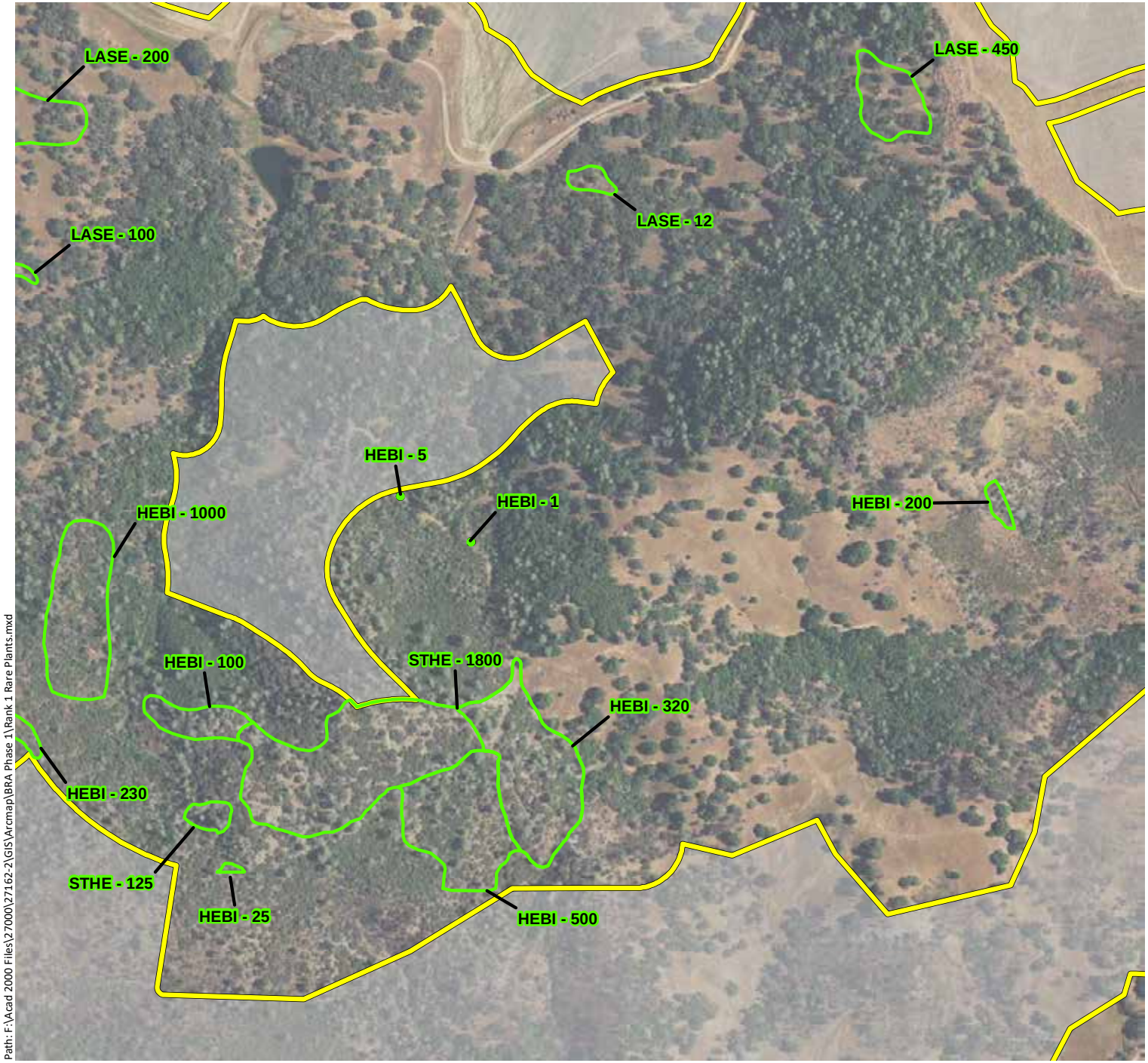
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019



Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 32)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

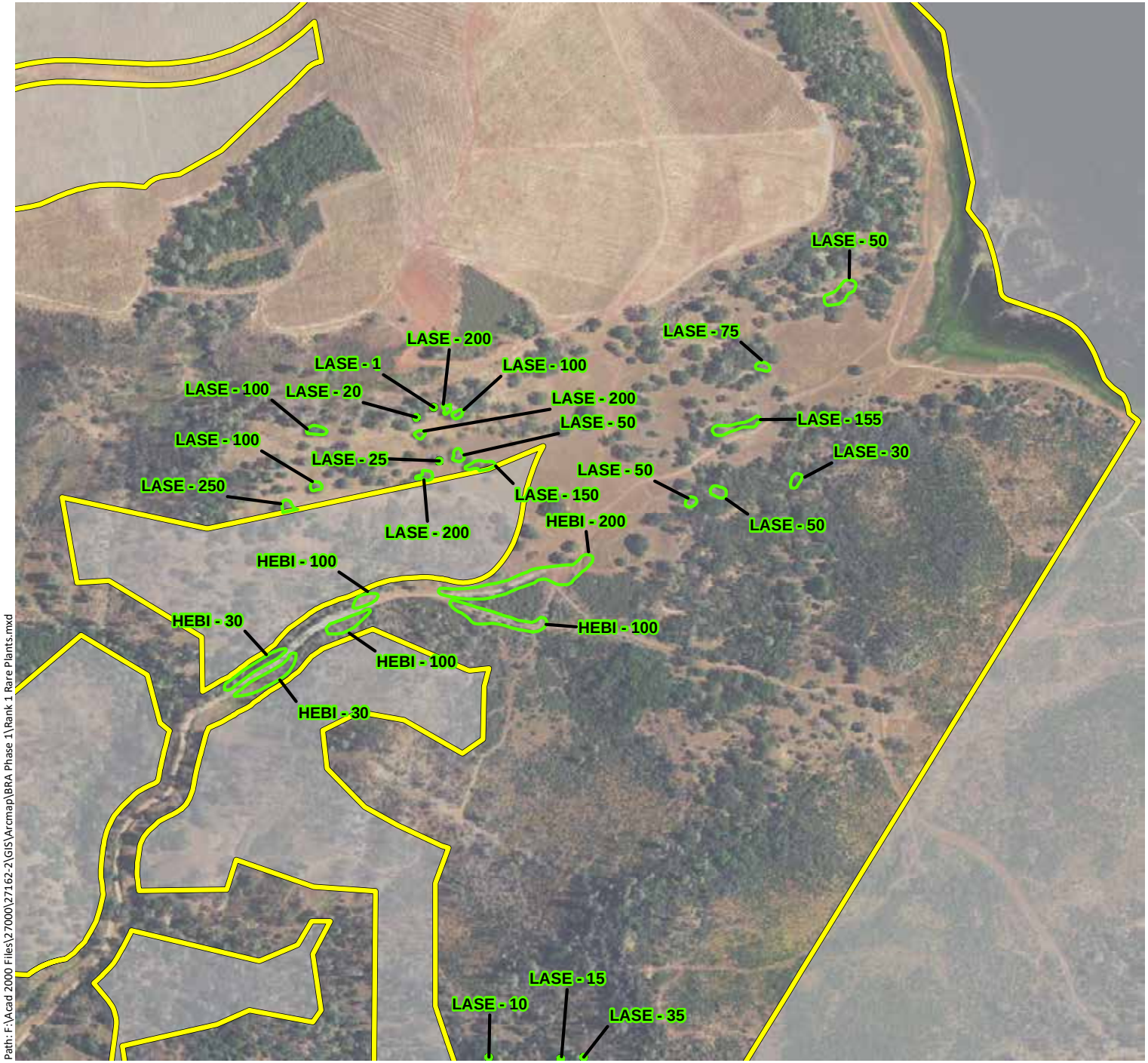
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 33)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.
Federally-Endangered Plants
State-Endangered Plants
CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 34)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

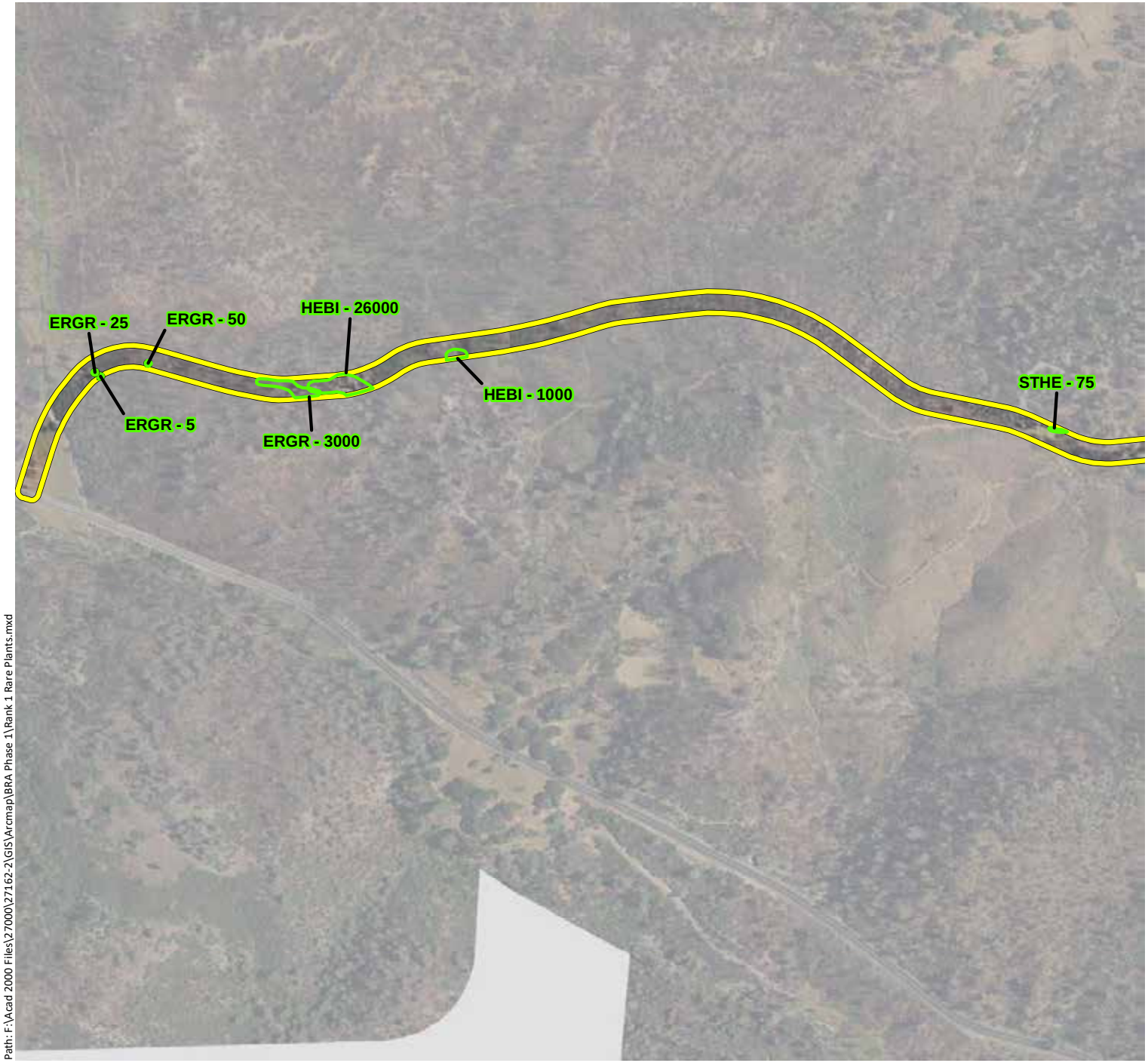
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 35)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.
Federally-Endangered Plants
State-Endangered Plants
CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

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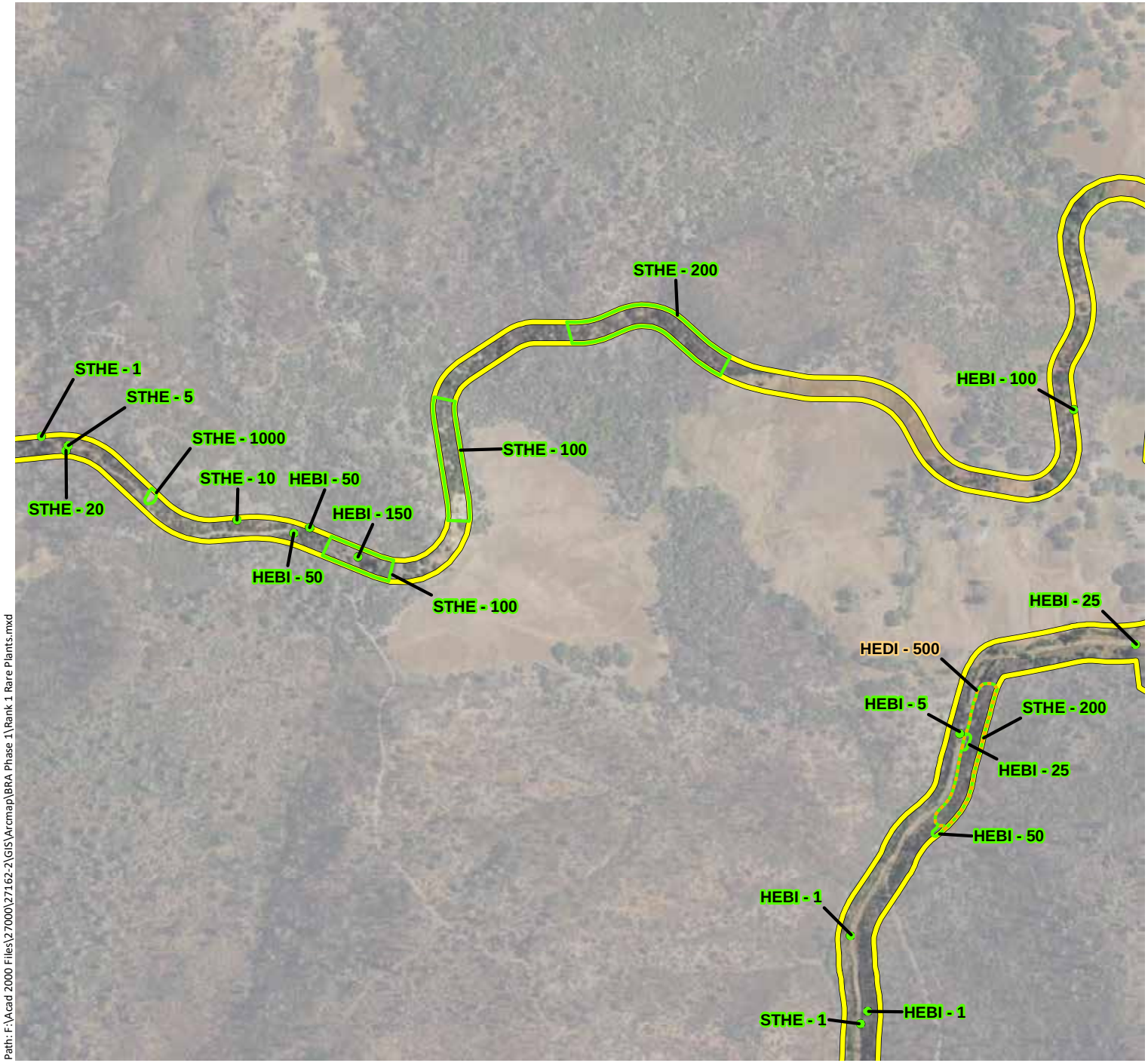
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 36)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.
Federally-Endangered Plants
State-Endangered Plants
CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch
BAMA: Big-scale balsamroot
BRLE: Narrow-flowered California brodiaea
ERGR: Greene's narrow-leaved fleabane
HEBI: Two carpellate western flax
LASE: Colusa layia
STHE: Green jewelflower
STMO: Morrison's jewelflower

N

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Feet

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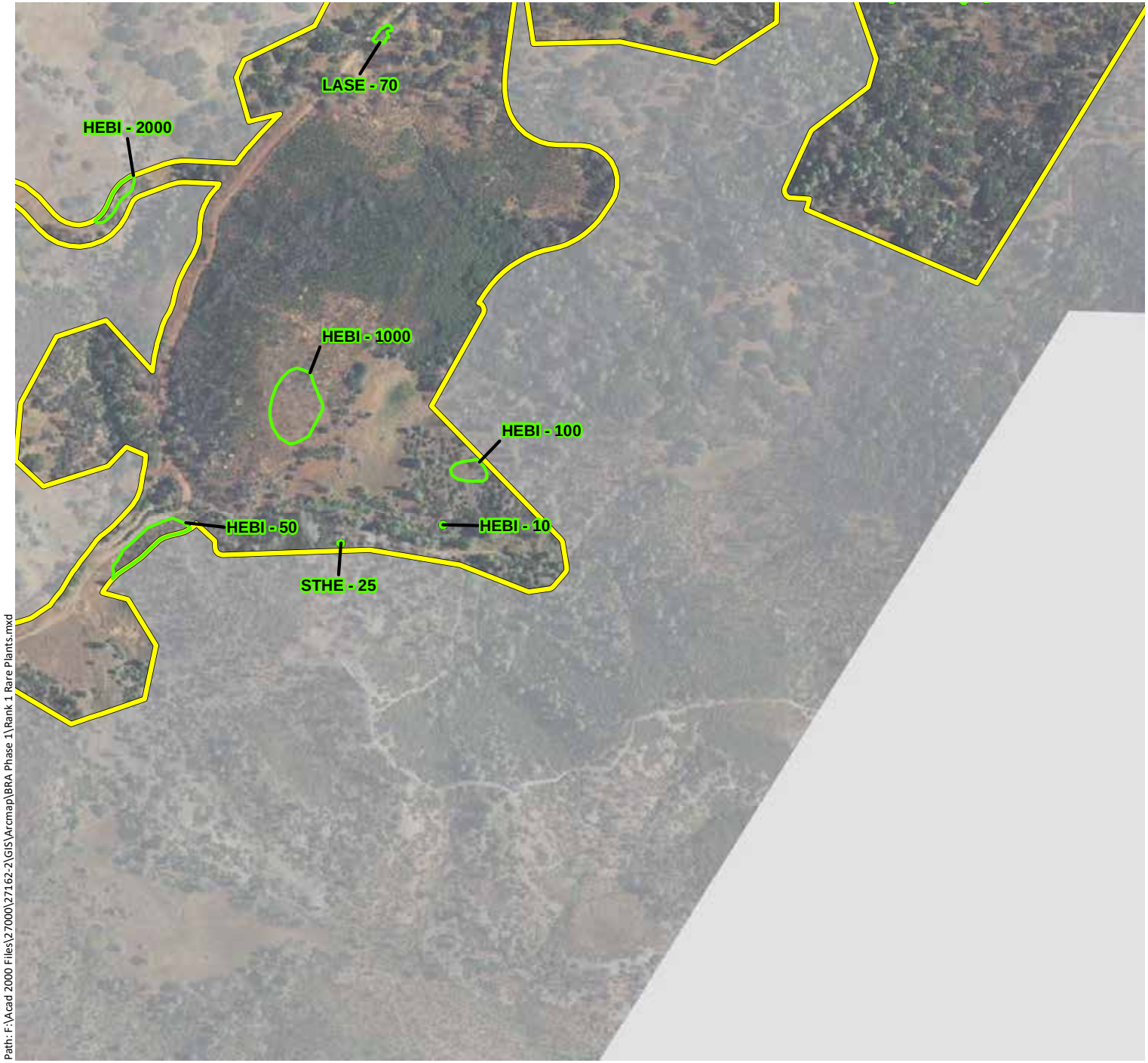
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019



Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 37)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 4,977 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 38)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.
Federally-Endangered Plants
State-Endangered Plants
CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch
BAMA: Big-scale balsamroot
BRLE: Narrow-flowered California brodiaea
ERGR: Greene's narrow-leaved fleabane
HEBI: Two carpellate western flax
LASE: Colusa layia
STHE: Green jewelflower
STMO: Morrison's jewelflower

N

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 1 Rare Plants.mxd

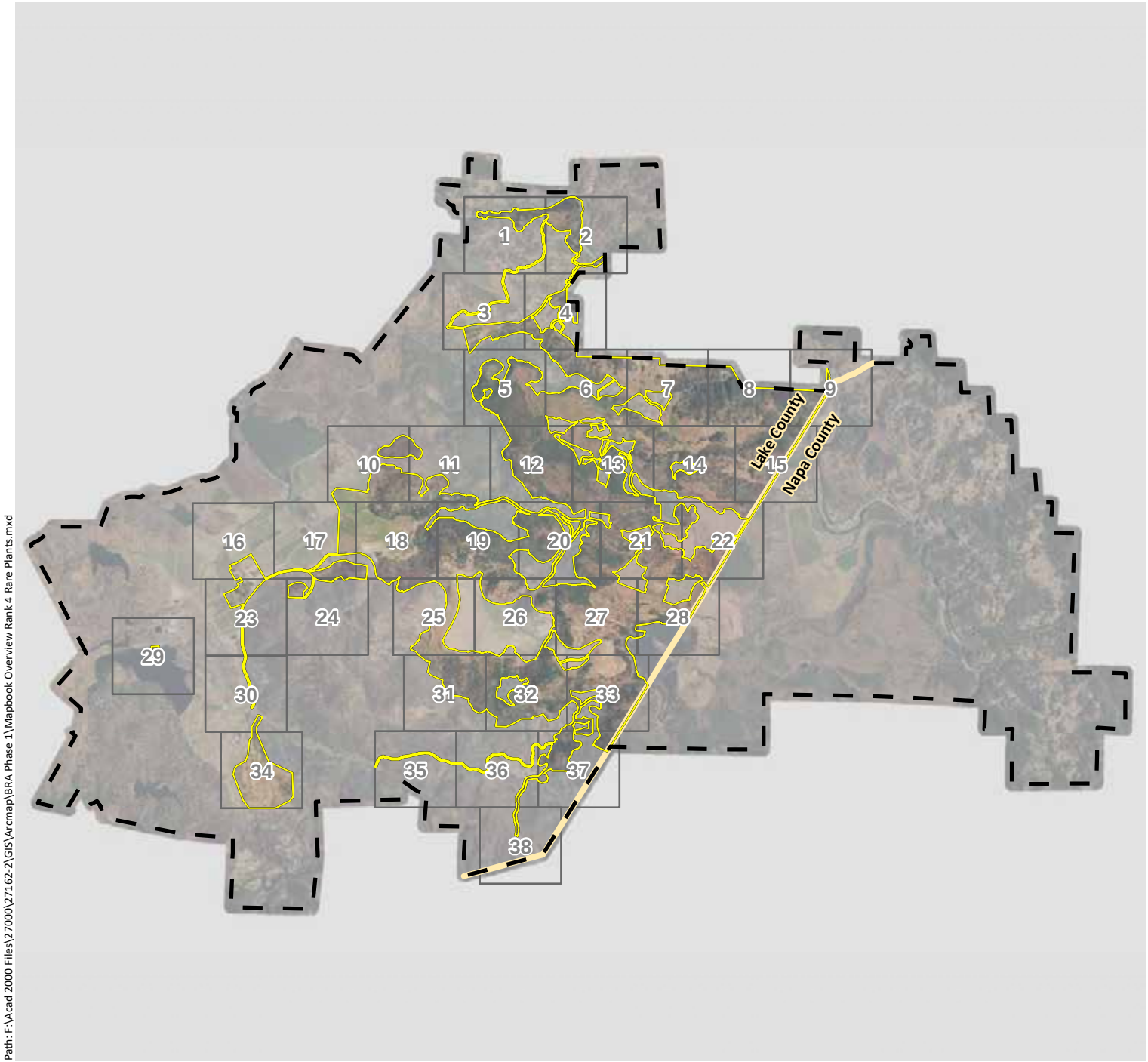
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

APPENDIX E2

CNPS RANK 4 SPECIAL-STATUS PLANT SPECIES OBSERVED WITHIN THE PHASE 1 STUDY AREA

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Overview)

Maha Resort and Guenoc Valley Development, Phase 1



Property Boundary
Phase 1 Study Area
Mapbook Grid
County Boundary

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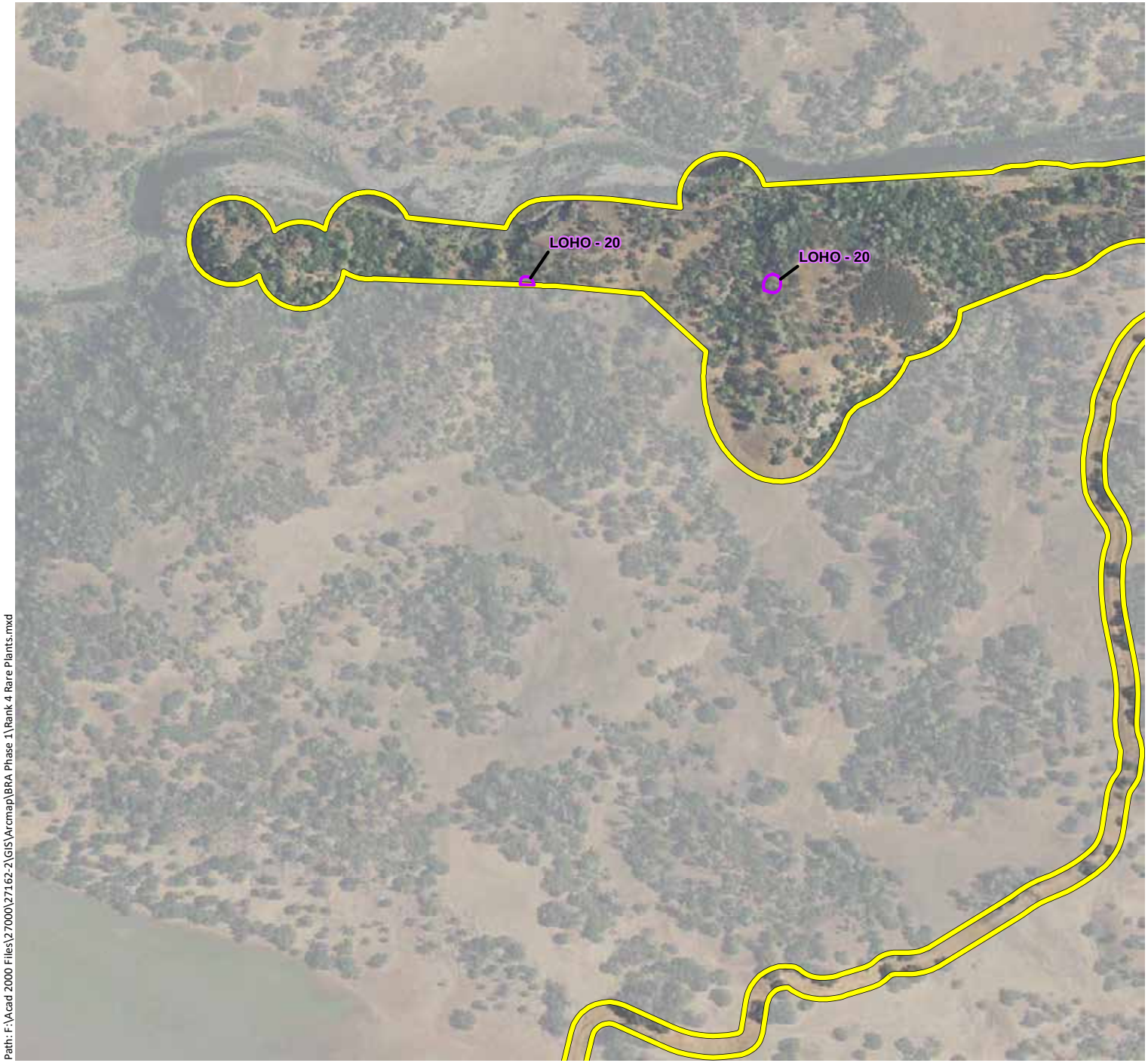
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Mapbook Overview Rank 4 Rare Plants.mxd

Sources: Hexagon 2016 Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 1)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

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Feet

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 2)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

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Feet

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 3)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

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Feet

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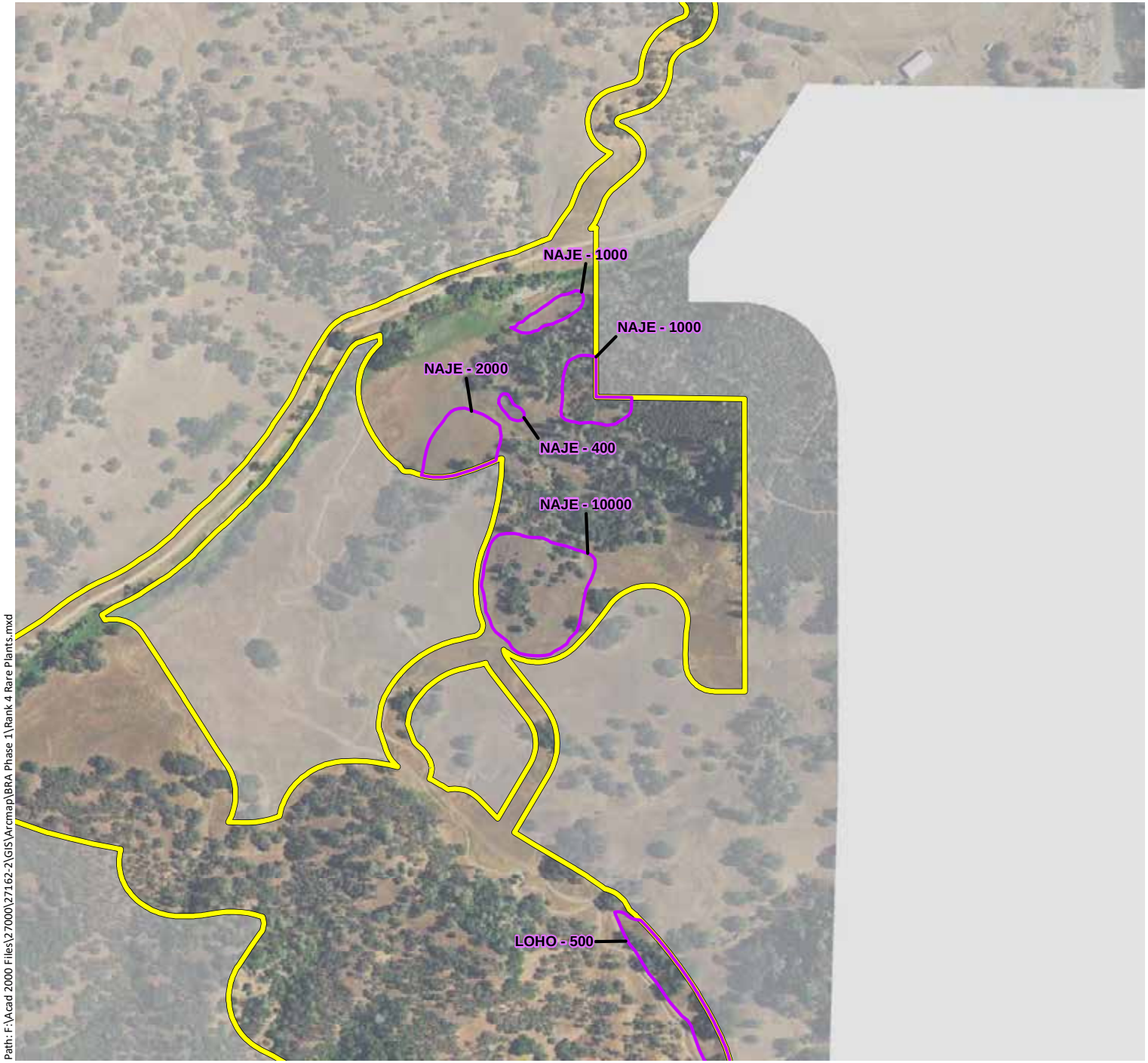
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 4)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

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Feet

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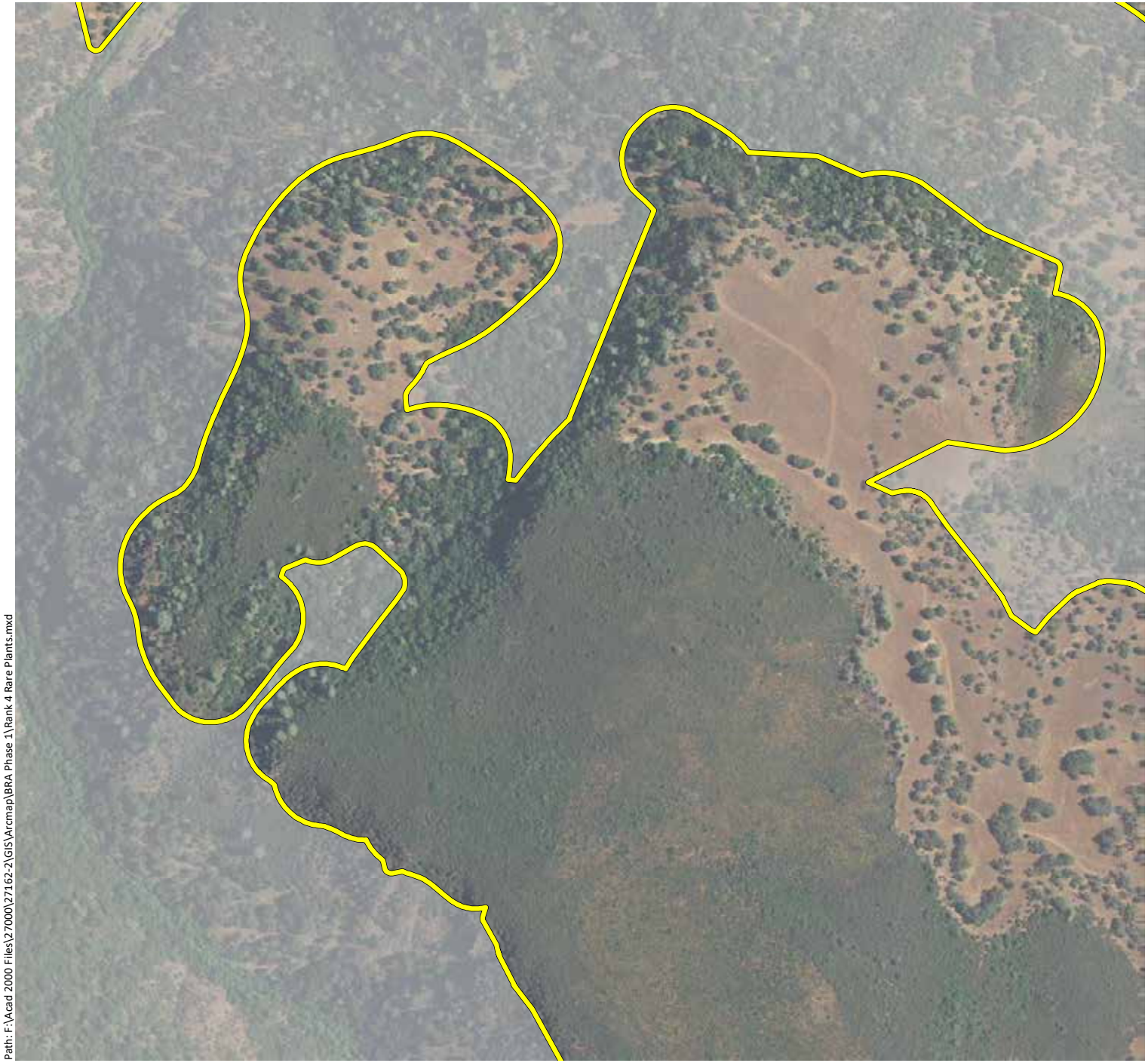
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019



Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 5)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

0 500 1,000

Feet

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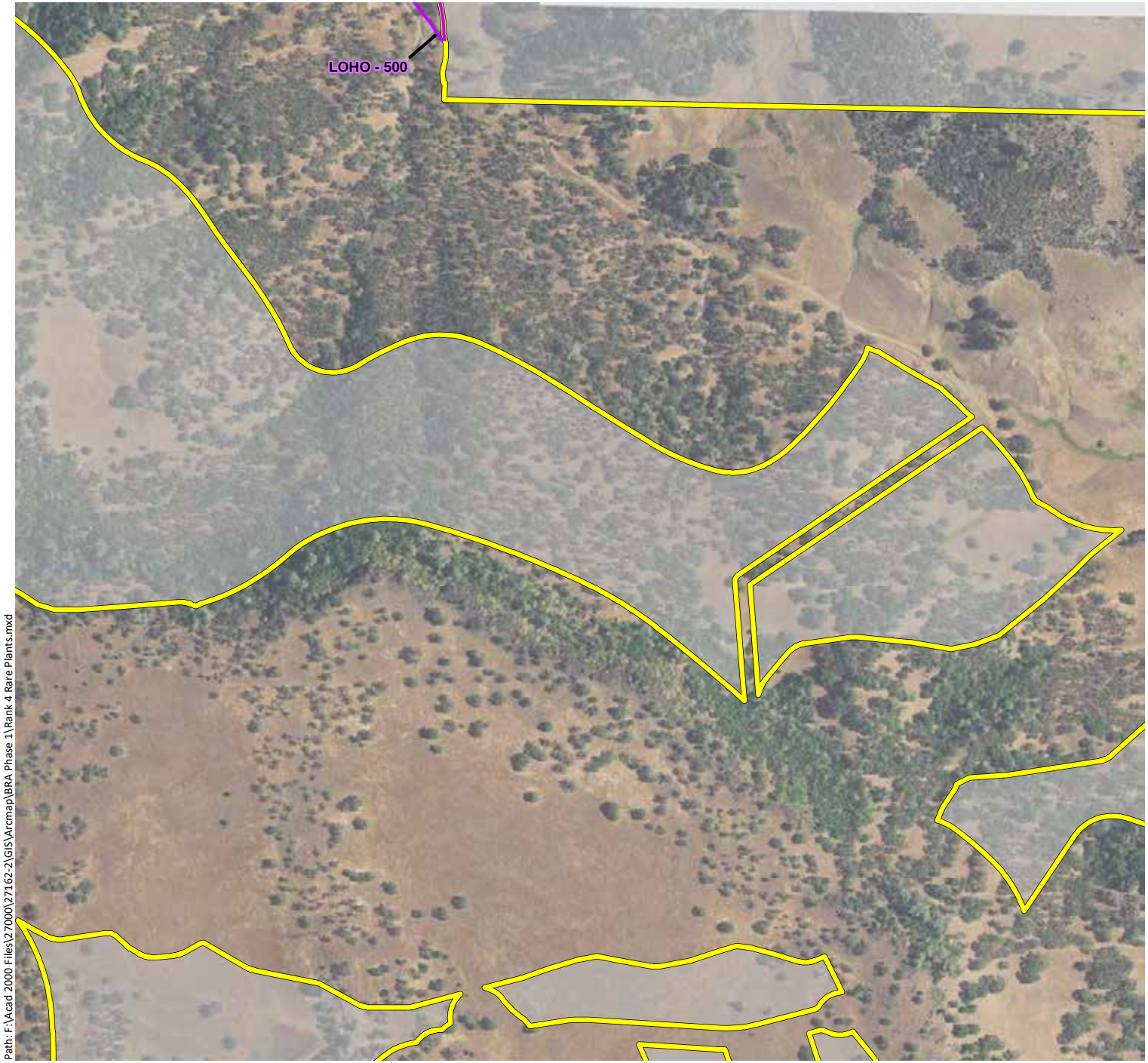
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019



Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 6)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

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Feet

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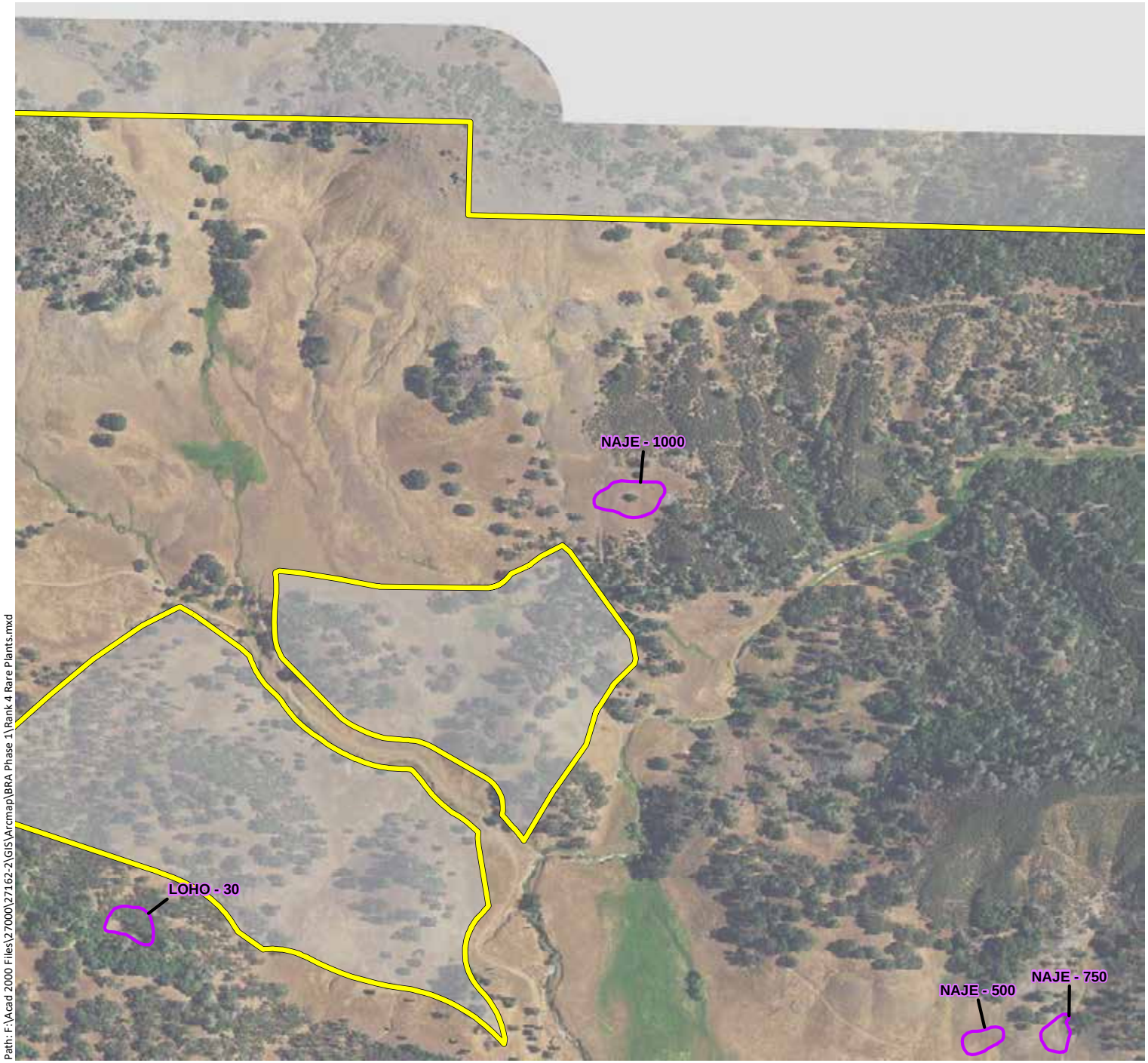
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 7)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

0 500 1,000

Feet

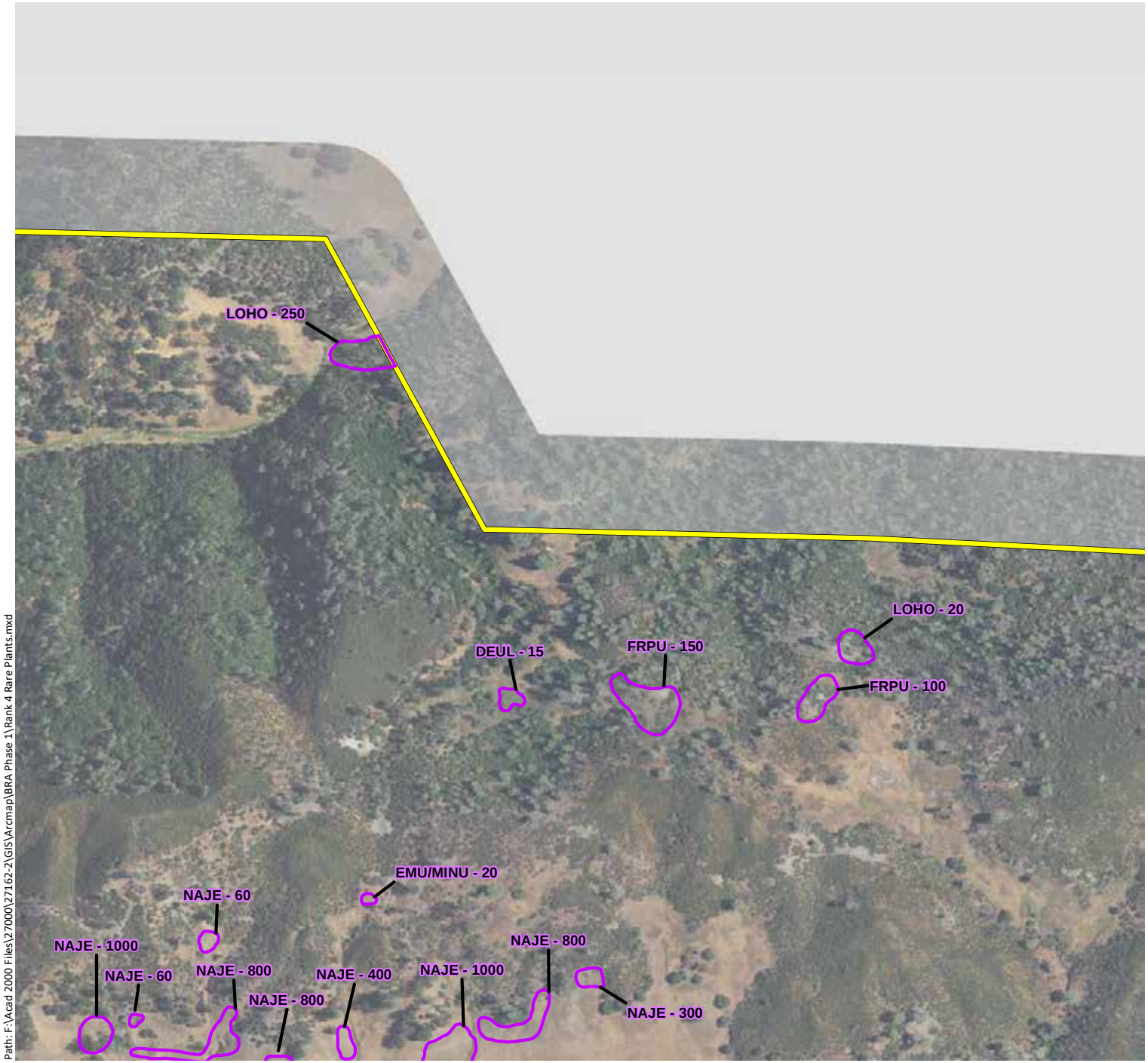
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 8)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

0 500 1,000

Feet

wra

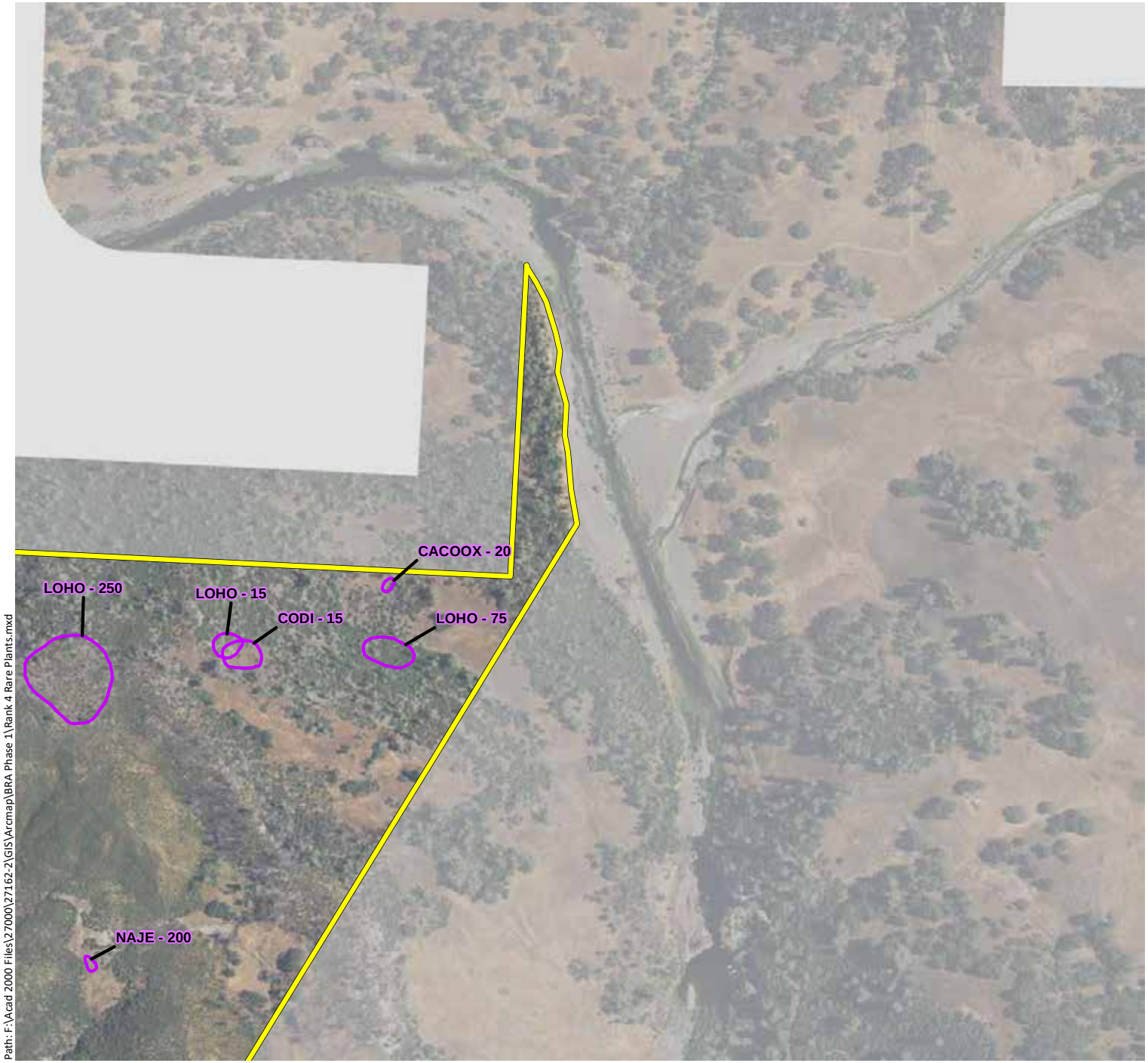
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 9)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

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Feet

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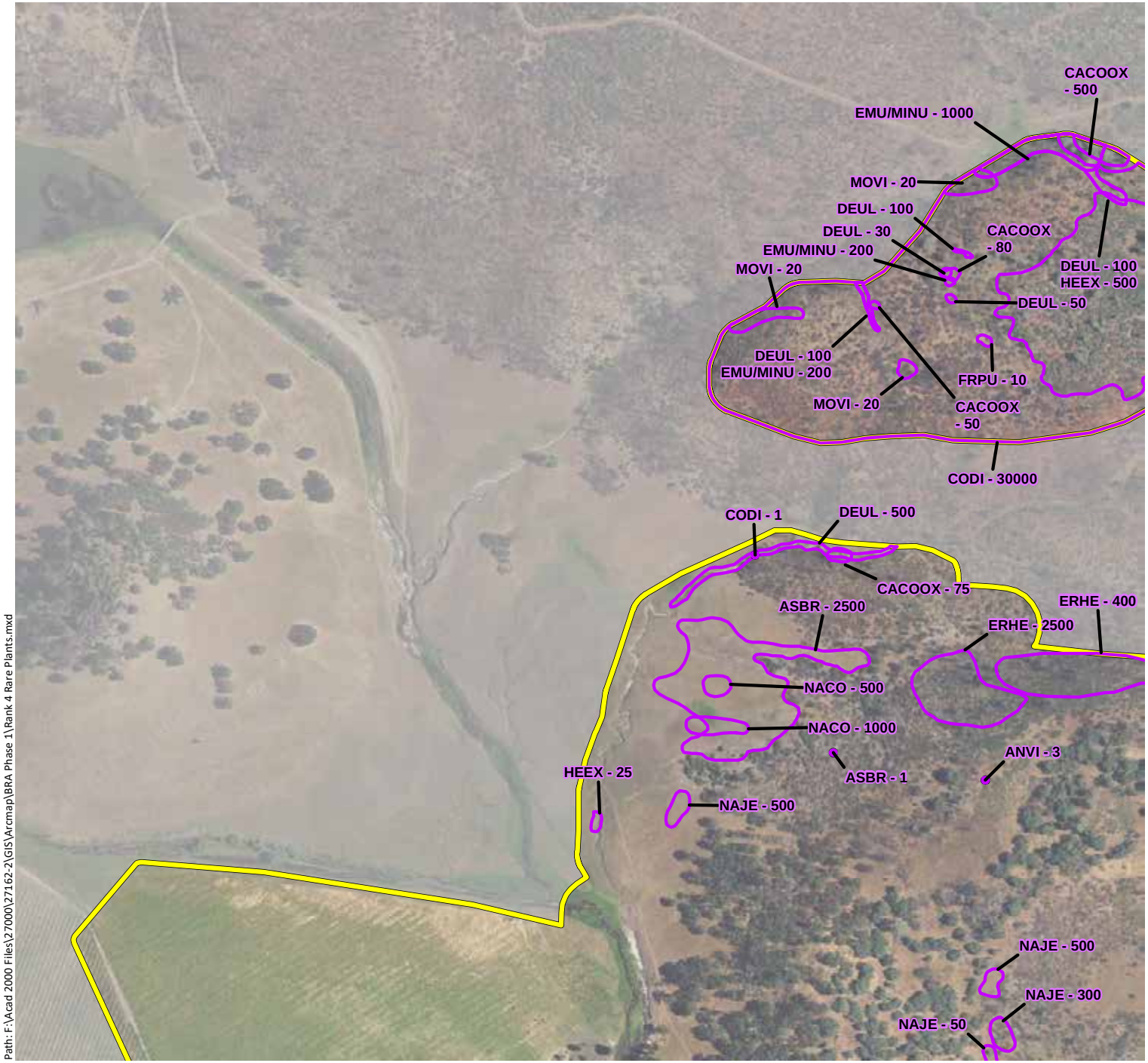
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 10)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

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Feet

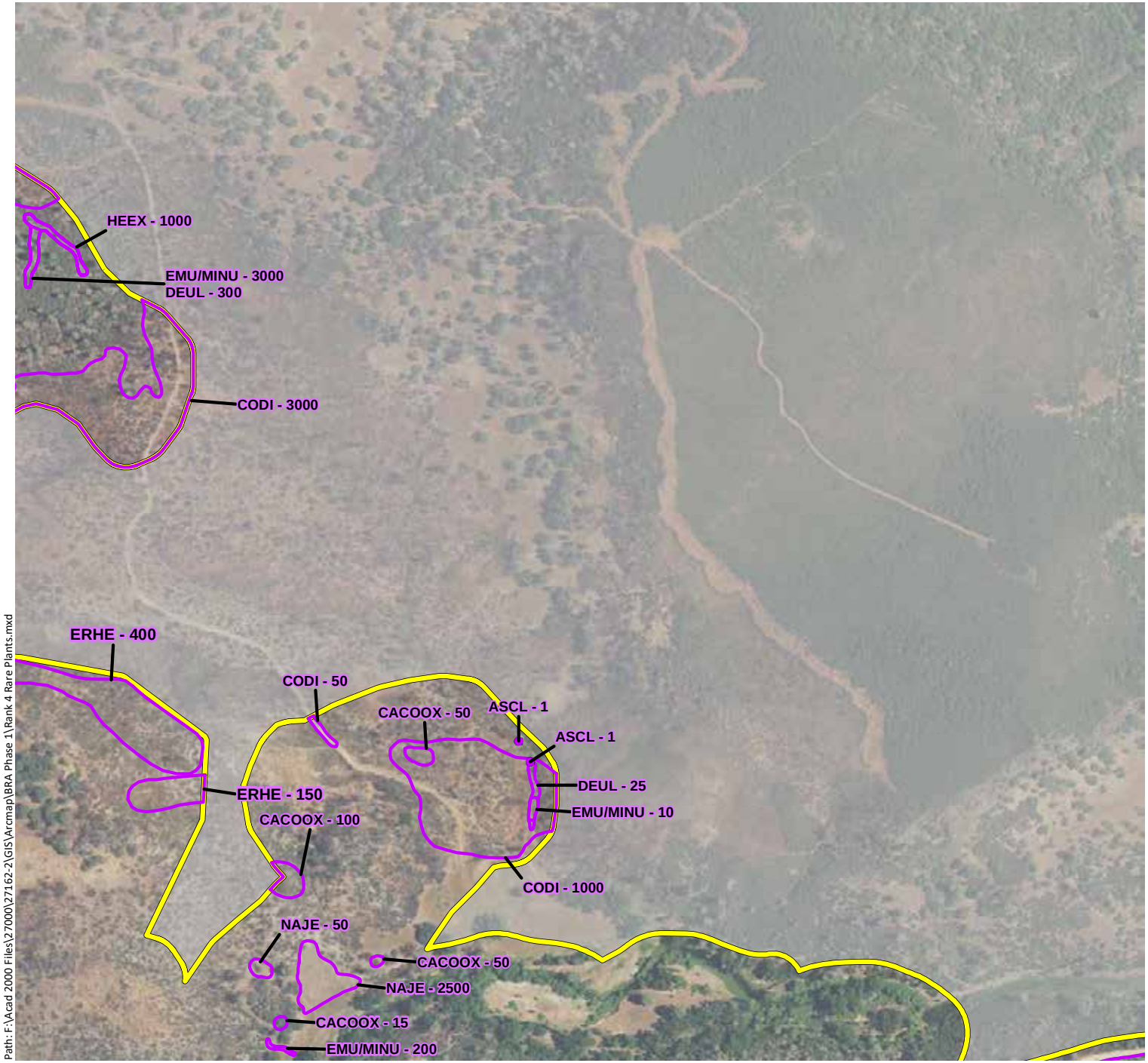
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 11)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 12)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

0 500 1,000

Feet

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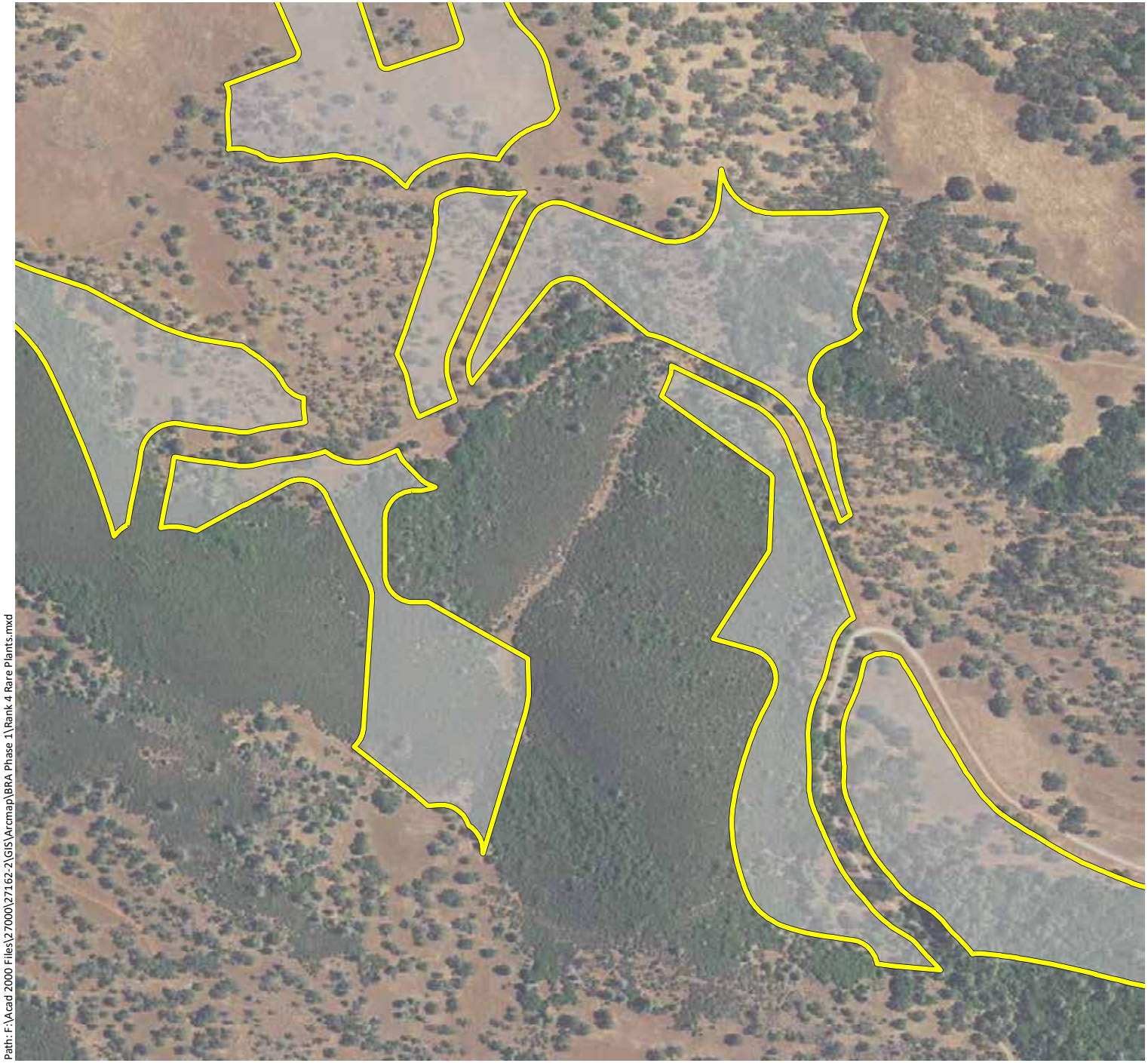
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019



Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 13)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

0 500 1,000

Feet

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ENVIRONMENTAL CONSULTANTS

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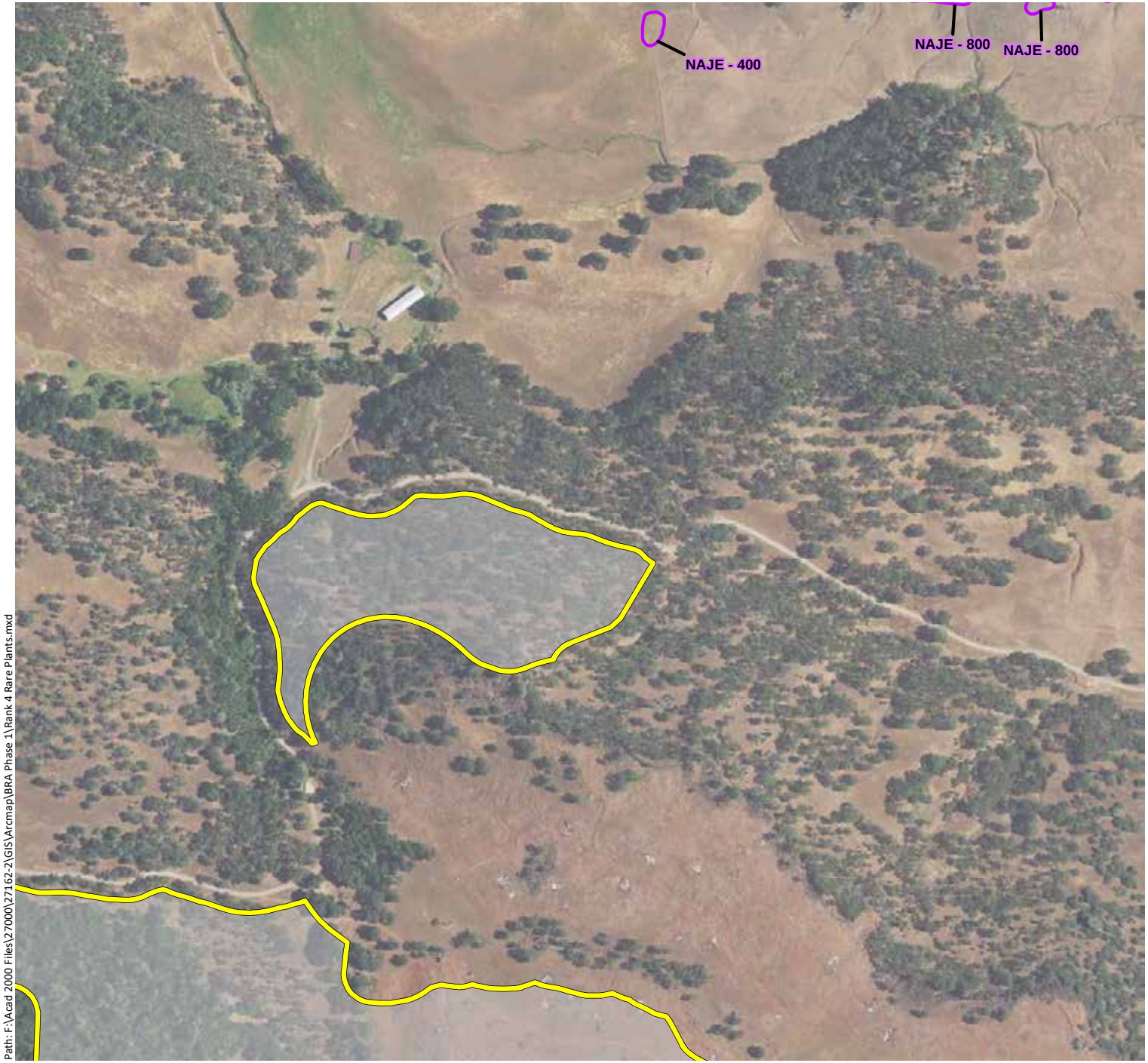
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019



Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 14)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

0 500 1,000

Feet

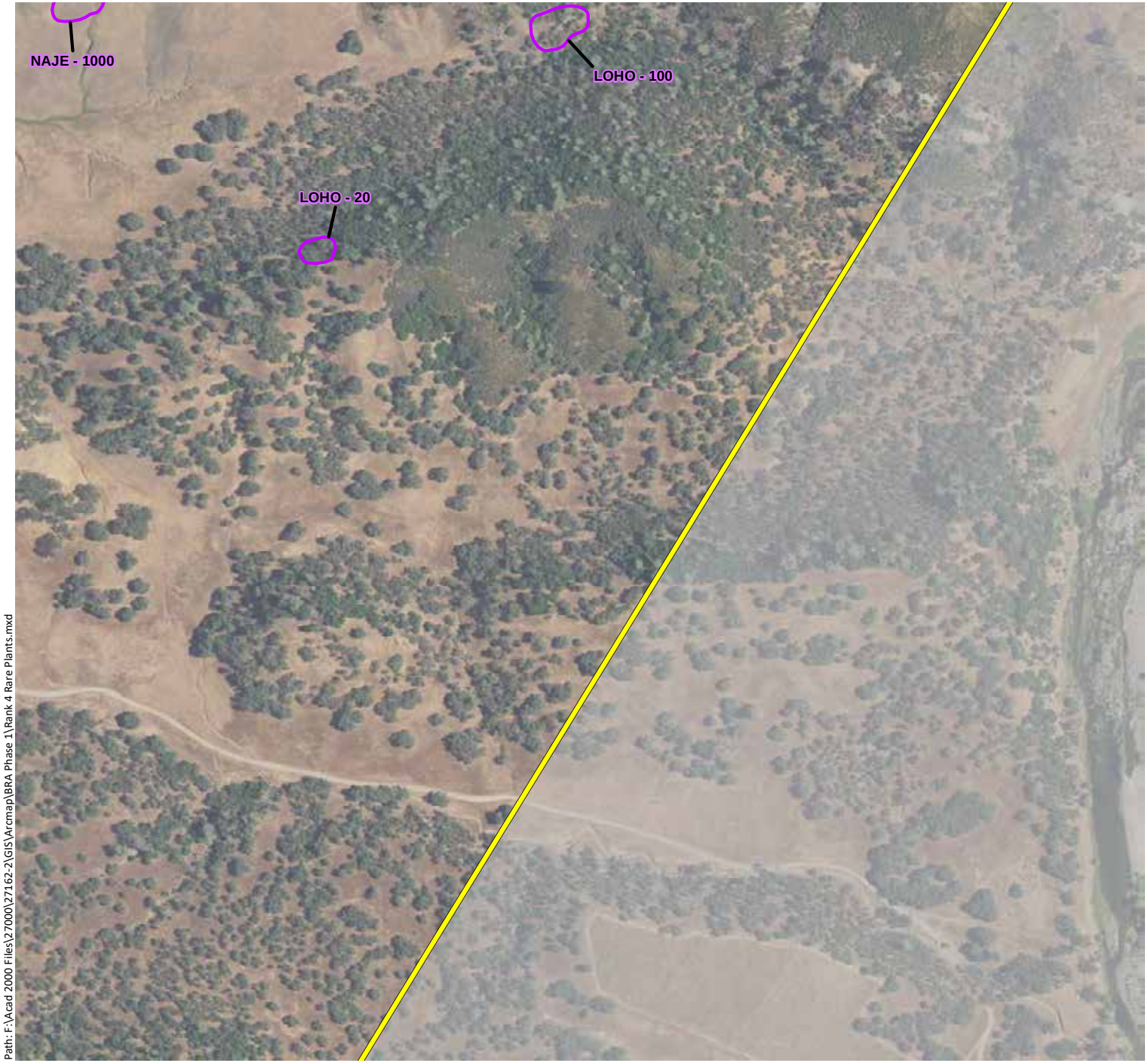
wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 15)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 16)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

0 500 1,000

Feet

wra

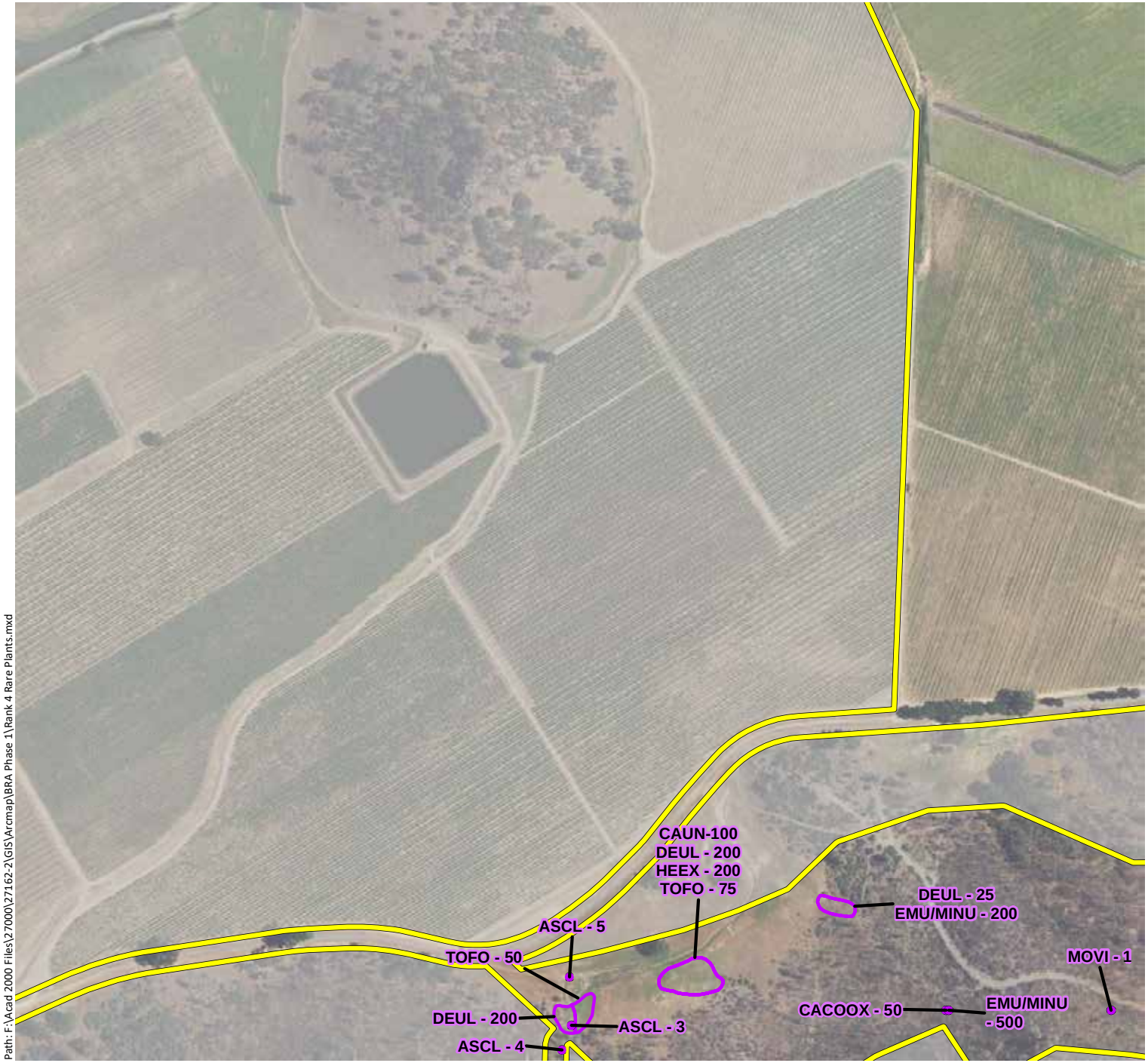
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 17)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

0 500 1,000

Feet

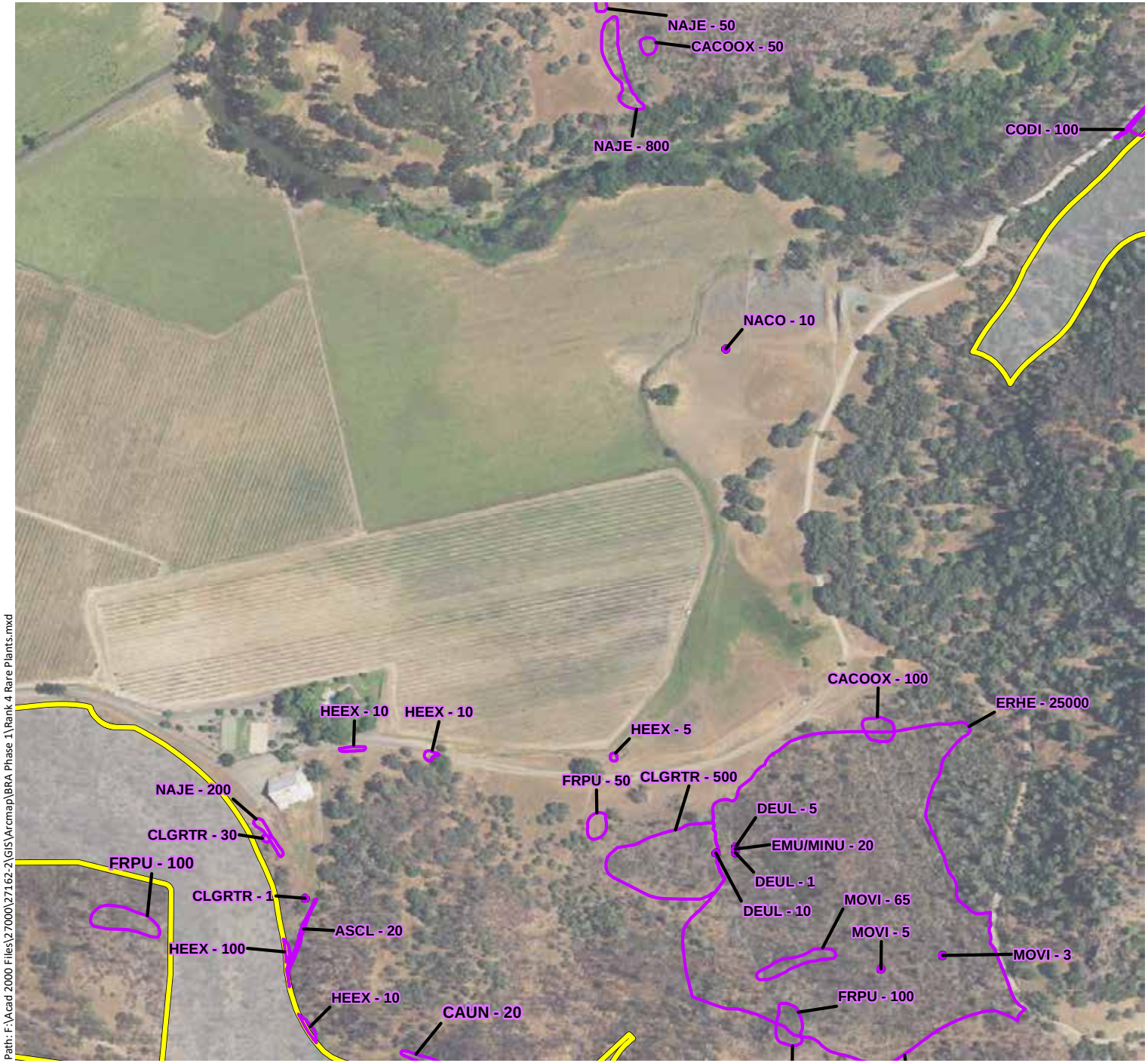
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 18)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

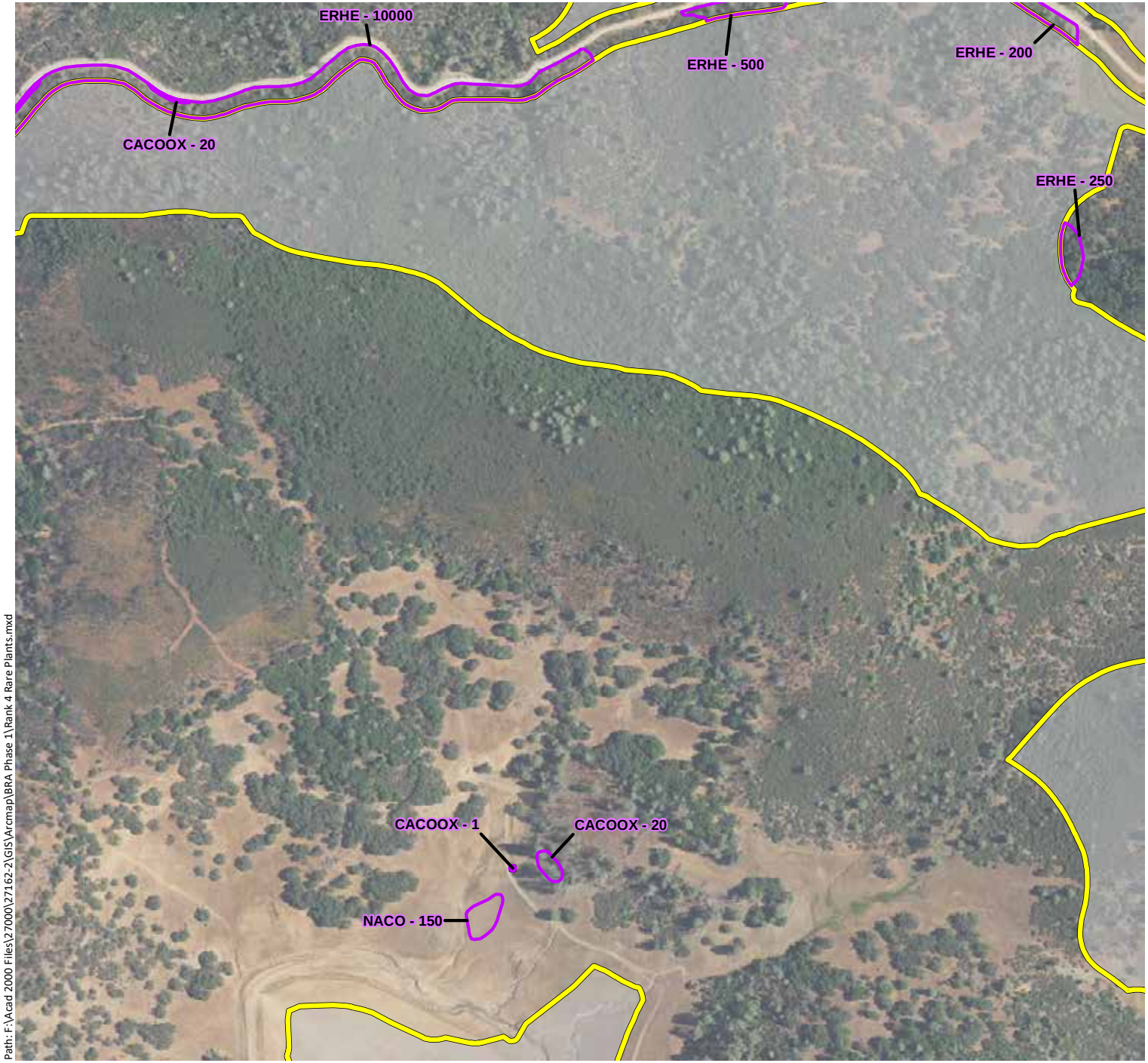
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019



Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 19)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

0 500 1,000

Feet

wra

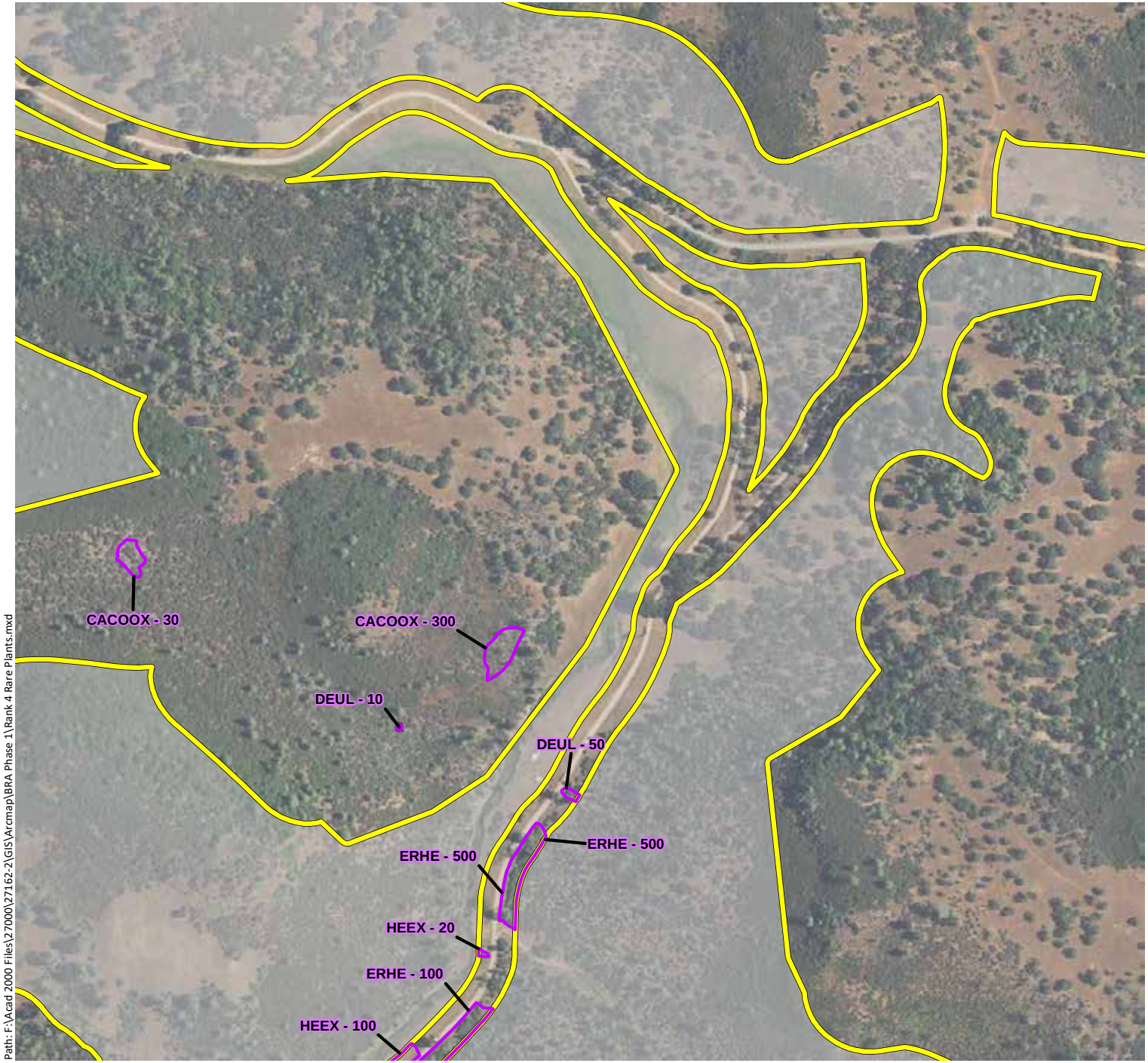
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 20)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 21)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

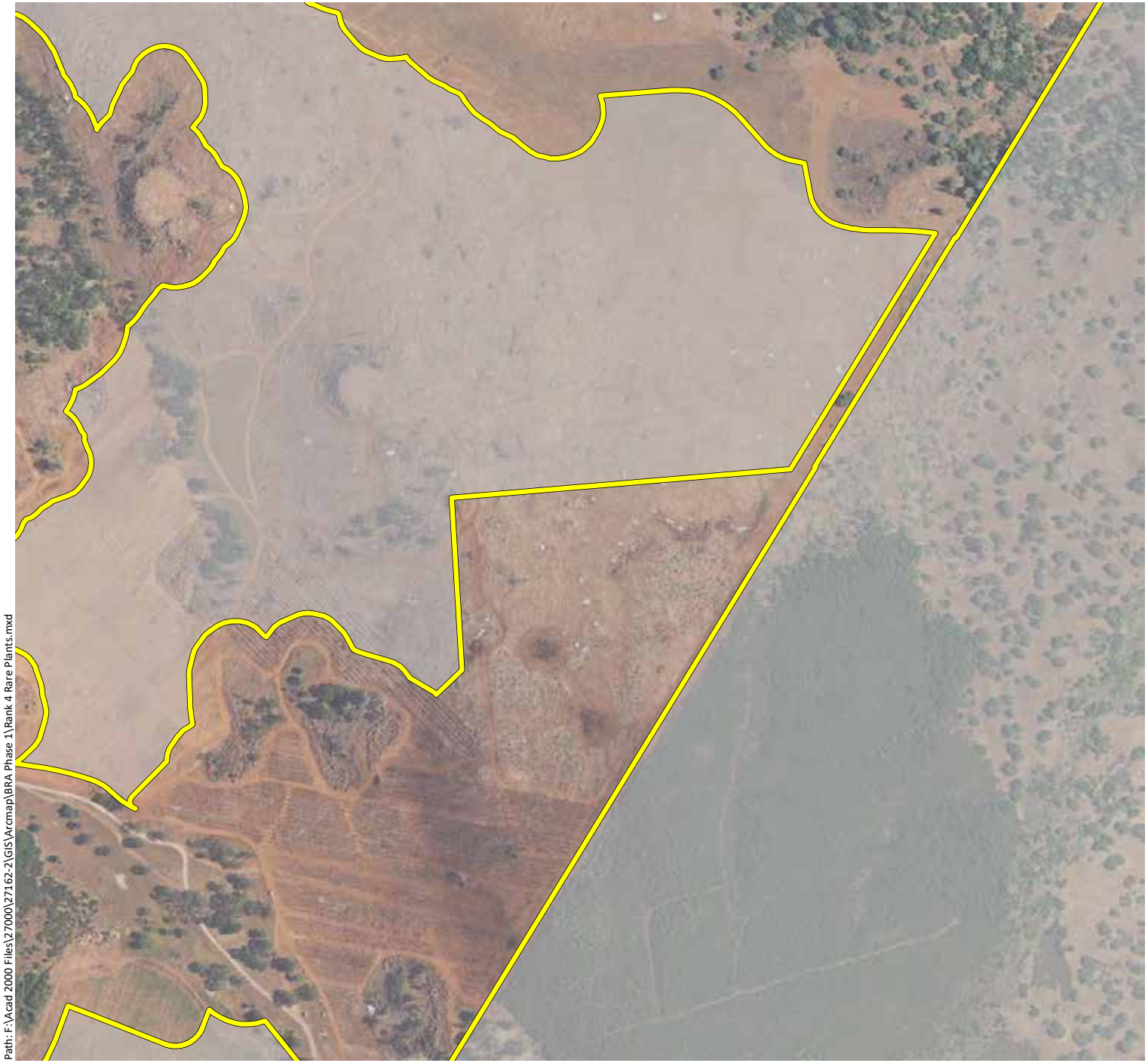
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019



Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 22)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

0 500 1,000

Feet

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ENVIRONMENTAL CONSULTANTS

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 23)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

0 500 1,000

Feet

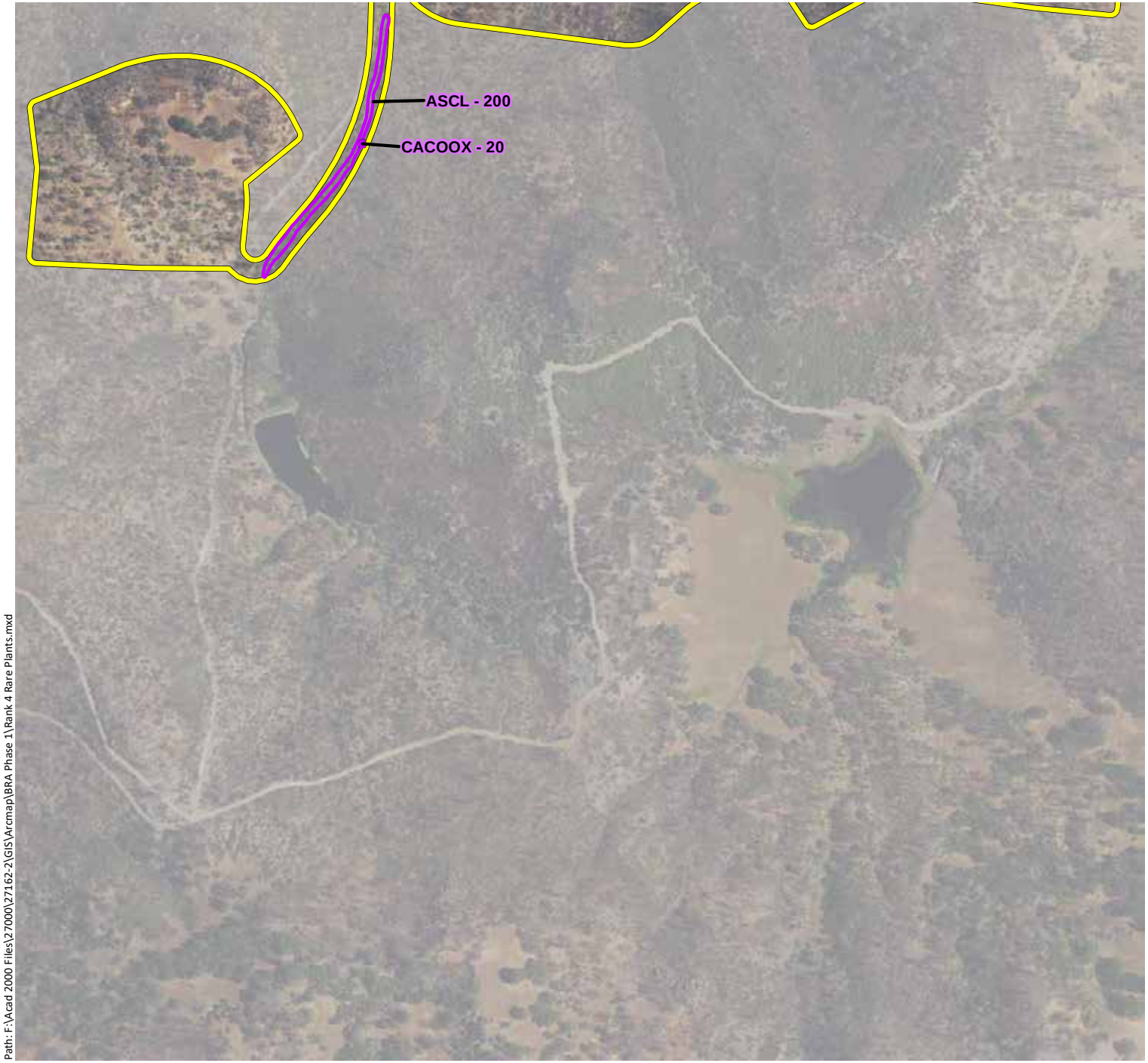
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 24)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

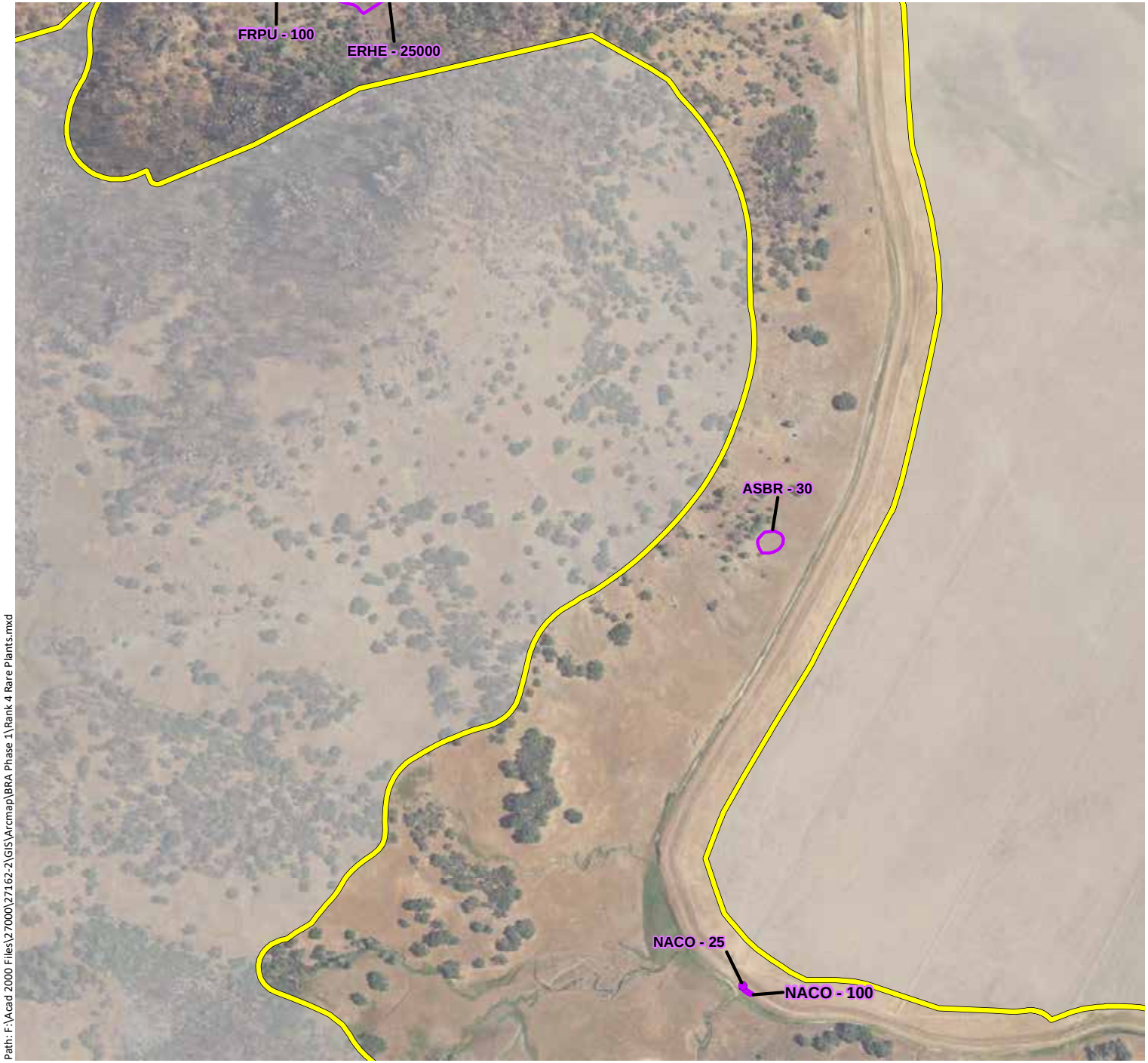
0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019



Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 25)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

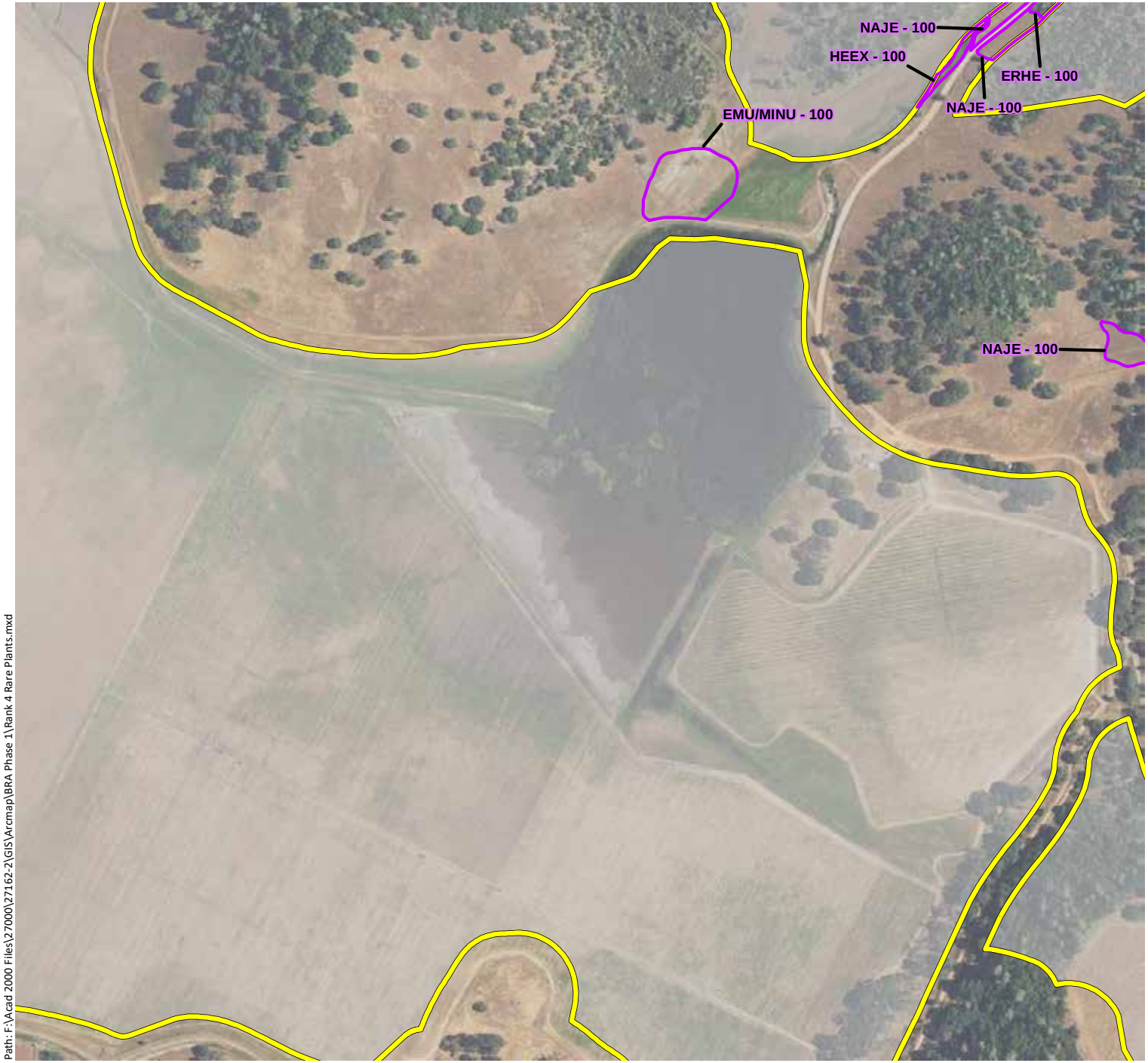
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019



Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 26)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 27)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

0 500 1,000

Feet

wra

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 28)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 29)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

0 500 1,000

Feet

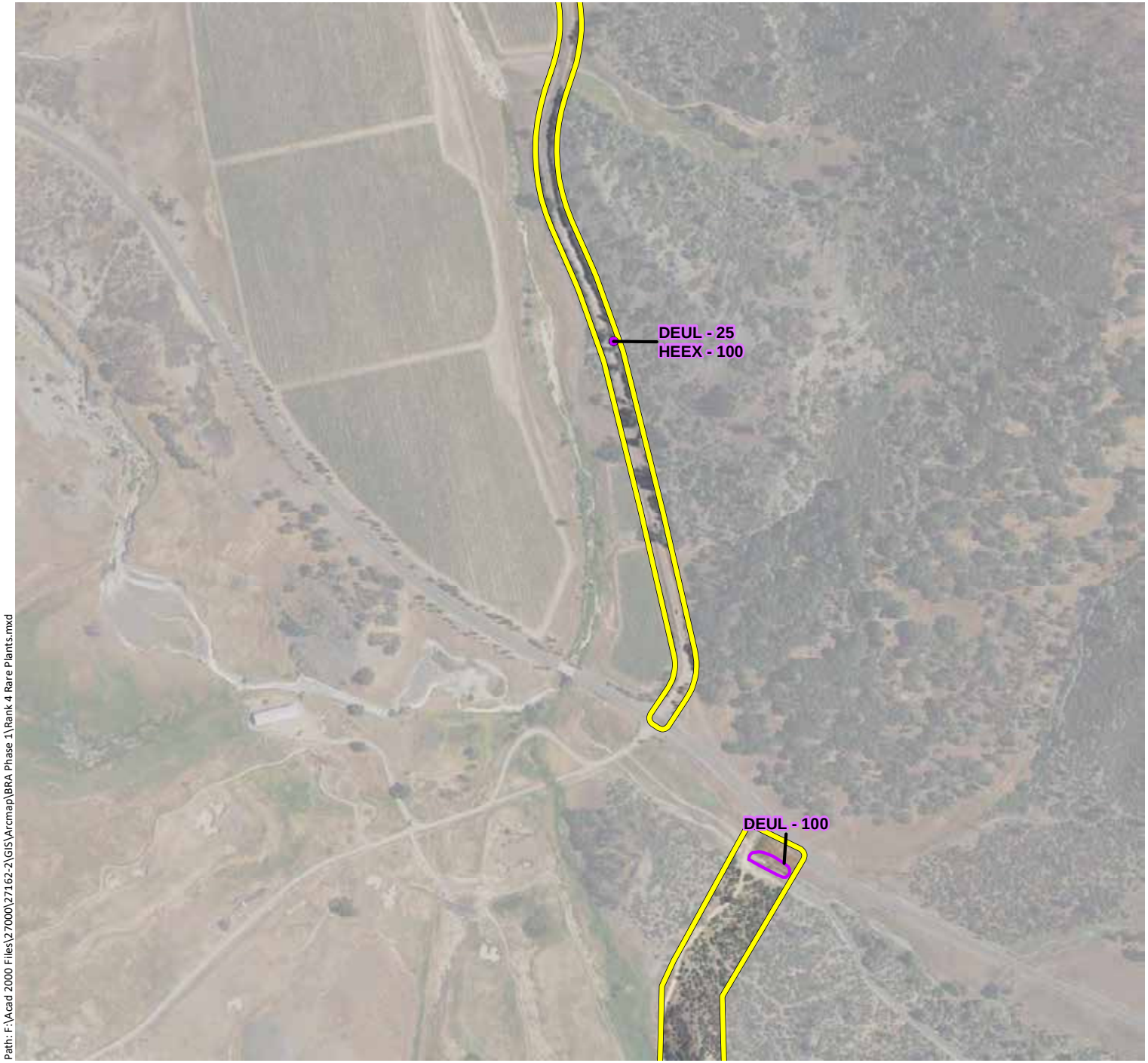
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 30)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

LOHO: Hoover's lomatium

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

0 500 1,000

Feet

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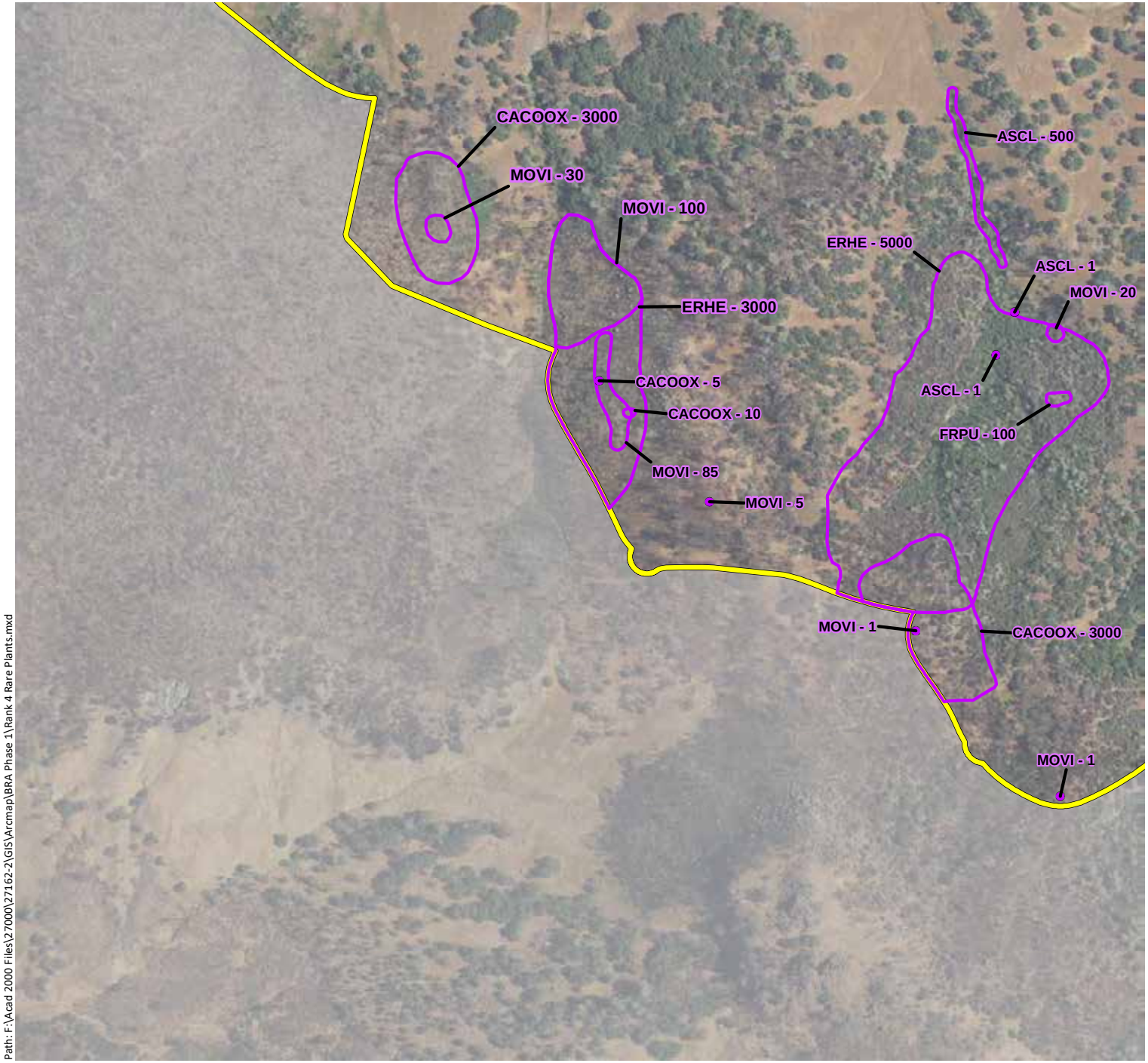
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 31)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

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TOFO: Marsh zigadenus

N

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Feet

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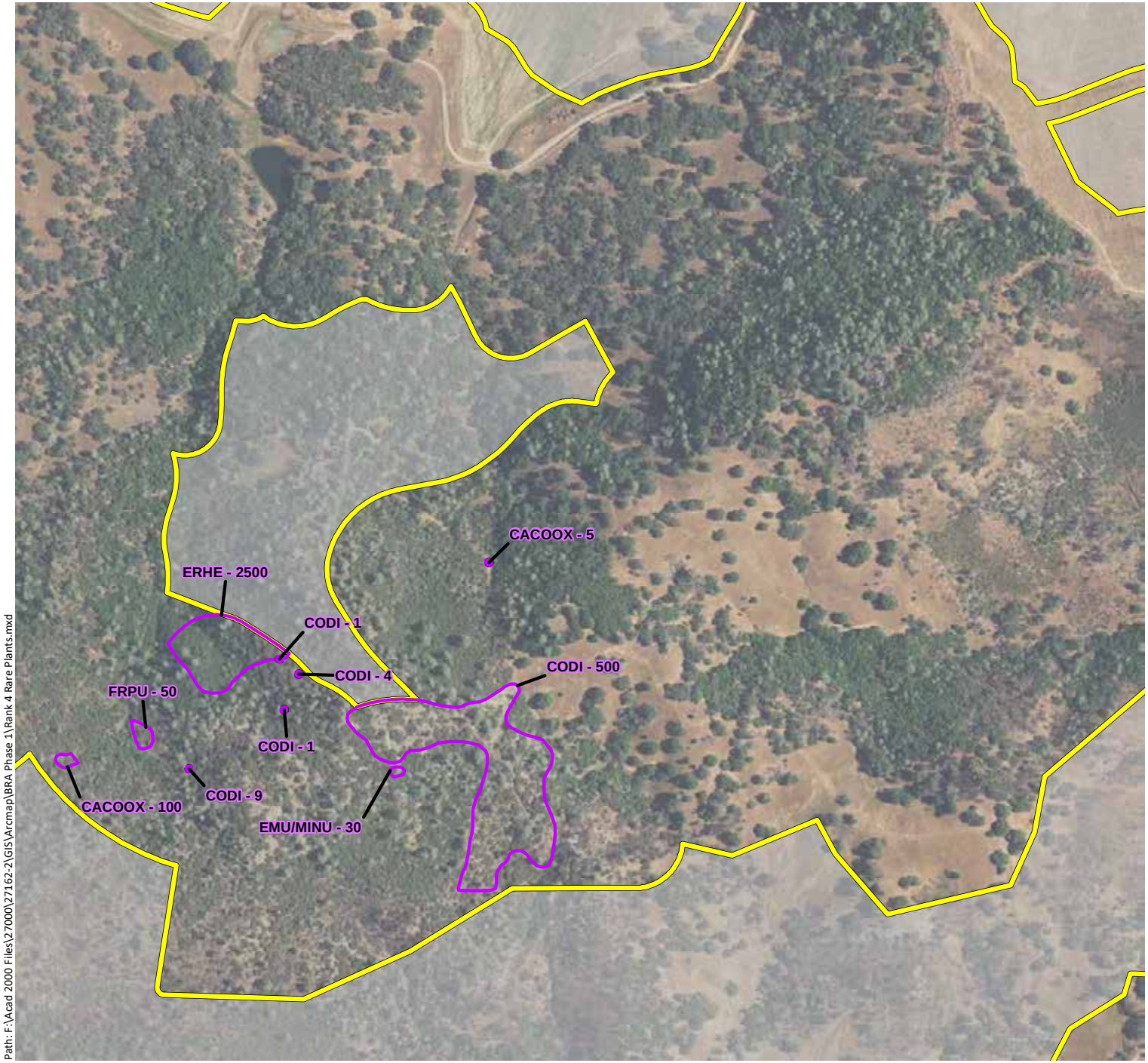
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 32)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

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SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

0 500 1,000

Feet

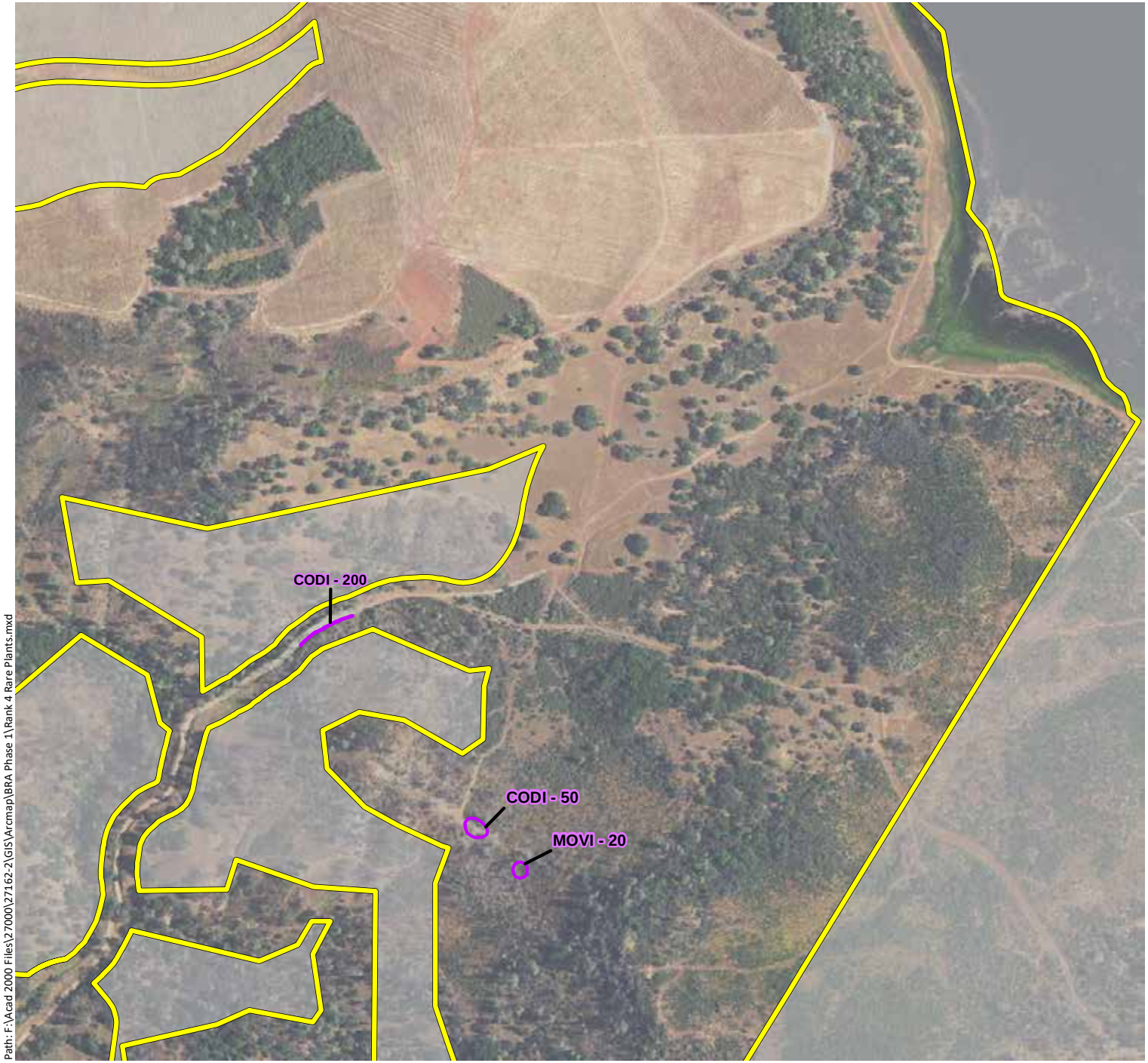
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 33)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

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TOFO: Marsh zigadenus

N

0 500 1,000

Feet

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 34)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASBR: Brewer's milk-vetch

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

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TOFO: Marsh zigadenus

N

0 500 1,000

Feet

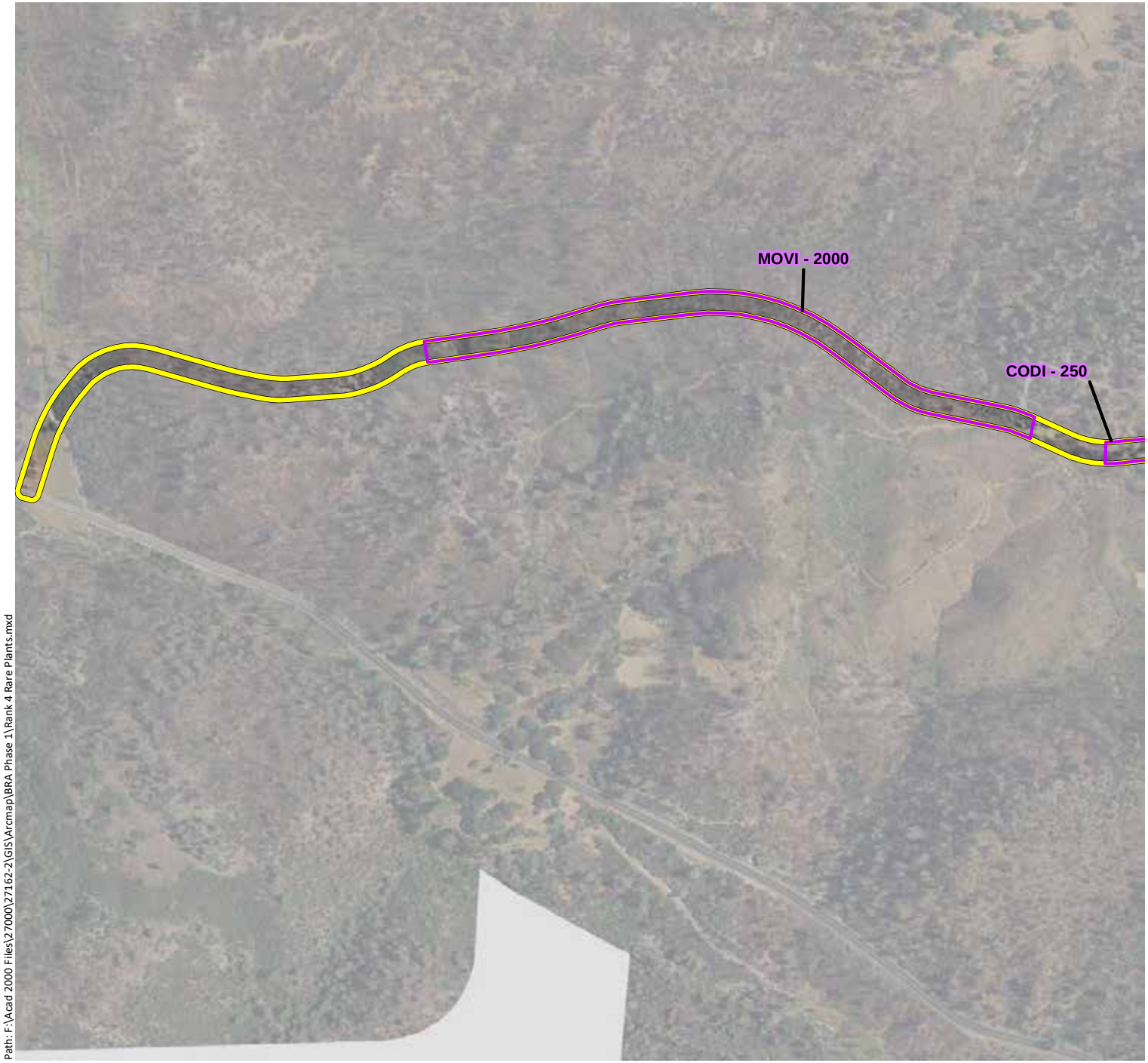
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 35)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

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SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

N

0 500 1,000

Feet

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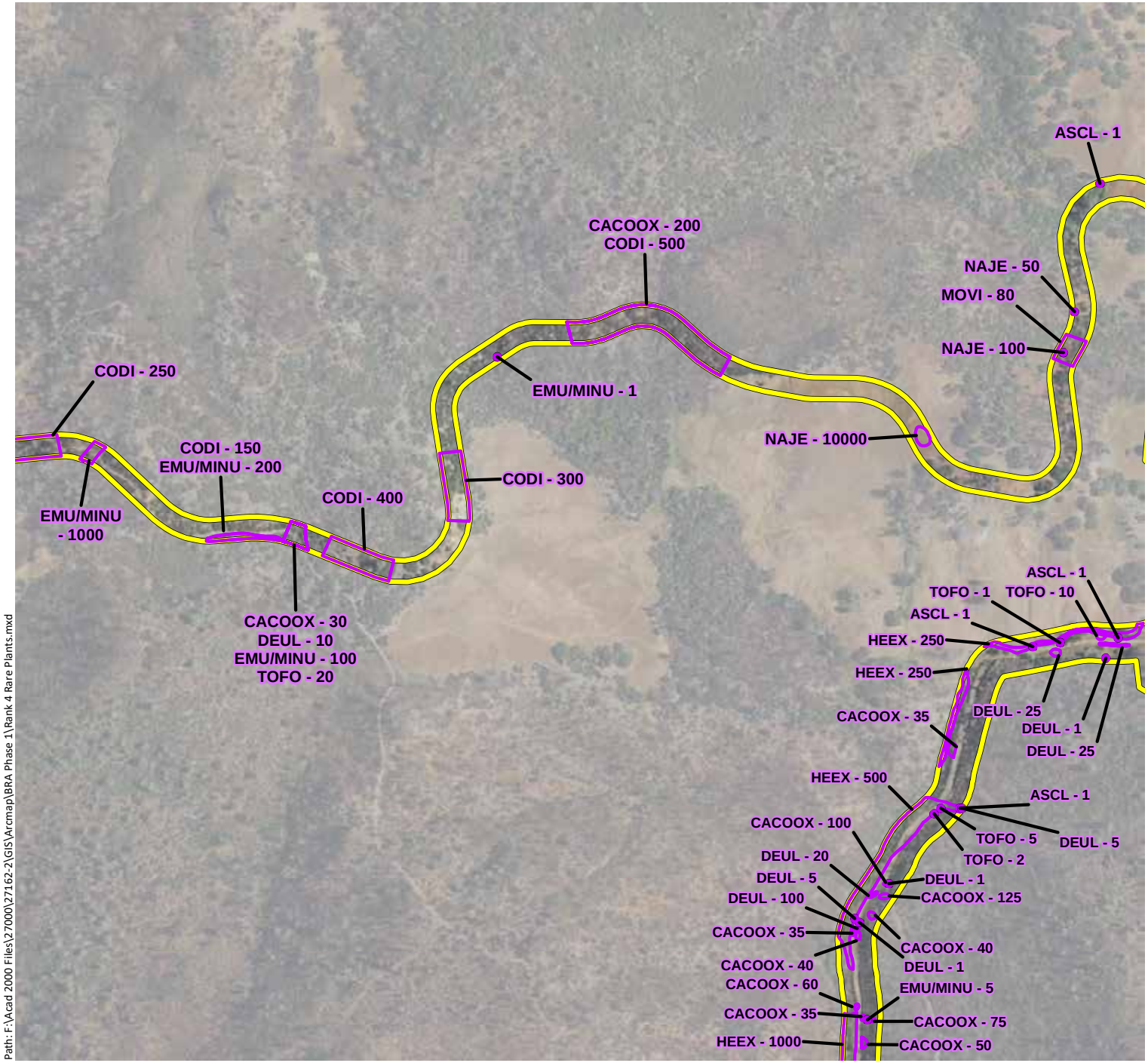
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 36)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

Key to Species Codes

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TOFO: Marsh zigadenus

N

0 500 1,000

Feet

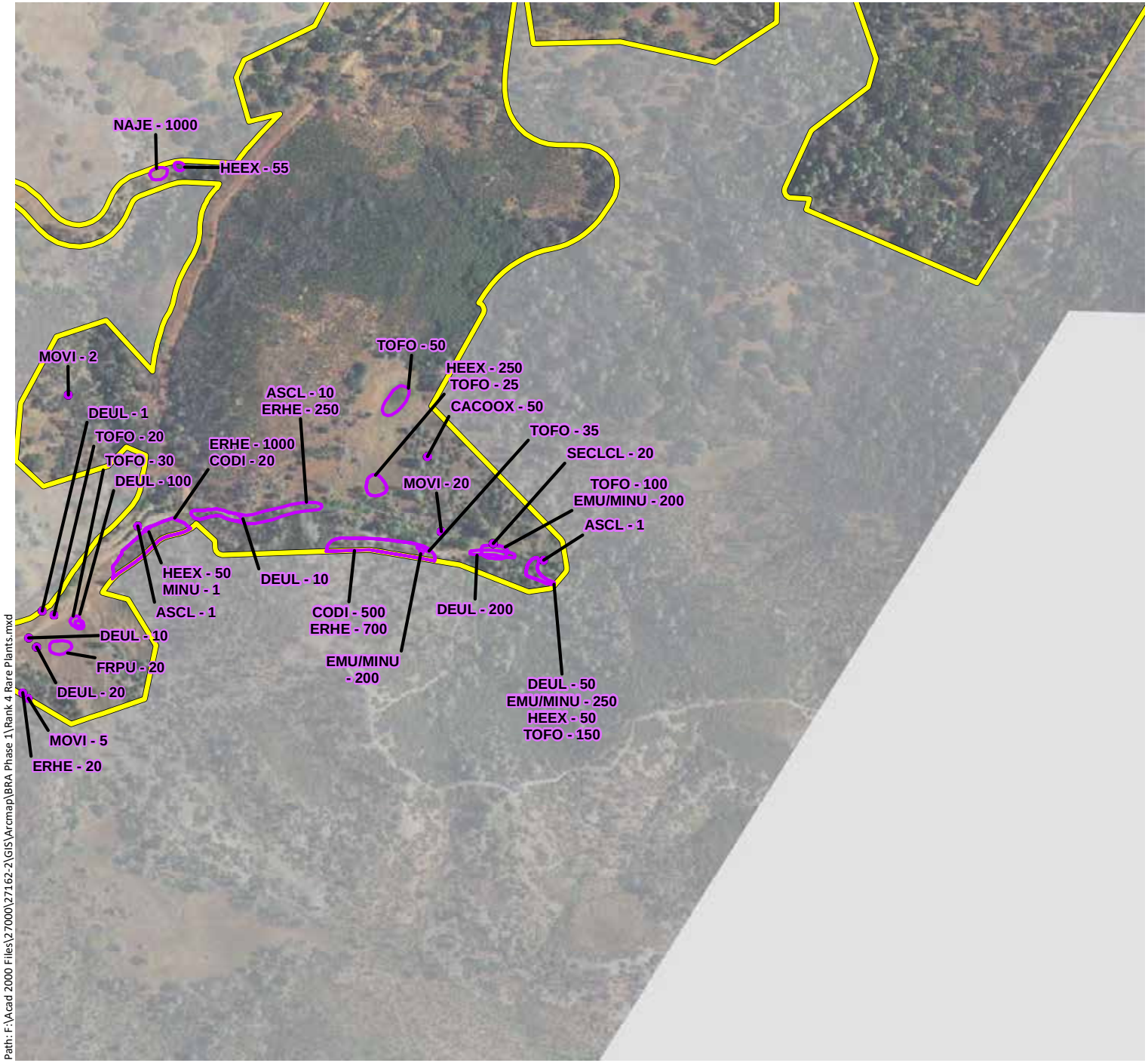
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 37)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

CNPS Rank 4 Plants

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N

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Feet

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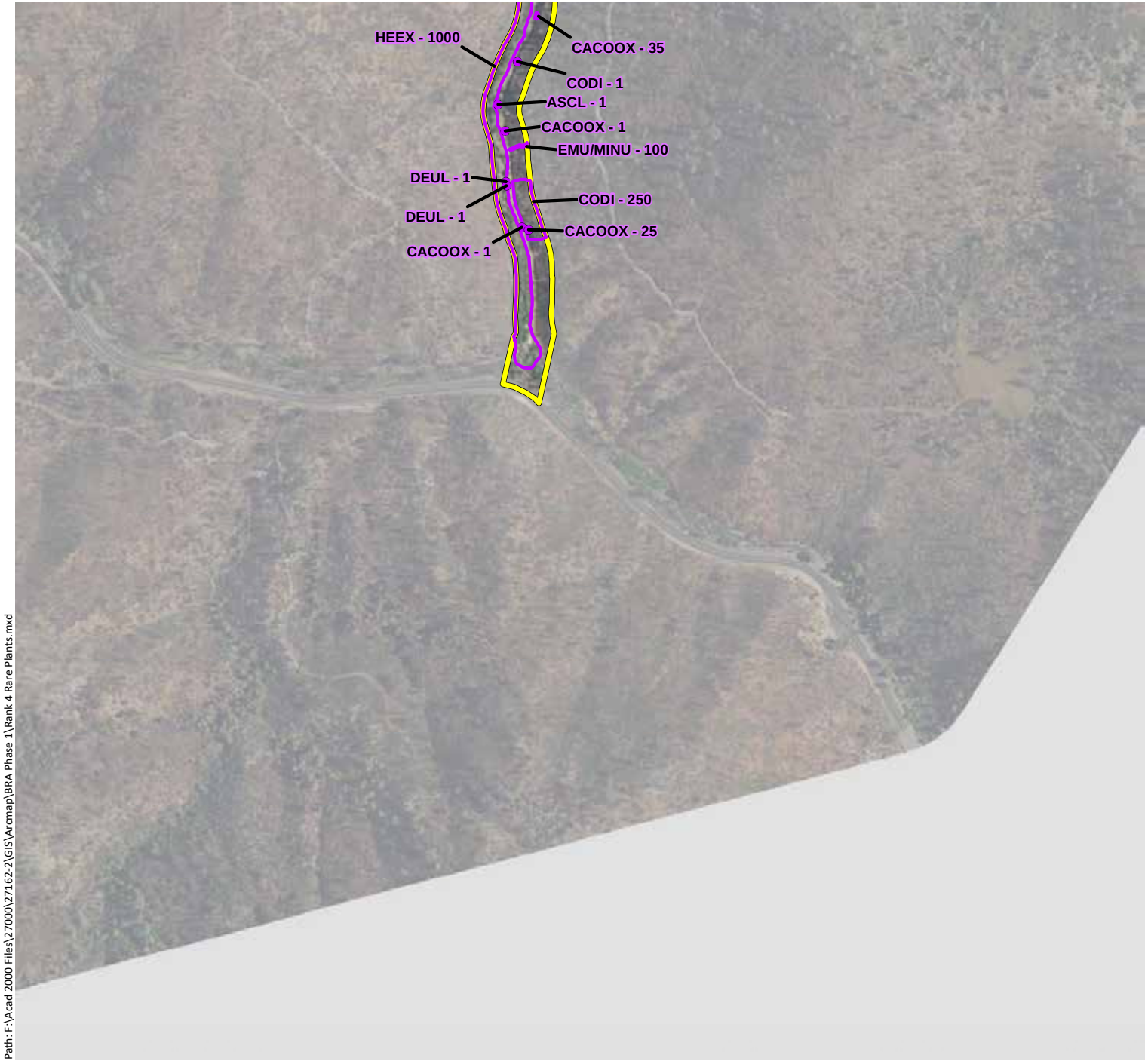
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 1 Study Area (Mapbook Sheet 38)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 4,977 ac.

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N

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Feet

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase 1\Rank 4 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/27/2019

APPENDIX F

LIST OF WILDLIFE SPECIES OBSERVED WITHIN GUENOC RANCH

Appendix F. List of Wildlife Species Observed within Guenoc Ranch

Surveys were conducted by WRA wildlife biologists between 2017 and 2019.

Scientific Name	Common Name	Conservation Status[1]
Mammals		
Antrozous pallidus	Pallid bat	SSC WBWG High
Canis latrans	Coyote	-
Dipodomys californicus	California kangaroo rat	-
Eptesicus fuscus	Big brown bat	-
Geomyidae sp.	Gopher sp.	-
Lasionycteris noctivagans	Silver-haired bat	WBWG Medium
Lepus californicus	Black-tailed jackrabbit	-
Lynx rufus	Bobcat	-
Mephitis mephitis	Skunk	-
Myotis californicus	California myotis	-
Myotis yumanensis	Yuma myotis	-
Odocoileus hemionus californicus	California mule deer	-
Otospermophilus beecheyi	California ground squirrel	-
Parastrellus hesperus	Canyon bat	-
Procyon lotor	Raccoon	-
Sciurus griseus	Western gray squirrel	-
Sciurus niger	Eastern fox squirrel	-
Sus scrofa	Feral pig	-
Tadarida brasiliensis	Mexican free-tailed bat	-
Birds		
Accipiter cooperii	Cooper's hawk	-

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Scientific Name	Common Name	Conservation Status[1]
Aechmophorus clarkii	Clark's grebe	-
Aechmophorus occidentalis	Western grebe	-
Agelaius phoeniceus	Red-winged blackbird	-
Aimophila ruficeps	Rufous-crowned sparrow	-
Aix sponsa	Wood duck	-
Anas platyrhynchos	Mallard	-
Anas strepera	Gadwall	-
Aphelocoma californica	California scrub-jay	-
Apodidae sp.	Swift sp.	-
Aquila chrysaetos	Golden eagle	CFP, BCC
Ardea herodias	Great blue heron	-
Baeolophus inornatus	Oak titmouse	BCC
Branta canadensis	Canada goose	-
Bubo virginianus	Great horned owl	-
Buteo jamaicensis	Red-tailed hawk	-
Buteo lineatus	Red-shouldered hawk	-
Butorides virescens	Green heron	-
Callipepla californica	California quail	-
Calypte anna	Anna's hummingbird	-
Cathartes aura	Turkey vulture	-
Charadrius vociferus	Killdeer	-
Chondestes grammacus	Lark sparrow	-
Circus cyaneus	Northern harrier	SSC
Cistothorus palustris	Marsh wren	-
Colaptes auratus	Northern flicker	-

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Scientific Name	Common Name	Conservation Status[1]
Columba livia	Rock pigeon	-
Corvus brachyrhynchos	American crow	-
Corvus corax	Common raven	-
Elanus leucurus	White-tailed kite	CFP
Eremophila alpestris	Horned lark	-
Euphagus cyanocephalus	Brewer's blackbird	-
Falco peregrinus	Peregrine falcon	CFP, BCC
Falco sparverius	American kestrel	-
Falco spp.	Falcon	-
Geothlypis trichas	Common yellowthroat	-
Haemorhous mexicanus	House finch	-
Haliaeetus leucocephalus	Bald eagle	SE, CFP, BCC
Hirundo rustica	Barn swallow	-
Junco hyemalis	Dark-eyed junco	-
Megaceryle alcyon	Belted kingfisher	-
Megascops kennicottii	Western screech owl	-
Melanerpes formicivorus	Acorn woodpecker	-
Meleagris gallopavo	Wild turkey	-
Melospiza melodia	Song sparrow	-
Melozone crissalis	California towhee	-
Mimus polyglottos	Northern mockingbird	-
Myiarchus cinerascens	Ash-throated flycatcher	-
Nycticorax nycticorax	Black-crowned night heron	-
Pandion haliaetus	Osprey	-
Petrochelidon pyrrhonota	Cliff swallow	-

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Scientific Name	Common Name	Conservation Status[1]
Phalacrocorax auritus	Double-crested cormorant	-
Phalaenoptilus nuttallii	Common poorwill	-
Picoides nuttallii	Nuttall's woodpecker	BCC
Podilymbus podiceps	Pied-billed grebe	-
Poecile rufescens	Chestnut-backed chickadee	-
Psaltriparus minimus	Bushtit	-
Quiscalus mexicanus	Great-tailed grackle	-
Sayornis nigricans	Black phoebe	-
Selasphorus sasin	Allen's hummingbird	BCC
Setophaga petechia	Yellow warbler	SSC, BCC
Setophaga townsendi	Townsend's warbler	-
Sialia mexicana	Western bluebird	-
Sitta carolinensis	White-breasted nuthatch	-
Sphyrapicus ruber	Red-breasted sapsucker	-
Spinus psaltria	Lesser goldfinch	-
Spinus tristis	American goldfinch	-
Stelgidopteryx serripennis	Northern rough-winged swallow	-
Streptopelia decaocto	Eurasian collared-dove	-
Sturnella sp.	Meadow lark	-
Sturnella neglecta	Western meadowlark	-
Sturnus vulgaris	European starling	-
Tachycineta bicolor	Tree swallow	-
Tachycineta thalassina	Violet green swallow	-
Thryomanes bewickii	Bewick's wren	-
Troglodytes aedon	House wren	-

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Scientific Name	Common Name	Conservation Status[1]
Turdus migratorius	American robin	-
Tringa melanoleuca	greater yellowlegs	-
Tyrannus verticalis	Western kingbird	-
Tyto alba	Barn owl	-
Xanthocephalus xanthocephalus	Yellow-headed blackbird	SSC
Zenaida macroura	Mourning dove	-
Reptiles and Amphibians		
Actinemys marmorata	Western pond turtle	SSC
Anaxyrus boreas	Western toad	-
Lampropeltis getula californiae	California kingsnake	-
Lithobates catesbeianus	American bullfrog	-
Pituophis catenifer	Gopher snake	-
Plestiodon skiltonianus	Western skink	-
Pseudacris regilla	Pacific tree frog	-
Pseudacris sierra	Sierran treefrog	-
Rana boylii	Foothill yellow-legged frog	SC, SSC
Sceloporus occidentalis	Western fence lizard	-
Taricha granulosa	Rough-skinned newt	-
Thamnophis sirtalis	Common garter snake	-
Fishes		
Catostomus occidentalis	Sacramento sucker	-
Cyprinus carpio	Common carp	-
Gambusia affinis	Western mosquitofish	-
Lavinia symmetricus symmetricus	Central California roach	-
Lepomis cyanellus	Green sunfish	-

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Scientific Name	Common Name	Conservation Status[1]
Lepomis macrochirus	Bluegill	-
Micropterus dolomieu	Smallmouth bass	-
Micropterus salmoides	Largemouth bass	-
Oncorhynchus mykiss	Rainbow trout	-
Ptychocheilus grandis	Sacramento pikeminnow	-
Invertebrates		
Euphydryas chalcedona	Variable checkerspot butterfly	-
Junonia coenia	Buckeye butterfly	-
Lethocerus americanus	Giant water bug	-
Pacifastacus leniusculus	Signal crayfish	-
Papilio zelicaon	Anise swallowtail butterfly	-
Pieris rapae	Cabbage white butterfly	-
Vanessa cardui	Painted lady butterfly	-

[1]Key to Conservation Status:

SC	State Candidate
SE	State Endangered
CFP	CDFW Fully Protected Animal
SSC	CDFW Species of Special Concern
BCC	USFWS Birds of Conservation Concern
WBWG	Western Bat Working Group

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APPENDIX G

POTENTIAL FOR SPECIAL-STATUS WILDLIFE SPECIES TO OCCUR WITHIN THE PHASE 1 STUDY AREA

Appendix G. Potential for Special-Status Wildlife Species to occur within the Phase 1 Study Area

List compiled from database searches focused on the following 7.5-minute USGS quadrangles: Aetna Springs, Calistoga, Chiles Valley, Clearlake Highlands, Detert Reservoir, Glascock Mountain, Jericho Valley, Knoxville, Lower Lake, Mark West Springs, Middletown, Mount St. Helena, St. Helena, Walter Springs, Whispering Pines, and Wilson Valley USGS 7.5' quadrangles (CDFW 2019; USFWS 2019). List also compiled by a review of other CDFW and USFWS lists and publications (Tomson et al. 2016, Shuford and Gardali 2008, Moyle et al. 2015, USFWS 2008, Bolster 1998, WBWG 2019) focused on the region.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Mammals				
Pallid bat *Antrozous pallidus*	SSC, WBWG	Found in deserts, grasslands, shrublands, woodlands, and forests. Most common in open, forages along river channels. Roost sites include crevices in rocky outcrops and cliffs, caves, mines, trees and various human structures such as bridges, barns, and buildings (including occupied buildings). Roosts must protect bats from high temperatures. Sensitive to disturbance of roosting sites.	**Present.** This species was documented on the property in 2018. The Phase 1 Study Area contains shrubland, forested habitats, rocky outcroppings, chaparral, agricultural areas and buildings that are typically associated with the species. Stream, riparian, and grassland boarding open water provide foraging for this species.	Recommendations for this species can be found in Section 6.4.
Ring-tailed cat (Ringtail) *Bassariscus astutus*	CFP	Widely distributed throughout most of California, absent from some portions of the Central Valley and northeastern California. Found in a variety of habitats throughout the western US including riparian areas, semi-arid country, deserts, chaparral, oak woodlands, pinyon pine woodlands, juniper woodlands and montane conifer forests usually under 1400m in elevation. Typically uses cliffs or large trees for shelter.	**Moderate Potential.** Oak woodland, riparian, scrub and chaparral within the Phase 1 Study Area provide potentially suitable habitat for this species. Additionally, the property is within a greater area that is largely undeveloped and densely vegetated that may provide suitable habitat for this species.	Recommendations for this species can be found in Section 6.4.

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Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Townsend's big-eared bat *Corynorhinus townsendii*	SSC, WBWG	This species is associated with a wide variety of habitats from deserts to mid-elevation mixed coniferous-deciduous forest. Females form maternity colonies in buildings, caves and mines and males roost singly or in small groups. Foraging occurs in open forest habitats where they glean moths from vegetation.	**High Potential.** The Phase 1 Phase 1 Study Area contains buildings that may be suitable for roosting, along with the mixed forest and many water features which provide foraging habitat. There are also many occurrences of this species within five miles of the Phase 1 Study Area (CDFW 2019).	Recommendations for this species can be found in Section 6.4.
Silver-haired bat *Lasionycteris noctivagans*	WBWG	Primarily a forest dweller, feeding over streams, ponds, and open brushy areas. Summer habitats include a variety of forest and woodland types, both coastal and montane. Roosts in hollow trees, snags, buildings, rock crevices, caves, and under bark.	**Present.** This species was detected on the property during surveys in 2018. The Phase 1 Study Area contains woodland, forest, riparian and open habitat suitable for this species. The Phase 1 Study Area could also support roosting in hollow trees, snags, rock crevices, and buildings.	Recommendations for this species can be found in Section 6.4.
Western red bat *Lasiurus blossevillii*	SSC, WBWG	This species is highly migratory and is typically solitary, roosting primarily in the foliage of trees or shrubs. It is associated with broad-leaved tree species including cottonwoods, sycamores, alders, and maples. Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas.	**Moderate Potential.** This species has not been documented within 10 miles of the property (CDFW 2019). However, the Phase 1 Study Area contains broad-leaved tree species typically associated with this species. Stream channel, riparian, open water and edge habitats provide suitable foraging habitat for this species.	Recommendations for this species can be found in Section 6.4.
Hoary bat *Lasiurus cinereus*	WBWG	Prefers open forested habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.	**High Potential.** The Phase 1 Phase 1 Study Area contains forested habitats and habitat mosaics, with large pine and oak trees throughout. Grassland boarding open water and edge habitats along forested areas provide foraging for this species.	Recommendations for this species can be found in Section 6.4.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Fisher, west coast DPS *Martes pennanti* [*M. pennant pacifica*]	SSC	Intermediate to large-tree stages of coniferous forests and deciduous-riparian areas with high percent canopy closure. Use cavities, snags, logs and rocky areas for cover and denning. Need large areas of mature, dense forest.	**No Potential.** The project does not contain suitable coniferous forest and is located outside of the species range.	No further actions are recommended for this species.
Long-eared myotis *Myotis evotis*	WBWG	Occurs in semiarid shrublands, sage, chaparral, and agricultural areas, but is usually associated with coniferous forests from sea level to 9000 feet. Individuals roost under exfoliating tree bark, and in hollow trees, caves, mines, cliff crevices, and rocky outcrops on the ground. They also sometimes roost in buildings and under bridges.	**High Potential.** The Phase 1 Study Area contains shrubland, forested habitats, rocky outcroppings, chaparral, agricultural areas and buildings that are typically associated with the species. Grassland boarding open water and edge habitats along forested areas provide foraging for this species.	Recommendations for this species can be found in Section 6.4.
Fringed myotis *Myotis thysanodes*	WBWG	Associated with a wide variety of habitats including dry woodlands, desert scrub, mesic coniferous forest, grassland, and sage-grass steppes. Buildings, mines and large trees and snags are important day and night roosts.	**Moderate Potential.** The Phase 1 Study Area contains dry woodland and grassland habitat that could provide suitable foraging for this species. Buildings and trees within the Phase 1 Study Area could also provide suitable roosting habitat for this species.	Recommendations for this species can be found in Section 6.4.
Long-legged myotis *Myotis volans*	WBWG	Primarily found in coniferous forests, but also occurs seasonally in riparian and desert habitats. Large hollow trees, rock crevices and buildings are important day roosts. Other roosts include caves, mines and buildings.	**Moderate Potential.** The Phase 1 Study Area contains dry woodland and grassland habitat that could provide suitable foraging for this species. Buildings, rock crevices, and trees within the Phase 1 Study Area could also provide suitable roosting habitat for this species.	Recommendations for this species can be found in Section 6.4.

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Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
American badger *Taxidea taxus*	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Requires friable soils and open, uncultivated ground. Preys on burrowing rodents.	**Moderate Potential.** The Phase 1 Study Area contains, and is surrounded by, large expanses of uncultivated open ground with shrub, grassland, and forest habitat. Few burrowing rodents were observed within the Phase 1 Study Area, which may support a prey base for the species.	Recommendations for this species can be found in Section 6.4.
Birds				
Tricolored blackbird *Agelaius tricolor*	BCC, SSC, ST	Nearly endemic to California, where it is most numerous in the Central Valley and vicinity. Highly colonial, nesting in dense aggregations over or near freshwater in emergent growth or riparian thickets. Also uses flooded agricultural fields. Abundant insect prey near breeding areas essential.	**High Potential.** The Phase 1 Study Area is directly adjacent to several reservoirs containing extensive amounts of emergent vegetation that may support nesting and the species has been documented to nest within 1 mile of the property (CDFW 2019).	Recommendations for this species can be found in Section 6.4.
Grasshopper sparrow *Ammodramus savannarum*	SSC	Summer resident. Breeds in open grasslands, generally with low- to moderate-height grasses and scattered shrubs. Well-hidden nests are placed on the ground.	**High Potential.** The Phase 1 Study Area is within this species' breeding range, and the Phase 1 Study Area contains large areas of grasslands to support foraging and nesting (CDFW 2019, eBird 2019). This species has been documented within 0.5 mile of the property (eBird 2019).	Recommendations for this species can be found in Section 6.4.
Golden eagle *Aquila chrysaetos*	BCC, CFP	Occurs year-round in rolling foothills, mountain areas, sage-juniper flats, and deserts. Cliff-walled canyons provide nesting habitat in most parts of range; also nests in large trees, usually within otherwise open areas.	**Present.** This species was observed nesting just south of property in 2018. Adult and juvenile golden eagles were observed in oak woodland communities within the property. The Phase 1 Study Area contains suitable open areas with large trees to support nesting and foraging.	Recommendations for this species can be found in Section 6.4.

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Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Short-eared owl *Asio flammeus*	SSC	Occurs year-round, but primarily as a winter visitor; breeding very restricted in most of California. Found in open, treeless areas (e.g., marshes, grasslands) with elevated sites for foraging perches and dense herbaceous vegetation for roosting and nesting. Preys mostly on small mammals, particularly voles.	**Unlikely.** The Phase 1 Study Area contains suitable grassland foraging habitat for this species, which may winter there. However, this species does not breed in Lake County (CDFW 2019, eBird 2019).	No further actions are recommended for this species.
Long-eared owl *Asio otus*	SSC	Occurs year-round in California. Nests in trees in a variety of woodland habitats, including oak and riparian, as well as tree groves. Requires adjacent open land with rodents for foraging, and the presence of old nests of larger birds (hawks, crows, magpies) for breeding.	**Moderate Potential.** The Phase 1 Study Area contains oak and riparian habitats adjacent to open lands that could support foraging and nesting.	Recommendations for this species can be found in Section 6.4.
Burrowing owl *Athene cunicularia*	SSC, BCC	Year-round resident and winter visitor. Occurs in open, dry grasslands and scrub habitats with low-growing vegetation, perches and abundant mammal burrows. Preys upon insects and small vertebrates. Nests and roosts in old mammal burrows, most commonly those of ground squirrels.	**Moderate Potential.** This species has not been documented breeding in Lake County (CDFW 2019, eBird 2019). This species may occasionally winter within uncanopied grassland areas within the Phase 1 Study Area with suitable burrows. This species has been documented to winter within 2 miles of the property (CDFW 2019). Burrows suitable for burrowing owl occupation were observed in open grassland within the property. In addition, ground squirrels were observed throughout the Phase 1 Study Area and additional suitable burrow habitat for owls may arise in the future.	Recommendations for this species can be found in Section 6.4.
Oak titmouse *Baeolophus inornatus*	BCC	Occurs year-round in woodland and savannah habitats where oaks are present, as well as riparian areas. Nests in tree cavities.	**Present.** This species was observed within the woodland communities on the property in 2018 and 2019. The Phase 1 Study Area contains woodland and tree cavities suitable for nesting.	Recommendations for this species can be found in Section 6.4.

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Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Vaux's swift *Chaetura vauxi*	SSC	Summer resident, breeding primarily in forested areas. Nests in tree cavities, favoring those with a large vertical extent; also uses chimneys and other man-made substrates. Forages aerially for insects.	**Unlikely.** The Phase 1 Study Area does not contain the dense coniferous forest this species prefers, and is outside of the known breeding range of the species (CDFW 2019).	No further actions are recommended for this species.
Northern harrier *Circus cyaneus*	SSC	Year-round resident and winter visitor. Found in open habitats including grasslands, prairies, marshes and agricultural areas. Nests on the ground in dense vegetation, typically near water or otherwise moist areas. Preys on small vertebrates.	**Present.** Although this species was observed foraging within the Phase 1 Study Area in 2018. The Phase 1 Study Area contains open grassland which may support nesting and foraging by this species.	No further actions are recommended for this species.
Olive-sided flycatcher *Contopus cooperi*	SSC, BCC	Summer resident. Typical breeding habitat is montane coniferous forests. At lower elevations, also occurs in wooded canyons and mixed forests and woodlands. Often associated with forest edges. Arboreal nest sites located well off the ground.	**Moderate Potential.** The Phase 1 Study Area contains woodland and riparian habitats that may support nesting.	Recommendations for this species can be found in Section 6.4.
White-tailed kite *Elanus leucurus*	CFP	Year-round resident in coastal and valley lowlands with scattered trees and large shrubs, including grasslands, marshes and agricultural areas. Nests in trees, of which the type and setting are highly variable. Preys on small mammals and other vertebrates.	**Present.** This species was observed within the Phase 1 Study Area in 2018. The Phase 1 Study Area provides open foraging habitat for this species and large trees and shrubs suitable for nesting.	Recommendations for this species can be found in Section 6.4.
Prairie falcon *Falco mexicanus*	BCC	Year-round resident and winter visitor. Inhabits dry, open terrains, including foothills and valleys. Breeding sites located on steep cliffs. Forages widely.	**Moderate Potential.** The Phase 1 Study Area contains open areas and rocky cliffs that provide potential foraging and nesting habitat for this species.	Recommendations for this species can be found in Section 6.4.

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Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
American peregrine falcon *Falco peregrinus anatum*	CFP, BCC	Year-round resident and winter visitor. Occurs in a wide variety of habitats, though often associated with coasts, bays, marshes and other bodies of water. Nests on protected cliffs and also on man-made structures including buildings and bridges. Preys on birds, especially waterbirds. Forages widely.	**Present.** This species was observed nesting on exposed cliffs within the property in 2018, approx. 0.75 mile west of Phase 1 Study Area. The Phase 1 Study Area is adjacent to several reservoirs and rocky cliffs that provide potential foraging and nesting habitat for this species.	Recommendations for this species can be found in Section 6.4.
Bald eagle *Haliaeetus leucocephalus*	SE, CFP, BCC	Occurs year-round in California, but primarily a winter visitor. Nests in large trees in the vicinity of larger lakes, reservoirs and rivers. Wintering habitat somewhat more variable but usually features large concentrations of waterfowl or fish.	**Present.** Adult and juvenile bald eagles were observed flying and roosting adjacent to multiple reservoirs within and adjacent to the Phase 1 Study Area in 2018 and 2019. This species has been previously documented to nest within the property around McCreary Reservoir, and nest structures attended by eagles were observed in this vicinity during the site visits (CDFW 2019).	Recommendations for this species can be found in Section 6.4.
Yellow-breasted chat *Icteria virens*	SSC	Summer resident, occurring in riparian areas with an open canopy, very dense understory, and trees for song perches. Nests in thickets of willow, blackberry, and wild grape.	**Moderate Potential.** The Phase 1 Study Area contains riparian areas with dense vegetation to support nesting, and this species has been documented approximately 3 miles south of the property (eBird 2019).	Recommendations for this species can be found in Section 6.4.
Least bittern *Ixobrychus exilis*	SSC, BCC	Summer resident primarily in portions of the Central Valley and southern California. Typically breeds in deeper freshwater marshes with dense emergent and woody vegetation.	**Moderate Potential.** The Phase 1 Study Area is adjacent to several deep reservoirs containing extensive emergent vegetation.	Recommendations for this species can be found in Section 6.4.
Loggerhead shrike *Lanius ludovicianus*	BCC, SSC	Year-round resident in open woodland, grassland, savannah and scrub. Prefers areas with sparse shrubs, trees, posts, and other suitable perches for foraging. Preys upon large insects and small vertebrates. Nests are well-concealed in densely-foliaged shrubs or trees.	**High Potential.** The Phase 1 Study Area provides open areas for foraging as well as suitably dense vegetation in scrub and woodland communities to support nesting. This species has been documented within 1.5 miles of the property (eBird 2019).	Recommendations for this species can be found in Section 6.4.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Lewis's woodpecker *Melanerpes lewis*	BCC	Uncommon resident in California occurring on open oak savannahs, broken deciduous and coniferous habitats. Breeds primarily in ponderosa pine forests, riparian woodlands and disturbed pine forests but is also known to nest in orchards and oak woodlands.	**High Potential.** The Phase 1 Study Area contains oak savannah and woodland habitat to support this species, and the Phase 1 Study Area is within the known breeding range of this species. This species has been documented within the property, within 0.5 miles of the Phase 1 Study Area (eBird 2019).	Recommendations for this species can be found in Section 6.4.
Flammulated owl *Otus flammeolus*	BCC	Nesting habitat includes multi-age class stands with multiple canopy layers, including a veteran tree component for nesting and roosting. Secondary cavity nester, utilizing natural cavities or those excavated by woodpeckers.	**Unlikely.** The Phase 1 Study Area does not contain dense canopied-coniferous forest habitat that this species prefers, and this species is not known to inhabit eastern Lake County (CDFW 2019)	No further actions are recommended for this species.
Nuttall's woodpecker *Picoides nuttallii*	BCC	Year-round resident in lowland woodlands throughout much of California west of the Sierra Nevada. Typical habitat is dominated by oaks; also occurs in riparian woodland. Nests in tree cavities.	**Present.** This species was observed within the woodland communities in the property. The Phase 1 Study Area contains woodland and tree cavities suitable for nesting.	Recommendations for this species can be found in Section 6.4.
Purple martin *Progne subis*	SSC	Inhabits woodlands and low elevation coniferous forests. Nests in old woodpecker cavities and human-made structures. Nest is often located in tall, isolated tree or snag.	**High Potential.** The Phase 1 Study Area contains woodlands with snags and cavities to support nesting, and this species has been documented to nest on the property within 0.5 mile of the Phase 1 Study Area (CDFW 2019).	Recommendations for this species can be found in Section 6.4.

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Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Bank swallow *Riparia riparia*	ST	Summer resident in riparian and other lowland habitats near rivers, lakes and the ocean in northern California. Nests colonially in excavated burrows on vertical cliffs and bank cuts (natural and manmade) with fine-textured soils. Historical nesting range in southern and central areas of California has been eliminated by habitat loss. Currently known to breed in Siskiyou, Shasta, and Lassen Cos., portions of the north coast, and along Sacramento River from Shasta Co. south to Yolo Co.	**Unlikely.** The Phase 1 Study Area is outside of the breeding range for this species. There are no documented sightings of this species within 12 miles of the Phase 1 Study Area (CDFW 2019).	No further actions are recommended for this species.
Allen's hummingbird *Selasphorus sasin*	BCC	Summer resident along the California coast, breeding in a variety of woodland and forest habitats, including parks and gardens with abundant nectar sources. Nest in shrubs and trees with dense vegetation.	**Present.** This species was observed within the property during site assessments in 2018. The Phase 1 Study Area contains woodland and riparian habitats with nectar sources that may support nesting.	Recommendations for this species can be found in Section 6.4.
Yellow warbler *Setophaga* [*Dendroica*] *petechia brewsteri*	SSC, BCC	Summer resident throughout much of California. Breeds in riparian vegetation close to water, including streams and wet meadows. Microhabitat used for nesting variable, but dense willow growth is typical. Occurs widely on migration.	**Present.** This species was observed in the property in 2018. The Phase 1 Study Area contains riparian areas with dense vegetation to support nesting.	Recommendations for this species can be found in Section 6.4.
Lawrence's goldfinch *Spinus* [*Carduelis*] *lawrencei*	BCC	Summer resident; generally uncommon and local. Typically found in arid open woodlands, including oak savannah. Breeding distribution is erratic from year to year.	**Moderate Potential.** The Phase 1 Study Area contains undisturbed oak savannah, which provides breeding habitat for this species.	Recommendations for this species can be found in Section 6.4.
Black-chinned sparrow *Spizella atrogularis*	BCC	Prefers sloping ground in mixed chaparral, chamise-redshank chaparral, sagebrush, and similar brushy habitats. Often on arid, south-facing slopes with ceanothus, manzanita, sagebrush, and chamise.	**High Potential.** The property is within this species' breeding range, and the Phase 1 Study Area contains dense shrub and chaparral habitats this species requires for nesting (eBird 2019).	Recommendations for this species can be found in Section 6.4.

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Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Northern spotted owl *Strix occidentalis caurina*	FT, ST, SSC	Year-round resident in dense, structurally complex forests, primarily those with old-growth conifers. . Nests on platform-like substrates in the forest canopy, including in tree cavities. Preys on mammals.	**No Potential.** The Phase 1 Study Area does not contain the dense, old growth coniferous forest this species prefers. The nearest documented occurrence of this species is near Robert Louis Stevenson State Park, 5 miles southwest of the property (CDFW 2019).	No further actions are recommended for this species.
Yellow-headed blackbird *Xanthocephalus xanthocephalus*	SSC	Summer resident. Breeds colonially in freshwater emergent wetlands with dense vegetation and deep water, often along borders of lakes or ponds. Requires abundant large insects such as dragonflies; nesting is timed for maximum emergence of insect prey.	**Present.** This species was observed nesting in emergent vegetation in the property, directly adjacent to the Phase 1 Study Area in 2018 and 2019. The Phase 1 Study Area has freshwater emergent vegetation and may support nesting by this species.	Recommendations for this species can be found in Section 6.4.
Reptiles and Amphibians				
Western pond turtle *Actinemys marmorata*	SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches with aquatic vegetation. Require basking sites such as partially submerged logs, vegetation mats, or open mud banks, and suitable upland habitat (sandy banks or grassy open fields) for egg-laying.	**Present.** The species was observed within portions of Bucksnort Creek. The various streams and large open-water reservoirs within the property provide suitable aquatic habitat, and the associated open grasslands adjacent to these features may support nesting. This species has also been documented in CNDDB within the Phase 1 Study Area (CDFW 2019).	Recommendations for this species can be found in Section 6.4.
California giant salamander *Dicamptodon ensatus*	SSC	Occurs in the north-central Coast Ranges. Moist coniferous and mixed forests are typical habitat; also uses woodland and chaparral. Adults are terrestrial and fossorial, breeding in cold, permanent or semi-permanent streams. Larvae usually remain aquatic for over a year.	**Unlikely.** The Phase 1 Study Area does not contain suitable coniferous forest typical of the species habitat requirements. Streams in the Phase 1 Study Area are suboptimal to unsuitable for this species with warm summer water temperatures and non-native predatory fish and bullfrogs. The property is also located outside of the species known range.	No further actions are recommended for this species.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Foothill yellow-legged frog *Rana boylii*	SSC, SC	Found in or near rocky streams in a variety of habitats. Prefers partly-shaded, shallow streams and riffles with a rocky substrate; requires at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis. Feeds on both aquatic and terrestrial invertebrates.	**Present.** The species was observed within the property, in association with Butts Creek. Perennial streams with rocky substrate provide suitable habitat for the species, including both Butts Creek and Putah Creek. This species has also been documented in CNDDB within the property (CDFW 2019).	Recommendations for this species can be found in Section 6.4.
California red-legged frog *Rana draytonii*	FT, SSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11 to 20 weeks of permanent water for larval development. Associated with quiet perennial to intermittent ponds, stream pools and wetlands. Prefers shorelines with extensive vegetation. Disperses through upland habitats after rains.	**Unlikely.** Focused surveys for the species were conducted within the property in 2018 and 2019 and found no individuals. Aquatic habitat features within the Phase 1 Study Area are dominated by several non-native predators including bass, sunfish, American bullfrog, and crayfish. There are no CNDDB occurrences of the species within 10-miles of the site. Due to the lack of detections during focused nighttime surveys, non-native predator dominated aquatic habitat, and absence of nearby documented occurrences, it is unlikely that the species would occur within the Phase 2 and Open Space Study Area.	No further actions are recommended for this species.
Red-bellied newt *Taricha rivularis*	SSC	Inhabits coastal forests from southern Sonoma County northward, with an isolated population in Santa Clara County. Redwood forest provides typical habitat, though other forest types (e.g., hardwood) are also occupied. Adults are terrestrial and fossorial. Breeding occurs in streams, usually with relatively strong flow.	**Unlikely.** The Phase 1 Study Area does not contain suitable redwood or hardwood forest typical of the species habitat requirements. The property is also located outside of the species known range.	No further actions are recommended for this species.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Fishes				
Pacific lamprey *Entosphenus* [*Lampetra*] *tridentatus*	SSC	Spawns between March and July in gravel bottomed streams in riffle habitat. Larvae drift downstream to areas of low velocity and fine substrates and are relatively immobile in the stream substrates.	**No Potential.** The property does not contain anadromous aquatic habitat necessary to support this species. The property is within the upper Putah Creek Watershed that drains into Lake Berryessa, which forms a complete fish passage barrier for fish returning from the ocean and blocks this species from the Phase 1 Study Area.	No further actions are recommended for this species.
Clear Lake tule perch *Hysterocarpus traski lagunae*	SSC	Occurs in low elevation streams of the Russian River system. Requires clear, flowing water with abundant cover and deep (> 1 m) pools.	**Unlikely.** The property is within the upper Putah Creek Watershed that drains into Lake Berryessa. This species is only known for Clear Lake and associated tributaries; which is outside of the Phase 1 Study Area. Tule perch is not known for the upper Putah Creek Watershed.	No further actions are recommended for this species.
Russian River tule perch *Hysterocarpus traski pomo*	SSC	Occurs in low elevation streams of the Russian River system. Requires clear, flowing water with abundant cover and deep (> 1 m) pools.	**Unlikely.** The property is within the upper Putah Creek Watershed that drains into Lake Berryessa. This species is only known for the Russian River and its tributaries; which is outside of the Phase 1 Study Area.	No further actions are recommended for this species.
River lamprey *Lampetra ayresi*	SSC	Lower Sacramento River, San Joaquin River and Russian River. May occur in coastal streams north of San Francisco Bay. Adults need clean, gravelly riffles, Ammocoetes need sandy backwaters or stream edges, good water quality and temps < 25 degrees C.	**No Potential.** The Phase 1 Study Area does not contain anadromous aquatic habitat necessary to support this species. The property is within the upper Putah Creek Watershed that drains into Lake Berryessa, which forms a complete fish passage barrier for fish returning from the ocean and blocks this species from the Phase 1 Study Area.	No further actions are recommended for this species.

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Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Clear Lake hitch *Lavinia exilicauda chi*	ST, SSC	Found only in Clear Lake, Lake County, and associated ponds. Spawns in streams flowing into Clear Lake. Adults found in the limnetic zone. Juveniles found in the nearshore shallow-water habitat hiding in the vegetation.	**Unlikely.** The property is within the upper Putah Creek Watershed that drains into Lake Berryessa. This species is only known for Clear Lake and associated tributaries; which is outside of the property.	No further actions are recommended for this species.
Clear Lake – Russian River roach *Lavinia symmetricus ssp. 4*	SSC	Habitat generalists. Found in warm intermittent streams as well as cold, well-aerated streams.	**Unlikely.** The Phase 1 Study Area is within the upper Putah Creek Watershed that drains into Lake Berryessa. This species is only known for Clear Lake and associated tributaries; which is outside of the Phase 1 Study Area. Roach in the Phase 1 Study Area are within the range and distribution of Central California roach, which are not a special-status species.	No further actions are recommended for this species.
Navarro roach *Lavinia symmetricus navarroensis*	SSC	Occurs only in the Navarro River and its tributaries. Adaptable; found in warm, intermittent streams as well as cold, well-aerated streams.	**Unlikely.** The property is within the upper Putah Creek Watershed that drains into Lake Berryessa. This species is only known for the Navarro River and its tributaries; which is outside of the property.	No further actions are recommended for this species.
Coho salmon - central CA coast ESU *Oncorhynchus kisutch*	FE, SE	Federal listing includes populations between Punta Gorda and San Lorenzo River. State listing includes populations south of San Francisco Bay only. Occurs inland and in coastal marine waters. Requires beds of loose, silt-free, coarse gravel for spawning. Also needs cover, cool water and sufficient dissolved oxygen.	**No Potential.** This species is considered extirpated from San Francisco Bay and associated tributaries, including the greater Sacramento River Watershed. The Phase 1 Study Area does not contain anadromous aquatic habitat necessary to support this species. The property is within the upper Putah Creek Watershed that drains into Lake Berryessa, which forms a complete fish passage barrier for fish returning from the ocean and blocks this species from the Phase 1 Study Area.	No further actions are recommended for this species.

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Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Steelhead - Central Valley DPS *Oncorhynchus mykiss*	FT	Occurs from the Russian River south to Soquel Creek and Pajaro River. Also in San Francisco and San Pablo Bay Basins. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for 1 or more years before migrating downstream to the ocean.	**Unlikely.** The Phase 1 Study Area does not contain anadromous aquatic habitat necessary to support this species. The property is within the upper Putah Creek Watershed that drains into Lake Berryessa, which forms a complete fish passage barrier for fish returning from the ocean and blocks this species from the Phase 1 Study Area. The resident form, rainbow trout, is known to occur in Lake Berryessa and may utilize portions of upper Putah Creek and associated tributaries that are within the Phase 1 Study Area. Rainbow trout was observed within Butts Creek in 2018. However, the resident form of the species is not protected as a steelhead in areas where anadromy is blocked, such as the waters within the Phase 1 Study Area.	No further actions are recommended for this species.
Chinook salmon - California coastal ESU *Oncorhynchus tshawytscha*	FT	California Coastal Chinook Salmon ESU includes all naturally spawned populations of Chinook salmon from rivers and streams south of the Klamath River (exclusive) to the Russian River (inclusive). Adult numbers depend on pool depth and volume, amount of cover, and proximity to gravel. Water temps >27 degrees C lethal to adults.	**No Potential.** The Phase 1 Study Area does not contain anadromous aquatic habitat necessary to support this species. The property is within the upper Putah Creek Watershed that drains into Lake Berryessa, which forms a complete fish passage barrier for fish returning from the ocean and blocks this species from the Phase 1 Study Area.	No further actions are recommended for this species.
Invertebrates				
Crotch bumble bee *Bombus crotchii*	SC	Crotch bumble bee occurs primarily in the Mediterranean region, pacific coast, western desert, and great valley of southwestern California. Populations used to extend through the southern two-thirds of California, but is now absent through much of its historic range.	**Unlikely.** The property is north of this species current range.	

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Western bumble bee *Bombus occidentalis*	SC	Once widespread in the western United States and Canada, populations of this insect have drastically declined in recent decades. Pollinates a variety of wild flowering plants and crops. Recent studies have shown this species range in California limited to high elevations sites in the Sierra Nevada with some observations on the northern California coast.	**Unlikely.** Although this species historically occurred throughout California, recent studies have shown that the property is outside of this species current extent of occurrence.	No further actions are recommended for this species.
Conservancy fairy shrimp *Branchinecta conservation*	FE	Endemic to the grasslands of the northern two-thirds of the Central Valley, found in large, turbid pools. Inhabits astatic pools located in swales formed by old, braided alluvium, filled by winter/spring rains, lasting until June.	**Unlikely.** Although there are vernal pools that are a part of the Lake-Napa Vernal Pool complex about 2 miles north west of the property, this species has not been documented in Lake County (CDFW 2019, Erikson and Belk, 1999). Additionally, no vernal pools with soil and/or hydrological characteristics that could support this species were observed within the Phase 1 Study Area.	No further actions are recommended for this species.
Vernal pool fairy shrimp *Branchinecta lynchi*	FT	Endemic to the grasslands of the Central Valley, central coast mountains, and south coast mountains, in astatic rain-filled pools. Inhabits small, clear-water sandstone-depression pools, and grassy swales, earth slumps, or basalt-flow depression pools.	**Unlikely.** Although there are vernal pools that are a part of the Lake-Napa Vernal Pool complex about 2 miles north west of the property, this species has not been documented in Lake County (CDFW 2019, Erikson and Belk, 1999). Additionally, no vernal pools with soil and/or hydrological characteristics that could support this species were observed within the Phase 1 Study Area.	No further actions are recommended for this species.

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Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT	Occurs only in the central valley of California, in association with blue elderberry (*Sambucus mexicana*). Prefers to lay eggs in elderberry 2 to 8 inches in diameter; some preference shown for "stressed" elderberry.	**Unlikely.** The property is located west of this species' documented range in the Central Valley. A non-listed subspecies, *Desmocerus californicus californicus*, is known to occur in the coast range hills. The closest documented occurrence of valley elderberry longhorn beetle is 12 miles northeast of the property (CDFW 2019.) Given the low dispersal ability of this species, it is unlikely to occur within the property (Collinge et al. 2001)	No further actions are recommended for this species.
California freshwater shrimp *Syncaris pacifica*	FE, SE	Endemic to Marin, Napa, and Sonoma counties. Found in low elevation, low gradient streams where riparian cover is moderate to heavy. Shallow pools away from main stream flow. Winter: undercut banks with exposed roots. Summer: leafy branches touching water.	**Unlikely.** Although the Phase 1 Study Area contains perennial streams, this species has not been documented in Lake County and the nearest documented occurrence is over 10 miles southwest of the property near Calistoga, in a different watershed from the Phase 1 Study Area (CDFW 2019).	No further actions are recommended for this species.

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[1]Key to Conservation Status:

FE	Federal Endangered
FT	Federal Threatened
FC	Federal Candidate
BCC	USFWS Birds of Conservation Concern
SE	State Endangered
ST	State Threatened
SC	State Candidate
SSC	CDFW Species of Special Concern
CFP	California Fully Protected Animal
WBWG	Western Bat Working Group High or Medium Priority Species

[2]Key to Potential for Occurrence:

No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements (cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).

Unlikely. Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.

Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.

High Potential. All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

Present. Species was observed on the site or has been recorded (i.e. CNDDB, other reports) on the site recently.

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APPENDIX H

FOCUSED RAPTOR SURVEYS

Appendix H. Focused Raptor Surveys

1.0 INTRODUCTION

This raptor study documents the findings of focused raptor surveys performed by WRA for Phase 1 Study Area of the proposed Maha Resort and Guenoc Valley Development. The surveys covered the Phase 1 Study Area, as well as surrounding areas within the larger Guenoc Ranch (property) located in unincorporated Lake County, California. The purpose of the survey effort was to evaluate baseline levels of raptor activity during the breeding season; including species presence, nesting, and behavioral activity with a particular focus on bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*). The surveys were indented to identify areas where eagle and special-status raptors nesting occurred, the number of nesting pairs of eagle, document species presence and diversity of raptor species, and identify activity or "hot spot" areas for raptors in the property. This analysis of sensitive resources is intended to support project planning and development of conservation measures for the Phase 1 Study Area. This report describes the methods and results of the surveys conducted along with information relevant to special-status and non-status raptor species protected by local, state, or federal laws and regulations.

2.0 STUDY AREA

The Phase 1 Study Area is an approximately 4,977-acre mix of undeveloped lands, agricultural lands, and minor infrastructure to support vineyard, winery, and cattle operations located within the larger property of Guenoc Ranch. The property includes 22,695-acres located in unincorporated Lake and Napa counties, four miles east of Middletown. The Phase 1 Study Area and property are bounded to the north by the U.S. Coast Guard LORAN Reservation, Putah Creek, and the Cedars mountain range; to the east by Putah Creek and Mysterious Valley; to the south by Table Mountain and the Pope Valley; and to the west by Long Valley and Coyote Valley. The raptor survey effort was focused on the Phase 1 Study Area.

3.0 REGULATORY BACKGROUND

Federal and State laws, regulations and designations applicable to raptors with potential to occur within the property are discussed below. Within the context of this document and standard environmental review, the term "special-status" is typically used to refer to species with heightened legal protections beyond baseline levels, if any such exist. Federal regulations and applied designations for raptors include:

- Federal Endangered Species Act
- Bald and Golden Eagle Protection Act
- Migratory Bird Treaty Act
- US Fish and Wildlife Service Birds of Conservation Concern through the Fish and Wildlife Conservation Act

State regulations and applied designations for raptors include:

- California Endangered Species Act
- California Fish and Game Code
- Fully Protected Species through the California Fish and Game Code

- Species of Special Concern through the California Fish and Game Code

A brief description of each regulation and additional designation are provided below.

Federal Endangered Species Act. The Endangered Species Act of 1973, as amended, herein the Federal Endangered Species Act (ESA), was enacted to provide a means to identify and protect endangered and threatened species. The ESA is implemented by the United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). Pursuant to Section 4 of ESA, the USFWS and NMFS maintain lists of "endangered" and "threatened" plant and animal species (referred to as "listed species"). Under ESA Section 9, it is unlawful to take any listed species; take is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Harass is defined in regulation as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR 17.3). Harm is defined in regulation as an act which actually kills or injures fish or wildlife, and may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 17.3; 50 CFR 222.102). Actions that may result in a "take" of an ESA-listed species are subject to USFWS permit issuance ("take authorization") and monitoring.

Bald and Golden Eagle Protection Act. Golden and bald eagles have various protections at both the state and federal levels and are considered special-status species. While golden and bald eagles are not currently listed under the ESA, these species are afforded a somewhat analogous level of protection under the federal Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c). The Act prohibits the taking, possession and/or commerce of eagles and establishes civil penalties for violations. Similar to the ESA, "take" is defined as pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, or disturb. Disturb means "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior" (50 CFR 22.3).

Migratory Bird Treaty Act. In addition to regulations for special-status species, most birds in the United States, including non-status species, are protected by the Migratory Bird Treaty Act of 1918 (MBTA) and the CFGC (Section 3503). The MBTA establishes a federal prohibition, unless permitted by regulations, to "pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention" (16 USC 703). Recently, the U.S. Department of the Interior (USDOI; 2017) issued guidance clarifying that the MBTA only applies to the intentional/deliberate killing, harm or collection of covered species, and that unintentional impacts to birds/nests that occur within the context of otherwise lawful activities are not violations of the MBTA.

USFWS Birds of Conservation Concern. The Fish and Wildlife Conservation Act, as amended in 1988, requires USFWS to "identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing" under ESA. The USFWS names bird species that represent conservation priorities as

Birds of Conservation Concern (BCC), with the most recent list issued in 2008. Although BCC species generally have no heightened legal status, they are typically given special consideration under CEQA.

California Endangered Species Act. The California Endangered Species Act (CESA) (California Fish and Game Code [CFGC] 2050 *et seq*.) prohibits a "take" of any plant and animal species that the California Fish and Game Commission determines to be an endangered or threatened species in California. CESA regulations differ from the ESA in that under the CESA omits "harm and harassment" from their definition of “take”. In addition, the CESA authorizes the take of endangered, threatened, or candidate species if the take is incidental to otherwise lawful activity and specific criteria are met. These provisions also require the CDFW to consult with the USFWS for actions involving state-listed species that are also listed under the ESA. In certain circumstances, the CESA allows the CDFW to adopt an incidental take authorization from the USFWS or NMFS as satisfactory for the purposes of CEQA based on findings that the federal permit adequately protects the species and is consistent with state law. A CESA permit may not authorize the take of fully protected species that are protected in other provisions of the CFGC, discussed further below.

California Fish and Game Code. In addition to regulations for special-status species, most birds in the United States, including non-status species, are protected by CFGC under sections 3503, 3503.5 and 3513. Section 3503 and 3503.5 prohibits the killing of birds and raptors or the destruction or collection of active bird or raptor nests, including eggs and young. Section 3513 prohibits unlawful take or possession of birds designated by the MBTA.

CDFW Fully Protected Species. The CFGC Section 3511 explicitly designates Fully Protected birds. Fully Protected species may not be taken or possessed at any time. No licenses or permits may be issued for take of fully protected species, except for necessary scientific research and relocation of fully protected bird species for the protection of livestock. The definition of "take" is the same under the CFGC and the CESA. However, unlike species listed under the ESA or the CESA, incidental take of Fully Protected species is not authorized by law.

CDFW Species of Special Concern. The CDFW names species native to California susceptible to conservation risk as Species of Special Concern (SSC). The original list was published in 1978 and was updated to the current list in 2008. CDFW defines a California bird as an SSC as “those species, subspecies, or distinct populations of native birds that currently satisfy one or more criteria on populations size and trend, range size and trend, threats, and population concentration.” Although SSC species generally have no heightened legal status, they are typically given special consideration under CEQA.

4.0 BIOLOGICAL BACKGROUND

Raptors are a biologically diverse group of predatory birds that includes hawk, eagle, falcon, vulture, kite, and owl. Raptors can occupy a variety of habitats ranging from large open fields to tall manmade structures. Raptors may nest on the ground, on cliffs, in trees (many types and settings, including in cavities) and large shrubs, and on anthropogenic structures such utility towers and buildings. Nests are often in remote locations and/or cryptic, and detection of an active nest often occurs via observations of behavior, adult or nestling calls, or sign of recent activity (i.e. whitewash [feces stains], prey remains). Several raptor species may also reuse a nest site, setting up a territory and returning for several years to breed and forage in the same general area. Because of this, these often large charismatic species, may be observed flying or soaring over large areas but may be reliant on more discrete locations to complete important parts

of their life history, such as breeding. Identifying these locations can help inform the number of breeding pairs and preferred nesting locations in an area for special-status raptors, such as eagles and falcons.

5.0 METHODS

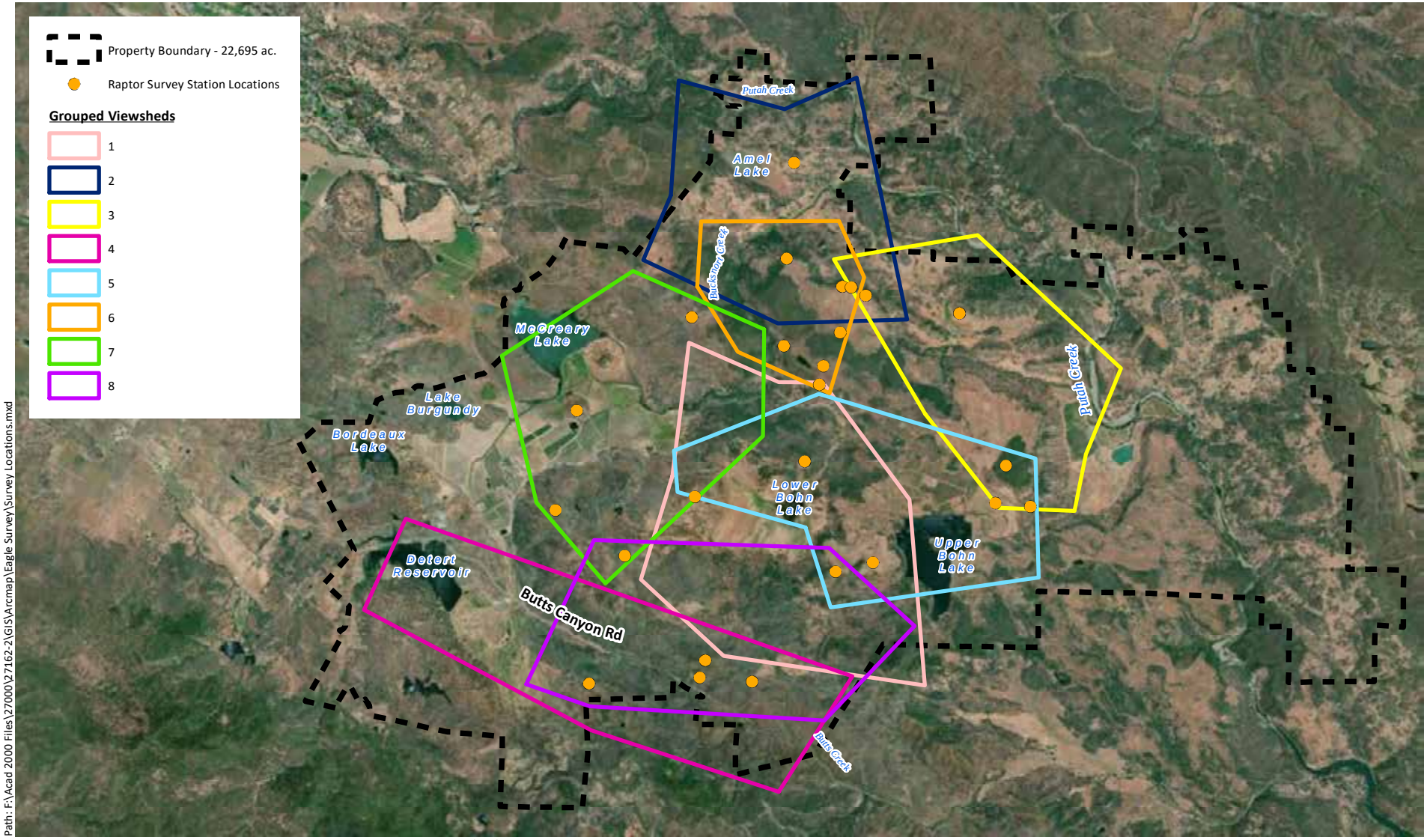
The methodology was based on the protocol outlined in the site-specific Raptor Study Plan developed by WRA and summarized below. Surveys took place in April and May of 2018, during the active breeding period for raptor species most likely to occur within the region. All surveys occurred during weather conducive to visual and auditory detections of raptors (i.e. no heavy rainfall or dense fog). WRA wildlife biologists with the training and field experience necessary to identify raptor species known to occur within the region conducted the fieldwork, which consisted of a combination of fixed-point surveys and roving surveys. Surveys were focused on diurnal raptors (hawks, eagle and allies, falcons, and vultures). Any nocturnal raptors (i.e. owl) observed incidentally were recorded and mapped.

Fixed-Point Surveys

Prior to the initiation of surveys, fixed survey points were identified across the property using a GIS-based viewshed analysis intended to provide maximum survey coverage of the Phase 1 Study Area and surrounding habitats. The Phase 1 Study Area was broken into eight grouped viewsheds based on the approximate area that could be seen from a set of survey points. Survey points were modified in the field based on accessibility and to maximize visibility around localized obstructions such as trees or boulders. Survey points were recorded by GPS and are shown on Figure 1.

Surveys were conducted in the morning (dawn to approximately 10 AM) or late in the day (approximately 5 PM to dusk), with a single biologist stationed at a fixed survey point for three continuous hours. Surveys were conducted by three to four biologists at a time, with biologists positioned at complimentary survey points, which allowed biologists to maximize viewshed coverage, communicate relevant observations and behaviors, and triangulate observation locations. These complimentary survey points are shown within the eight grouped viewsheds in Figure 1. The survey efforts were distributed evenly across the eight viewsheds, and surveyors made observations using binoculars, spotting scopes with a zoom lens, and the naked eye. Observations were made to identify raptors to the lowest taxonomic level feasible.

During fixed-point surveys, biologists recorded the start and end time of the survey, the weather, and observational data including the species, time, location, and behavior. Behaviors were recorded to help with the identification of nesting and breeding activity and included flying, soaring, perching, foraging, breeding, and nest building. Each raptor observed during a fixed-point survey was assigned a unique identifier to aid in tracking changes in behavior and location. Locations of the observed birds were mapped using a combination of triangulation and mapping with a handheld GPS unit. Special attention was paid to potential nesting locations and bird courtship or breeding behavior. Active nests were mapped using a combination of handheld GPS units and hand drawing on field maps with high resolution aerial imagery and 20-foot topographic contours, and were investigated in more detail during roving surveys, described in the following section.



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Sources: Esri Streaming - NAIP 2016, WRA | Prepared By: mrochelle, 8/31/2018

Figure 1. Fixed Point Grouped Viewsheds with Survey Stations and Property Boundary

Maha Resort and Guenoc Valley Development, Phase 1
Biological Resources Assessment
Lake County, California

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Roving Surveys

In addition to fixed-point observation periods, biologists spent several hours each day a fixed-point survey occurred conducting ground-based roving surveys in focal portions of the property. Roving locations were selected to compliment fixed survey points and included areas not well covered by the fixed-point stations and areas where biologists observed concentrated raptor activity or suspected nesting activity during fixed-point surveys. Potential nest sites identified during fixed-point surveys were investigated more closely during roving surveys to determine nesting status. When a nest site was suspected to be active, surveyors observed from as far away as feasible to avoid disturbing nesting birds. Information was gathered regarding species, nesting substrate, distance from the ground, nest structure type, and nest stage.

Roving surveys also covered "blind-spots" that were not directly visible during fixed-point surveys. Roving surveys were covered by vehicle and on foot. Raptors observed were recorded with location, species, and any associated behavior. Roving surveys were of no specified duration and were intended to supplement data collected during fixed-point surveys. Roving surveys were conducted individually and as pairs. Figure 2 shows the extent of the area covered over the course of the various roving surveys.

Survey Level of Effort

From April 2 to May 24, 2018, a total of four 3-day survey efforts were conducted with three to four surveyors present during each survey. A total of 50 fixed-point surveys were conducted over the course of 12 survey days. Roving surveys were quantified by the number of surveyors conducting a roving survey at any given time. Under these parameters, 27 roving surveys were conducted over the course of 12 survey days. The survey efforts are summarized in Table 1.

GIS Analysis

A GIS viewshed analysis was conducted prior to the initial fieldwork to identify potential survey locations with the greatest visual coverage of the Phase 1 Study Area and surrounding habitats. The viewshed analysis was performed using the ESRI viewshed tool and United States Geological Survey 10 meter elevation profiles for the site. The viewshed tool provides a digital representation of the area which can be viewed from a selected point. A set of eight survey points with viewsheds spanning the Phase 1 Study Area was developed as a baseline for survey point locations to be used in the field. Survey points were modified in the field based on access and localized visual obstructions such as trees or boulders.

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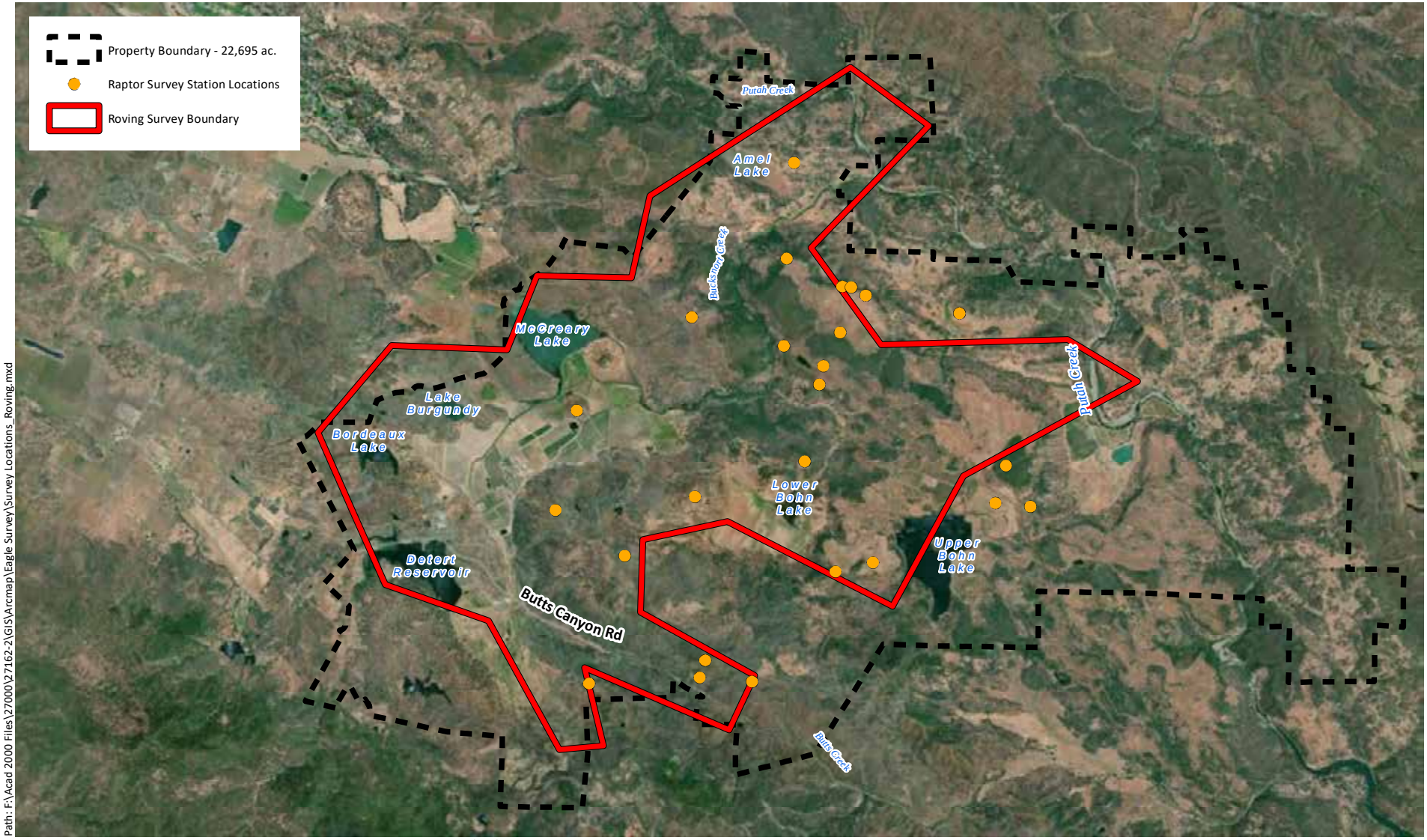

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Sources: Esri Streaming - NAIP 2016, WRA | Prepared By: mrochelle, 8/31/2018

Figure 2. Roving Survey Boundary with Survey Stations and Property Boundary

Maha Resort and Guenoc Valley Development, Phase 1
Biological Resources Assessment
Lake County, California

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Table 1. Summary of Survey Effort

Survey Date	Number of Dawn Fixed-point Surveys	Number of Surveyors Conducting Roving Survey	Number of Dusk Fixed-point Surveys	Viewshed(s) Surveyed
April 2	-	3	3	1
April 3	3	3	3	2,3
April 4	3	3	-	4
April 24	-	3	3	5
April 25	3	3	3	6,7
April 26	3	3	-	8
May 8	-	3	3	1
May 9	3	3	3	2,3
May 10	3	3	-	4
May 22	-	3	4	5
May 23	4	4	3	6,7
May 24	3	3	-	8
Total	**25**	**27**	**25**	

Following the surveys, georeferenced observations of special-status raptors were analyzed by GIS to develop density heat maps. Density heat maps depict areas where more frequent observations were made and represent locations more frequently utilized by raptors. Density analysis for special-status raptor occurrences was performed by the Kernel Density geoprocessing tool within ESRI's ArcGIS environment. Kernel Density calculates the density of point occurrences within the surrounding neighborhood for each cell within the analysis extent. A search diameter of 1 mile was used as the input parameter and weighted by the number of observations recorded during the field surveys.

6.0 RESULTS

General Observations

During the survey period, a total of 78 avian species were observed, including 14 raptor species[1] (Table 2). Raptors were observed foraging, perching, flying, soaring, and nesting. All recorded raptor observations from the survey period are shown on Figure 3. The figure shows the highest concentration of observations near Lower Bohn and Upper Bohn lakes. While raptors were

[1] Cooper's hawk (*Accipiter cooperii*) was observed incidentally during a biological survey conducted on August 14, 2018, which was outside the survey period of this report. The observation was of an individual and not a nesting pair nor active nest site, and the species is not a special-status species; however, has been included as an observed raptor for this report.

observed flying and soaring throughout the property, active nests (i.e. those containing eggs or young) were only observed in undeveloped portions of the property often in association with bodies of water or edge habitats. Approximately 732 recorded raptor observations[2] were made during the survey period. Turkey vulture constituted the highest number of occurrences during the survey period with 419 observations. Turkey vulture are a common species and can be seen traveling or foraging in groups. Turkey vulture often travel by gliding or soaring on high-altitude thermals, which may account for their high detectability during fixed-point and roving surveys. Red-tailed hawk and American kestrel were also among the most frequent observed raptor species in the property. Red-tailed hawk and American kestrels are common and widespread and typically breed in semi-open habitats.

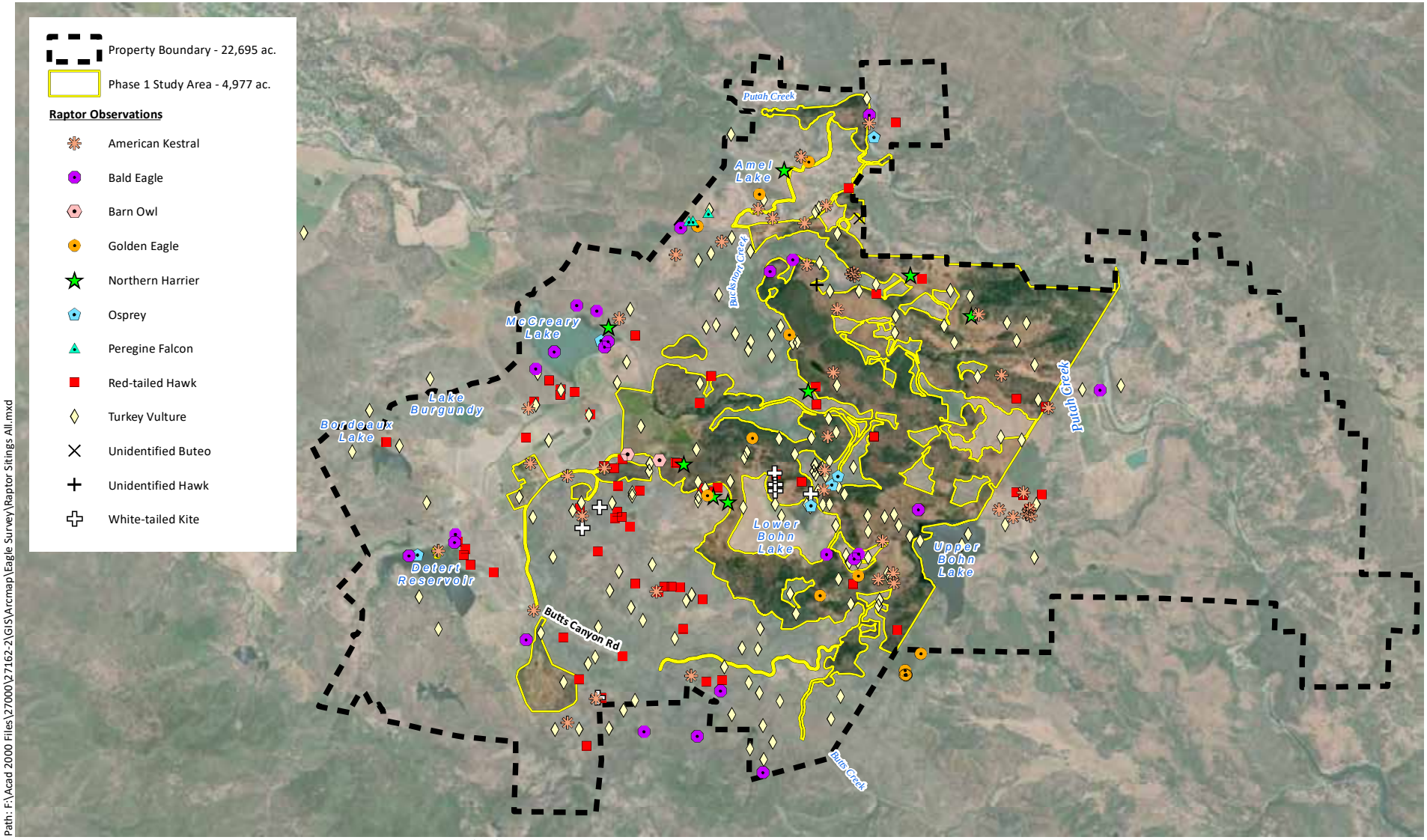
Raptors observed in the property may be protected by one or more state or federal law and designation. Table 2 outlines the laws and designations pertinent to raptor species observed in the property during the survey period.

Special-Status Species Observations

Special-status raptor species observed during the survey period are shown in bold in Table 2, and are described in more detail below. Bald eagle was the most-observed special-status species, with 30 observations throughout the survey period, followed by golden eagle, which was observed 16 times. Special-status raptor observations are summarized in Table 3. Figure 4 shows the density of special-status raptor observations across the property. The density of observations ranges from low (blue) to high (red), giving a visual representation of areas with increased activity of special-status raptors. Special-status raptors were observed in higher concentration near Lower Bohn Lake, McCreary Lake, and north of Bucksnort Creek, which are areas with a greater mix of open habitat types and heterogeneous areas (i.e. edge habitat areas). Additionally, these locations are part of habitat linkages that enable prey movement and raptor foraging that are along valley or open corridors.

Six active special-status raptor nests were observed including four bald eagle, one golden eagle, and one peregrine falcon (Figure 5). Based on the number of active nests observed, at least 12 special-status breeding raptors were supported by the property in 2018, including eight bald eagle, two golden eagle, and two peregrine falcon.

[2] A recorded raptor observation can include one or more individuals from the same species. As individual raptors were not marked or tagged, an individual may have been recorded as an observation more than once per survey and between surveys. Therefore, the recorded observations can be used to infer activity hot spot areas and relative prevalence in an area, but should not be considered a total number of individuals for a species at the site.



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Sources: Esri Streaming - NAIP 2016, WRA | Prepared By: mrochelle, 6/28/2019

Figure 3. All Raptor Observations with Phase 1 and Property Boundaries

Maha Resort and Guenoc Valley Development, Phase 1
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Lake County, California

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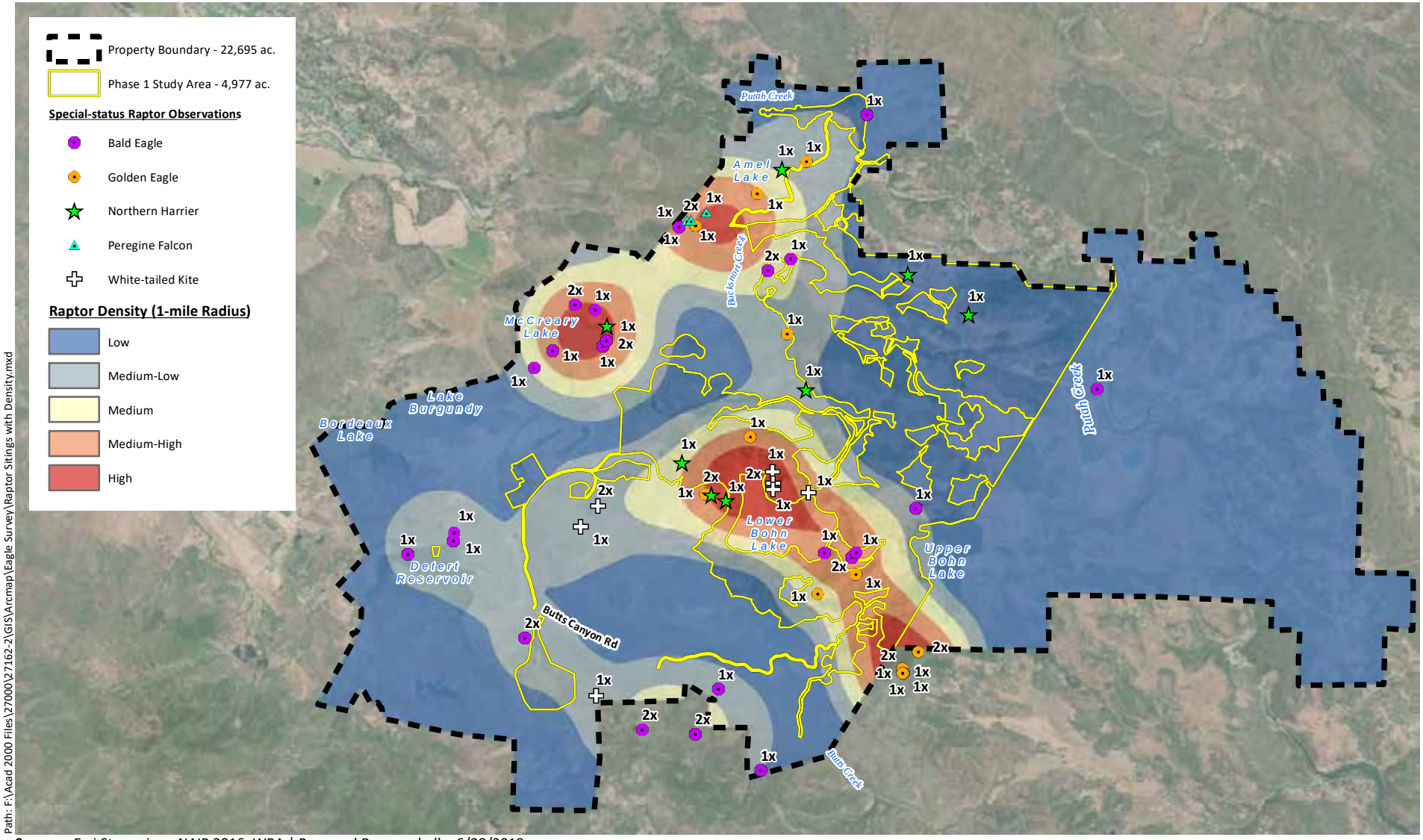

Sources: Esri Streaming - NAIP 2016, WRA | Prepared By: mrochelle, 6/28/2019

Figure 4. Special-Status Raptor Observation Density Map

Maha Resort and Guenoc Valley Development, Phase 1
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Lake County, California

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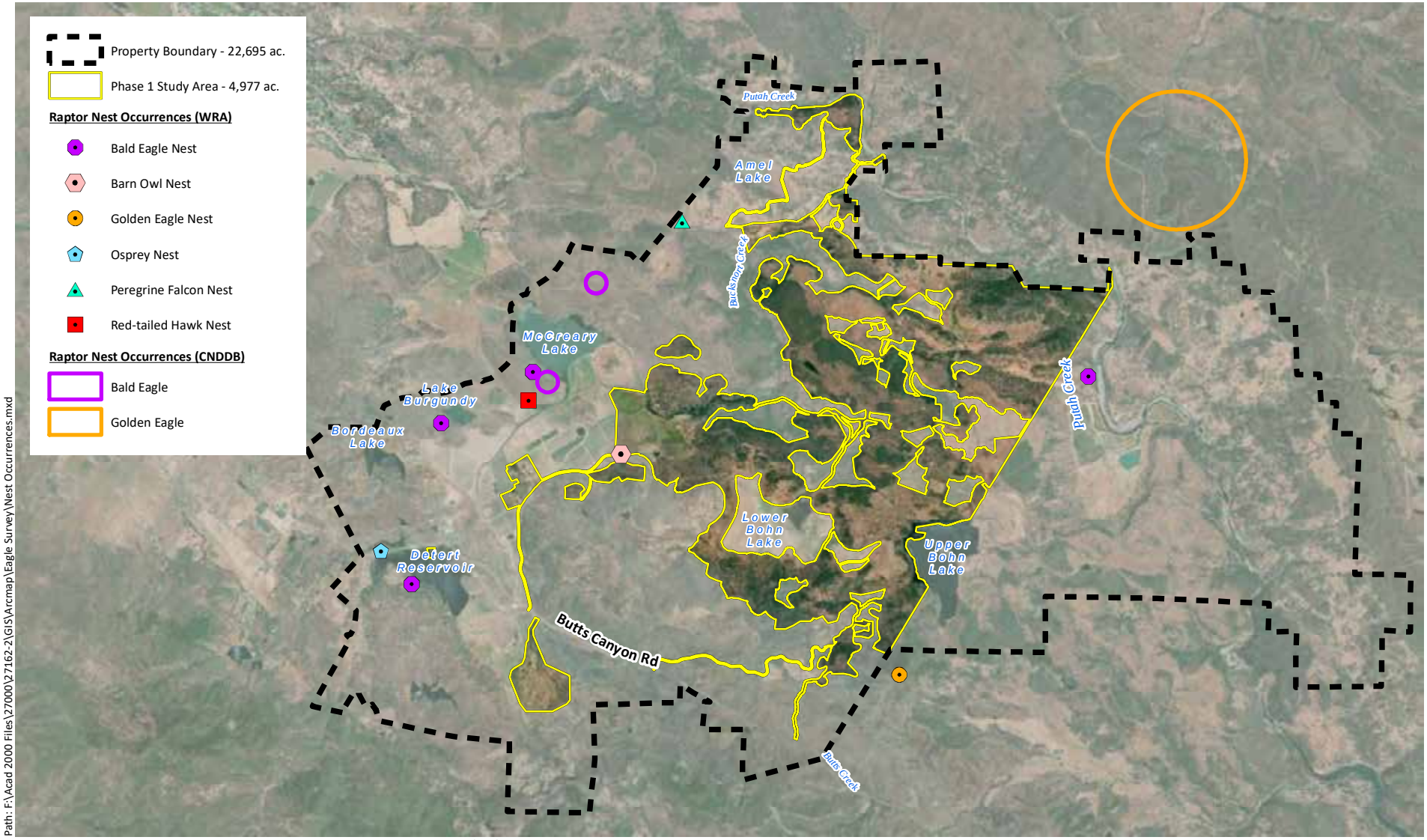

Sources: Esri Streaming - NAIP 2016, WRA | Prepared By: mrochelle, 6/28/2019

Figure 5. Raptor Nest Occurrences

Maha Resort and Guenoc Valley Development, Phase 1
Biological Resources Assessment
Lake County, California

0 1 2 Miles

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Table 2. Raptors Observed within the property and Status of their Regulatory Protection (species listed in bold are special-status raptors)

Scientific Name	Common Name	CESA	BGEA	BCC, SSC	CFP	MBTA, CFGC
Accipiter cooperii	Cooper's hawk	-	-	-	-	×
Aquila chrysaetos	**Golden eagle**	-	×	×	×	×
Bubo virginianus	Great-horned owl	-	-	-	-	×
Buteo jamaicensis	Red-tailed hawk	-	-	-	-	×
Buteo lineatus	Red-shouldered hawk	-	-	-	-	×
Cathartes aura	Turkey vulture	-	-	-	-	×
Circus cyaneus	**Northern harrier**	-	-	×	-	×
Elanus leucurus	**White-tailed kite**	-	-	-	×	×
Falco peregrinus	**Peregrine falcon**	-	-	×	×	×
Falco sparverius	American kestrel	-	-	-	-	×
Haliaeetus leucocephalus	**Bald eagle**	×	×	×	×	×
Megascops kennicottii	Western screech owl	-	-	-	-	×
Pandion haliaetus	Osprey	-	-	-	-	×
Tyto alba	Barn owl	-	-	-	-	×

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Table 3. Special-Status Raptor Species Observations

Species	Number of Observations	Number of Nests Located
Golden eagle	**16**	**1**
Bald eagle	**30**	**4**
White-tailed kite	**9**	**0**
Peregrine falcon	**4**	**1**
Northern harrier	**9**	**0**

The following sections provide additional information on the special-status raptors that were observed during the survey period.

Bald eagle (*Haliaeetus leucocephalus*), Federal Eagle Protection Act, State Endangered, CDFW Fully Protected Species, USFWS Bird of Conservation Concern. The bald eagle occurs primarily as a winter visitor but also as a year-round (breeding) resident throughout most of California. Habitat is somewhat variable, but the species is usually strongly associated with larger bodies of water including lakes, reservoirs, major river systems, estuaries, and the ocean. Breeding occurs primarily in forested areas near water bodies; wintering habitat is more general, though water is usually present. The species typically builds or occupies large nests that are usually built in in the upper portions of large, live trees that provide dominant views of surrounding areas (Buehler 2000). Bald eagles are highly opportunistic foragers; fishes and waterfowl are usually favored, but a variety of live prey and carrion are consumed.

Multiple observations were made during the survey period of adult and juvenile bald eagle flying and roosting adjacent to reservoirs within and adjacent to the Phase 1 Study Area. Four total active bald eagle nests were observed near the following water features: Detert Reservoir, Lake Burgundy, McCreary Lake, and Putah Creek (see Figure 5). Two juveniles were observed in the nest by Detert Reservoir. The number of young in the other three nests was undetermined due to the height and angle of the nests. The nests were determined to be active after observing the behavior of adults which included food carries and sitting (i.e. incubating) in the nest. In addition to four nests located during the 2018 survey efforts, this species has two documented nesting occurrences in the CNDDB adjacent to the Phase 1 Study Area around McCreary Reservoir (CDFW 2018; see figure 5).

American peregrine falcon (*Falco peregrinus anatum*); Federal Delisted, State Delisted, CDFW Fully Protected, USFWS Bird of Conservation Concern. This large falcon occurs as a generally uncommon resident as well as a winter visitor and migrant throughout much of California. Occupied habitat (both breeding and non-breeding) is highly variable, but this species is typically associated with open areas and/or bodies of water. Nesting typically occurs on the ledges of steep cliffs, or on man-made structures with ledges above sheer faces such as bridges and the tops of buildings (White et. al 2002). The peregrine falcon preys upon a wide variety of animals, mostly birds; on the Pacific coast, waterbirds (e.g., waterfowl, shorebirds and seabirds) are especially favored (White et. al 2002). This species forages over wide areas, even during the breeding season.

There are several reservoirs and rocky cliffs within and adjacent to the property that provide potential foraging and nesting habitat for this species. During the survey period, an active peregrine falcon nest was observed on a south-facing rocky cliff north of Bucksnort Creek (see Figure 5). Two adults were seen tending to the nest which had whitewash below the platform. The number of young in the nest could not be determined due to its height and position on the cliff. This species was only observed in close proximity to the nest site near Bucksnort Creek, in an undeveloped portion of the property.

Golden eagle (*Aquila chrysaetos*), Federal Eagle Protection Act, CDFW Fully Protected Species, USFWS Bird of Conservation Concern. The golden eagle is a large raptor that occurs in open and semi-open areas from sea level to high elevation. Typical occupied habitats include grasslands, shrublands, deserts, woodlands, and coniferous forests. Breeding activity occurs broadly from January through August, and in California is usually initiated from January to March. Egg laying and incubation can take between 44 and 50 days, with chicks fledging the nest an average of 64 days after hatching (Kochert et al. 2002). The large stick nests of this species are reused across years and may be maintained throughout the year. Nests are most often placed on the ledges of steep cliffs, but nesting also occurs in trees and on tall manmade structures (e.g., utility towers) (Kochert et al. 2002). Golden eagles forage over wide areas, feeding primarily on medium-sized mammals (e.g., ground squirrels and rabbits), large birds, and carrion.

Multiple observations were made during the survey period of adult and juvenile golden eagle flying, foraging, and perching throughout the property and Phase 1 Study Area, including over forest habitat, open grassland, and agricultural areas. The Phase 1 Study Area contains suitable nesting and foraging habitat for this species, and an active golden eagle nest was located just south of the property (see Figure 5). The nest was monitored with a spotting scope to determine the status of the nest. Adults were observed tending to the nest with two juveniles. In addition to the nest located during 2018 surveys, this species has a documented nesting occurrence north of the property (CDFW 2018; see figure 5).

Northern harrier (*Circus hudsonius [cyaneus]*). CDFW Species of Special Concern. The northern harrier occurs as a resident and winter visitor in open habitats throughout most of California, including freshwater and brackish marshes, grasslands and fields, agricultural areas, and deserts. Harriers typically nest in treeless areas within patches of dense, relatively tall, vegetation, the composition of which is highly variable; nests are placed on the ground and often located near water or within wetlands (Shuford and Gardali 2008). Harriers are birds of prey and subsist on a variety of small mammals and other vertebrates.

This species was observed foraging in marsh and grassland habitat of the Phase 1 Study Area. The species was typically observed within the vicinity of water features, including McCreary Lake, Lower Bohn Lake, and Butcherknife Creek. No nesting activity or active nests for this species were detected during the survey; however, suitable nesting habitat is present along the tall vegetated marsh and grassland areas around the reservoirs and creeks in the Phase 1 Study Area.

White-tailed kite (*Elanus leucurus*). CDFW Fully Protected Species. The white-tailed kite is a resident in open to semi-open habitats throughout the lower elevations of California, including grasslands, savannahs, woodlands, agricultural areas and wetlands. Vegetative structure and prey availability seem to be more important habitat elements than associations with specific plants or vegetative communities (Dunk 1995). Nests are constructed mostly of twigs and placed in trees, often at habitat edges. Nest trees are highly variable in size, structure, and immediate

surroundings, ranging from shrubs to trees greater than 150 feet tall (Dunk 1995). This species preys upon a variety of small mammals, as well as other vertebrates and invertebrates.

The Phase 1 Study Area contains open foraging habitat as well as trees and shrubs suitable for nesting by this species. White-tailed kite was observed flying and foraging within the Phase 1 Study Area in open fields, areas of agricultural productions, and forest edge habitat. No nesting activity or active nests for this species were detected during the survey; however, suitable nesting habitat areas and habitat occur along the forested edges and grassland portions of the property.

Non-Status Raptor Nest Observations

Three non-status raptor nests documented during the surveys. Non-status raptor nests included an osprey nest by Detert Reservoir and a red-tailed hawk nest by McCreary Lake. Additionally, an active barn owl nest was observed within a bird box that was adjacent to a vineyard. No nesting behavior was observed directly in areas of agricultural production; however, the occurrence of barn owl and their frequency for using human structures including barns, buildings, and artificial bird boxes can make the agricultural areas potentially suitable for the species.

Many remnant nest structures of suitable size for raptors were observed throughout the property. However, because there are other avian species which may have similar nest structures, nests were not recorded and mapped as raptor nests unless a raptor was observed in direct association with the nest. Figure 5 shows the raptor nests that were confirmed as active during the survey period.

7.0 DISCUSSION AND RECOMMENDATIONS

Fourteen special-status and non-status raptor species were observed within the property exhibiting behaviors which included flying, foraging, and nesting. Nine active raptor nests were located and these nesting occurrences were confined to land that is not currently used for agricultural production. With the exception of a barn owl nest located in an actively used barn, no active raptor nests were detected within the Phase 1 Study Area during the survey period. However, construction activities within the Phase 1 development area may cause noise disturbance or direct loss of foraging habitat, resulting in impacts to nesting raptor species. In order to avoid impacts to nesting raptor species, it is recommended that vegetation removal, demolition of buildings or work on bridges, or initial ground disturbance activity occur outside of the nesting season, defined as February 1 through August 31. If initiation of project work within the nesting season cannot be avoided, then a pre-construction nesting bird survey within the work area should be completed by a biologist no more than 14 days prior to the start of work.

Areas with recurring special-status nesting observations (McCreary Lake) or meeting specific habitat requirements (cliff habitat by Bucksnort Creek) may be considered important for the conservation of special-status raptors. Construction related activities should be avoided in these areas or limited to outside of the nesting season. Additionally, the land use that could increase lighting or anthropogenic noise could reduce nesting suitability and should be minimized or avoided in these areas.

Raptor foraging areas can be large, depending on species, and include several habitat types that are present in the Phase 1 Study Area. The loss or conversation of grassland and forest habitats into buildings or vineyards may reduce prey availability for some species, such as golden eagle and white-tailed kite that may frequently forage on small mammals like lagomorphs (i.e. hares and rabbits) or ground squirrels. Conversion of these areas may have less of an impact on some

species foraging, like American kestrel or bald eagle, which are not as dependent upon those small mammals as a dominate prey base. In general, providing habitat linkages and a mix of habitat types can support a broader prey base and would be important to the conservation of raptors in the property. Additionally, supporting raptor friendly land management practices such as limiting or preventing the use of small mammal poisoning is recommended to prevent indirectly poising raptors that may prey on organisms that have ingested the poison.

While the raptor surveys indicate presence of special-status species and suitable habitat within the Phase 1 Study Area, the survey results may not represent the density of all special-status species due to survey constraints. Suitable habitat varies between raptor species. For example, northern harriers nest on the ground in open fields where bald eagles generally nest in forested areas adjacent to large bodies of water. While preferred prey and forage habitat can vary by species, foraging across all special-status raptor species was more frequently observed in and around open grassland, edge habitats such as forest and wetland/stream areas, and in association with water. Less direct foraging was observed in vineyard areas or developed sites, which may be attributed to lower levels of prey availability (i.e. small mammals, birds, reptiles, and fish) in these locations. Additionally, areas with greater habitat heterogeneity and linkages, such as a series of ponds/lakes, or interconnected grassland and forest habitats, had a greater abundance of raptors observed (Figure 4). Surveys were conducted during the 2018 breeding season and thus do not reflect winter-concentration or non-breeding season behavior.

The fixed-point surveys were generally within ¼-mile of a road with a varying degree of anthropogenic disturbance. The survey efforts were evenly distributed throughout the Phase 1 Study Area to the extent possible. However, rugged areas with minimal anthropogenic disturbance such as steep cliff-faces and dense forest may be underrepresented in the survey results due to accessibility. Additionally, there may be multiple observations of an individual raptor. Surveyors attempted to keep track of reoccurring individuals during each survey, but an individual may have been recorded more than once due to overlapping views from separate survey points. Conversely, there may be species that went under detected during a survey due to obstructions in the viewshed. Furthermore, some raptors may be less detectable during fixed-point surveys due to their behavior and preferred habitat type. For example, red-shouldered hawks generally perch in a forest canopy, whereas a bald eagle forages over open water. Bald and golden eagles were the most detected special-status raptor, as fixed-point surveys at high vantage points focus more on soaring species than species more closely associated with forested habitat. Despite these limitations, the field surveys conducted in April and May of 2018 provided baseline levels of raptor activity, presence, and nesting behavior within the property.

8.0 REFERENCES

California Department of Fish and Wildlife (CDFW). 2018. California Natural Diversity Database. Wildlife and Habitat Data Analysis Branch, Sacramento, CA.

Buehler, D. 2000. Bald Eagle (*Haliaeetus leucocephalus*), The Birds of North America (P. G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America: https://birdsna.org/Species-Account/bna/species/baleag.

Dunk, JR. 1995. White-tailed Kite (*Elanus leucurus*), The Birds of North America Online (A Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/178.

Kochert, M., K. Steenhof, C. McIntyre, E. Craig. 2002. Golden Eagle (Aquila chrysaetos). Pp.1-44 in A. Poole, F. Gill, eds. The Birds of North America, Vol. 684. Philadelphia: The Birds of North America.

Shuford, W.D., and T. Gardali (eds). 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and CDFG, Sacramento.

White, C. M., N. J. Clum, T. J. Cade, and W. G. Hunt (2002). Peregrine Falcon (*Falco peregrinus*), version 2.0. In The Birds of North America (A. F. Poole and F. B. Gill, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA.

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APPENDIX I

SITE PHOTOGRAPHS

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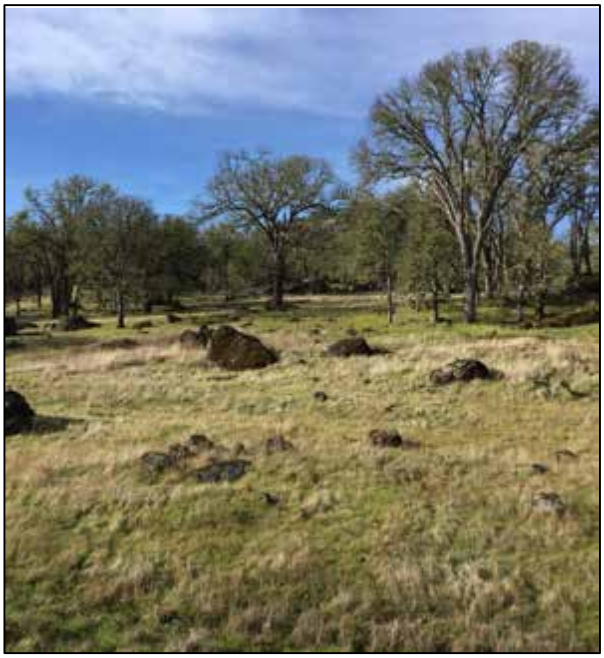
Photograph 2. White alder groves along Bucksnort Creek in the northern portion of the Phase 1 Study Area (taken June 7, 2018).

Photograph 3. Foothill pine woodland within the Phase 1 Study Area (taken April 2, 2018).

Photograph 4. Foothill pine woodland within the Phase 1 Study Area (taken March 30, 2018).

Photograph 5. Blue oak woodland within the Phase 1 Study Area (taken April 18, 2018).



Photograph 6. Blue oak woodland within the Phase 1 Study Area (taken March 30, 2018).

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Photograph 11. Interior live oak woodland within the Phase 1 Study Area (taken June 6, 2017).

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Photograph 13. Chamise chaparral (burned) within the Phase 1 Study Area (taken April 20, 2018).

Photograph 14. Chamise chaparral within the Phase 1 Study Area (taken May 1, 2018).

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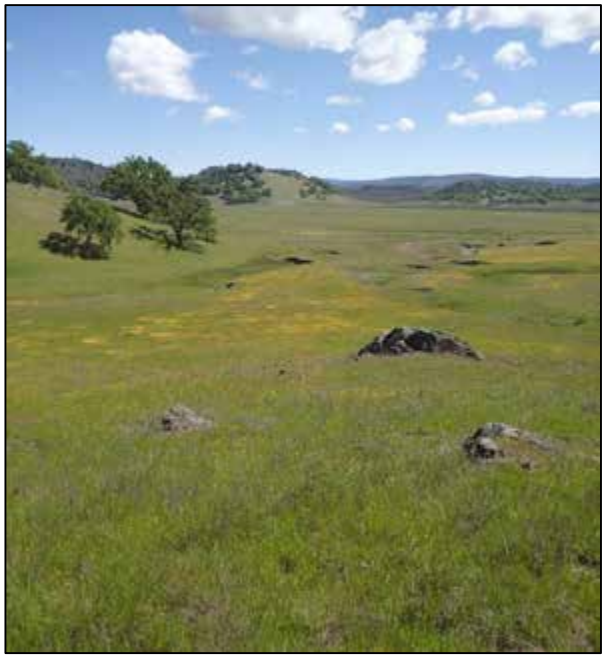
Photograph 26. Brewer willow thickets along McCain Creek (taken May 18, 2018).

Photograph 27. Non-native grasslands within the Phase 1 Study Area, in spring (taken March 30, 2018).



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Photograph 53. Rock outcrops within the Phase 1 Study Area (taken June 7, 2018).

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Photograph 55. Keck's checkerbloom within the Phase 1 Study Area (taken May 17, 2018).

Photograph 56. Lake County western flax (*Hesperolinon didymocarpum*; SE, CNPS Rank 1B.2) within the Phase 1 Study Area (taken May 17, 2018).

Photograph 57. Lake County western flax within the Phase 1 Study Area (taken May 15, 2018).

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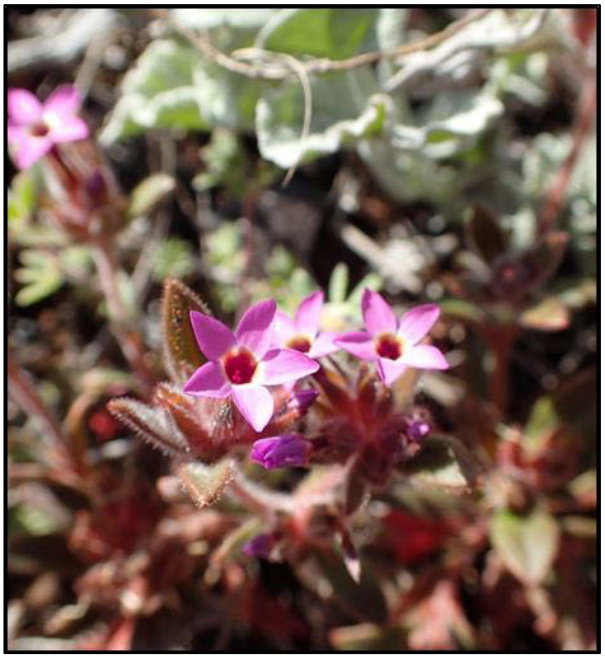
Photograph 71. Tracy's clarkia (*Clarkia gracilis* ssp. *tracyi*; Rank 4.2) within the Phase 1 Study Area (taken June 8, 2018).



Photograph 72. Serpentine collomia (*Collomia diversifolia*; CNPS Rank 4.3) within the Phase 1 Study Area (taken April 18, 2018).

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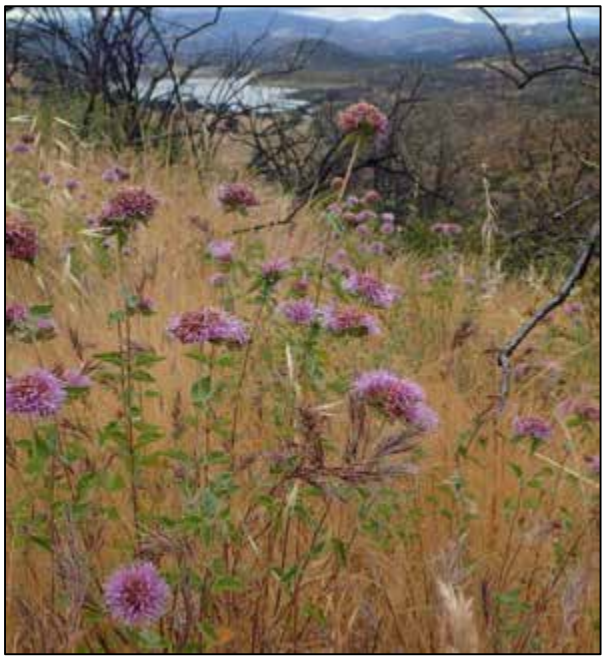
Photograph 78. Hoover's lomatium (*Lomatium hooveri*; CNPS Rank 4.3) within the Phase 1 Study Area (taken March 29, 2018).



Photograph 79. Green monardella (*Monardella viridis*; CNPS Rank 4.3) within the Phase 1 Study Area (taken June 8, 2017).

Photograph 80. Cotula navarretia (*Navarretia cotulifolia*; CNPS Rank 4.2) within the Phase 1 Study Area (taken May 3, 2018).

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Photograph 84. Golden eagle (*Aquila chrysaetos*; BGEA, CFP, BCC) within the Phase 1 Study Area (taken April 2, 2018).

Photograph 85. Bald eagle (*Haliaeetus leucocephalus*; BGEA, SE, CFP BCC) within the Phase 1 Study Area (taken April 25, 2018).

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Photograph 88. Western pond turtle within the Phase 1 Study Area (taken April 3, 2018).

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Photograph 90. Foothill yellow-legged frog egg masses within Butts Creek in the southern portion of the Phase 1 Study Area (taken April 4, 2018).

APPENDIX BRA2

FUTURE PHASES BIOLOGICAL RESOURCES ASSESSMENT

Biological Resources Assessment

MAHA RESORT AND GUENOC VALLEY DEVELOPMENT, PHASE 2 AND OPEN SPACE LAKE COUNTY, CALIFORNIA

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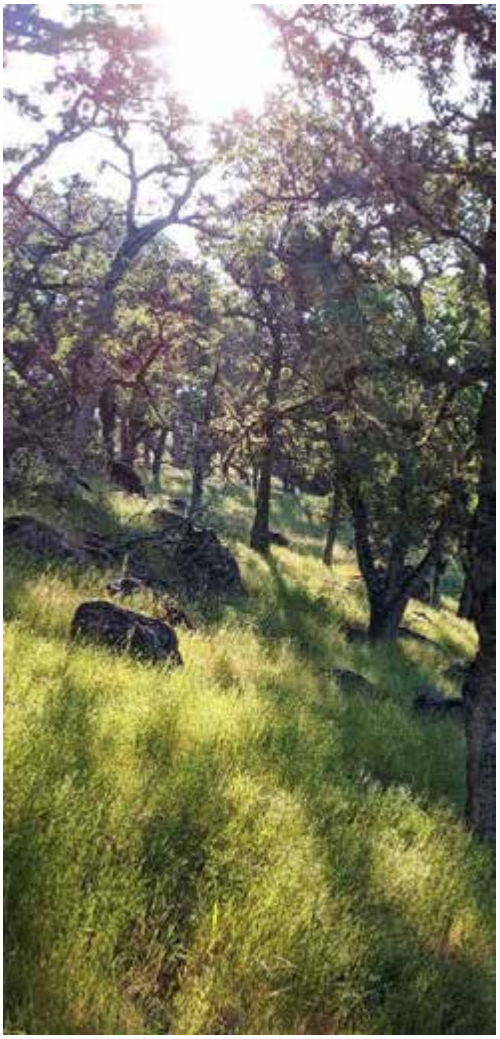
WRA Project No. 27162-2



EXECUTIVE SUMMARY

This report provides an assessment of biological communities and special-status plant and wildlife species within the approximately 11,550-acre Phase 2 and Open Space Study Area for the proposed Maha Resort and Guenoc Valley Development located on the approximately 22,695-acre Guenoc Ranch. This report is intended to supplement the Biological Resources Assessment report prepared for Phase 1 of the project (WRA 2019).

On multiple dates in 2018 and 2019, WRA biologists conducted surveys across Guenoc Ranch to document baseline biological conditions to support an assessment of biological resources under the California Environmental Quality Act. The specific focus of WRA's efforts included mapping biological communities and landcover types, conducting reconnaissance-level surveys for special-status plants, and assessing the potential for special-status wildlife species to occur. Efforts in 2018 primarily focused on the Phase 1 portions of the property, but had some overlap with the Phase 2 and Open Space portions of the property. Efforts in 2019 had a specific focus on the Phase 2 and Open Space areas. This report describes the methods and results of those surveys and assessments and also provides recommendations for avoiding or minimizing impacts to sensitive resources, as well as mitigation measures for unavoidable impacts.

Guenoc Ranch is located in unincorporated Lake and Napa counties, California, with the Phase 2/Open Space Study Area occurring entirely within Lake County. The Ranch contains a mix of undeveloped lands, agricultural lands including cattle pastures and vineyards, and minor areas of infrastructure to support vineyard, winery, and cattle operations. Within the Phase 2 and Open Space Areas, WRA documented 25 biological communities and other land use designations, including 13 sensitive biological community types covering 4,932 acres. This includes approximately 330 acres of wetland habitat, 626 acres of ponds and reservoirs, and 148 acres and 736,000 linear feet of streams (including 941 linear feet of ditches that may be considered Waters of the United States and/or Waters of the State).

WRA documented 660 plant taxa[1], and 130 wildlife species[2]. Twenty-eight special-status plant species were observed, and an additional 80 special-status plant species were determined to have moderate to high potential to occur, primarily associated with serpentine and volcanic habitats found throughout the Phase 2 and Open Space areas. Fourteen special-status wildlife species were observed within the larger Guenoc Ranch and have potential to occur in the Phase 2 and Open Space areas. An additional 21 special-status wildlife species were determined to have potential to occur in one or more habitats within the Phase 2/Open Space Study Area.

WRA documented several federal- and state-protected species including Keck's checkerbloom (*Sidalcea keckii*; Federal Endangered), Lake County western flax (*Hesperolinon didymocarpum;* State Endangered), bald eagle (*Haliaeetus leucocephalus*; Federal Bald and Golden Eagle Protection Act, State Endangered), golden eagle (*Aquila chrysaetos*; Federal Bald and Golden Eagle Protection Act, California Fully Protected Species), and foothill yellow-legged frog (*Rana boylii*; State Candidate), white tailed kite (*Elanus leucurus*; California Fully Protected Species),

[1] Includes plant species observed throughout the property, in both the Phase 1 and Phase 2/Open Space areas.
[2] Includes wildlife species observed throughout the property, in both the Phase 1 and Phase 2/Open Space areas.

and peregrine falcon (*Falco peregrinus*; California Fully Protected Species). Bald eagle, golden eagle, and peregrine falcon nests were observed in association with Detert Reservoir, McCreary Lake, Lake Burgundy, and other areas. White tailed kite was observed foraging near Lower Bohn Lake and other portions of the Phase 2/Open Space Study Area, but was not documented nesting.

The size and diversity of habitats found within the Phase 2/Open Space Study Area makes it an important resource for plant and wildlife species. The large acreage of serpentine and volcanic soils and the high number of aquatic resources found within the Phase 2/Open Space Study Area provides suitable habitat for numerous special-status plant and wildlife species. The Project proposes to minimize impacts to sensitive resources to the fullest extent feasible and practicable through a combination of (1) extensive pre-planning surveys to document and avoid sensitive resources during the design phase, (2) pre-construction surveys to account for project phasing and potential changes in the distribution of sensitive resources following the original pre-planning surveys, (3) robust best management practices to avoid and/or minimize potential impacts when working around sensitive resources or within suitable habitat for special-status species. Where it is infeasible to avoid impacts, the project proposes to offset impacts through the conservation of a large open space corridor and other selected portions of the Ranch that contain high-quality examples of the sensitive resources in question.

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LIST OF ACRONYMS AND ABBREVIATIONS

BCC	USFWS Bird of Conservation Concern
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFGC	California Fish and Game Code
CFP	California Fully Protected Species
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
Corps	U.S. Army Corps of Engineers
CRLF	California Red-Legged Frog
CWA	Clean Water Act
DBH	Diameter at Breast Height
EFH	Essential Fish Habitat
ESA	Federal Endangered Species Act
FC	Federal Candidate
FE	Federal-Endangered
FT	Federal-Threatened
FYLF	Foothill Yellow-Legged Frog
HMMP	Habitat Mitigation and Monitoring Plan
ITP	Individual Take Permit
MBTA	Migratory Bird Treaty Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
OWHM	Ordinary High Water Mark
Rank	California Rare Plant Rank
RWQCB	Regional Water Quality Control Board
SC	State-Candidate
SE	State-Endangered
SSC	CDFW Species of Special Concern
SSI	CDFW Special-Status Invertebrate
ST	State-Threatened
USDA	U.S. Department of Agriculture
USDOI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WBWG	Western Bat Working Group
WPT	Western pond turtle
WRA	WRA, Inc.

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1.0 INTRODUCTION

On multiple dates in 2018 and 2019, WRA, Inc. (WRA) performed a reconnaissance-level assessment of biological resources within the approximately 11,550-acre Study Area for the Phase 2 and the Open Space portions of the proposed Maha Resort and Guenoc Valley Development located in Lake County, California (Figure 1, 2). The project is sited within the approximately 22,695-acre Guenoc Ranch, located on Butts Canyon Road, approximately 6 miles southeast of Middletown. Guenoc Ranch spans portions of both unincorporated Lake and Napa counties; however, the Study Area for Phase 2 and the Open Space occurs entirely within Lake County. The purpose of the assessment was to develop a baseline biological inventory to help guide planning efforts and to gather information on sensitive biological communities, special-status plant and wildlife species, and other sensitive biological resources to support an evaluation of the proposed project under the California Environmental Quality Act (CEQA).

This report is intended to supplement the Biological Resources Assessment report prepared for Phase 1 of the project (WRA 2020). This report describes the methods and results of the surveys and assessments conducted by WRA biologists to determine (1) the presence of sensitive biological communities, (2) the potential for biological communities on the site to support special-status plant and wildlife species, (3) the presence of any special-status plant or wildlife species encountered during reconnaissance-level and focused surveys, and (4) the presence of any other sensitive natural resources protected by local, state, or federal laws and regulations.

A biological resources assessment provides general information on the presence, or potential presence, of sensitive habitats and species. The biological resources assessment is not an official protocol-level survey for listed species or an official wetland delineation that may be required for project approval by local, state, or federal agencies. An overview of the delineation methods and results is provided here for completeness. The assessments presented here are based on information available at the time of the study and on conditions observed on the dates the site was visited.

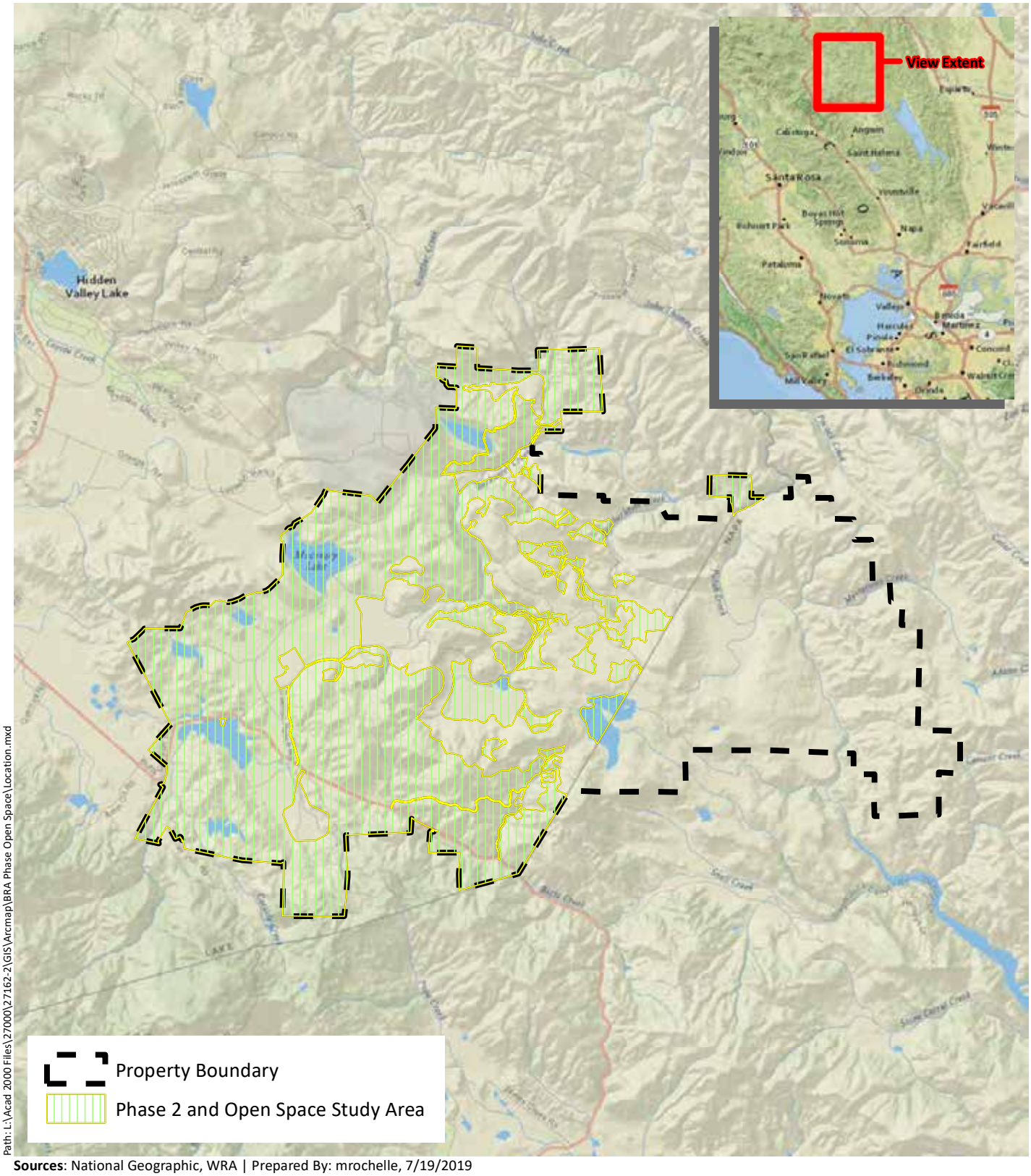
2.0 REGULATORY BACKGROUND

The following sections describe the regulatory context of the biological resources assessment, including laws and regulations that were applied to the field investigations.

2.1 Biological Communities

2.1.1 Non-Sensitive Biological Communities

Non-sensitive biological communities include plant communities with a California Department of Fish and Wildlife (CDFW) rarity ranking of S4 or S5, as well as other non-sensitive land use designations such as agriculture, developed areas, etc. These biological communities and land uses are not protected by federal, state, or local laws and are not considered sensitive under CEQA.



Sources: National Geographic, WRA | Prepared By: mrochelle, 7/19/2019

Figure 1. Phase 2 and Open Space Study Area Location

Maha Resort and Guenoc Valley
Development, Phase 2 and Open Space
Lake County, California

0 1 2 Miles

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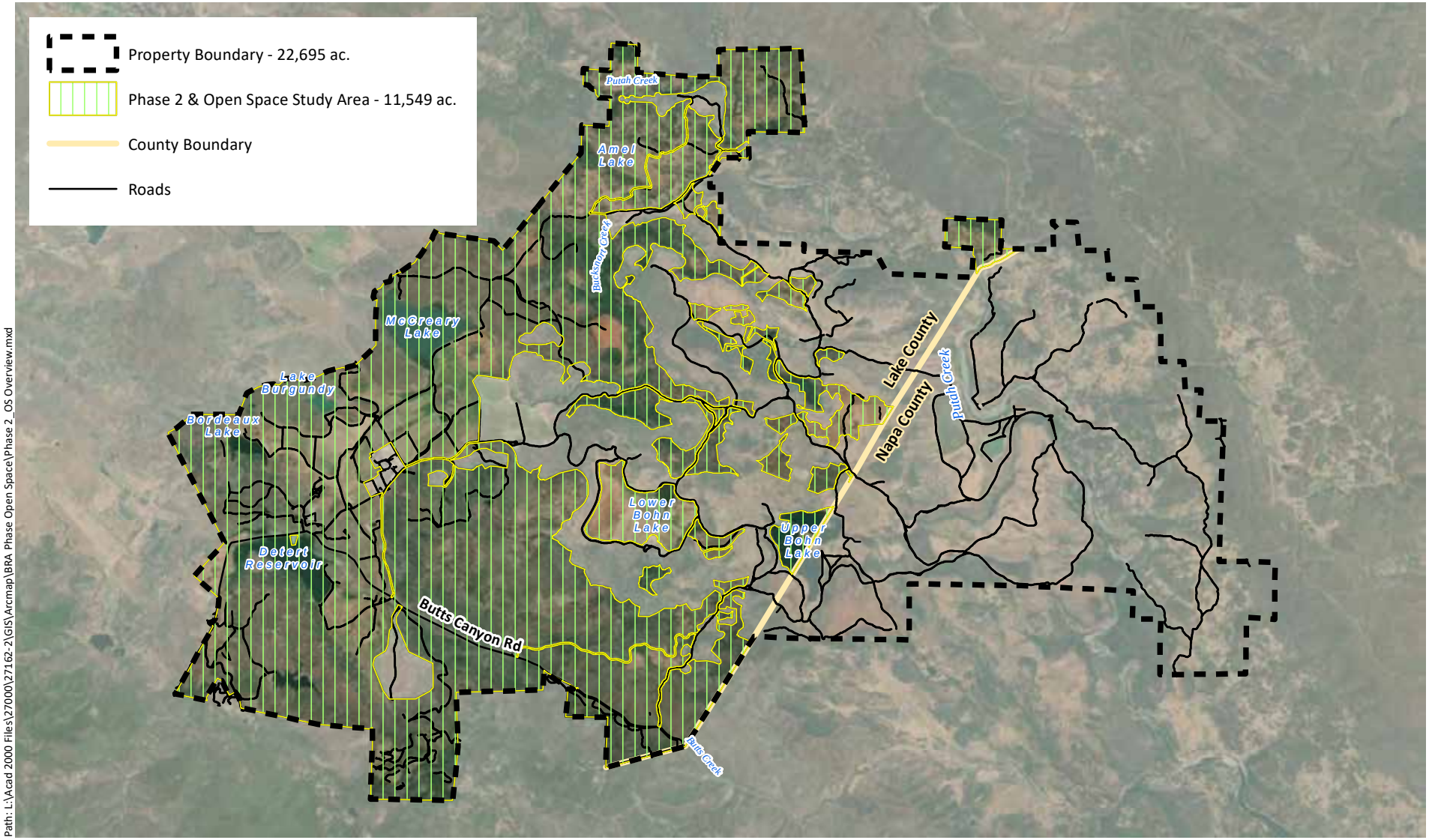

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Sources: Esri Streaming - NAIP 2016, WRA | Prepared By: mrochelle, 7/19/2019

Figure 2. Phase 2 and Open Space Study Area Overview

Maha Resort and Guenoc Valley
Development, Phase 2 and Open Space
Lake County, California

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2.1.2 Sensitive Biological Communities

Sensitive biological communities include habitats that fulfill special functions or have special values, such as wetlands, streams, or riparian habitat. These habitats are protected under federal regulations such as the Clean Water Act (CWA); state regulations such as the Porter-Cologne Act, the California Fish and Game Code (CFGC), and CEQA; or local ordinances such as the County of Lake's Municipal Code and Zoning Ordinance.

Sensitive Terrestrial Communities

Other sensitive biological communities not discussed above include habitats that fulfill special functions or have special values. Natural communities considered sensitive are those identified in local or regional plans, policies, regulations, or by the CDFW. The CDFW ranks sensitive communities as "threatened" or "very threatened" and keeps records of their occurrences in its California Natural Diversity Database (CNDDB; CDFW 2019a). Sensitive plant communities are also identified on the CDFW's Natural Community List (CDFW 2019b) and in the Manual of California Vegetation (California Native Plant Society [CNPS] 2019a). Vegetation alliances are ranked 1 through 5 based on NatureServe's methodology, with those alliances ranked globally (G) or statewide (S) as 1 through 3 considered sensitive. Impacts to sensitive natural communities identified in local or regional plans, policies, or regulations or those identified by the CDFW or U.S. Fish and Wildlife Service (USFWS) must be considered and evaluated under CEQA (California Code of Regulations [CCR] Title 14, Div. 6, Chap. 3). Specific habitats may also be identified as sensitive in city or county general plans or ordinances; the County of Lake specifically protects oak woodlands.

Sensitive Aquatic Communities

Waters of the United States

The U.S. Army Corps of Engineers (Corps) regulates "Waters of the United States" under Section 404 of the CWA. Waters of the U.S. are defined in the Code of Federal Regulations (CFR) as (1) waters used for commerce; (2) interstate waters and wetlands; (3) territorial seas; (4) impoundments of waters listed here; (5) tributaries to the above waters; (6) waters and wetlands adjacent to the above waters; and (7) prairie potholes, Carolina and Delmarva bays, Pocosins, western vernal pools, and Texas coastal prairie wetlands, provided these features have a significant nexus to the above listed waters[3]; (8) all waters located within the 100-year floodplain of waters listed above in items 1-3 or within 4,000 feet of the high tide line (HTL) or ordinary high water mark (OHWM) of a water listed above in items 1-5, provided those waters are determined to have a significant nexus to waters identified in items 1-3 above. For purposes of the determining Corps jurisdiction under the CWA, "navigable waters" as defined in the CWA are the same as "waters of the U.S." defined in 33 CFR 328.3.

Areas not considered to be "waters of the United States" as defined in 33 CFR 328.3 (b), are summarized as follows: (1) waste treatment systems; (2) prior converted cropland; (3) specific classes of ditches, including (i) ditches with ephemeral flow that are not a relocated tributary or

[3] Wetlands and non-wetland waters in this category are similarly situated and are combined, for purposes of a significant nexus analysis, in the watershed that drains to the nearest water identified in paragraphs (a)(1) through (3) of 33 CFR 328.3.

excavated in a tributary, (ii) ditches with intermittent flow that are not a relocated tributary, excavated in a tributary, or drain wetlands, and (iii) ditches that do not flow, either directly or through another water, into a water identified in 33 CFR 328.3 paragraphs (a) (1) through (3); (4) artificially irrigated areas that would otherwise revert to dry land and manmade aquatic features in otherwise dry land such as stock watering ponds, irrigation ponds, settling basins, fields flooded for rice growing, log cleaning ponds, cooling ponds, reflecting pools, swimming pools, small ornamental waters, depressions incidental to mining and construction activity, erosional features, and puddles; (5) groundwater; (6) stormwater control features; (7) wastewater recycling structures, groundwater recharge basins, percolation ponds for wastewater recycling, and distribution networks for wastewater recycling.

Potential wetlands, as defined in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), are identified by the presence of (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. Other areas such as streams and ponds, often referred to as "other waters", are characterized by an ordinary high water mark (OHWM). The placement of fill material into Waters of the U.S generally requires an individual or nationwide permit from the Corps under Section 404 of the CWA.

Waters of the State

The term "Waters of the State" is defined by the Porter-Cologne Act as "any surface water or groundwater, including saline waters, within the boundaries of the state." The Regional Water Quality Control Board (RWQCB) protects all waters in its regulatory scope and has special responsibility for wetlands, riparian areas, and headwaters. These waterbodies have high resource value, are vulnerable to filling, and are not systematically protected by other programs. RWQCB jurisdiction includes "isolated" wetlands and waters that may not be regulated by the Corps under Section 404 of the CWA. Waters of the State are regulated by the RWQCB under the State Water Quality Certification Program which regulates discharges of fill and dredged material under Section 401 of the CWA and the Porter-Cologne Water Quality Control Act. Projects that require a Corps permit, or fall under other federal jurisdiction, and have the potential to impact Waters of the State, are required to comply with the terms of the Water Quality Certification determination. If a proposed project does not require a federal permit, but does involve dredge or fill activities that may result in a discharge to Waters of the State, the RWQCB has the option to regulate the dredge and fill activities under its state authority in the form of Waste Discharge Requirements.

Streams, Lakes, and Riparian Habitat

Streams and lakes, as habitat for fish and wildlife species, are subject to jurisdiction by CDFW under Sections 1600 to 1616 of the CFGC. Alterations to or work within or adjacent to streambeds or lakes generally require a Section 1602 Lake and Streambed Alteration Agreement. The term "stream", which includes creeks and rivers, is defined as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life [including] watercourses having a surface or subsurface flow that supports or has supported riparian vegetation" (14 CCR 1.72). In addition, the term "stream" can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife. "Riparian" is defined as "on, or pertaining to, the banks of a stream." Riparian vegetation is defined as "vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself". Removal of

riparian vegetation also requires a Section 1602 Lake and Streambed Alteration Agreement from CDFW.

The County of Lake has developed a "Waterway Combining District" zoning designation that applies to all perennial and intermittent streams, including adjacent wetlands and riparian vegetation (Section 37 of the Zoning Ordinance). The County defines a protected riparian zone as an area extending:

- 30 feet from the top of bank any perennial stream,
- 20 feet from the top of bank of any intermittent stream,
- 20 feet from the edge of any adjacent wetlands or the ordinary high water mark of other bodies of water, or
- To the outer extent of vegetation dominated by common riparian species such as Fremont cottonwood (*Populus fremontii*), white alder (*Alnus rhombifolia*), box elder (*Acer negundo*), dogwood (*Cornus* spp.), willow (*Salix* spp.), and big leaf maple (*Acer macrophyllum*) (this latter zone may extend beyond 30 feet).

The County restricts development and other activities within the riparian zone defined above, with a number of exemptions for agriculture, management, and other resource-dependent activities as outlined in Sections 37.5 and 37.6 of the zoning ordinance.[4]

2.2 Special-Status Species

Special-status species include those plant and wildlife species that have been formally listed, are proposed as endangered or threatened, or are candidates for such listing under the Federal Endangered Species Act (ESA) or California Endangered Species Act (CESA). These acts afford protection to both listed species and those that are formal candidates for listing. Plant species on the California Native Plant Society (CNPS) Rare and Endangered Plant Inventory (CNPS 2019b) with California Rare Plant Ranks (Rank) of 1 and 2 are also considered special-status plant species and must be considered under CEQA. Rank 3 and Rank 4 species are afforded little or no protection under CEQA, but are included in this analysis for completeness. A description of the CNPS Ranks is provided below in Table 1.

The federal Bald and Golden Eagle Protection Act also provides broad protections to both eagle species. Additionally, CDFW Species of Special Concern (SSC), CDFW California Fully Protected (CFP) species, USFWS Birds of Conservation Concern (BCC), and CDFW Special-Status Invertebrates (SSI) are all considered special-status species. Although these aforementioned species generally have no special legal status, they are given special consideration under CEQA. Bat species are also evaluated for conservation status by the Western Bat Working Group (WBWG), a non-governmental entity; bats named as a "High Priority" or "Medium Priority" species for conservation by the WBWG are typically considered special-status and also considered under CEQA.

[4] Section 30-9 of the County Municipal Code provides different watercourse setbacks based on stream class and erosion hazard ratings. Based on conversations with the Lake County Planning Department, WRA believes that the watercourse setbacks provided in Article 37 of the Zoning Ordinance take precedence.

In addition to regulations for species that carry a special designation, most native birds in the United States (including non-status species) have baseline protections under the federal Migratory Bird Treaty Act of 1918 (MBTA) and the CFGC under sections 3503, 3503.5 and 3513. In addition to prohibiting the unauthorized intentional take of adult birds, these laws codes also prohibit the destruction or collection of active nests, including eggs and young.

Table 1. Description of CNPS California Rare Plant Ranks and Threat Codes

California Rare Plant Ranks (formerly known as CNPS Lists)	
Rank 1A	Presumed extirpated in California and either rare or extinct elsewhere
Rank 1B	Rare, threatened, or endangered in California and elsewhere
Rank 2A	Presumed extirpated in California, but more common elsewhere
Rank 2B	Rare, threatened, or endangered in California, but more common elsewhere
Rank 3	Plants about which more information is needed - A review list
Rank 4	Plants of limited distribution - A watch list
Threat Ranks	
0.1	Seriously threatened in California
0.2	Moderately threatened in California
0.3	Not very threatened in California

Critical Habitat

Critical habitat is a term defined in the ESA as a designated geographic area that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. The ESA requires federal agencies to consult with the USFWS to conserve listed species on their lands and to ensure that any activities or projects they fund, authorize, or carry out will not jeopardize the survival of a threatened or endangered species. In consultation for those species with critical habitat, federal agencies must also ensure that their activities or projects do not adversely modify critical habitat to the point that it will no longer aid in the species' recovery.

3.0 ENVIRONMENTAL SETTING

The Property is an approximately 22,695-acre property located in unincorporated Lake and Napa counties, approximately 6 miles southeast of the town of Middletown (Figure 1). The property contains a mix of undeveloped lands, agricultural lands including cattle pastures and vineyards, and minor areas of infrastructure to support vineyard, winery, and cattle operations. The property is bounded to the north by the U.S. Coast Guard LORAN Reservation, Putah Creek, and the Cedars mountain range; to the east by Putah Creek and Mysterious Valley; to the south by Table Mountain and Pope Valley; and to the west by Long Valley and Coyote Valley.

The approximately 11,550-acre Phase 2/Open Space Study Area that was examined for this report contains a subset of Guenoc Ranch that occurs entirely within Lake County. The location and extent of the Phase 2/Open Space Study Area is shown on Figure 2.

3.1 Climate and Hydrology

The Property experiences a Mediterranean climate, with cool, wet winters and hot, dry summers. Average annual rainfall is approximately 43 inches, as measured at the Natural Resources Conservation Service (NRCS) weather station in Middletown, approximately 3.5 miles to the west of the site. The majority of rain falls between November and March. Average annual temperature is 51 degrees Fahrenheit, as measured at the NRCS weather station in Clear Lake, approximately 10 miles to the northwest of the property. The average summer temperature (June through August) is 71 degrees Fahrenheit; the average winter temperature (December through February) is 44 degrees. Nearly all precipitation falls as rain.

The Property is located entirely within the Putah Creek watershed which drains into Lake Berryessa, located approximately 8 miles to the southeast of the property. The property contains significant hydrologic resources, with a large network of ponds and reservoirs connected by perennial to intermittent streams and agricultural ditches and channels. Putah Creek, a perennial stream, runs along the northern and eastern portions of the property, and many of the drainages within the property drain into Putah Creek. Other major creeks within the property include Bucksnort Creek, Butcherknife Creek, Hunting Creek, Butts Creek, and Cassidy Creek. Major ponds and reservoirs within the property include Detert Reservoir, McCreary Lake, Lake Burgundy, Lake Bordeaux, Upper Bohn Lake, Lower Bohn Lake, and Amel Lake. Many of the reservoirs within the property are connected through a network of natural streams and manmade ditches, allowing water to be moved across the site in response to management needs.

3.2 Geology and Soils

The Property contains a variety of geologic substrates including ultramafic rocks (primarily serpentinite, with minor inclusions of peridotite, gabbro, and diabase), rocks of the Franciscan complex (primarily sandstone with smaller amounts of shale, chert, limestone, and conglomerate), and volcanic flow rocks of the Clear Lake Volcanic Field (volcanic flow rocks with minor pyroclastic deposits, primarily andesite with minor amounts of dacite and basalt) (USGS 2017).

Soils mapped within Guenoc Ranch are shown on Figure 3. A list of soils and their acreage within the Phase 2/Open Space Study Area, as well as their parent material, is provided as Table 2. (California Soil Resources Lab [CSRL] 2019; USDA 1989). The ultramafic, or serpentine, origin of many of the soils found within the Phase 2/Open Space Study Area results in a unique physical and chemical composition that hinders the growth of most species that have not evolved on these soil types. As a result, serpentine soils harbor unique native plant assemblages that are resistant to invasion by non-native species and often support numerous special-status plants that are restricted to serpentine soils (Kruckeberg 1984; Alexander et al. 2007). Volcanic soils on the property may provide a similarly unique edaphic, or soil, condition that supports an atypically high diversity of native plants, including many special-status species.

In addition to the unique soil conditions found at Guenoc Ranch, a large portion of the site burned in the Valley Fire of 2015, resulting in ideal conditions for many special-status plants known to occur following fires (i.e., “fire followers”). These species are present in the seedbank, but often require a release from competition and a unique germination trigger associated with fire such as heat or smoke. The high numbers of special-status plants observed at the site is in part due to

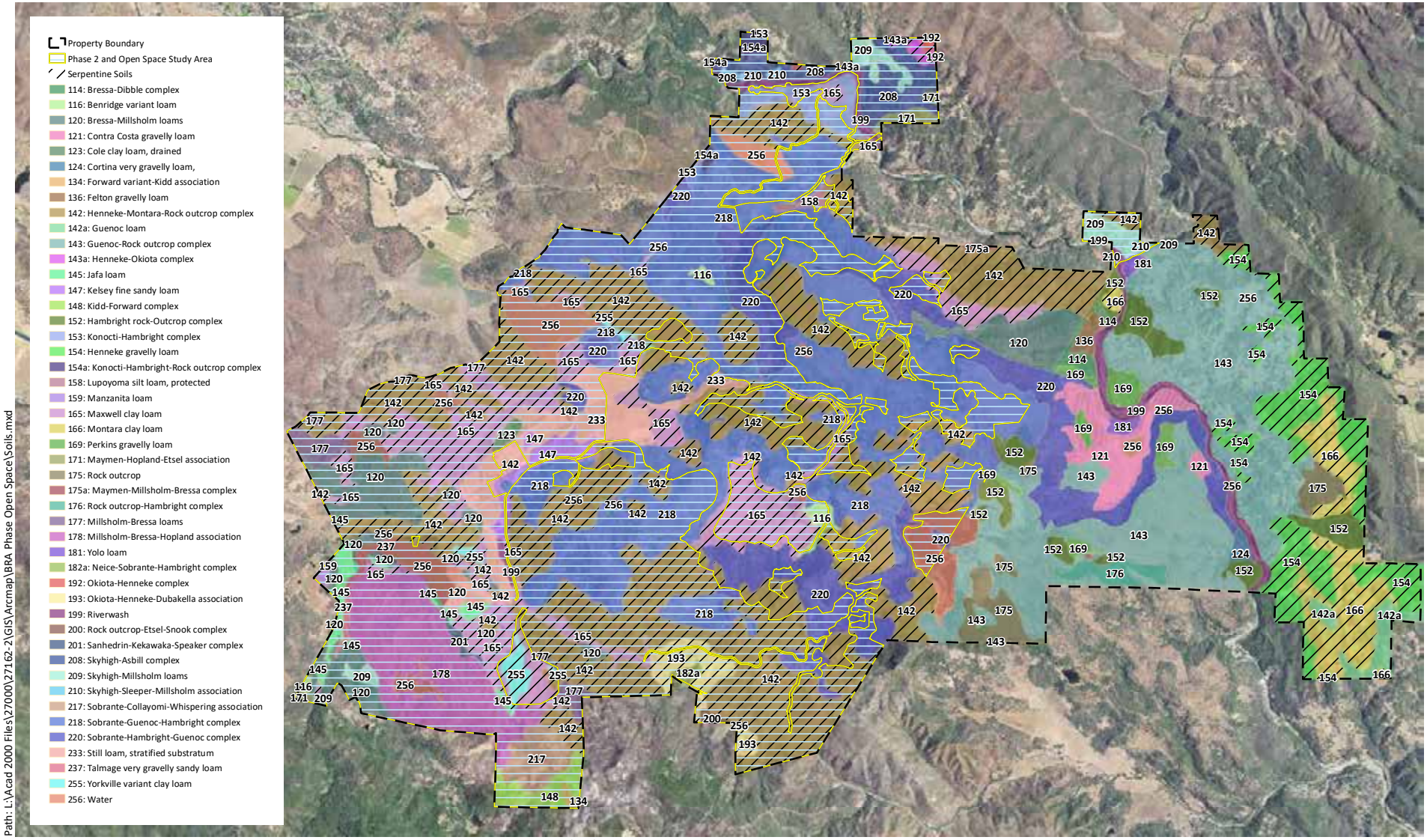
the recent fire, and it is likely that many of the occurrences will dwindle in size or disappear over time as communities develop toward climax conditions.

3.3 Vegetation and Land Use

The Phase 2/Open Space Study Area is located within the Inner North Coast Ranges geographic subdivision described by the Jepson Flora Project (2019). This area is characterized by widespread serpentine and volcanic soils experiencing relatively low rainfall and hot, dry summers; the resulting vegetation is dominated by a mix of chaparral, foothill pine woodland, and blue oak woodland, with grasslands in valley bottoms and alluvial positions. As is the case with Guenoc Ranch, many of the valley bottoms and alluvial positions throughout the region were historically converted for grazing lands, vineyards, or other agricultural uses. Much of the vegetation across the property burned during the Valley Fire of 2015, leaving many communities in an early seral stage of development, often with relict snags and downed woody debris giving evidence of the climax community that was present before the fire and may return over time.

4.0 METHODS

On multiple dates in 2018 and 2019, the Phase 2/Open Space Study Area was traversed on foot to determine (1) plant communities present within the Phase 2/Open Space Study Area, (2) whether existing conditions provide suitable habitat for any special-status plant or wildlife species, and (3) whether sensitive habitats are present. A list of all survey dates and the associated level of effort (i.e., person hours) is provided as Table 3. The assessment was conducted at the reconnaissance level only and should not be considered comprehensive. All plant and wildlife species encountered during the surveys were documented. Plant nomenclature follows Baldwin et al. (2012) and subsequent revisions by the Jepson Flora Project (2019), except where noted. For cases in which regulatory agencies, CNPS, or other entities base rarity on older taxonomic treatments, precedence was given to the treatment used by those entities. Detailed methods for each component of the assessment are provided in the following sections.



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Sources: Esri Streaming - NAIP 2016, SURGGO Soils, WRA | Prepared By: mrochelle, 7/19/2019

Figure 3. Soils within the Property Boundary

Maha Resort and Guenoc Valley
Development, Phase 2 and Open Space
Lake County, California

0 1 2 Miles

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Table 2. Soils Mapped within the Phase 2 and Open Space Study Area

Soil Map Unit	Parent Material	Acres
Benridge variant loam	Basalt	43.50
Bressa-Millsholm loams	Sandstone	519.53
Cole clay loam, drained	Mixed alluvium	23.36
Forward variant-Kidd association	Rhyolytic tuff and rhyolite	10.04
Guenoc-Rock outcrop complex	Volcanic and metamorphic rocks (basaltic)	0.73
Hambright rock-Outcrop complex	Basic volcanic rock	0.11
Henneke-Montara-Rock outcrop complex	Serpentine	3,302.60
Henneke-Okiota complex	Serpentine	28.87
Jafa loam	Mixed alluvium	114.32
Kelsey fine sandy loam	Mixed alluvium	97.46
Kidd-Forward complex	Rhyolite and rhyolytic tuff	114.40
Konocti-Hambright complex	Adesite, basalt, dacite and other basic igneous rock	112.00
Konocti-Hambright-Rock outcrop complex	Adesite, basalt, dacite and other basic igneous rock	44.46
Lupoyoma silt loam, protected	Mixed alluvium	14.72
Manzanita loam	Mixed alluvium	11.46
Maxwell clay loam	Serpentine	1,132.44
Maymen-Hopland-Etsel association	Shale, schist, greenstone, sandstone, and conglomerate	48.54
Millsholm-Bressa loams	Sandstone, mudstone, and shale	129.54
Millsholm-Bressa-Hopland association	Sandstone, mudstone, and shale	799.67
Neice-Sobrante-Hambright complex	Basic igneous and metamorphic rocks	18.66
Okiota-Henneke complex	Serpentine	12.44
Okiota-Henneke-Dubakella association	Serpentine and other ultrabasic rocks	166.41

Soil Map Unit	Parent Material	Acres
Perkins gravelly loam	Mixed alluvium	1.14
Riverwash	Mixed alluvium	82.09
Rock outcrop-Etsel-Snook complex	Sandstone and shale	11.42
Sanhedrin-Kekawaka-Speaker complex	Sandstone and sedimentary and metamorphic rocks	21.47
Skyhigh-Asbill complex	Sandstone, siltstone, and shale	277.18
Skyhigh-Millsholm loams	Sandstone, mudstone, and shale	161.44
Skyhigh-Sleeper-Millsholm association	Sandstone, siltstone, mudstone, and shale	23.99
Sobrante-Collayomi-Whispering association	Igneous (basic) and metamorphic rocks	154.65
Sobrante-Guenoc-Hambright complex	Volcanic igneous (basic) and metamorphic rocks	2,473.92
Sobrante-Hambright-Guenoc complex	Volcanic igneous (basic) and metamorphic rocks	575.51
Still loam, stratified substratum	Sedimentary rocks	360.64
Talmage very gravelly sandy loam	Mixed alluvium	34.17
Yolo loam	Mixed alluvium	0.31
Yorkville variant clay loam	Chloritic schist and other sedimentary and metamorphic rocks	31.90
Water	n/a	594.12
	Total:	**11,549.19**

Table 3. Summary of Survey Dates and Level of Effort

Survey Dates	Survey Description	Person Hours[5]
April 2-4, 2018	Focused raptor surveys and general wildlife surveys	90
April 24-26, 2018	Focused raptor surveys and general wildlife surveys	90
May 8-10, 2018	Focused raptor surveys and general wildlife surveys	90
May 22-24, 2018	Focused raptor surveys and general wildlife surveys	106
August 14-16, 2018	Focused amphibian surveys	40
April 24-26, 2019	Special-status plant surveys, vegetation mapping	57
May 2-3, 2019	Special-status plant surveys, vegetation mapping	40
May 7-9, 2019	Special-status plant surveys, vegetation mapping	97
May 14-15, 2019	General wildlife surveys and assessments	39
May 28, 2019	Special-status plant surveys	12
	Total:	**661**

4.1 Biological Communities

Prior to the site visits, detailed soil survey data for Lake and Napa counties was reviewed using the CSRL SoilWeb Google Earth application (2019) to determine whether any unique soil types that could support sensitive plant communities and/or aquatic features are present in the Phase 2/Open Space Study Area. WRA generated field maps at a scale sufficient (1:500) to navigate through the Phase 2/Open Space Study Area and to identify distinct features (e.g., changes in vegetation, individual trees, rock outcrops). Field maps contained recent (April – August 2016) high-quality aerial photographs overlain with 10-foot contour lines generated from LiDAR Point Cloud Data for Lake County (USGS 2015). Field maps were of sufficient resolution to allow biologists to hand-draw vegetation polygons and other features, with a ground resolution of 0.3 to 0.6 meter. Hand-drawn polygons were digitized in the office using ArcGIS software. Each biologist also carried a Trimble Geo XH GPS unit with sub-meter accuracy to map small-scale or localized features such as rare plant occurrences or wetland boundaries.

Terrestrial Communities

To map plant communities, WRA botanists traversed the site on foot during daylight hours and documented the plant communities observed using the field maps described above. Areas that were inaccessible due to dangerous or steep terrain, impenetrable chaparral, or dense poison

[5] Includes overlap with surveys conducted within the Phase 1 portions of the property; those surveys are documented in a separate report (WRA 2019).

oak were observed from an appropriate vantage using binoculars to allow for identification of plant alliances and an assessment of the potential for special-status plant species to occur in those areas. During the site visits, biological communities present in the Phase 2/Open Space Study Area were classified based on a hierarchical approach combining the habitat- and physiognomic-based community descriptions in the CDFG publication *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986) with the species-based plant alliance descriptions in the CDFW and CNPS *Manual of California Vegetation* (CNPS 2019a). In some cases, it was necessary to identify variants of community types or to describe ruderal or non-vegetated areas that are not described in the literature. Biological communities were classified as sensitive or non-sensitive as defined by their CDFW ranking (CDFW 2019b, CNPS 2019a), CEQA guidelines, and other applicable laws and regulations.

Aquatic Communities

WRA conducted a desktop GIS analysis combined with limited field verification to document the approximate location and extent of aquatic communities within the Phase 2/Open Space Study Area. Stream flowlines were modeled in ArcGIS using high-resolution topographic data derived from the Lake County LiDAR (USGS 2015). Where possible, the location of the top of bank and/or ordinary high water mark was visually estimated from recent, high-resolution aerial imagery. The location of wetlands was approximated using a combination of wetland signatures visible in aerial imagery and a depression analysis conducted in ArcGIS. The GIS-based mapping was supplemented by observations of wetland conditions by WRA biologists in a subset of locations across the Phase 2/Open Space Study Area.

4.2 Special-Status Species

Literature Review

The potential occurrence of special-status species in the Phase 2/Open Space Study Area was evaluated by first determining which special-status species occur in the vicinity of the Phase 2/Open Space Study Area through a literature and database review. Database searches for known occurrences of special-status species focused on the 7.5-minute USGS quadrangles that include and surround the Phase 2/Open Space Study Area: Aetna Springs, Calistoga, Chiles Valley, Clearlake Highlands, Detert Reservoir, Glascock Mountain, Jericho Valley, Knoxville, Lower Lake, Mark West Springs, Middletown, Mount Saint Helena, Saint Helena, Walter Springs, Whispering Pines, and Wilson Valley. The following sources were reviewed to determine which special-status plant and wildlife species have been documented to occur in the vicinity of these quadrangles:

- California Natural Diversity Database (CDFW 2019a)
- USFWS Information for Planning and Conservation Species Lists (USFWS 2019)
- CNPS Rare Plant Inventory (CNPS 2019b)
- CDFG publication *California Bird Species of Special Concern* (Shuford and Gardali 2008)
- CDFW publication *Fish Species of Special Concern in California* (Moyle et. al. 2015)
- USFWS publication *Birds of Conservation Concern* (2008)
- Western Bat Working Group Online Species Accounts (2019)
- CDFW and University of California Press publication *California Amphibian and Reptile Species of Special Concern* (Thomson et al. 2016)

Site Assessment

During the site assessment, WRA biologists surveyed a representative sample of the Phase 2/Open Space Study Area by truck and on foot to document the type and condition of habitats present. Habitat conditions observed within the Phase 2/Open Space Study Area were evaluated for their potential to support special-status plant and wildlife species documented from the literature and database review. The potential for each special-status species to occur in the Phase 2/Open Space Study Area was then evaluated according to the following criteria:

- **No Potential.** Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).

- **Unlikely.** Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.

- **Moderate Potential.** Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.

- **High Potential.** All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

- **Present.** Species is observed on the site or has been recorded (i.e. CNDDB, other reports) on the site recently.

The site assessment is intended to identify the presence or absence of suitable habitat for each special-status species known to occur in the vicinity to determine its potential to occur within the Phase 2/Open Space Study Area. The site assessment does not constitute a protocol-level survey and is not intended to determine the actual presence or absence of a species; however, all special-status species observed incidentally during the site visits were documented. The locations of observed special-status plant species were recorded using a combination of Trimble Geo XH GPS units with sub-meter accuracy and hand-drawn locations on field maps that contained recent (April – August 2016), high-resolution (0.3- to 0.6-meter ground resolution) aerial photographs overlain with 10-foot contours. Hand-drawn locations were digitized in the office using ArcGIS software.

In cases where little information is known about species occurrences and habitat requirements, the species evaluation was based on best professional judgment of WRA biologists with experience working with the species and habitats in question. If necessary, recognized experts in individual species biology were contacted to obtain the most up to date information regarding species biology and ecology.

For some species, a site assessment visit at the level conducted for this report may not be sufficient to determine presence or absence of a species to the specifications of regulatory agencies. In these cases, a species may be assumed to be present or further protocol-level special-status species surveys may be necessary. Special-status species for which further protocol-level surveys may be necessary are described below in Section 6.0.

Special-Status Plants

WRA biologists conducted reconnaissance-level special-status plant surveys within the Phase 2/Open Space Study Area on multiple dates in 2018 and 2019 (Table 3). In 2018, a limited portion of the Phase 2/Open Space Study Area found on serpentine soils was subjected to a full suite of seasonally-timed surveys, including early-, mid-, and late-season surveys—surveys in these areas may provide a good indication of the special-status plant diversity to be expected in other serpentine portions of the Phase 2/Open Space Study Area. Other portions of the Phase 2/Open Space Study Area were subject to late-season surveys only in 2018. The majority of the Phase 2/Open Space Study Area was subject to limited spot-checks of specific areas during May and June, 2019. A map showing the spatial distribution and timing of special-status plant survey efforts within the Phase 2/Open Space Study Area is included in Appendix E.

Special-Status Wildlife

General Wildlife Surveys

WRA biologists conducted biological site assessments and general wildlife surveys within the Phase 2/Open Space Study Area on multiple dates in 2018 and 2019 (Table 3). Wildlife observations made over that time period are included in this report. Surveys for fish and amphibian species were conducted in and around aquatic features using the naked eye and binoculars. A Sonobat recording device was deployed on the nights of August 14 and 15, 2018 at a small in-line reservoir in the Phase 1 Study Area determined to contain suitable bat habitat located south of the vineyards at Lower Bohn Lake. Audio generated from the recording device was analyzed using Sonobat software to determine which bat species are present within the area. Based on the similarity of habitats, species determined to be present in the Phase 1 Study Area are assumed to be present in the Phase 2/Open Space Study Area.

In addition to general wildlife surveys, WRA conducted several rounds of focused wildlife surveys, which investigated the Phase 2/Open Space Study Area for the presence of raptors and special-status amphibians. The methods of those focused surveys are described below.

Raptor Surveys

In 2018, twelve (12) days of focused raptor surveys were conducted over the course of four periods, April 2-4, April 24-26, May 8-10, and May 22-24. Over this two month period, 50 fixed point surveys were conducted during weather conducive to visual and auditory detections of raptors. Survey points were chosen based on a GIS viewshed analysis, which maximized the Phase 1 Study Area within line of site. However, many of these vantage points were within the Phase 2/Open Space Study Area and also covered a large portion of the Phase 2/Open Space Study Area in line of site. All raptor observations within the property were documented. In addition to fixed point surveys, 27 roving surveys were conducted within the property, both from vehicle and on foot. These surveys were focused on covering “blind spots” of the Phase 1 Study Area that were not directly visible from the fixed observation points. Much of the Phase 2/Open Space Study Area was also covered during roving surveys. For a detailed description of the methods used during focused raptor surveys, see Appendix H in the Phase 1 BRA (WRA 2019).

Amphibian Visual Encounter Surveys

On August 14-16, 2018 and May 14-15, 2019, WRA biologists conducted nighttime focused surveys for special-status native anurans, including California red-legged frog (*Rana draytonii*; CRLF) and foothill yellow-legged frog (*Rana boylii*; FYLF), at selected habitats across the property. Stock ponds and other impoundments selected for surveys were smaller, more remote habitat features that were relatively isolated from large reservoirs and operational agricultural basins that were more often support non-native aquatic predators. These smaller, isolated features were determined to have the highest potential to host CRLF, if present, due to their relative lack of predatory fish and bullfrogs compared to larger ponds and reservoirs which are connected by streams and manmade channels that allow these invasive species to move from one feature to another. Additionally, select reaches of several streams were also surveyed for the presence of FYLF and CRLF. Biologists traversed aquatic features by foot using flashlights and binoculars to detect species eyeshine within and adjacent to the aquatic features.

5.0 RESULTS

The following sections summarize the results of WRA's surveys from 2018 to 2019 within the Study Area for Phase 2 and the Open Space. An overview of biological communities observed within the Phase 2/Open Space Study Area is provided as Table 4. Maps showing the location and extent of biological communities are provided as Appendix A; maps showing the location and extent of aquatic resources and riparian habitat are provided as Appendix B. A list of all plant species observed within the Phase 2/Open Space Study Area is provided as Appendix C. A summary of the special-status plant species documented from the region and their potential to occur within the Phase 2/Open Space Study Area is provided as Appendix D. Maps showing the special-status plant species observed within the Phase 2/Open Space Study Area are provided as Appendix E. A list of all wildlife species observed within the Phase 2/Open Space Study Area is provided as Appendix F. A summary of the special-status wildlife species documented from the region and their potential to occur within the Phase 2/Open Space Study Area is provided as Appendix G. Representative photographs of the Phase 2/Open Space Study Area are provided as Appendix H. Results of focused raptor surveys are provided in the Phase 1 BRA (WRA 2019).

5.1 Biological Communities

Table 4 summarizes the area of each biological community type observed in the Phase 2/Open Space Study Area, including 12 non-sensitive communities or other non-vegetated land use designations and 13 sensitive communities. Biological communities and other land use designations mapped in the Phase 2/Open Space Study Area are shown in Appendix A; aquatic resources and riparian habitat are shown in Appendix B. Descriptions for biological communities observed in the Phase 2/Open Space Study Area are described below, organized by non-sensitive and sensitive habitats and by growth form (i.e., tree, shrub, herb), with alliances listed alphabetically therein.

Table 4. Biological Communities Mapped within the Phase 2/Open Space Study Area

Vegetation Structure/ Land Use	Community (Holland 1986)	Vegetation Alliance (CDFW 2019b, CNPS 2019a)	Sensitive Status	Rarity Ranking	Acres within P2/OS Study Area
Terrestrial Communities					
Tree-dominated	White alder riparian forest	White alder groves *Alnus rhombifolia* Forest Alliance	Sensitive[6]	G4S4	10.23
	Northern interior cypress forest	Sargent cypress woodland *Hesperocyparis sargentii* woodland alliance	Sensitive	G3S3	10.65
	Serpentine digger [foothill] pine-chaparral woodland	Foothill pine woodland *Pinus sabiniana* woodland alliance	Non-sensitive	G4S4	1,050.24
	Coast Range mixed coniferous forest	Douglas fir forest *Pseudotsuga menziesii* Forest Alliance	Non-sensitive	G5S4	61.45
	Oak forest	Mixed oak forest *Quercus* (*agrifolia, douglasii, garryana, kelloggii, lobata, wislizeni*) Forest Alliance	Sensitive	G4S4	174.88
	Blue oak woodland	Blue oak woodland *Quercus douglasii* woodland alliance	Sensitive[7]	G4S4	2,431.25
	Blue oak woodland	Blue oak savanna *Quercus douglasii* woodland alliance	Sensitive[6]	G4S4	752.84
	Valley oak woodland	Valley oak woodland *Quercus lobata* woodland alliance	Sensitive	G3S3	6.62

[6] Although not considered a sensitive plant community by the CDFW, where they occur within the Study Area, white alder groves qualify as forested wetlands and/or riparian vegetation and are therefore treated as sensitive.
[7] Although not considered a sensitive plant community by the CDFW, blue oak woodland, blue oak savanna, interior live oak woodland, and mixed oak woodland are protected by the County of Lake and are therefore treated as sensitive.

Vegetation Structure/ Land Use	Community (Holland 1986)	Vegetation Alliance (CDFW 2019b, CNPS 2019a)	Sensitive Status	Rarity Ranking	Acres within P2/OS Study Area
Tree-dominated	Interior live oak woodland	Interior live oak woodland *Quercus wislizeni* forest alliance	Sensitive[6]	G4S4	437.93
Shrub-dominated	Deer weed scrub	Deer weed scrub *Acmispon glaber* [*Lotus scoparius*] shrubland alliance	Non-sensitive	G5S5	15.01
	Chamise chaparral	Chamise chaparral *Adenostoma fasciculatum* shrubland alliance	Non-sensitive	G5S5	445.83
	Serpentine chaparral	Whiteleaf manzanita chaparral *Arctostaphylos viscida* shrubland alliance	Non-sensitive	G4S4	69.37
	Serpentine chaparral	Musk brush chaparral[8] *Ceanothus jepsonii* shrubland alliance	Sensitive[9]	n/a	2.01
	Serpentine chaparral	California yerba santa scrub *Eriodictyon californicum* shrubland alliance	Non-sensitive	G4S4	30.24
	Scrub oak chaparral	Scrub oak chaparral *Quercus berberidifolia* shrubland alliance	Non-sensitive	G4S4	9.67
	Leather oak chaparral	Leather oak chaparral *Quercus durata* shrubland alliance	Non-sensitive	G4S4	2,256.87
	North coast riparian scrub	Brewer willow thickets *Salix breweri* Shrubland Alliance	Sensitive	G2S2	1.37

[8] This community or land use designation is not described by Holland (1986), CDFW (2019b), or CNPS (2019b).
[9] Although CDFW does not recognize this community as its own alliance, it does recognize a leather oak – musk brush provisional association, which is sensitive (CDFW 2018a); therefore, this community is treated as sensitive.

Vegetation Structure/ Land Use	Community (Holland 1986)	Vegetation Alliance (CDFW 2019b, CNPS 2019a)	Sensitive Status	Rarity Ranking	Acres within P2/OS Study Area
Herb-dominated	Non-native grasslands	Multiple	Non-sensitive	n/a	1,347.90
Herb-dominated	Valley needlegrass grasslands	Purple needle grass grasslands – (an association of needle grass – melic grass grassland [*Nassella* spp. – *Melica* spp. Herbaceous Alliance])	Sensitive[10]	G4S4	0.77
Aquatic Communities					
Emergent Wetlands	Multiple	Multiple	Sensitive	Multiple	330.00
Ponds and Reservoirs	n/a	n/a	Sensitive	n/a	626.08
Streams	n/a	n/a	Sensitive	n/a	147.85 (736,004 lf)
Other Land Use Designations					
Agriculture	n/a	n/a	Non-sensitive	n/a	1,170.67
Developed	n/a	n/a	Non-sensitive	n/a	136.75
Rock Outcrop	n/a	n/a	Non-sensitive	n/a	22.70
				Total:	11,549.19

[10] Although the broader needle grass – melic grass grassland alliance is not considered sensitive, the purple needle grass grassland association is considered sensitive by the CDFW and native grasslands are generally protected under CEQA.

5.1.1 Non-Sensitive Biological Communities

Non-Sensitive Tree-Dominated Communities

Foothill pine woodland (*Pinus sabiniana* Woodland Alliance); Rank G4S4. Foothill pine woodland typically occurs on streamside terraces, valleys, slopes and ridges on shallow, often infertile, moderately drained soils throughout cismontane California. Often this alliance is intermixed with chaparral (CNPS 2019b). Within the Phase 2/Open Space Study Area, foothill pine woodland was located along alluvial terraces and on both rocky and finer-substrate slopes. On rocky substrates, it occurred with a chaparral understory, often on serpentine soils. In these situations, the overstory was composed of open foothill pine. The understory was variously composed of open to dense shrubs, including whiteleaf manzanita (*Arctostaphylos viscida*), leather oak (*Quercus durata*), and California yerba santa (*Eriodictyon californicum*). Herbaceous cover was typically of low density and included species such as woolly sunflower (*Eriophyllum lanatum*), small fescue (*Festuca microstachys*), golden buckwheat (*Eriogonum luteolum* var. *luteolum*), and Napa cryptantha (*Cryptantha hispidula*). Where soils are less rocky, foothill pine woodland often occurred in mixed stands of blue oak (*Quercus douglasii*) woodland and savanna. In such situations, blue oak was co- or subdominant in the overstory, with overall canopy cover ranging from closed to somewhat open. The understory shrubs are generally sparse, consisting of species such as common manzanita (*Arctostaphylos manzanita* ssp. *manzanita*) and poison oak (*Toxicodendron diversilobum*). Where canopy cover is dense, herbaceous cover is typically sparse. Where canopy cover is more open, the herbaceous layer is often dense grassland characterized by non-native annual species.

Foothill pine woodland intergrades with leather oak scrub, California yerba santa chaparral, whiteleaf manzanita scrub, blue oak woodland, and interior live oak woodland. In many areas, foothill pine was the dominant tree species prior to the Valley Fire of 2015, but was killed in the fire and is giving way to resprouting leather oak or California yerba santa. In these areas, the vegetation was mapped as foothill pine woodland if a large number of trees survived the fire; however, if only a small number of pines survived, the vegetation was mapped based on the dominant understory shrub, generally leather oak or yerba santa.

The foothill pine woodland alliance is considered non-sensitive; however, there may be sensitive associations within the alliance present within the Phase 1 Study Area such as the foothill pine – leather oak provisional association (CDFW 2018a).

Douglas fir forest (*Pseudotsuga menziesii* Forest Alliance): Rank G5S4. Douglas fir forest occurs on all topographic positions and aspects on various substrates, including serpentine, throughout coastal and cismontane northern and central California (CNPS 2019a). Within the Phase 2/Open Space Study Area, Douglas fir forest occurs in the far southern portion of the Study Area, on volcanic substrates on the steep slopes above the vineyards on the south side of Butts Canyon Road. The canopy is dense and dominated by Douglas fir, with occasional subdominace by canyon live oak (*Quercus chrysolepis*), California black oak (*Q. kelloggii*), and madrone (*Arbutus menziesii*). The understory is typically open and sparse. Douglas fir forest is considered non-sensitive.

Non-Sensitive Shrub-Dominated Communities

Deer weed scrub (*Acmispon glaber* shrubland Alliance); Rank G5S5. Deer weed scrub typically occurs in areas of recent disturbance such as clearing, fire, or intermittent flooding throughout cismontane California (CNPS 2019b). Within the Phase 2/Open Space Study Area,

this alliance was observed in a limited number of areas affected by the Valley Fire of 2015, and it is expected that this community will transition into other shrub- or tree-dominated alliances in the years and decades to come. Trees were generally absent. The shrub layer was open to dense, dominated by deer weed, with lower cover of leather oak, yerba santa, and pitcher sage (*Lepechinia calycina*). The herbaceous layer was denser in more open stands and was characterized by annual grasses such as small fescue and soft chess (*Bromus hordeaceus*). Deer weed scrub is considered non-sensitive.

Chamise chaparral (*Adenostoma fasciculatum* Shrubland Alliance); Rank G5S5. Chamise chaparral is known from the interior North Coast Ranges south to interior and coastal South Coast Ranges, Transverse Ranges, and Sierra Nevada Foothills. This community is typically located on steep, dry, south-facing terrain underlain by shallow, often nutrient-poor (e.g., serpentine), well-drained substrates (CNPS 2019b). Within the Phase 2/Open Space Study Area, this community is located primarily on south-facing aspects and ridgelines underlain by well-drained stony clay loam derived from volcanic parent material and to a lesser extent from serpentine parent material. Chamise chaparral was typically dense and often composed of monotypic stands of chamise. Occasional other shrub species were present, including leather oak and yerba santa. Occasional trees were present, including foothill pine, blue oak, and interior live oak. The herbaceous layer is typically sparse to absent, particularly in dense stands. In more open stands, the interstitial areas are characterized by sparse annual herbs.

Chamise chaparral is considered a non-sensitive alliance. However, there may be sensitive associations within the alliance present within the Phase 1 Study Area such as the leather oak – chamise provisional association (CDFW 2018a).

Whiteleaf manzanita chaparral (*Arctostaphylos viscida* Shrubland Alliance); Rank G4S4. Whiteleaf manzanita chaparral occurs on ridges and upper slopes on shallow, weathered substrate developed from sandstone, granitic, or ultramafic substrates in the northern and central cismontane mountain ranges of California (CNPS 2019b). Stands of whiteleaf manzanita chaparral were found at scattered locations within the Phase 2/Open Space Study Area on gently to moderately sloped serpentine substrates. The tree layer is sparse to absent, comprised of foothill pine and interior live oak. The shrub layer is typically dense and tall, dominated by whiteleaf manzanita, with leather oak, chamise, yerba santa, and toyon (*Heteromeles arbutifolia*). The herbaceous layer is often sparse, composed of species such as woolly sunflower, small fescue, and Napa cryptantha. In many areas, whiteleaf manzanita was present at high cover, but was mixed with foothill pine at greater than 10 percent cover, and in these areas, the vegetation was mapped as foothill pine woodland.

Whiteleaf manzanita chaparral is considered a non-sensitive alliance. However, there may be sensitive associations within the alliance present within the Phase 2/Open Space Study Area such as the whiteleaf manzanita – musk brush provisional association (CDFW 2018a).

California yerba santa scrub (*Eriodictyon californicum* Shrubland Alliance); Rank G4S4. California yerba santa scrub typically occurs on lower to middle slopes of serpentine, metavolcanic, and plutonic substrates in the eastern foothills of the Northern Coast Range and along the western foothills of the Sierra Nevada Range in California (CNPS 2019b). Within the Phase 2/Open Space Study Area, California yerba santa scrub typically occurs in areas that burned in the 2015 Valley Fire, on rocky, serpentine and volcanic substrates. Stands range from dense to open, with the interstitial areas characterized by sparse herbs. The tree layer is sparse to absent and composed of foothill pine, blue oak, or interior live oak. The shrub layer is dominated by California yerba santa with chamise, buckbrush, deer weed, poison oak, and leather

oak as sub-dominants. In many areas, this community forms a patchwork mosaic within larger stands of leather oak chaparral and chamise chaparral, making it difficult to draw distinctions between the California yerba santa scrub and the other two communities. In this cases, smaller stands of California yerba santa scrub were lumped into the larger surrounding community, whether leather oak or chamise. California yerba santa scrub is best described under Holland's mixed serpentine chaparral. California yerba santa scrub is considered non-sensitive.

Scrub oak chaparral (*Quercus berberidifolia* Shrubland Alliance); Rank G4S4. Scrub oak chaparral typically occurs on steep, north-facing slopes on deep to shallow, well-drained soils throughout cismontane California. This vegetation alliance is dominated by scrub oak in the shrub layer canopy with several other scrubby species present such as leather oak, yerba santa, and toyon. Emergent trees may be present at low cover (CNPS 2019b). Within the Phase 2/Open Space Study Area, scrub oak chaparral was located in a limited number of locations, typically on northern and eastern slopes on serpentine soils and along ridgelines and dry slopes on non-serpentine soils. Scrub oak chaparral is considered non-sensitive.

Leather oak chaparral (*Quercus durata* Shrubland Alliance); Rank G4S4. Leather oak chaparral is known from the North and Central Coast Ranges and Sierra Nevada Foothills from Del Norte County south to Santa Barbara County. This vegetation alliance is typically located on hills, steep slopes, and ridgelines underlain by shallow, rocky substrate derived from serpentine soils (CNPS2019b). Within the Phase 2/Open Space Study Area, leather oak chaparral is located on a range of aspects and on ridgelines underlain by soils derived from serpentine; often intergrading with foothill pine woodland. In areas affected by the Valley Fire, leather oak represents the dominant shrub, re-sprouting from its base in all but the most severely burned areas. The shrub canopy is generally open in areas burned during the Valley Fire and dense in unburned areas. Tree cover is sparse to absent, typically consisting of foothill pine. The shrub canopy is dominated by leather oak, with occasional co- or sub-dominance by toyon, yerba santa, whiteleaf manzanita, and chamise.

Leather oak chaparral is considered a non-sensitive alliance; however, there may be associations within this alliance that are considered sensitive by the CDFW such as the foothill pine – leather oak provisional association or the leather oak – chamise provisional association.

Non-Sensitive Herb-Dominated Communities

Non-native annual grasslands (various Semi-Natural Herbaceous Stands); No Rank. Non-native annual grasslands occur throughout California on all aspects and topographic positions underlain by a variety of substrates. Within the Phase 2/Open Space Study Area, non-native annual grasslands include elements of multiple vegetation alliances including:

- Wild oat grass grasslands (*Avena barbata, A. fatua* Herbaceous Semi-Natural Alliance); No Rank
- Annual brome grasslands (*Bromus diandrus, B. hordeaceus – Brachypodium distachyon* Herbaceous Semi-Natural Alliance); No Rank
- Wild barley grasslands (*Hordeum murinum* Herbaceous Semi-Natural Alliance; undescribed); No Rank
- Perennial ryegrass fields (*Festuca perennis* Herbaceous Semi-Natural Alliance); No Rank
- Barbed goat grass patches (*Aegilops triuncialis* Provisional Herbaceous Semi-Natural Alliance); No Rank

- Cheatgrass – medusahead grassland (*Bromus tectorum - Elymus caput-medusae* Herbaceous Semi-Natural Alliance); No Rank
- Yellow star-thistle fields (*Centaurea* [*solstitialis, melitensis*] Herbaceous Semi-Natural Alliance); No Rank

These grasslands are located on all aspects and topographic positions, and are underlain by nearly all mapped soil units found within the Phase 2/Open Space Study Area. Non-native annual grasslands are considered non-sensitive. Yellow star-thistle fields is included in this category because this species typically occurred within the matrix of grasses. In cases where non-native annual grasslands occurred in seasonal wetland habitat, they were mapped as seasonal wetlands, rather than as grasslands and their acreage is incorporated into the seasonal wetland acreage reported in Table 4.

Other Non-Sensitive Land Use Designations

Agriculture. Large portions of the Phase 2/Open Space Study Area have been or are currently being converted to vineyard production. Areas of existing vineyards, as well as areas with active clearing, planting, and other vineyard creation activities were mapped as agricultural areas. These areas contain some natural vegetation, primarily non-native, weedy annual species, but in large part are dominated by grape vines with little to no understory. Soils within these areas are regularly disturbed, greatly reducing their potential to host special-status plants. Agricultural areas are not considered sensitive.

Developed. Some portions of the Phase 2/Open Space Study Area were historicall converted to development supporting agriculture and ranching activities; these areas include roadways, work yards, barns, ranch houses, driveways, and other associated buildings and features, as well as landscaped vegetation such as lawns. Developed areas are not considered sensitive.

Rock Outcrop. While not described in the literature and generally considered non-sensitive, rock outcrops may provide important habitat features for special-status plant and wildlife species. Vegetation is typically absent to sparse, although some stunted vegetation may be present. Within the Phase 2/Open Space Study Area, rock outcrops occurred as large cliff faces and denuded serpentine ridges and other outcroppings.

5*.1.2 Sensitive Biological Communities*

Sensitive Tree-Dominated Communities

White alder groves (*Alnus rhombifolia* Forest Alliance); Rank G4S4. White alder groves typically occurs along riparian corridors, incised canyons, seeps, stream banks, mid-channel bars, floodplains, and stream terraces throughout California (CNPS 2019b). White alder is typically co-dominant with a variety of other riparian trees. The shrub layer is generally sparse to absent, and the herbaceous layer is variable. Within the Phase 2/Open Space Study Area, white alder groves occur along a low-gradient portion of Butcherknife Creek, where it occurred as the dominant with a mix of sedge and grass species in the understory. Where white alder groves occur within the Phase 1 Study Area, they qualify as forested wetlands subject to federal and state regulation. Although this alliance is not considered sensitive by the CDFW, because it is considered wetland habitat, it is treated as a sensitive community here. In addition, there may be sensitive associations within this alliance present within the Phase 1 Study Area such as white alder – American dogwood association or the white alder – western azalea association (CDFW 2018a).

Sargent cypress woodland (*Hesperocyparis sargentii* Woodland Alliance); Rank G3S3. Sargent cypress woodland typically occurs on stream benches and terraces, open slopes, and ridges on ultramafic substrates in the northern and central California Coast Ranges. Sargent cypress tends to form pure stands in its southern range and mixed stands with species such as McNab cypress (*H. macnabiana*), foothill pine, and California bay in its northern range (CNPS 2019b). Within the Phase 2/Open Space Study Area, Sargent cypress woodland was observed in small areas south of Butts Canyon Road, typically on gentle, north-facing slopes on serpentine substrates. The tree canopy is dense to open, consisting of Sargent cypress with occasional foothill pine. Under dense canopy, the understory is sparse to absent. Where the canopy is more open, the interstitial areas are characterized by dense shrubs such as whiteleaf manzanita and leather oak. Sargent cypress woodland is considered a sensitive vegetation alliance by the CDFW.

Mixed oak forest (*Quercus* [*douglasii, kelloggii, wislizeni*] Forest Alliance); Rank G4S4. Mixed oak forest occurs on valleys and gentle to steep slopes on moderately deep soils in the northern and central California coast and Coast Ranges (CNPS 2019a). Within the Phase 2/Open Space Study Area, mixed oak forest was mapped in the southern portion of the Study Area on volcanic substrates on the steep slopes adjacent to the vineyards south of Butts Canyon Road. Blue oak, interior live oak, and California black oak were co-dominant in the tree canopy. In addition to the previously listed oak species, other tree and shrub species include madrone, California bay (*Umbellularia californica*), leather oak, birch-leaf mountain mahogany (*Cercocarpus betuloides*), poison oak (*Toxicodendron diversilobum*), toyon (*Heteromeles arbutifolia*), and deer brush. In certain areas, the canopy is dense, in others it is open, resembling open woodland, with the interstitial areas characterized by dense annual herb species. Although it is not considered a sensitive alliance by the CDFW, mixed oak woodland is protected by the County of Lake.

Blue oak woodland & savanna (*Quercus douglasii* Woodland Alliance); Rank G4S4. Blue oak woodland and savanna are typically located on valley bottoms, foothills, and rocky outcrops on shallow, moderately to excessively drained soil low in fertility throughout cismontane California. Blue oaks are dominant or co-dominant with other oak species and species such as buckeye (*Aesculus californica*) and foothill pine. The canopy of blue oak woodland is typically intermittent to continuous, often occurring as broad savanna (CNPS 2019b). Within the Phase 2/Open Space Study Area, blue oak woodland and savanna was observed on valley bottoms and slopes, typically on deeper, finer-textured serpentine and volcanic soils.

Although CDFW does not distinguish between blue oak woodland and savanna, blue oak habitats were mapped into these two categories to facilitate impact and mitigation calculations. Blue oak woodland and savanna we differentiated by a desktop visual assessment of tree density and canopy closure. Savanna included areas with approximately 60 percent or less total canopy cover and with less than two thirds of tree canopies touching; areas with greater cover of blue oaks or a higher percentage of tree canopies touching were considered woodland. Although it is not considered a sensitive alliance by the CDFW, blue oak woodland and savanna is protected by the County of Lake.

Valley oak woodland (*Quercus lobata* Woodland Alliance); Rank G3S3. Valley oak woodland is known from the southern Cascade Range, Coast Ranges, Central Valley, Transverse Range, and Sierra Valley Foothills from Siskiyou County south to Los Angeles County. This community is typically located on deep, poorly drained clay soils in valley bottoms, alluvial floodplains, and lower slopes (CNPS 2019b). Within the Phase 2/Open Space Study Area, valley oak woodland was observed in alluvial terraces along perennial streams. Canopy cover was continuous to intermittent, dominated by valley oak with scattered arroyo willow (*Salix lasiolepis*) and Fremont cottonwood. Valley oak woodland is considered a sensitive vegetation alliance by the CDFW, and where it occurs within the Phase 2/Open Space Study Area, it would generally be considered riparian vegetation, adding an additional layer of protection. Valley oak woodland is also protected by the County of Lake.

Interior live oak woodland (*Quercus wislizenii* Woodland Alliance); Rank G4S4. Interior live oak woodland typically occurs on upland slopes, valley bottoms, and terraces on shallow, moderately to excessively drained soils throughout cismontane California. Interior live oaks are dominant or co-dominant in the tree canopy layer with other oak species, California buckeye, madrone (*Arbutus menziesii*), and/or foothill pine. Canopy cover is intermittent or savanna-like (CNPS 2019b). Within the Phase 2/Open Space Study Area, interior live oak woodland was observed in a variety of topographic positions, both on and off of serpentine. In most cases, interior live oak woodland canopy was dense, characterized by pure interior live oak, with occasional co- or subdominance by blue oak or foothill pine. In dense canopy, the understory that was often open and sparse occasionally dense with shrubs as poison oak. Interior live oak woodland was sometimes characterized by a more open canopy, and in such situations, the understory was characterized either by dense shrubs such as chamise and common manzanita or by dense non-native annual grasses. Although it is not considered a sensitive alliance by the CDFW, interior live oak woodland is protected by the County of Lake.

Sensitive Shrub-Dominated Communities

Musk brush chaparral (*Ceanothus jepsonii* Shrubland Alliance); No Rank. While not described as its own alliance in the literature, musk brush (*Ceanothus jepsonii*) was observed as the dominant plant in chaparral communities on serpentine soils in several portions of the Phase 2/Open Space Study Area. The tree layer was sparse to absent and composed of foothill pine and interior live oak. The shrub layer was typically dense and dominated by musk brush, with leather oak, whiteleaf manzanita, and chamise as sub-dominants. The herbaceous layer is sparse to dense and composed of species such as small fescue, Napa cryptantha, and woolly sunflower, and woolly malacothrix (*Malacothrix floccifera*). This community is best described under Holland's mixed serpentine chaparral. Although CDFW does not recognize this community as its own alliance, it does recognize a leather oak – musk brush provisional association, which is sensitive (CDFW 2018a); therefore, this community is treated as sensitive.

Brewer willow thickets (*Salix breweri* Shrubland Alliance); Rank G2S2. Brewer willow thickets typically occur along creek bottoms and stream terraces, typically on serpentine-derived alluvium. This community occurs throughout the North Coast Range as well as the northern, interior portion of the South Coast Range. Brewer willow is the dominant species, with other shrubs such as coffeeberry (*Frangula californica*), spice bush (*Calycanthus occidentalis*), and western azalea (*Rhododendron occidentale*) as co-dominants (CNPS 2019b). Within the Phase 2/Open Space Study Area, Brewer willow thickets were primarily observed along McCain and Butts creeks. Stands were typically dense, dominated by Brewer willow, with other shrubs such as western azalea present at low cover. Where the community occurs along low-gradient streams, it generally qualified as scrub-shrub wetlands. Where the community occurs along

relatively high-gradient streams, it generally did not qualify as scrub-shrub wetlands, but was considered riparian vegetation.

Sensitive Herb-Dominated Communities

Purple needle grass grasslands. Purple needle grass grasslands occurs in valley and foothill areas on all topographic locations. The community occurs throughout cismontane California. Purple needle grass grassland is part of the needle grass – melic grass grassland alliance (*Nassella* spp. – *Melica* spp. Herbaceous Alliance). Although this alliance is listed as apparently secure at the global (G4) and state (S4) levels by the CDFW, the purple needlegrass association within the alliance is considered sensitive (CDFW 2018a). Within the Phase 2/Open Space Study Area, purple needle grass grassland was observed in a limited number of locations set within larger expanses of non-native annual grassland. Following CNPS 2019b, stands of purple needle grass were mapped where purple needlegrass was characteristic, typically a minimum of 10 percent absolute cover. In most cases, non-native annual grasses comprised the highest cover. Although the broader needle grass – melic grass grassland alliance is not considered sensitive, the purple needle grass grassland association is considered sensitive by the CDFW. In addition, native grasslands are generally protected under CEQA.

Sensitive Aquatic Communities

A desktop wetland assessment was conducted within the Phase 2/Open Space Study Area in 2019 to document areas that are potentially subject to jurisdiction by the Corps, RWQCB, and/or CDFW. A formal wetland delineation was not conducted within the Phase 2/Open Space Study Area and the regulated extent of potential wetlands is approximate only.

Emergent Wetlands; No Rank. A variety of wetland habitats were observed within the Phase 2/Open Space Study Area, including forested wetlands, scrub-shrub wetlands, perennial marshes, and seasonal wetlands. Forested and scrub-shrub wetlands are dominated by white alder groves along Butcherknife Creek and Brewer willow thickets along Butts Creek; these communities are described above in the sensitive tree and shrub sub-sections, respectively. Emergent wetlands included perennial marshes and seasonal wetlands, described below.

Perennial marshes occur at the edges of larger ponds and reservoirs and may occupy the entirety of more shallow features. These habitats are dominated by a range of perennial vegetation alliances including:

- Pale spike rush marsh (*Eleocharis macrostachya* Herbaceous Alliance); Rank G4S4
- Hardstem bulrush marsh (*Schoenoplectus acutus* Herbaceous Alliance); Rank G5S4
- Cattail marsh (*Typha latifolia* Herbaceous Alliance); Rank G5S5

Seasonal wetlands are biotic communities in which the water table is near the surface for a portion of the year long enough to support hydrophytic vegetation, but dries out during some portion of the normal growing season. Within the Phase 2/Open Space Study Area, several seasonal wetland types were observed which are best described by their different vegetation alliances:

- Bent grass-tall fescue meadows (*Agrostis gigantea, A. stolonifera-Festuca arundinacea* Herbaceous Semi-Natural Alliance); No Rank

- Fremont's goldfields – downingia vernal pools (*Lasthenia fremontii – Downingia* [*bicornuta*] Herbaceous Alliance; Rank G2S2
- California button celery patches (*Eryngium aristulatum* Herbaceous Alliance); Rank G3S3
- Common monkeyflower seeps (*Mimulus* [*guttatus*]) Herbaceous Alliance); Rank G4?S3?
- Meadow barley patches (*Hordeum brachyantherum* Herbaceous Alliance); Rank G4S3
- Mediterranean barley patches (*Hordeum marinum* Herbaceous Semi-Natural Alliance; undescribed); No Rank
- White-tip clover swales (*Trifolium variegatum* Herbaceous Alliance); Rank G3S3
- Rabbit's foot grass swales (*Polypogon monspeliensis* Herbaceous Semi-Natural Alliance; undescribed); No Rank

Although the wetland habitats observed within the Phase 2/Open Space Study Area contain a mix of sensitive and non-sensitive vegetation alliances, all wetland habitats are considered sensitive under CEQA and are protected under other federal and state laws.

Ponds and Reservoirs; No Rank. The Phase 2/Open Space Study Area contains a number of ponds and reservoirs, ranging from small depressions that pond water during only a portion of the growing season to larger features that hold water year round. Many of these features were historically created by damming natural drainage courses to support ranching and agricultural activities. These features provide a resource for wildlife species; however, because they offer a source of perennial water, they support a number of non-native aquatic wildlife species that may limit the potential for other native aquatic species including American bullfrog (*Lithobates catesbeianus*) and a number of non-native fishes. Ponds and reservoirs, despite their origin, are generally considered sensitive under CEQA and are protected under other federal and state laws as aquatic habitats.

Streams; No Rank. The Phase 2/Open Space Study Area contains a number of ephemeral, intermittent, and perennial streams. Ephemeral streams are linear features within which water flows only during or immediately after a significant rain event. These streams are dry for the majority of the year. Intermittent streams are linear features within which water flows for a portion of the year, generally drying out during the driest time of the year. Perennial streams are linear features within which water flows the entire year, even during the dry season. For the purposes of this report, streams were classified as ephemeral, intermittent, or perennial based on the County Code, which defines streams based on their symbology on USGS maps, with solid blue line streams considered perennial, dashed blue line streams considered intermittent, and all other streams considered ephemeral.

Larger streams within the Phase 2/Open Space Study Area include Putah Creek, Bucksnort Creek, Butts Creek, and Butcherknife Creek. These streams are intermittent to perennial and generally have a well-developed riparian corridor dominated by valley oak, white alder, and red, arroyo, and Brewer willows. Where these streams occur near old barns and homesteads, northern California black walnut (*Juglans hindsii*) is also present. These well-developed riparian corridors provide a valuable resource for wildlife species. The extent of riparian vegetation within the Phase 2/Open Space Study Area is shown in Appendix B. Streams and their riparian corridors may be considered sensitive under CEQA and are protected by other federal and state laws.

5.2 Special-Status Plant Species

WRA botanists identified a total of 660 vascular plant taxa within the Guenoc Ranch property, including 500 native taxa and 160 non-native taxa. Of the 160 non-native species observed at the site, 60 are listed as invasive by the Cal-IPC (2019). A list of all plant species observed within the Guenoc Ranch property is provided as Appendix C.

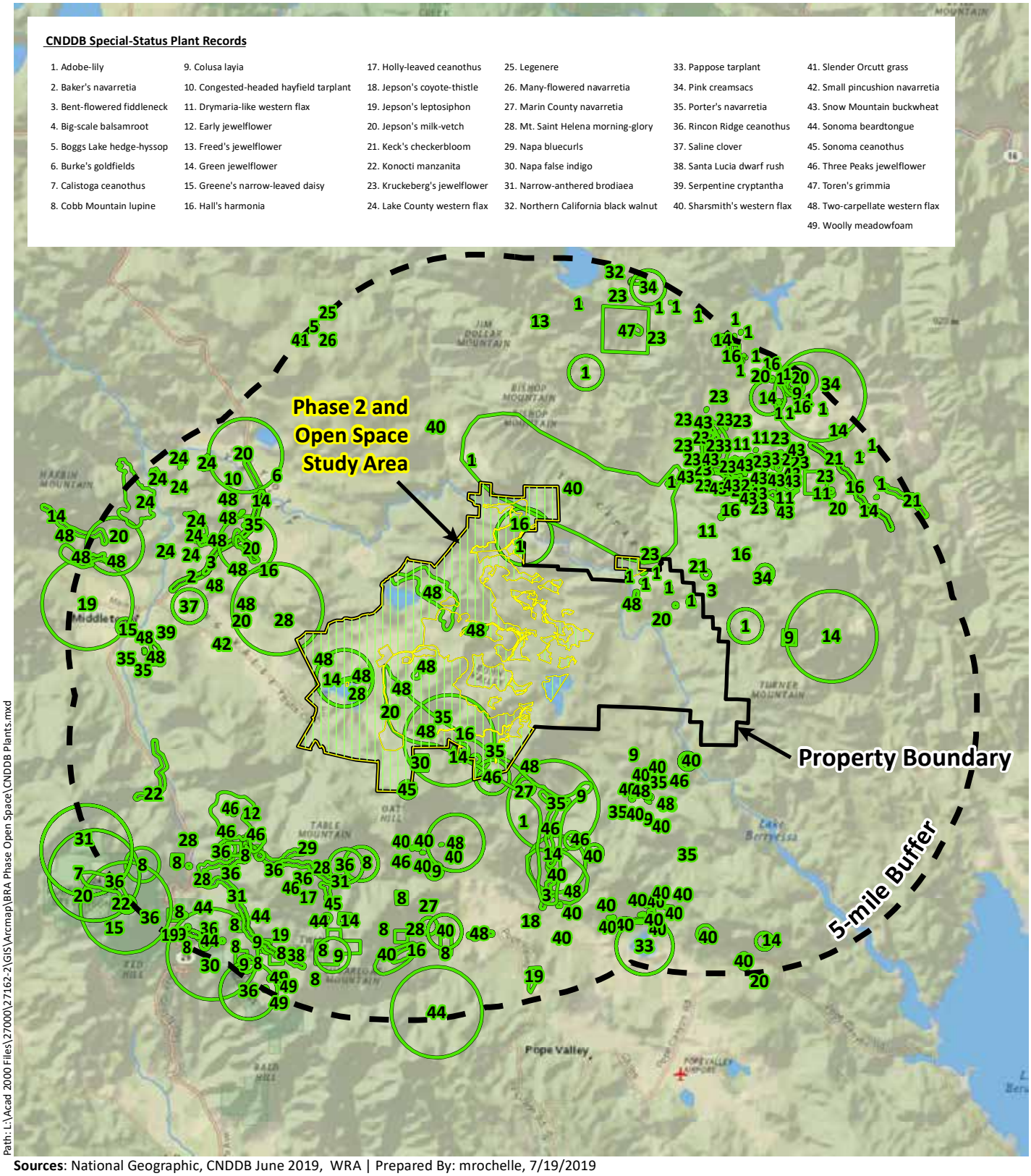
Based upon a review of the resources and databases listed in Section 4.0, it was determined that 131 special-status plant species have been documented from one or more of the 7.5-minute quadrangles in the vicinity of the Phase 2/Open Space Study Area (see Section 4.0); Figure 4 shows the subset of those species that occur within 5 miles of the larger Guenoc Ranch. Appendix D lists all special-status species documented from the referenced quadrangles and provides a summary of their preferred habitats and their potential for occurring within the Phase 2/Open Space Study Area based on the types and condition of habitats found there. The Phase 2/Open Space Study Area does not contain designated Critical Habitat for any plant species.

During the site assessment and reconnaissance-level surveys, 27 special-status plant species were observed in the Phase 2/Open Space Study Area, and it was determined that the Phase 2/Open Space Study Area has moderate or high potential to support an additional 80 special-status plant species. The large area of serpentine and volcanic substrates, combined with recent fires and the generally undisturbed state of habitats, within the Phase 2/Open Space Study Area provides moderate to high potential for a large number of special-status plant species to occur.

The remaining 24 species were determined to have little to no potential to occur within the Phase 2/Open Space Study Area based on one or more of the following factors:

- The species is unique to a small, well-defined geographic range (i.e., a very limited range of endemism) and has never been observed in the vicinity of the Phase 2/Open Space Study Area;
- Specific hydrologic characteristics, such as perennial saline conditions, are absent from the Phase 2/Open Space Study Area;
- Unique pH characteristics, such as alkali scalds or acidic soils, are absent from the Phase 2/Open Space Study Area;
- Suitable habitat is not present such as redwood forest or other dense coniferous forest, coastal habitats, alpine habitats, etc.

Special-status plant species observed within the Phase 2/Open Space Study Area are listed in Table 5, and their locations and extents are shown in Appendix E. Special-status plant species observed in the Phase 2/Open Space Study Area are described below. Additional special-status plant species determined to have moderate to high potential to occur within the Phase 2/Open Space Study Area are listed in Table 6, and their preferred habitats are listed in Appendix D.



Sources: National Geographic, CNDDB June 2019, WRA | Prepared By: mrochelle, 7/19/2019

Figure 4. CNDDB Special-Status Plant Records within 5 miles of the Guenoc Ranch

Maha Resort and Guenoc Valley
Development, Phase 2 and Open Space
Lake County, California

0 2.5 5 Miles

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Table 5. Special-Status Plant Species Observed within the Phase 2/Open Space Study Area

Scientific Name	Common Name	Conservation Status	Acreage	Estimated Number of Individuals
Federal- and State-Listed				
Sidalcea keckii	Keck's checkerbloom	FE, Rank 1B.1	<0.01	1
Hesperolinon didymocarpum	Lake County western flax	SE, Rank 1B.2	1.36	3,884
CNPS Rank 1				
Arctostaphylos manzanita ssp. *elegans*	Konocti manzanita	Rank 1B.3	<0.01	14
Brodiaea leptandra	Narrow-anthered brodiaea	Rank 1B.2	1.08	50
Erigeron greenei	Greene's narrow-leaved fleabane	Rank 1B.2	14.96	7,049
Hesperolinon bicarpellatum	Two-carpellate western flax	Rank 1B.2	41.51	47,579
Layia septentrionalis	Colusa layia	Rank 1B.2	0.86	7,505
Streptanthus hesperidis	Green jewelflower	Rank 1B.2	26.55	8,433
Streptanthus morrisonii[11]	Morrison's jewelflower	Rank 1B.2	3.19	449
CNPS Rank 4				
Antirrhinum virga	Tall snapdragon	Rank 4.3	<0.01	9
Astragalus clevelandii	Cleveland's milk-vetch	Rank 4.3	<0.01	25
Calochortus uniflorus	Pink star-tulip	Rank 4.2	0.71	150
Calystegia collina ssp. *oxyphylla*	Mt. Saint Helena morning glory	Rank 4.2	13.84	11,712
Clarkia gracilis ssp. *tracyi*	Tracy's clarkia	Rank 4.2	0.93	875
Collomia diversifolia	Serpentine collomia	Rank 4.3	11.11	3,501
Cordylanthus tenuis ssp. *brunneus*	Serpentine bird's beak	Rank 4.3	<0.01	31

[11] Individuals observed were intermediate between ssp. *elatus* and ssp. *hirtiflorus* and were therefore mapped at the specific level only.

Scientific Name	Common Name	Conservation Status	Acreage	Estimated Number of Individuals
Delphinium uliginosum	Swamp larkspur	Rank 4.2	1.71	2,576
Erythranthe nudata	Bare monkeyflower	Rank 4.3	2.58	4,778
Erythronium helenae	St. Helena fawn lily	Rank 4.2	1.97	2,700
Fritillaria purdyi	Purdy's fritillary	Rank 4.3	0.93	185
Helianthus exilis	Serpentine sunflower	Rank 4.2	8.18	11,135
Monardella viridis	Green monardella	Rank 4.3	35.74	8,207
Navarretia cotulifolia	Cotula navarretia	Rank 4.2	16.00	197,300
Navarretia jepsonii	Jepson's navarretia	Rank 4.3	1.52	9,260
Senecio clevelandii var. *clevelandii*	Cleveland's ragwort	Rank 4.3	<0.01	100
Toxicoscordion fontanum	Marsh zigadenus	Rank 4.2	1.05	392
Triteleia lugens	Dark-mouthed triteleia	Rank 4.3	0.54	102

5.2.1 Special-Status Plant Species Observed within the Phase 2/Open Space Study Area

Special-status plant species observed within the Phase 2/Open Space Study Area are described below, grouped by conservation status and organized alphabetically by scientific name therein. Due to the limited nature of special-status plant surveys within the Phase 2/Open Space Study Area and the presence of large tracts of suitable habitat, it is presumed that these species are more widespread within the Phase 2/Open Space Study Area than described here and shown in Appendix E.

Federal-Listed Species

Keck's checkerbloom (*Sidalcea keckii*); FE, Rank 1B.1. Keck's checkerbloom is an annual herb in the mallow (Malvaceae) family that blooms from April through June. It typically occurs on exposed serpentine clays in cismontane woodland or non-native valley and foothill grassland habitats at elevations ranging from 250 to 2,200 feet (CNPS 2019a). This species has a serpentine affinity rank of "strong indicator" (3) (Safford et al. 2005). The nearest and most recently documented occurrence in the vicinity of the property is from May 2002 near Pocock Creek, approximately 1.5 miles to the east (CDFW 2019).

Within the Phase 2/Open Space Study Area, a single individual of Keck's checkerbloom was observed within a meadow on the south side of Butts Canyon Road. The species was also observed in other parts of the property, occurring on all aspects on serpentine clay substrates in annual grassland or in grassy openings within chaparral and blue oak woodland. Associated species included small fescue, California plantain (*Plantago erecta*), Cleveland's tarweed (*Hemizonia congesta* ssp. *clevelandii*), and soft chess.

State-Listed Species

Lake County western flax (*Hesperolinon didymocarpum*); SE, Rank 1B.2. Lake County western flax is an annual forb in the flax family (Linaceae) that blooms from May through July. It typically occurs on serpentine substrates in chaparral, cismontane woodland, and valley and foothill grassland habitats at elevations ranging from 1,070 to 1,190 feet (CNPS 2019a, CDFW 2019). This species has a serpentine affinity rank of "strict endemic" (6.2) (Safford et al. 2005). The nearest documented occurrence in the vicinity of the property is from June 1994 near Middletown, approximately 5.5 miles west of the property (CDFW 2019). The most recent documented occurrence in the vicinity of the property is from May 2014 near Middletown, approximately 7.25 miles west of the Study Area (CDFW 2019).

Within the Phase 2/Open Space Study Area, thousands of individuals of Lake County western flax were observed in several locations. The species occurred in burned and unburned chaparral habitat on rocky, serpentine substrates. Associated species included small fescue, leather oak, yerba santa, woolly sunflower, common hareleaf (*Lagophylla ramosissima*), and common soaproot (*Chlorogalum pomeridianum* var. *pomeridianum*).

CNPS Rank 1 Species

Konocti manzanita (*Arctostaphylos manzanita* ssp. *elegans*); Rank 1B.3. Konocti manzanita is an evergreen perennial shrub in the heath family (Ericaceae) that blooms from March to May, but is identifiable into summer months. It typically occurs on volcanic soils in chaparral, cismontane woodland, and lower montane coniferous forest habitat at elevations ranging from 1,200 to 4,845 feet (CNPS 2019b). Known associated species include California black oak,

interior live oak, blue oak, chamise, Ponderosa pine (*Pinus ponderosa*), common manzanita, and hoary manzanita (*Arctostaphylos canescens*) (CDFW 2019a). The species does not have a serpentine affinity rank (Safford et al. 2005), suggesting it does not have a particular affinity for serpentine soils. The nearest documented occurrence in the vicinity of the Phase 2/Open Space Study Area is from 1964 along Hildebrand Road, approximately 3.5 miles west of the Study Area (CDFW 2019a). The most recent documented occurrence in the vicinity of the Phase 2/Open Space Study Area is from May 2018 near Hidden Valley Lake, approximately 4.5 miles northwest of the Study Area (Calflora 2019).

Within the Phase 2/Open Space Study Area, Konocti manzanita was observed at two locations in the southwestern portion of the Study Area, south of Detert Reservoir, on soils that are mapped as being derived from sandstone and shale (CSRL 2019). This species occurred in openings in blue oak woodland, with an understory dominated by non-native annual grasses.

Narrow-anthered brodiaea (*Brodiaea leptandra*); Rank 1B.2. Narrow-anthered brodiaea is a perennial herb in the brodiaea family (Themidaceae) that blooms from May to July. It typically occurs in broadleaf upland forest, chaparral, and lower montane coniferous forest habitats at elevations ranging from 360 to 3,000 feet (CDFW 2019a, CNPS 2019a). Soil survey data from documented locations suggest this species is associated with gravelly loam and clay loam substrates derived from rhyolites, metavolcanics, and serpentine (CSRL 2019, CDFW 2019a). This species has a serpentine affinity rank of "weak indicator" (2.0) (Safford et al. 2005). The nearest documented occurrence in the vicinity of the Phase 1 Study Area is from 1999 along Kidd Canyon, approximately 4 miles southwest of the Study Area, although the location information is vague (CDFW 2019a). The most recent documented occurrence in the vicinity of the Phase 1 Study Area is from May 2013 at the north end of Las Posadas State Forest, approximately 10 miles south of the Study Area (CDFW 2019a).

Within the Phase 2/Open Space Study Area, approximately 50 individuals of narrow-anthered brodiaea were observed at a single location in the southwestern portion of the Study Area, south of Butts Canyon Road. It occurred on fine-textured, reddish soils in openings in chaparral in an area that burned in the 2015 Valley Fire. Associated species included chamise (*Adenostoma fasciculatum*), wavy-leaved ceanothus (*Ceanothus foliosus* var. *foliosus*), peak rush-rose (*Crocanthemum scoparium*), and small fescue.

Greene's narrow-leaved fleabane (*Erigeron greenei*); Rank 1B.2. Greene's narrow-leaved fleabane is a perennial forb in the sunflower family (Asteraceae) that blooms from May to September. It typically occurs on rocky substrate derived from volcanics or serpentine within shrubby vegetation in chaparral habitat at elevations ranging from 260 to 3,270 feet (CDFW 2019, CNPS 2019a). This species has a serpentine affinity rank of strict endemic (5.7) (Safford et al. 2005); however, this species has been documented from volcanic substrates as well. The nearest documented occurrence in the vicinity of the property is from August 1971 at the foot of Rabbit Hill, approximately 6.5 miles west of the property (CDFW 2019). The most recent documented occurrence in the vicinity of the property is from June 1996 between Soda Valley and Little Sugarloaf Peak, approximately 17.5 miles southeast of the property (CDFW 2019).

Within the Phase 2/Open Space Study Area, thousands of individuals of Greene's narrow-leaved fleabane were observed in numerous locations. It occurred in rocky, sloped, burned and unburned chaparral habitat, usually on serpentine substrates. Associated species included leather oak, yerba santa, woolly sunflower, green monardella (*Monardella viridis*), and small fescue.

Two-carpellate western flax (*Hesperolinon bicarpellatum*); Rank 1B.2. Two-carpellate western flax is an annual forb in the flax family (Linaceae) that blooms from May through July. It typically occurs on serpentine substrates in chaparral habitat at elevations ranging from 195 to 3,270 feet (CNPS 2019a, CDFW 2019). This species has a serpentine affinity rank of strict endemic (6.2) (Safford et al. 2005). The nearest documented occurrence in the vicinity of the property is from June 2017 within the property, east of Bucksnort Creek (CDFW 2019). The most recent documented occurrence in the vicinity of the property is from May 2018 along the upper slope of Dead Horse Flat, approximately 3.25 miles west of the property (CDFW 2019).

Within the Phase 2/Open Space Study Area, tens of thousands of individuals of two-carpellate western flax were observed at numerous locations. It occurred in burned and unburned areas, most commonly on rocky volcanic or serpentine substrates in chaparral or Sargent cypress woodland habitats. Associated species include Sargent cypress, whiteleaf manzanita, green jewelflower (*Streptanthus hesperidis*), foothill pine, woolly sunflower, chamise, Sonoma lessingia (*Lessingia ramulosa*), and small fescue.

Colusa layia (*Layia septentrionalis*); Rank 1B.2. Colusa layia is an annual forb in the sunflower family (Asteraceae) that blooms from April through May. It typically occurs in openings and herbaceous areas underlain by serpentine substrates within chaparral, cismontane woodland, and valley and foothill grassland habitats at elevations ranging from 330 to 3,595 feet (CNPS 2019a, CDFW 2019). This species has a serpentine affinity rank of "strong indicator" (3.2) (Safford et al. 2005). The nearest documented occurrence in the vicinity of the property is from April 1980 in Routan Creek Canyon, approximately 1 mile south of the property (CDFW 2019). The most recent documented occurrence in the vicinity of the property is from May 2010 between Snell Valley and Spanish Valley, approximately 2.25 miles south of the property (CDFW 2019).

Within the Phase 2/Open Space Study Area, thousands of individuals of Colusa layia were observed at several locations. The species occurred within and occasionally at the edges of blue oak woodland on sloping to flat terrain. Associated species included blue oak, Italian thistle (*Carduus pycnocephalus* ssp. *pycnocephalus*), blue dicks (*Dichelostemma capitatum*), and several species of non-native annual grasses.

Green jewelflower (*Streptanthus hesperidis*); Rank 1B.2. Green jewelflower is an annual forb in the mustard family (Brassicaceae) that blooms from May through July. It typically occurs in openings of brushy wooded areas underlain by serpentine substrates in chaparral and cismontane woodland habitat at elevations ranging from 420 to 2,470 feet (CNPS 2019a, CDFW 2019). This species has a serpentine affinity rank of "strict endemic" (6.1) (Safford et al. 2005). The nearest documented occurrence to the property is from June 1952 along Butts Canyon Road, near the southern boundary of the property (CDFW 2019). The most recent documented occurrence in the vicinity of the property is from June 2007 at the northern edge of Las Posadas State Forest, approximately 10.75 miles south of the property (CDFW 2019).

Within the Phase 2/Open Space Study Area, thousands of individuals of green jewelflower were observed at numerous locations. The species occurred in burned and unburned, often sparsely vegetated rocky areas in chaparral on serpentine substrates. Associated species included leather oak, whiteleaf manzanita, yerba santa, serpentine collomia (*Collomia diversifolia*), woolly sunflower, golden buckwheat, Napa cryptantha, and small fescue.

Morrison's jewelflower (*Streptanthus morrisonii*); Rank 1B.2. Morrison's jewel-flower is a perennial forb in the mustard family (Brassicaceae) that blooms from May through August, sometimes into September. It typically occurs on serpentine talus or rocky sites in chaparral habitat at elevations ranging from 585 to 1,920 feet (CDFW 2019a, CNPS 2019a). This species has a serpentine affinity rank of "strict endemic" (6.1) (Safford et al. 2005).

The taxonomy of this species is uncertain. The CNPS recognizes four subspecies (CNPS 2019a); however, the Jepson eFlora (Jepson Flora Project 2019) considers those subspecies as synonyms and does not recognize any infraspecific taxa (CDFW 2019a). Within the vicinity of the Phase 2/Open Space Study Area, two subspecies have been documented: Three Peaks jewelflower (*S. morrisonii* ssp. *elatus*) and Kruckeberg's jewelflower (*S. morrisonii* ssp. *kruckebergii*). The nearest and most recent documented occurrence of Three Peaks jewelflower from within the vicinity of the Phase 2/Open Space Study Area is from May 2009 along Butts Canyon at the Napa/Lake County line (CDFW 2019a). Kruckeberg's jewelflower has its nearest documented occurrence in the vicinity of the Phase 2/Open Space Study Area from July 1981 at the west side of Hunting Creek, approximately 0.25 mile north of the Study Area (CDFW 2019a). The most recent documented occurrence in the vicinity of the Phase 2/Open Space Study Area is from April 2008 near the tributary of Zim Zim Creek, approximately 5 miles northeast of the Study Area (CDFW 2019a).

Within the Phase 2/Open Space Study Area, hundreds of individuals of Morrison's jewelflower were observed in a small number of locations south of Butts Canyon Road in the southwestern portion of the Study Area. The species occurred in serpentine barrens within chaparral habitat that burned in the 2015 Valley Fire. Associated species included Brewer's jewelflower (*S. breweri*), green jewelflower (*S. hesperidis*), leather oak (*Quercus durata*), serpentine collomia (*Collomia diversifolia*), two-carpellate wesern flax (*Hesperolinon bicarpellatum*), nude buckwheat (*Eriogonum nudum*), and woolly malacothrix (*Malacothrix floccosa*).

All CNDDB and CCH records of *S. morrisonii* from the vicinity of the occurrences that WRA documented are identified as Three Peaks jewelflower, subspecies *elatus* (CDFW 2019a). However, the plants that WRA observed appeared morphologically intermediate between Three Peaks jewelflower and a subspecies that may also occur in the vicinity of the Phase 2/Open Space Study Area: Dorr's Cabin jewelflower (*S. morrisonii* ssp. *hirtiflorus*). Dolan and LaPré (1989) state that Dorr's Cabin jewelflower is only known from Sonoma County near Austin Creek, approximately 30 miles west of the Phase 2/Open Space Study Area. However, there is a collection by Ruygt from 1980 in the vicinity of Black Mountain, approximately 9 miles northeast of the Study Area. However, based on the location description for that occurrence (described as "off Devilshead Road, E of Hunting Creek"); WRA assumes that this occurrence is likely much closer to the Phase 2/Open Space Study Area, approximately 3 to 5 miles east to northeast (CCH 2019).

Three Peaks jewelflower should have "glabrous to slightly pubescent, greenish yellow to golden yellow" calyces, whereas Dorr's Cabin jewelflower should have "densely pubescent with long (2 mm) hairs, dark purple" calyces (Dolan and LaPré 1989). All individuals observed by WRA had greenish yellow to golden yellow calyces, which fits Three Peaks jewelflower; however, the vestiture of the calyces was, in the judgment of WRA biologists, denser than "slightly pubescent" but not "densely pubescent," and no hairs were 2 millimeters long. As such, all *S. morrisonii* individuals observed by WRA were assumed to be intermediate between Three Peaks jewelflower and Dorr's Cabin jewelflower and were only identified to the specific level for this report. That said, because both of the putative parent subspecies have a Rank of 1B.2, plants observed within

the Phase 2/Open Space Study Area are also considered to be Rank 1B.2 for the purposes of this report.

CNPS Rank 4 Species

Tall snapdragon (*Antirrhinum virga*); Rank 4.3. Tall snapdragon is a perennial forb in the plantain (Plantaginaceae) family that blooms from June through July. The species typically occurs in rock openings on serpentine soils within chaparral and lower montane coniferous forests at elevations ranging from 300 to 6,045 feet (CNPS 2019a). This species has a serpentine affinity rank of "strong indicator" (2.8) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from June 1983 near Twin Peaks Mine, approximately 2.25 miles southwest of the Study Area (CCH 2019). The most recent documented occurrence in the vicinity of the property is from June 2014 at Livermore Ranch, approximately 4.5 miles southwest of the Study Area (CCH 2019).

Within the Phase 2/Open Space Study Area, approximately nine individuals of tall snapdragon were observed multiple locations. The species occurred in chaparral and foothill pine woodland habitats on rhyolitic and sandstone substrates in areas that burned in the 2015 Valley Fire. Associated species included foothill pine, leather oak, deer weed, chamise, and yerba santa.

Cleveland's milk-vetch (*Astragalus clevelandii*); Rank 4.3. Cleveland's milk-vetch is an annual forb in the pea family (Fabaceae) that blooms from June through September. It typically occurs on serpentine substrates, particularly in and around seeps and swales, within chaparral, cismontane woodland, and riparian forest habitats at elevations ranging from 650 to 4,875 feet (CNPS 2019a, CCH 2019). This species has a serpentine affinity rank of "strict endemic" (6.1) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from June 1945 along Butts Canyon Road. The most recent previously documented occurrence in the vicinity of the property is from June 2018 in Morgan Valley, approximately 6 miles northeast of the property (Calflora 2019).

Within the Phase 2/Open Space Study Area, approximately 25 indivduals of Cleveland's milk-vetch were observed at several locations in and along the edges of ephemeral to perennial streams, seeps, and wetlands on serpentine substrates. Associated species included Brewer's willow, swamp larkspur (*Delphinium uliginosum*), marsh zigadenus (*Toxicoscordion fontanum*), and seep monkeyflower (*Erythranthe guttata*).

Pink star-tulip (*Calochortus uniflorus*); Rank 4.2. Pink star-tulip is a perennial bulbiferous forb in the lily family (Liliaceae) that blooms from April through June. The species typically occurs in coastal prairie, coastal scrub, meadows and seeps, and North Coast coniferous forest at elevations ranging from 33 to 3,510 feet (CNPS 2019a). This species has a serpentine affinity rank of "weak indicator" (1.7) (Safford et al. 2005). Known associated species include California oatgrass (*Danthonia californica*), western buttercup (*Ranunculus occidentalis*), cream sacs (*Castilleja rubicundula*), cream cups (*Platystemon californicus*), and smooth tidytips (*Layia chrysanthemoides*). The nearest and most recent previously documented occurrence in the vicinity of the property is from May 1999 in Snell Valley, approximately 2.5 miles east of the property (CCH 2019).

Within the Phase 2/Open Space Study Area, approximately 150 individuals of pink star-tulip were observed at several locations. The species was found on serpentine substrates in and around seasonal wetland seeps in open, herbaceous areas adjacent to chaparral habitat. Associated species include swamp larkspur, marsh zigadenus, bare monkeyflower (*Erythranthe nudata*), and Italian ryegrass.

Mt. Saint Helena morning glory (*Calystegia collina* ssp. *oxyphylla*); Rank 4.2. Mt. Saint Helena morning-glory is a perennial forb in the morning-glory family (Convolvulaceae) that blooms from April through June. The species typically occurs on slopes and hillsides in barrens or openings within chaparral habitat at elevations ranging from 815 to 3,315 feet (CNPS 2019a). This species has a serpentine affinity rank of "strict endemic" (5.6) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from May 1998 along Butts Canyon Road adjacent to the property (CCH 2019). The most recent previously documented occurrence in the vicinity of the property is near Highway 29, approximately 5.5 miles southwest of the property (CCH 2019).

Within the Phase 2/Open Space Study Area, thousands of individuals of Mt. Saint Helena morning glory were observed at numerous locations. The species occurs in chaparral and woodland habitats on rocky, typically serpentine substrates in burned and unburned areas. Associated species included leather oak, chamise, woolly sunflower, foothill pine, Sargent cypress, two-carpellate western flax, and small fescue.

Tracy's clarkia (*Clarkia gracilis* ssp. *tracyi*); Rank 4.2. Tracy's clarkia is an annual forb in the evening primrose family (Onagraceae) that blooms from April through July. The species typically occurs in openings and bare areas underlain by serpentine substrates within chaparral habitat at elevations ranging from 210 to 2,115 feet (CNPS 2019a, CDFW 2019). This species has a serpentine affinity rank of "broad endemic" (5.0) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from June 1980 along Butts Canyon Road, approximately 0.75 mile southeast of the property (CCH 2019). The most recent previously documented occurrence in the vicinity of the property is from is from May 2016 at the University of California McLaughlin Reserve, approximately 6 miles northeast of the property (CCH 2019).

Within the Phase 2/Open Space Study Area, hundreds of individuals of Tracy's clarkia were observed at several locations. The species occurred in chaparral and annual grassland habitats on serpentine substrates in areas that burned in the 2015 Valley Fire. Associated species included leather oak, small fescue, two-carpellate western flax, narrow tarplant (*Holocarpha virgata* ssp. *virgata*), and Coast Range mariposa lily (*Calochortus vestae*).

Serpentine collomia (*Collomia diversifolia*); Rank 4.3. Serpentine collomia is an annual forb in the phlox family (Polemoniaceae) that blooms from May through June. The species typically occurs on rocky or gravelly serpentine substrates within chaparral and cismontane woodland habitats at elevations ranging from 975 to 1,950 feet (CNPS 2019a). This species has a serpentine affinity rank of "strict endemic" (5.6) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from May 2015 along Butts Canyon Road, adjacent to the property (CCH 2019). The most recent previously documented occurrence in the vicinity of the property is from May 2017 along Hunting Creek, approximately 3 miles east of the property (Calfora 2019).

Within the Phase 2/Open Space Study Area, thousands of individuals of serpentine collomia were observed at numerous locations. The species occurred on rocky, serpentine substrates in chaparral and woodland habitats. Associated species included leather oak, woolly sunflower, Mt. Saint Helena morning-glory, small fescue, green jewelflower, and toyon.

Serpentine bird's beak (*Cordylanthus tenuis* ssp. *brunneus*); Rank 4.3. Serpentine bird's-beak is an annual hemiparasitic forb in the broomrape family (Orobanchaceae) that blooms from July through August. It typically occurs on serpentine substrates in chaparral, cismontane woodland, and closed-cone coniferous forest habitats at elevations ranging from 1,540 to 2,975

feet (CNPS 2019a). This species has a serpentine affinity rank of "broad endemic" (5.1) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the Phase 2/Open Space Study Area is from September 1938 in Butts Canyon, within the Study Area (CCH 2019). The most recent previously documented occurrence in the vicinity of the Phase 2/Open Space Study Area is from June 2016 along Knoxville-Devilhead Road, approximately 4.5 miles northeast of the Study Area (CCH 2019).

Within the Phase 2/Open Space Study Area, approximately 30 individuals of serpentine bird's beak were observed south of Butts Canyon Road. The species occurred on steep, rocky, serpentine substrates in leather oak chaparral and foothill pine woodland. Associated species included leather oak, foothill pine (*Pinus sabiniana*), yerba santa (*Eriodictyon californicum*), Greene's narrow-leaved fleabane (*Erigeron greenei*), serpentine collomia, woolly sunflower (*Eriophyllum lanatum*), and small fescue (*Festuca microstachys*).

Swamp larkspur (*Delphinium uliginosum*); Rank 4.2. Swamp larkspur is a perennial herb in the buttercup (Ranunculaceae) family that blooms from May through June. The species typically occurs in serpentine seeps, chaparral openings, and valley and foothill grassland habitats at elevations ranging from 1,100 to 2,000 feet (CNPS 2019a). This species has a serpentine affinity rank of "strict endemic" (5.7) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from May 1952 along Butts Canyon Road, adjacent to the property (CCH 2019). The most recent previously documented occurrence in the vicinity of the property is from May 2010 along Butts Canyon Road, approximately 1.25 miles southeast of the property (CCH 2019).

Within the Phase 2/Open Space Study Area, thousands of individuals of swamp larkspur were observed at numerous locations in and along the edges of ephemeral to perennial streams, seeps, and wetlands on serpentine substrates. Associated species included Cleveland's milk-vetch, marsh zigadenus, seep monkeyflower, and Italian ryegrass.

Bare monkeyflower (*Erythranthe nudata*); Rank 4.3. Bare monkeyflower is an annual herb in the lopseed family (Phrymaceae) that blooms from May through June. The species typically occurs in seeps and other wet spots in chaparral and cismontane woodland habitats on serpentine substrates at elevations ranging from 655 feet to 2,300 feet (CNPS 2019a). This species has a serpentine affinity rank of "strict endemic" (5.6) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from May 2015 along Butts Canyon Road, adjacent to the property (CCH 2019). The most recent previously documented occurrence in the vicinity of the property is also from May 2015 along Butts Canyon Road, but is approximately 1.25 miles southeast of the property (CCH 2019).

Within the Phase 2/Open Space Study Area, thousands of individuals of bare monkeyflower were observed at numerous locations. The species occurred in and along the edges of ephemeral to perennial streams, seeps, and wetlands, as well as occasionally in mesic, non-wetland areas, but always on serpentine substrates. Associated species included foothill pine, seep monkeyflower, leather oak, woolly sunflower, and swamp larkspur.

St. Helena fawn lily (*Erythronium helenae*); Rank 4.2. St. Helena fawn lily is a perennial bulbiferous herb in the lily (Lilliaceae) family that blooms from March to May. The species typically occurs on volcanic or serpentine soils in chaparral, cismontane woodland, valley and foothill grassland, and lower montane coniferous forest habitats at elevations ranging from 1,050 to 1,660 feet (CNPS 2019a). This species has a serpentine affinity rank of "broad endemic" (4.5) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from

March 1963 along Butts Canyon Road (CCH 2019). The most recent previously documented occurrence in the vicinity of the property is from April 2016 along Livermore Road, near Highway 29, approximately 5.25 miles southwest of the property (CCH 2019).

Within the Phase 2/Open Space Study Area, thousands of individuals of St. Helena fawn lily were observed at several locations. The species occurred in burned and unburned areas on moderately steep, north-facing, rocky slopes in leather oak chaparral habitat on serpentine substrates. Associated species included green monardella, toyon, Greene's narrow-leaved fleabane, coffeeberry, and whiteleaf manzanita.

Purdy's fritillary (*Fritillaria purdyi*); Rank 4.3. Purdy's fritillary is a low-growing, bulbiferous perennial forb in the lily family (Liliaceae) that blooms from March through June. The species typically occurs on dry ridges underlain by serpentine substrate in chaparral, cismontane woodland, and lower montane coniferous forest habitats at elevations ranging from 565 to 7,330 feet (CNPS 2019a, Jepson eFlora 2019). This species has a serpentine affinity rank of "broad endemic" (4.3) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from March 1982 along Butts Canyon Road, approximately 1.25 miles southeast of the property (CCH 2019). The most recent previously documented occurrence in the vicinity of the property is from April 2005 at the McLaughlin Reserve, approximately 6 miles northeast of the property (CCH 2019).

Within the Phase 2/Open Space Study Area, approximately 185 individuals of Purdy's fritillary were observed at several locations. The species occurred on rocky, serpentine substrates in chaparral and woodland habitats in areas that burned in the 2015 Valley Fire. Associated species included leather oak, whiteleaf manzanita, foothill pine, green jewelflower, serpentine collomia, Napa cryptantha, and small fescue.

Serpentine sunflower (*Helianthus exilis*); Rank 4.2. Serpentine sunflower is an annual forb in the sunflower family that blooms from June through November. The species typically occurs in in seeps and other wet areas in chaparral and cismontane woodland on serpentine soils (CNPS 2019a). This species has a serpentine affinity rank of "strict endemic" (5.7) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from October 1994 along Butts Canyon Road, approximately 3 miles southeast of the property (CCH 2019). The most recent previously documented occurrence in the vicinity of the property is from July 2005 at the McLaughlin Reserve, approximately 5 miles to the northeast.

Within the Phase 2/Open Space Study Area, thousands of individuals of serpentine sunflower were observed at numerous locations. The species occurred in and adjacent to wetlands, seeps, and streams on serpentine substrates. Associated species included Brewer's willow, swamp larkspur, Cleveland's ragwort (*Senecio clevelandii* var. *clevelandii*), white hedgenettle (*Stachys albens*), and leather oak.

Green monardella (*Monardella viridis*); Rank 4.3. Green monardella is a perennial forb in the mint family (Lamiaceae) that blooms from June through September. The species typically occurs in chaparral, cismontane woodland, and broadleaf upland forest habitats on serpentine substrates at elevations ranging from 325 to 3,285 feet (CNPS 2019a). This species has a serpentine affinity rank of "broad endemic/strict indicator" (4.3) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from May 2015 along Butts Canyon Road, adjacent to the property (CCH 2019). The most recent previously documented occurrence in the vicinity of the property is from June 2015 on Snell Peak (CCH 2019).

Within the Phase 2/Open Space Study Area, thousands of individuals of green monardella were observed at numerous locations. The species occurred in burned and unburned chaparral on serpentine and volcanic substrates. Associated species included woolly sunflower, leather oak, toyon, Mt. Saint Helena morning-glory, and small fescue.

Cotula navarretia (*Navarretia cotulifolia*); Rank 4.2. Cotula navarretia is an annual forb in the phlox family (Polemoniaceae) that blooms from May through June. The species typically occurs on vernally wet areas underlain by adobe clay in chaparral, cismontane woodland, and valley and foothill grassland habitats at elevations ranging from 10 to 6,005 feet (CNPS 2019a, Jepson Flora Project 2019). The species does not have a serpentine affinity rank (Safford et al. 2005), suggesting it does not have a particular affinity for serpentine soils. The nearest previously documented occurrence in the vicinity of the property is from April 1935 near Aetna Springs, approximately 1.5 miles south of the property (CCH 2019). The most recent previously documented occurrence in the vicinity of the property is from May 1982 along Pope Canyon Rd, approximately 7 miles southeast of the property (CCH 2019).

Within the Phase 2/Open Space Study Area, hundreds of thousands of individuals of cotula navarretia were observed across multiple locations. The species occurred on heavy, serpentine clay soils in mesic grassland. Associated species included slim oat (*Avena barbata*), Italian ryegrass, small fescue, and Douglas' microseris (*Microseris douglasii* ssp. *douglasii*).

Jepson's navarretia (*Navarretia jepsonii*); Rank 4.3. Jepson's navarretia is an annual herb in the phlox (Polemoniaceae) family that blooms from April through June. The species typically occurs in transitional zones between cismontane woodland, chaparral, and valley and foothill annual grassland habitats on clay soils (often serpentine) at elevations ranging from 550 to 2,800 feet (CNPS 2019a). This species has a serpentine affinity rank of "strict endemic" (5.6) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the property is from May 1946 near Detert Reservoir (CCH 2019). The most recent previously documented occurrence in the vicinity of the property is from May 2015 in the Missimer – Snell Valley Preserve, approximately 2.75 miles east of the property (CCH 2019).

Within the Phase 2/Open Space Study Area, thousands of individuals of Jepson's navarretia were observed across numerous locations. The species occurred on heavy, sometimes rocky, serpentine or mixed serpentine/volcanic clay soils in grassland habitat or in grassy openings in chaparral and foothill pine woodland. Associated species included Cleveland's tarplant, small fescue, common soaproot, and trefoil.

Cleveland's ragwort (*Senecio clevelandii* var. *clevelandii*); Rank 4.3. Cleveland's ragwort is a perennial forb in the sunflower family (Asteraceae) that blooms from June through July. The species typically occurs in chaparral habitats on serpentine substrates at elevations ranging from 1,185 to 2,925 feet (CNPS 2018a, CDFW 2018a). This species has a serpentine affinity rank of "strict endemic" (5.8) (Safford et al. 2005). The nearest previously documented occurrence in the vicinity of the Phase 2/Open Space Study Area is from June 1968 along Butts Canyon Road, within the Study Area (CCH 2019). The most recent previously documented occurrence in the vicinity of the Phase 2/Open Space Study Area is from June 2010 in the Cache Creek Wilderness, approximately 9.5 miles north of the Study Area (CCH 2019).

Within the Phase 2/Open Space Study Area, approximately 100 individuals of Cleveland's ragwort were observed south of Butts Canyon Road. The species occurred on intermittent to perennial streams and in wetland meadows on serpentine substrates in areas that burned in the 2015 Valley Fire. Associated species included swamp larkspur, serpentine sunflower (*Helianthus exilis*),

meadow barley (*Hordeum brachyantherum*), marsh zigadenus (*Toxicoscordion fontanum*), marsh triteleia (*Triteleia peduncularis*), and little paintbrush (*Castilleja minor*).

Marsh zigadenus (*Toxicoscordion fontanum*); Rank 4.2. Marsh zigadenus is a bulbiferous perennial forb in the false-helleborine family (Melanthiaceae) that blooms from April to July. The species typically occurs in vernally mesic areas underlain by clay soils derived from serpentine in chaparral, cismontane woodland, lower montane coniferous forest, meadow and seep, and marsh and swamp habitats at elevations ranging from 45 to 3,250 feet (CNPS 2019a, CDFW 2019). This species has a serpentine affinity rank of "broad endemic/strong indicator" (3.8) (Safford et al. 2005). The nearest and most recent previously documented occurrence in the vicinity of the property is from May 2010 along Butts Canyon Road (CCH 2019).

Within the Phase 2/Open Space Study Area, hundreds of individuals of marsh zigadenus were observed at numerous locations. The species occurred in and along the edges of ephemeral to perennial streams, seeps, and wetlands on serpentine substrates. Associated species included seep monkeyflower, Italian ryegrass, swamp larkspur, and iris-leaved rush (*Juncus xiphioides*).

Dark-mouthed triteleia (*Triteleia lugens*); Rank 4.3. Dark-mouthed triteleia is a perennial bulbiferous forb in the brodiaea family (Themidaceae) that blooms from April through June. The species typically occurs in chaparral, coastal scrub, broadleaf upland forest, and lower montane coniferous forest habitats at elevations ranging from 325 to 3,250 feet (CNPS 2018a). The species does not have a serpentine affinity rank (Safford et al. 2005), suggesting it does not have a particular affinity for serpentine soils. The nearest previously documented occurrence in the vicinity of the Phase 2/Open Space Study Area is from June 1933, approximately 3.5 miles southwest of the Study Area (CCH 2019). The most recent previously documented occurrence in the vicinity of the Phase 2/Open Space Study Area is from May 1999 at Livermore Ranch, approximately 4.5 miles southwest of the Study Area (CCH 2019).

Within the Phase 2/Open Space Study Area, approximately 100 individuals of dark-mouthed triteleia were observed south of Butts Canyon Road in burned chaparral on rocky volcanic substrates. Associated species included leather oak, coffeeberry (*Frangula californica*), toyon (*Heteromeles arbutifolia*), small fescue, and Sargent cypress (*Hesperocyparis sargentii*).

5.2.2 Special-Status Plant Species with Potential to Occur

In addition to those special-status plant species that were observed within the Phase 2/Open Space Study Area, the 80 special-status plant species listed in Table 6 were determined to have at least a moderate potential to occur based on the types and condition of habitats found there. These species were not observed during reconnaissance-level surveys for special-status plants; however, their presence cannot be ruled out as suitable habitat is present and the species may be present in low numbers or may have been historically present and remain onsite in a dormant condition waiting for favorable climatic conditions. For example, many species may be present in the seed bank, but may only germinate following fire or during periods of substantial rainfall. The preferred habitat and blooming period for each of these species is described in Appendix D.

Table 6. Special-Status Plant Species with Moderate Potential to Occur within the Phase 2/Open Space Study Area

Scientific Name	Common Name	Conservation Status
Allium fimbriatum var. *purdyi*	Purdy's onion	Rank 4.3
Amorpha californica var. napensis	Napa false indigo	Rank 1B.2
Amsinckia lunaris	Bent-flowered fiddleneck	Rank 1B.2
Antirrhinum subcordatum	Dimorphic snapdragon	Rank 4.3
Arabis modesta	Modest rockcress	Rank 4.3
Arabis oregana	Oregon rockcress	Rank 4.3
Asclepias solanoana	Serpentine milkweed	Rank 4.2
Astragalus breweri	Brewer's milk-vetch	Rank 4.2
Astragalus claranus	Clara Hunt's milk-vetch	FE, ST Rank 1B.3
Astragalus rattanii var. *jepsonianus*	Jepson's milk-vetch	Rank 1B.2
Balsamorhiza macrolepis	Big-scale balsamroot	Rank 1B.2
Brasenia schreberi	Watershield	Rank 2B.3
Calamagrostis ophitidis	Serpentine reed grass	Rank 4.3
Calyptridium quadripetalum	Four-petaled pussypaws	Rank 4.3
Calystegia collina ssp. *venusta*	South coast range morning-glory	Rank 4.3
Castilleja rubicundula var. *rubicundula*	Pink cream sacs	Rank 1B.2
Ceanothus confusus	Rincon Ridge ceanothus	Rank 1B.1
Ceanothus divergens	Calistoga ceanothus	Rank 1B.2
Ceanothus purpureus	Holly-leaved ceanothus	Rank 1B.2
Ceanothus sonomensis	Sonoma ceanothus	Rank 1B.2
Chlorogalum pomeridianum var. minus	Dwarf soaproot	Rank 1B.2
Clarkia breweri	Brewer's clarkia	Rank 4.2
Cryptantha dissita	Serpentine cryptantha	Rank 1B.2
Cryptantha excavata	Deep-scarred cryptantha	Rank 1B.1
Cryptantha rostellata	Red-stemmed cryptantha	Rank 4.2
Downingia willamettensis	Cascade downingia	Rank 2B.2
Eriastrum brandegeeae	Brandegee's eriastrum	Rank 1B.1
Erigeron biolettii	Streamside daisy	Rank 3
Eriogonum nervulosum	Snow Mountain buckwheat	Rank 1B.2
Eriogonum umbellatum var. *bahiiforme*	Bay buckwheat	Rank 4.2
Eryngium constancei	Loch Lomond button celery	FE, SE Rank 1B.1

Scientific Name	Common Name	Conservation Status
Eryngium jepsonii	Jepson's coyote thistle	Rank 1B.2
Fritillaria pluriflora	Adobe lily	Rank 1B.2
Gratiola heterosepala	Boggs Lake hedge hyssop	SE, Rank 1B.2
Harmonia hallii	Hall's harmonia	Rank 1B.2
Harmonia nutans	Nodding harmonia	Rank 4.3
Hemizonia congesta ssp. *congesta*	Congested-headed hayfield tarplant	Rank 1B.2
Hesperolinon adenophyllum	Glandular western flax	Rank 1B.2
Hesperolinon drymarioides	Drymaria-like western flax	Rank 1B.2
Hesperolinon sharsmithiae	Sharsmith's western flax	Rank 1B.2
Horkelia bolanderi	Bolander's horkelia	Rank 1B.2
Juncus luciensis	Santa Lucia dwarf rush	Rank 1B.2
Lasthenia burkei	Burke's goldfields	FE, SE Rank 1B.1
Legenere limosa	Legenere	Rank 1B.1
Leptosiphon acicularis	Bristly leptosiphon	Rank 4.2
Leptosiphon jepsonii	Jepson's leptosiphon	Rank 1B.2
Leptosiphon latisectus	Broad-lobed leptosiphon	Rank4.3
Lessingia hololeuca	Woolly-headed lessingia	Rank 3
Lilium rubescens	Redwood lily	Rank 4.2
Limnanthes floccosa ssp. *floccosa*	Woolly meadowfoam	Rank 4.2
Limnanthes vinculans	Sebastopol meadowfoam	FE, SE Rank 1B.1
Lomatium hooveri	Hoover's lomatium	Rank 4.3
Lomatium repostum	Napa lomatium	Rank 4.3
Lupinus sericatus	Cobb Mountain lupine	Rank 1B.2
Malacothamnus helleri	Heller's bush-mallow	Rank 3.3
Micropus amphibolus	Mt.Diablo cottonweed	Rank 3.2
Microseris paludosa	Marsh microseris	Rank 1B.2
Microseris sylvatica	Sylvan microseris	Rank 4.2
Navarretia leucocephala ssp. *bakeri*	Baker's navarretia	Rank 1B.1
Navarretia myersii ssp. deminuta	Small pincushion navarretia	Rank 1B.2
Navarretia nigelliformis ssp. nigelliformis	Adobe navarretia	Rank 4.2
Navarretia paradoxinota	Porter's navarretia	Rank 1B.3
Navarretia rosulata	Marin County navarretia	Rank 1B.2

Scientific Name	Common Name	Conservation Status
Orcuttia tenuis	Slender Orcutt grass	FT, SE, Rank 1B.1
Orobanche valida ssp. *howellii*	Howell's broomrape	Rank 4.3
Penstemon newberryi var. *sonomensis*	Sonoma beardtongue	Rank 1B.3
Plagiobothrys hystriculus	Bearded popcornflower	Rank 1B.1
Potamageton zosteriformis	Eel-grass pondweed	Rank 2B.2
Ranunculus lobbii	Lobb's aquatic buttercup	Rank 4.2
Sedella leiocarpa	Lake County stonecrop	FE, SE Rank 1B.1
Sidalcea hickmanii ssp. *napensis*	Napa checkerbloom	Rank 1B.1
Sidalcea oregana ssp. *hydrophila*	Marsh checkerbloom	Rank 1B.2
Streptanthus brachiatus ssp. *brachiatus*	Socrates Mine jewelflower	Rank 1B.2
Streptanthus brachiatus ssp. *hoffmanii*	Freed's jewelflower	Rank 1B.2
Streptanthus morrisonii ssp. elatus	Three Peaks jewelflower	Rank 1B.2
Streptanthus vernalis	Early jewelflower	Rank 1B.2
Stuckenia filiformis ssp. alpina	Slender-leaved pondweed	Rank 2B.2
Thelypodium brachycarpum	Short-podded Thelypodium	Rank 4.2
Trichostema ruygtii	Napa bluecurls	Rank 1B.2
Viburnum ellipticum	Oval-leaved viburnum	Rank 2B.3

5.3 Special-Status Wildlife Species

WRA wildlife biologists observed a total of 130 wildlife species within[12] the property, including 19 mammal species, 82 bird species, 12 reptile and amphibian species, 10 fish species, and seven invertebrate species. A list of all wildlife species observed is provided as Appendix F.

Based upon a review of the resources listed in Section 4.0, it was determined that 60 special-status wildlife species have been documented in one or more of the referenced 7.5-minute quadrangles in the vicinity of the Phase 2/Open Space Study Area (see Section 4.0). Figure 5 depicts the subset of those species that occur within 5 miles of the property. Appendix G summarizes the potential for each of these species to occur within the Phase 2/Open Space Study Area. Fourteen special-status wildlife species were observed within or adjacent to the Phase 2/Open Space Study Area, and an additional 21 special-status wildlife species were determined to have a moderate to high potential to occur within the Phase 2/Open Space Study Area. The Phase 2/Open Space Study Area does not contain designated Critical Habitat for any species.

[12] All wildlife species observed within the property in 2018 and 2019 were documented and included in this list. Due to the ability of wildlife to move between suitable habitats within the property, specific locations were not noted unless the species was special-status or a raptor.

The remaining 25 species were determined to be unlikely or have no potential to occur in the Phase 2/Open Space Study Area for one or more of the following reasons:

- The Phase 2/Open Space Study Area is outside of the known or historical range of the species;
- The Phase 2/Open Space Study Area lacks specific habitat requirements (i.e. marsh, old growth conifers, etc.),
- Invasive or detrimental species, such as non-native fish and bullfrogs, are present and reduce habitat suitability; or,
- There are barriers to dispersal that make it unlikely for the species to occur on-site.

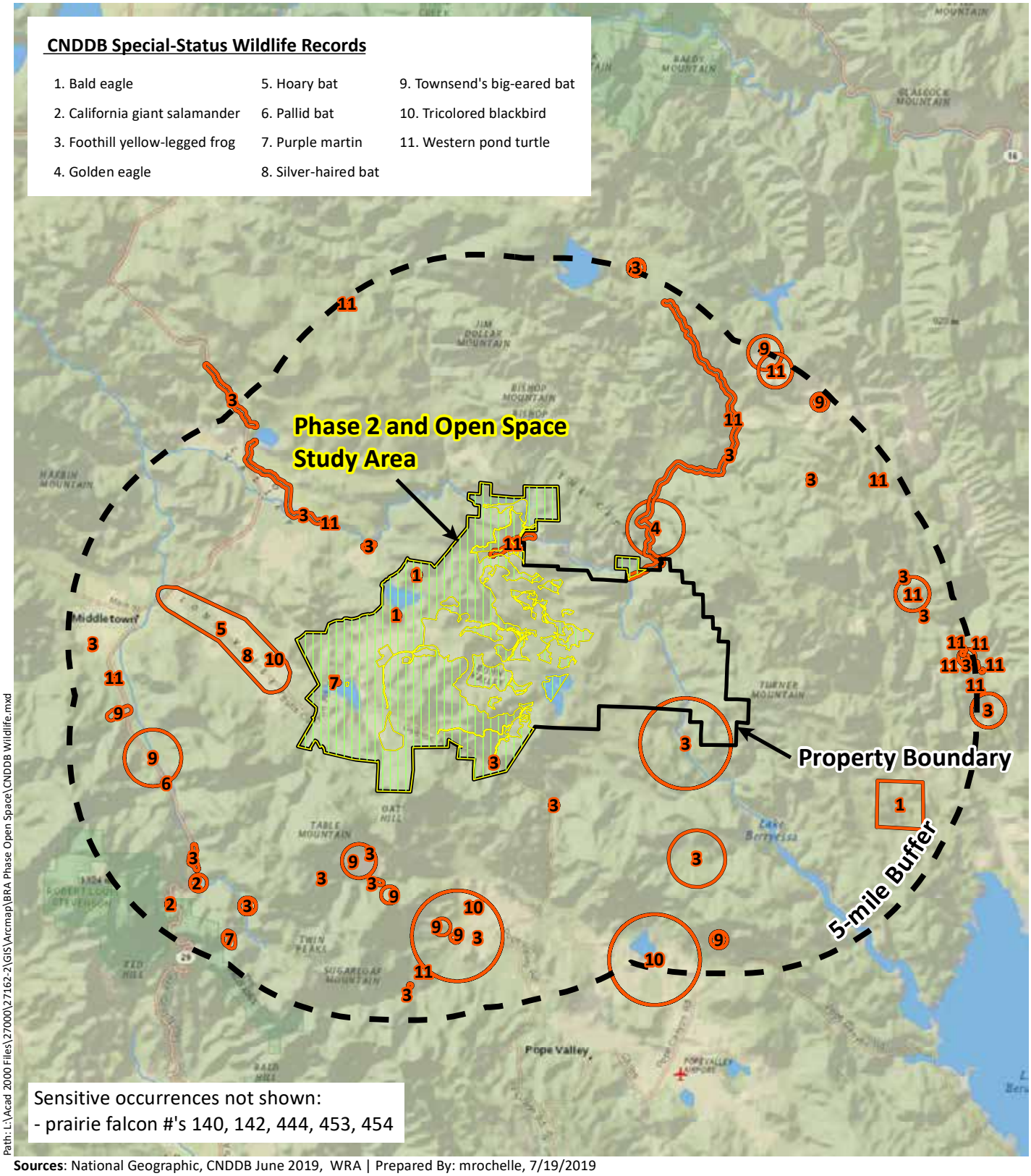
Table 7 lists the special-status wildlife species observed within or adjacent to the Phase 2/Open Space Study Area; Figure 6 shows their locations. Descriptions of these species, their preferred habitat, and their observed and potential distribution across the Phase 2/Open Space Study Area are provided below and summarized in Appendix G. Table 8 lists the special-status wildlife species determined to have moderate to high potential to occur within the Phase 2/Open Space Study Area. Descriptions of these species, their preferred habitat, and their potential for occurring within the Phase 2/Open Space Study Area are summarized in Appendix G.

Focused raptor surveys conducted in 2018 identified 14 raptor species and eight active raptor nests located within or adjacent to the Phase 2/Open Space Study Area. In 2019, an additional raptor species (Cooper's hawk) was observed. A total of 63 avian species were identified within the property. Detailed results of focused raptor surveys are provided in Appendix H of the Phase 1 BRA (WRA 2019).

Focused surveys for amphibians determined that FYLF is present within the property in association with Butts Creek. Additionally, surveys identified FYLF egg masses in Butts Creek, indicating that the species breeds there. Although FYLF has been documented as extant in the Phase 2/Open Space Study Area, the presence of numerous non-native predators including American bullfrog, non-native centrarchid fishes, and crayfish, may be limiting the distribution and overall success of FYLF within the Phase 2/Open Space Study Area.

Focused surveys conducted for CRLF had negative results. All of the lentic and lotic habitats, at the time of the survey, were documented to be infested with invasive predators, including American bullfrog, largemouth and smallmouth bass, and bluegill and green sunfish. Additionally signal-band crayfish were also observed in several of the habitats. Red swamp crayfish were observed in at least one area. The presence and density of these invasive aquatic species was determined to preclude the presence of CRLF from inhabiting the surveyed aquatic habitats, and make it unlikely to occur within the Phase 2/Open Space Study Area.

In addition to the special-status wildlife species that may occur, non-status wildlife species occur and may use portions of the Phase 2/Open Space Study Area as a migration corridor. Large expanses of uncultivated land can be used by native species, such as mule deer (*Odocoileus hemionus*), mountain lion (*Puma concolor*), and black bear (*Ursus americanus*), to move to various territories seasonally and throughout their life cycle. Within the Phase 2/Open Space Study Area, habitats including, but not limited to, open grassland valleys, oak woodlands, chaparral, and stream corridors may facilitate wildlife movement. Additionally, the many lakes, reservoirs, and ponds in and within close proximity to the Phase 2/Open Space Study Area are anticipated to attract native wildlife species. Therefore, portions of the Phase 2/Open Space



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Sources: National Geographic, CNDDB June 2019, WRA | Prepared By: mrochelle, 7/19/2019

Figure 5. CNDDB Special-Status Wildlife Records within 5 miles of the Guenoc Ranch

Maha Resort and Guenoc Valley
Development, Phase 2 and Open Space
Lake County, California

0 2.5 5 Miles

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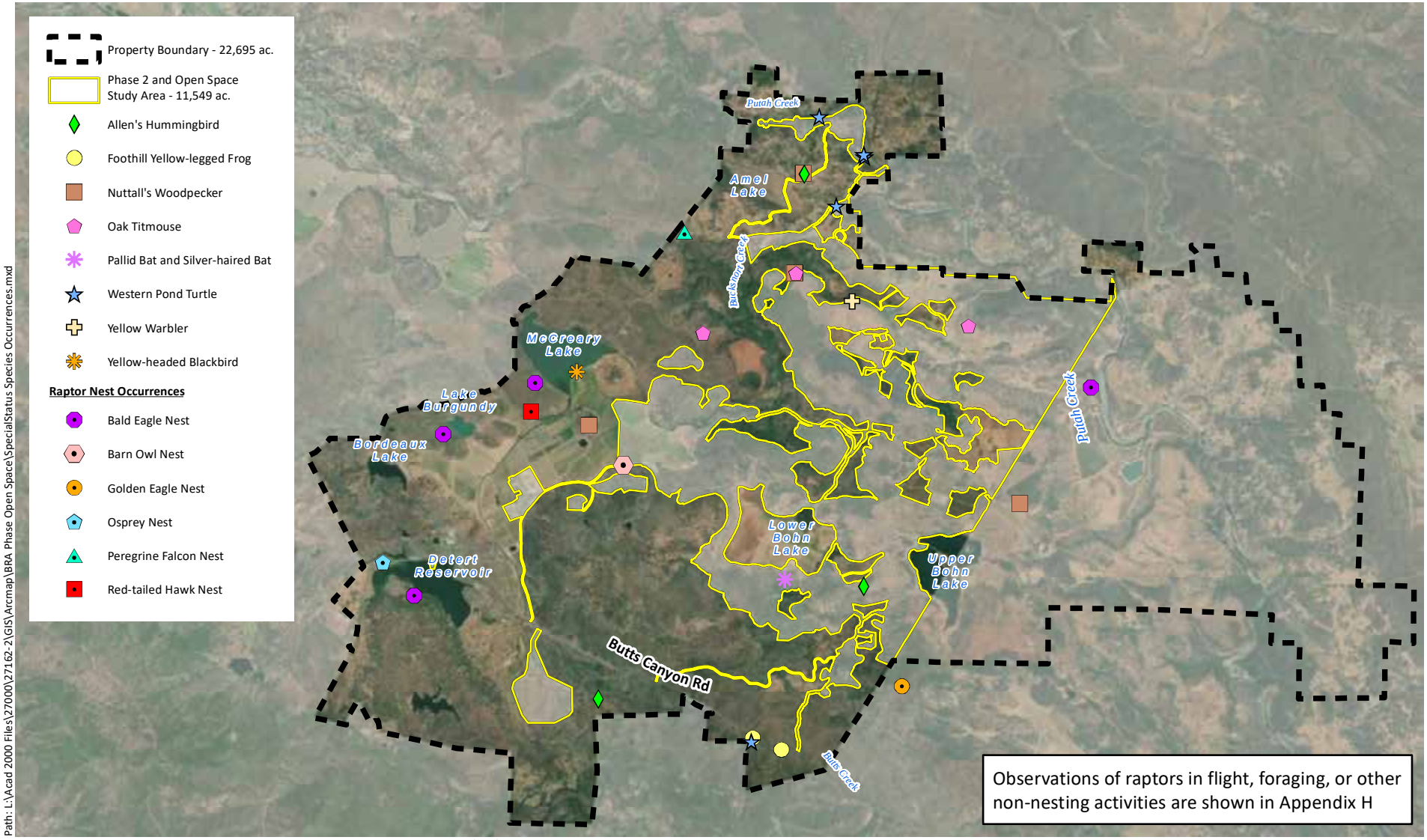

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Sources: Esri Streaming - NAIP 2016, WRA | Prepared By: mrochelle, 7/19/2019

Figure 6. Special-Status Wildlife Species Observed within the Guenoc Resort

Maha Resort and Guenoc Valley
Development, Phase 2 and Open Space
Lake County, California

0 1 2 Miles

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ENVIRONMENTAL CONSULTANTS

Table 7. Special-Status Wildlife Species Observed within or adjacent to the Phase 2/Open Space Study Area

Scientific Name	Common Name	Conservation Status
Birds		
Aquila chrysaetos	Golden eagle	BGEA, CFP, BCC
Baeolophus inornatus	Oak titmouse	BCC
Circus cyaneus	Northern harrier	SSC
Elanus leucurus	White-tailed kite	CFP
Falco peregrinus	Peregrine falcon	CFP, BCC
Haliaeetus leucocephalus	Bald eagle	BGEA, SE, CFP, BCC
Picoides nuttallii	Nuttall's woodpecker	BCC
Selasphorus sasin	Allen's hummingbird	BCC
Setophaga petechia	Yellow warbler	BCC, SSC
Xanthocephalus xanthocephalus	Yellow-headed blackbird	SSC
Mammals		
Antrozous pallidus	Pallid bat	SSC, WBWG High
Lasionycteris noctivagans	Silver-haired bat	WBWG Medium
Reptiles and Amphibians		
Actinemys marmorata	Western pond turtle	SSC
Rana boylii	Foothill yellow-legged frog	SC, SSC

Study Area may occur within one or more wildlife migration corridors, and additional focused studies may be needed to identify those corridors.

5.3.1 Special-Status Wildlife Species Observed within the Phase 2/Open Space Study Area

Wildlife documented to occur within the property in 2018 and 2019 are considered present in both the Phase 1 Study Area and Phase 2/ Open Space Study Area. As described for the Phase 1 Study Area (WRA 2019), 21 special-status wildlife species were observed Phase 1 and Phase 2/Open Space study areas; those species are described below, organized by conservation status and then alphabetically by species therein.

Federal-Protected and State-Listed Species

Golden eagle (*Aquila chrysaetos*); Federal Bald and Golden Eagle Protection Act, California Fully Protected Species, USFWS Bird of Conservation Concern. Golden eagle is a large raptor that occurs in open and semi-open areas from sea level to high elevations. Typical occupied habitats include grasslands, shrublands, deserts, woodlands, and coniferous forests. Breeding activity occurs broadly from January through August and is usually initiated from January to March in California. The large stick nests of this species are reused over multiple years and may be maintained throughout the year. Nests are most often located on the ledges

of steep cliffs, but nesting also occurs in large trees and on tall manmade structures (e.g., utility towers) (Kochert et al. 2002). Golden eagles forage over wide areas, feeding primarily on medium-sized mammals (e.g., ground squirrels and rabbits), large birds, and carrion.

An active golden eagle nest was observed approximately 0.2 mile south of the property (Figure 6). Adult and juvenile golden eagles were observed flying, foraging, and perching within a variety of habitats within the Phase 2/Open Space Study Area. No active golden eagle nests were observed within the Phase 2/Open Space Study Area; however, suitable nesting habitat is present and the species has potential to nest within the Phase 2/Open Space Study Area.

Bald eagle (*Haliaeetus leucocephalus*); Federal Bald and Golden Eagle Protection Act, State Endangered, CDFW Fully Protected Species, USFWS Bird of Conservation Concern. Bald eagle occurs primarily as a winter visitor but also as a year-round (breeding) resident throughout most of California. Habitat is somewhat variable, but the species is usually strongly associated with larger bodies of water including lakes, reservoirs, major river systems, estuaries, and the ocean. Breeding occurs primarily in forested areas near water bodies; wintering habitat is more general, but is generally located near water. Their sizable nests are typically built in in the upper portions of large, live trees that provide dominant views of surrounding areas (Buehler 2000). Bald eagles are highly opportunistic foragers; fish and waterfowl are usually favored, but a variety of live prey and carrion are consumed.

Adult and juvenile bald eagles were observed flying and roosting adjacent to multiple reservoirs in and adjacent to the Phase 2 Study Area, as well as in other habitats. In 2018, four bald eagle nests were observed in the Phase 2/Open Space Study Area, including one each at Detert Reservoir, Lake Burgundy, McCreary Lake, and Putah Creek (Figure 6). Nests of this species have been previously documented in the CNDDB within the phase 2/Open Space Study Area around McCreary Reservoir (CDFW 2019).

Foothill yellow-legged frog (*Rana boylii*); State Candidate Threatened. Foothill yellow-legged frog historically occurred in coastal and mountain streams from southern Oregon to Los Angeles County, but has declined in many parts of this range. This species is strongly associated with rivers and creeks, and prefers shallow, flowing water with a rocky substrate. Individuals do not typically move overland and are rarely observed far from a source of permanent water. In a study in northern California, adults were typically observed within ten feet and rarely over 40 feet from streams (Bourque 2008). Although upland habitat usage is not well-studied, the data suggest that movements away from water are related to flood events (Kupferberg 1996, Bourque 2008, Thomson et al. 2016) or autumnal rains (Cook et al 2012). Frogs in intermittent streams may move more than those in perennial streams, but movements are generally limited to within the creek corridor (Kupferberg 1996, Bourque 2008, Gonsolin 2010). Aquatic breeding sites are often located near stream confluences, with egg masses typically deposited behind or sometimes under rocks in low-flow areas with cobble and/or gravel substrate (Thomson et al. 2016).

During site assessments by WRA, foothill yellow-legged frog was observed within the Phase 2/Open Space Study Area, in association with Butts Creek, near its confluence with McCain Creek (Figure 6). Perennial and intermittent streams with rocky substrates throughout the Phase 2/Open Space Study Area provide potentially suitable habitat for the species, including both Butts and Putah creeks and potentially portions of Butcherknife, Bucksnort, and McCain creeks when favorable water levels are present.

California Fully Protected Species

White-tailed kite (*Elanus leucurus*); California Fully Protected Species. The white-tailed kite is resident in open to semi-open habitats throughout the lower elevations of California, including grasslands, savannahs, woodlands, agricultural areas and wetlands. Vegetative structure and prey availability seem to be more important habitat elements than associations with specific plants or vegetative communities (Dunk 1995). Nests are constructed mostly of twigs and placed in trees, often at habitat edges. Nest trees are highly variable in size, structure, and immediate surroundings, ranging from shrubs to trees greater than 150 feet tall (Dunk 1995). This species preys upon a variety of small mammals, as well as other vertebrates and invertebrates.

The Phase 2/Open Space Study Area contains open foraging habitat as well as trees and shrubs suitable for nesting by this species. White-tailed kite was observed foraging within the property, primarily in association with Lower Bohn Lake; however, no indication of nesting was observed.

American peregrine falcon (*Falco peregrinus anatum*); California Fully Protected Species, USFWS Bird of Conservation Concern (Federal Delisted, State Delisted). This large falcon occurs as a generally uncommon resident as well as a winter visitor and migrant throughout much of California. Occupied habitat (both breeding and non-breeding) is highly variable, but this species is typically associated with open areas and/or bodies of water. Nesting typically occurs on the ledges of steep cliffs, or on man-made structures with ledges above sheer faces such as bridges and the tops of buildings (White et. al 2002). The peregrine falcon preys upon a wide variety of animals, mostly birds; on the Pacific coast, waterbirds (e.g., waterfowl, shorebirds, and seabirds) are especially favored (White et. al 2002). This species forages over wide areas, even during the breeding season.

Reservoirs and rocky cliffs within the Phase 2/Open Space Study Area provide potential foraging and nesting habitat for this species. An active peregrine falcon nest was observed on a south-facing rocky cliff north of Bucksnort Creek, within the Phase 2/Open Space Study Area (Figure 6).

USFWS Birds of Concern, CDFW Species of Concern, WBWG Rated-Bats

Western pond turtle (*Actinemys marmorata*); CDFW Species of Special Concern. Western pond turtle (WPT) is the only native freshwater turtle in California. This turtle is uncommon to common in suitable aquatic habitat throughout California, west of the Sierra-Cascade crest and Transverse Ranges. Western pond turtle inhabits annual and perennial aquatic habitats, such as coastal lagoons, lakes, ponds, marshes, rivers, and streams from sea level to 5,500 feet in elevation. Pond turtle also occupies man-made habitats such as stock ponds, wastewater storage, percolation ponds, canals, and reservoirs. This species requires low-flowing or stagnant freshwater aquatic habitat with suitable basking structures, including rocks, logs, algal mats, mud banks and sand. Warm, shallow, nutrient-rich waters are ideal as they support WPT prey items, which include aquatic invertebrates and occasionally fish, carrion, and vegetation. Turtles require suitable aquatic habitat for most of the year; however, WPT often occupies creeks, rivers, and coastal lagoons that become seasonally unsuitable. To escape periods of high water flow, high salinity, or prolonged dry conditions, WPT may move upstream and/or take refuge in vegetated, upland habitat for up to four months (Rathbun et al. 2002). Although upland habitat is utilized for refuging and nesting, this species preferentially utilizes aquatic and riparian corridors for movement and dispersal. WPT nests from late April through July. This species requires open, dry upland habitat with friable soils for nesting and prefer to nest on unshaded slopes within 15 to

330 feet of suitable aquatic habitat (Rathbun et al. 1992). Nests are well-concealed, though native mammals are occasionally able to locate and predate upon eggs.

Western pond turtle was observed within portions of Bucksnort Creek, Putah Creek, and an unnamed reservoir south of Butts Creek on the west side of Butts Canyon Road (Figure 6). In addition, the other streams and large open water reservoirs with the Phase 2/Open Space Study Area provide suitable aquatic habitat, and the associated open grasslands adjacent to these features may support nesting.

Pallid bat (*Antrozous pallidus*); CDFW Species of Special Concern, WBWG High Priority. Pallid bat is broadly distributed throughout much of western North America and typically occurs in association with open, rocky areas. Occupied habitats are highly variable and range from deserts to forests in lowland areas and include higher-elevation forests. Roosting may occur singly or in groups of up to hundreds of individuals. Roosts must offer protection from high temperatures and are typically located in rock crevices, mines, caves, or tree hollows; manmade structures are also used, including buildings (both vacant and occupied) and bridges. Pallid bats are primarily insectivorous, feeding on large prey that is usually taken on the ground but sometimes in flight (WBWG 2018).

The Phase 2/Open Space Study Area contains shrubland, forested habitats, rocky outcroppings, chaparral, agricultural areas and buildings that may be suitable for roosting by this species. In addition, the Phase 2/Open Space Study Area contains stream, riparian, and grassland habitats bordering open water which provides foraging habitat for this species. Pallid bat was detected within the Phase 1 Study Area using a Sonobat recording device located near a small reservoir south of Lower Bohn Lake (Figure 6) and is assumed to be present in other portions of the Phase 2/Open Space Study Area, particularly near ponds and reservoirs.

Oak titmouse (*Baeolophus inornatus*); USFWS Bird of Conservation Concern. This relatively common species is year-round resident throughout much of California including most of the coastal slope, the Central Valley and the western Sierra Nevada foothills. In addition, the species may also occur in residential settings where landscaping provides foraging and nesting habitat. Its primary habitat is woodland dominated by oaks. Local populations have adapted to woodlands of pines and/or junipers in some areas (Cicero 2000). The oak titmouse nests in tree cavities, usually natural cavities or those excavated by woodpeckers, although they may partially excavate their own (Cicero 2000). Seeds and arboreal invertebrates make up the birds' diet.

The Phase 2/Open Space Study Area contains woodland and tree cavities suitable for nesting by this species. Oak titmouse was observed in woodland communities throughout Guenoc Ranch, including at least several location within and adjacent to the Phase 2/Open Space Study Area (Figure 6). Although no nests were documented, it is assumed that this species nests within the Phase 2/Open Space Study Area.

Northern harrier (*Circus hudsonius [cyaneus]*); CDFW Species of Special Concern. The northern harrier occurs as a resident and winter visitor in open habitats throughout most of California, including freshwater and brackish marshes, grasslands and fields, agricultural areas, and deserts. Harriers typically nest in treeless areas within patches of dense, relatively tall, vegetation, the composition of which is highly variable; nests are placed on the ground and often located near water or within wetlands (Shuford and Gardali 2008). Harriers are birds of prey and subsist on a variety of small mammals and other vertebrates.

This species was observed foraging in marsh and grassland throughout the Phase 2/Open Space Study Area (Figure 6); however, no nesting activity was observed.

Silver-haired bat (*Lasionycteris noctivagans*); WBWG Medium Priority. Silver-haired bats occur in temperate forests (coniferous, deciduous, and mixed) from southern Alaska to northeastern Mexico. Females form maternity roosts almost exclusively inside hollows or under loose bark of large trees and may switch roosts several times (WBWG 2018). Hibernation occurs in trees, rock crevices, leaf litter, in and under buildings, and in caves and mines. Foraging for insects occurs above the tree canopy. Silver-haired bats are known to migrate south in the winter, although overwintering at northern latitudes has also been documented (WBWG 2018).

The Phase 2/Open Space Study Area contains potentially suitable woodland, forest, riparian, and open habitat suitable for this species. This species is likely to roost in hollow trees, snags, rock crevices, and buildings in the Phase 2/Open Space Study Area. Silver-haired bat was detected within the Phase 1 Study Area using a Sonobat recording device located near a small reservoir south of Lower Bohn Lake (Figure 6). Silver-haired bat is assumed to be present in portions of the Phase 2/Open Space Study Area, particularly near ponds and reservoirs.

Nuttall's woodpecker (*Picoides nuttallii*); USFWS Bird of Conservation Concern. Nuttall's woodpecker, common in much of its range, is a year-round resident throughout most of California west of the Sierra Nevada Range. Typical habitat is oak or mixed woodland and riparian areas (Lowther 2000). Nesting occurs in tree cavities, principally those of oaks and larger riparian trees. Nuttall's woodpecker also occurs in older residential settings and orchards where large trees provide suitable foraging and nesting habitat. This species forages on a variety of arboreal invertebrates.

The Phase 2/Open Space Study Area contains numerous woodland areas and trees with cavities suitable for nesting by this species. Nuttall's woodpecker was observed within the woodland communities within and adjacent to the Phase 2/Open Space Study Area (Figure 6), and the species is assumed to nest there.

Allen's hummingbird (*Selasphorus sasin*); USFWS Bird of Conservation Concern. Allen's hummingbird, common in many portions of its range, is a summer resident along the majority of California's coast and a year-round resident in portions of coastal southern California and the Channel Islands. Breeding occurs in association with the coastal fog belt, and typical habitats used include coastal scrub, riparian, woodland and forest edges, and eucalyptus and cypress groves (Mitchell 2000). It feeds on nectar, as well as insects and spiders.

The Phase 2/Open Space Study Area contains woodland and riparian habitats with nectar sources that may support nesting. This species was observed in multiple locations within and adjacent to the Phase 2/Open Space Study Area (Figure 6) and has potential to occur in numerous habitats throughout the site.

(Brewster's) Yellow warbler (*Setophaga petechia brewsteri*); CDFW Species of Special Concern, USFWS Bird of Conservation Concern. The yellow warbler is a neotropical migrant bird that is widespread in North America, but has declined throughout much of its California breeding range. The Brewster's (*brewsteri*) subspecies is a summer resident and represents the vast majority of yellow warblers that breed in California. West of the Central Valley, typical yellow warbler breeding habitat consists of dense riparian vegetation along watercourses, including wet meadows, with willow growth especially being favored (Shuford and Gardali 2008). Insects comprise the majority of the diet.

The Phase 2/Open Space Study Area contains riparian areas with dense vegetation to support nesting by this species. This species was observed within at least one location adjacent to the

Phase 2/Open Space Study Area (Figure 6) and has potential to occur within riparian habitat throughout the Phase 2/Open Space Study Area.

Yellow-headed blackbird (*Xanthocephalus xanthocephalus*); CDFW Species of Special Concern. The yellow-headed blackbird occurs as a summer resident and migrant in southern California, with a patchy breeding distribution. This species nests colonially or semi-colonially in marshes dominated by tall emergent vegetation (e.g., cattails, tules), and with relatively deep water. Because of the latter requirement, marshes utilized for nesting are often along the edges of lakes and larger ponds (Shuford and Gardali 2008). Adults during the breeding season forage primarily for large aquatic insects such as dragonflies and damselflies.

The Phase 2/Open Space Study Area contains marshes with tall emergent vegetation suitable for this species. Yellow-headed blackbird was observed nesting in emergent vegetation within the Phase 2/Open Space Study Area (Figure 6), near McCreary Lake, and has potential to occur in association with other large ponds and reservoirs throughout the Phase 2/Open Space Study Area.

5.3.2 Special-Status Wildlife Species with Potential to Occur

Due to the ability of wildlife to move between suitable habitats within the property, the potential for special-status species to occur within the Phase 2/Open Space Study Area was determined to be the same as their potential to occur within the Phase 1 Study Area. While the Phase 2/ Open Space Study Area may contain a higher or lower concentration of certain habitat types relative to the Phase 1 Study Area, the differences in habitat composition are not significant enough to change the potential for special-status species to occur. The 21 special-status wildlife species listed in Table 8 were determined to have moderate to high potential to occur within the Phase 2/Open Space Study Area based on the types and condition of habitats found there. The preferred habitat for each of these species is described in Appendix G.

Table 8. Special-Status Wildlife Species with Potential to Occur within the Phase 2/Open Space Study Area

Scientific Name	Common Name	Conservation Status
Mammals		
Bassariscus astutus	Ring-tailed cat (ringtail)	CFP
Corynorhinus townsendii	Townsend's big-eared bat	SSC, WBWG High
Lasiurus blossevillii	Western red bat	SSC, WBWG High
Lasiurus cinereus	Hoary bat	WBWG Medium
Myotis evotis	Long-eared myotis	WBWG Medium
Myotis thysanodes	Fringed myotis	WBWG High
Myotis volans	Long-legged myotis	WBWG High
Taxidea taxus	American badger	SSC
Birds		
Agelaius tricolor	Tricolored blackbird	ST, SSC, BCC
Ammodramus savannarum	Grasshopper sparrow	BCC
Asio otus	Long-eared owl	SSC

Scientific Name	Common Name	Conservation Status
Athene cunicularia	Burrowing owl	SSC, BCC
Contopus cooperi	Olive-sided flycatcher	SSC, BCC
Falco mexicanus	Prairie falcon	BCC
Icteria virens	Yellow-breasted chat	SSC
Ixobrychus exilis	Least bittern	SSC, BCC
Lanius ludovicianus	Loggerhead shrike	SSC, BCC
Melanerpes lewis	Lewis' woodpecker	BCC
Progne subis	Purple martin	SSC
Spinus [*Carduelis*] *lawrencei*	Lawrence's goldfinch	BCC
Spizella atrogularis	Black-chinned sparrow	BCC

6.0 SUMMARY AND RECOMMENDATIONS

Twelve sensitive plant communities were identified within the Phase 2/Open Space Study Area, including approximately 330 acres of wetlands, 148 acres and 736,000 linear feet of streams, and 626 acres of ponds and reservoirs. Twenty-eight special-status plant species and 14 special-status wildlife species were observed within the Phase 2/Open Space Study Area. An additional 60 special-status plant species and 21 special-status wildlife species were determined to have moderate to high potential to occur within the Phase 2/Open Space Study Area. The project has the potential to result in direct and indirect impacts to these sensitive resources, and the measures presented below are recommended to reduce those impacts to a less than significant level under CEQA. The measures presented here have been developed at the programmatic-level; additional measures may be required as specific elements of the project are designed and a detailed impact analysis can be conducted.

The preferred approach for minimizing impacts to sensitive resources found within the Phase 2/Open Space Study Area is avoidance during project design. In some areas it may be impracticable or infeasible to avoid sensitive resources and some impacts may be anticipated. These impacts should be minimized to the fullest extent practicable and feasible through the use of Best Management Practices (BMPs) and other measures. The remaining minor impacts may be mitigated through a combination of onsite preservation and enhancement or restoration of sensitive biological communities and habitats for special-status plant and wildlife species.

6.1 General Measures

The following general BMPs and avoidance and minimization measures are recommended:

1. An environmental awareness training shall be provided to personnel working on the project. The training should include materials that describe the sensitive habitats and species present and the measures that have been incorporated into the project to protect those habitats and species. The training materials should be prepared by a qualified biologist who will train a member of the contractor's crew to provide follow-up trainings to newly hired employees during the construction period. These materials may be updated as new information is available.

2. All work areas, including parking and staging areas, should be the minimum size necessary to implement the project and should be clearly delimited prior to implementation of any work.

3. All trash and debris should be confined in enclosed bins located within staging areas.

4. No pets should be allowed within the construction area.

5. Any soil or other material stockpiled during construction that could be easily transported by wind or rain should be covered when not actively in use.

6. No materials should be placed where they may enter sensitive habitat, receiving waters, or a storm drain, or be subject to wind or runoff erosion and dispersion.

7. Appropriate washout, trackout, and dust control BMPs should be implemented during construction.

8. All vehicles and equipment scheduled for use in construction on the site should be clean and free of mud or vegetation that could introduce plant pathogens or propagules of non-native plants. This includes equipment hauled into the site. The importance of this measure will be discussed in the environmental awareness training materials.

9. No construction vehicles or machinery should be allowed outside of the delimited parking, staging, and work areas.

10. All vehicles and equipment used on site should be well maintained and checked upon site entry for fuel, oil, and hydraulic fluid leaks or other problems that could result in spills of toxic materials. Drip pans should be used under all vehicles and equipment when not in active use.

11. All vehicle fueling and maintenance activities should occur at least 100 feet away from any wetland, stream, or other water body.

12. Operation of vehicles and equipment should be limited to the hours from 7:00 am to 7:00 pm or from half an hour after sunrise to half an hour before sunset.

13. A Stormwater Pollution Prevention Plan (SWPPP) should be developed for the project in accordance with the Lake County Clean Water Program and all measures included in the SWPPP should be implemented during all phases of construction, as appropriate.

14. Temporary erosion control materials should be inspected on a regular basis consistent with the SWPPP during construction, and any required repairs should be implemented immediately.

15. For any work within aquatic features or their setback, the contractor should be prepared to handle any localized hazardous waste spills (e.g. gas, oil, or pesticides). Spill control and clean-up materials (e.g., oil absorbent pads, fiber

rolls) should be kept on-site at all times in case a spill occurs. Any waste materials including, but not limited to, raw cement/concrete or washings thereof, asphalt, paint, construction waste, or other coating material, oil or other petroleum products, or any other substances which could be hazardous to aquatic life, should be prevented from contaminating the soil and/or entering any waterways.

16. All erosion control materials should use certified weed-free straw or other biodegradable, weed-free materials. No materials containing monofilament netting should be used.

6.2 Biological Communities

6.2.1 Sensitive Terrestrial Communities

The Phase 2/Open Space Study Area contains nine sensitive terrestrial communities including five woodland communities (white alder groves, Sargent cypress woodland, mixed oak forest, blue oak woodland and savanna, valley oak woodland, and interior live oak woodland), two shrubland communities (musk brush chaparral and Brewer willow thickets), and one herbaceous community (purple needle grass grassland). While they have no legal standing, chaparral communities on serpentine soils within the Phase 2/Open Space Study Area provide high value for rare plants and should also be considered during project design and entitlement.

While project-specific impacts may require additional measures, the following programmatic measures are recommended to avoid impacts to sensitive terrestrial communities:

1. Minimize impacts to sensitive terrestrial communities to the extent practicable and feasible through avoidance during project design.

2. Given the limited distribution of valley oak woodland, which has a CDFW rarity ranking of S3 indicating that it has limited distribution within California, as well as the difficulty in regenerating this community, it should be avoided in its entirety if possible and if not possible completely mitigated to include an increase in planting to meet the goal of no significant impact consistent with the Oak mitigation plan prepared under #4 below.

3. To mitigate for unavoidable impacts to oak trees, an oak woodland mitigation plan should be developed that minimizes impacts and compensates for any loss of oak woodland (or in the case of oak savannah, individual trees) through a combination of enhancement (e.g., weed management within existing oak woodlands), restoration or creation (e.g., oak planting or seeding), transplanting, and/or preservation (e.g., placement of conservation easements over existing stands of high quality oak woodlands at least acre per acre 1:1). The plan should also include a monitoring and adaptive management component and clear performance standards. The plan should be approved by the County of Lake prior to any impacts.

4. Purple needle grass grassland should be avoided to the extent practicable and feasible. To mitigate for unavoidable impacts to purple needle grass grassland, mitigation should be developed that minimizes impacts and compensates for any loss of native grassland through some combination of enhancement (e.g., weed management within existing native grasslands), restoration or creation (e.g., native

grassland seeding), and preservation (e.g., placement of conservation easements over existing stands of high quality native grasslands). The mitigation should also include a robust monitoring and adaptive management component and clear performance standards. The mitigation should be approved by the County of Lake prior to any impacts.

5. To the extent feasible and practicable, minimize impacts to serpentine chaparral communities which have high potential to host rare plants and may contain one or more sensitive plant associations.

6.2.2 Sensitive Aquatic Communities

The Phase 2/Open Space Study Area contains a large network of wetlands, streams, ponds, reservoirs, and riparian habitat which are variously regulated by the Corps, RWQCB, and/or CDFW. While project-specific impacts may require additional measures, the following programmatic measures are recommended to avoid, minimize, or mitigate for impacts to aquatic communities:

1. The County of Lake defines setbacks from streams, ponds, wetlands, and riparian habitats that should be incorporated into the project design:

   a) 30 feet from the top of bank any perennial stream,
   b) 20 feet from the top of bank of any intermittent stream,
   c) 20 feet from the edge of any adjacent wetlands or the ordinary high water mark of other bodies of water, or
   d) To the outer extent of vegetation dominated by common riparian species such as Fremont cottonwood (*Populus fremontii*), white alder (*Alnus rhombifolia*), box elder (*Acer negundo*), dogwood (*Cornus* spp.), willow (*Salix* spp.), and big leaf maple (*Acer macrophyllum*) (this latter zone may extend beyond 30 feet).

   No setbacks are clearly defined by the County for ephemeral streams. However, for the purposes of this report, it is assumed that ephemeral streams are "other bodies of water" as stated in c) above. Therefore, a minimum setback of 20 feet or as directed by a qualified biologist, from the ordinary high water mark on natural ephemeral streams should be incorporated. No setback is required for man-made stormwater or irrigation ditches. In areas where ground disturbance will occur in close proximity to aquatic resources or riparian habitat, sediment control measures such as silt fencing and/or straw wattles should be installed between the work area and the appropriate setback.

2. Prior to any impacts to protected aquatic resources, the project proponent should submit applications for necessary permits from the Corps, RWQCB, CDFW, and/or County of Lake. Any avoidance, minimization, or compensatory mitigation measures required by those permits should be incorporated into the project design. An aquatic resources mitigation plan (HMMP) will be submitted as part of the permit applications in accordance with federal and state requirements. It is likely that most of the compensatory mitigation actions can be accomplished on-site within the project boundaries; however, off-site mitigation and purchase of mitigation credits may also be appropriate in some cases.

6.3 Special-Status Plant Species

WRA documented 27 special-status plant species within the Phase 2/Open Space Study Area during seasonally timed and reconnaissance-level surveys conducted in 2018 and 2019, including one federal-listed species, one state-listed species, seven CNPS Rank 1 species, and 18 CNPS Rank 4 species. The bulk of these plants occur either on serpentine soils or in wetlands and along stream corridors; however, special-status plants occur in other habitats as well. The following programmatic measures are recommended to avoid, minimize, or mitigate for impacts to special-status plants:

1. Pre-construction botanical surveys of herb-dominated habitats with the potential to support special-status plants (i.e. grasslands, wetlands) shall be conducted prior to ground breaking for each specific project component if more than one year has passed since most recent survey (i.e. areas surveyed in 2017 require surveys in 2020, however areas surveyed in 2019 require surveys in 2021). Pre-construction surveys of shrub or woodland dominated habitats with the potential to support special-status plants shall be surveyed prior to groundbreaking for each specific project component if more than four years have passed since most recent survey (i.e. shrub/woodland areas surveyed in 2017 will require surveys in 2022). Initial vegetation clearing along proposed roadways for fire management shall also be subject to these standards. Pre-construction surveys shall be completed by a qualified biologist during the appropriate identification period for plants with the potential to occur in the area scheduled for ground breaking.

2. To the extent feasible and practicable, all occurrences of special-status plants should be avoided during project design. To ensure no direct impacts, individual occurrences of special-status plants should be avoided by a minimum of 20 feet. Where ground disturbance will occur upslope of occurrences of special-status plants, silt fencing or straw wattles should be installed between the work area and the 20-foot setback and should not be removed until the disturbed areas have been revegetated or otherwise stabilized and the risk of erosion has been minimized.

3. When avoidance is not feasible or practicable, species-specific mitigation should be developed that minimizes impacts and compensates for any loss of federal or state listed rare, threatened, or endangered plant occurrences through a combination of enhancement (e.g., weed management and supplemental seeding within existing stands of the species in question), restoration or creation (e.g., establishment of new populations), and preservation (e.g., placement of appropriate protective assurances over existing examples of high quality occurrences). This mitigation for these species will need approval by the appropriate federal and/or state agency under which they are listed as part of the permitting process. In addition, for unavoidable impacts to those species which are considered CNPS Rank 1, mitigation should be undertaken through implementation of a species-specific mitigation developed and approved by the County.

4. Any mitigation should follow generally acceptable rare plant mitigation guidelines and should consider the specific ecology of the species in question, as well as the conservation status and the number of occurrences within the overall ranch. The mitigation should also include regularly scheduled monitoring, an adaptive management component, and clear performance standards to ensure success.

5. Federal-listed, state-listed, and CNPS Rank 1 species should be prioritized for avoidance. Where avoidance of these species is not possible, they should be considered for relocation or reestablishment in other portions of the property.

6. CNPS Rank 4 species that occur in limited numbers and/or limited locations (e.g., tall snapdragon, which occurred in only two locations within the Phase 2/Open Space Study Area) should be reviewed with the County of Lake to determine appropriate mitigation measures.

7. CNPS Rank 4 species that occur in large numbers and numerous locations (e.g., Jepson's navarretia, which occurred on serpentine balds in numerous locations across the property and numbered in the hundreds of thousands) should be reviewed with the County of Lake to determine appropriate mitigation measures.

8. Impacts to federal- or state-listed plant species may require consultation with the USFWS under Section 7 or Section 10 of the Endangered Species Act and/or application for a CFGC Section 2080 Consistency Determination (if a USFWS Biological Opinion is issued) or Section 2081 Incidental Take Permit (if a USFWS Biological Opinion is not issued or the species is state-listed only).

6.4 Special-Status Wildlife Species

Fourteen special-status wildlife species were documented within the property, including one State-Endangered species, one State-Candidate species, and several California Fully Protected species, in addition to other special-status species. An additional 21 special-status wildlife species were determined to have potential to occur. The Phase 2/Open Space Study Area is not located within Critical Habitat as designated by USFWS or NMFS, as Lake Berryessa forms a total barrier to anadromous fish including steelhead and Chinook salmon.

The following recommendations and potential constraints are provided based on the potential for special-status species and their habitat to occur within the Phase 1 Study Area. Where applicable, species with similar requirements and guidance are grouped together.

6.4.1 Special-Status Mammals

Bats

Two special-status bat species and five non-status bat species were determined to be present within the property. There is moderate or high potential for an additional six bat species to occur within the undisturbed oak woodland, riparian woodland, rock outcrops and buildings within the property. Direct impacts to roosting special-status bat species could occur due to the removal or modification of large trees (diameter at breast height [DBH] >12 inches), snags, and/or buildings. The destruction or injury of special-status bats or loss of a maternity roost would constitute a potentially significant impact under CEQA and is a violation of the CFGC. Indirect impacts to maternity roosting and/or roosting bat species may include roost abandonment due to noise, increased nighttime lighting and/or other human disturbances during construction and would also constitute a potentially significant impact under CEQA.

The following programmatic measures are recommended to avoid impacts to roosting bats:

1. Pre-construction survey(s) for bat roosts should be conducted by concentrating on large trees (DBH >12 inches), broadleaf trees in riparian woodland habitat, buildings, bridges, and cliffs/rocky outcroppings within 100 feet of any planned work areas. Surveys should occur no more than 14 days prior to the start of work, and one or more surveys may be needed for the biologist to evaluate whether potential roost habitat occurs and to determine the type (i.e., maternity or non-maternity) and status (i.e., active or inactive) of the roost. If an active maternity or special-status bat roost is found and is proposed to be removed or directly impacted as a result of project activities, consultation with the CDFW will be required.

2. If large trees (DBH >12 inches) identified as potential bat roosts that are not active maternity or special-status roosts are to be removed, they should be flagged by the surveying biologist. On the first day of removal of flagged trees, if weather conditions permit, limbs shall be removed in the late afternoon from flagged trees. This disturbance should cause any roosting bats to locate an alternative roost during their nighttime foraging. As potentially roosting bats will have left over the course of the night, the rest of the tree can be harvested on the second day. On the second day, if weather conditions permit, the trees shall be felled as late in the afternoon as is practicable. If weather conditions are not conducive to having the tree taken down on the second day and the procedure has been interrupted, an additional emergence survey shall be conducted the evening before taking the tree down in late afternoon.

Other Mammals

American badger is a SSC with moderate potential to occur in the Phase 2/Open Space Study Area. Ringtail is a CFP species with moderate potential to occur in the Phase 2/Open Space Study Area. Direct impacts to open grassland and oak woodland could potentially impact habitat for American badger and ringtail. While project-specific impacts may require additional measures, the following programmatic measures are recommended to avoid impacts to American badger and ringtail:

1. No more than 14 days before the start of ground disturbance activities within open grassland, oak woodland, or riparian forest habitat, a biologist should conduct pre-construction surveys to determine if American badger or ringtail dens are present.

2. If American badger dens are determined to be present, the biologist should monitor them for activity to determine whether the den is active. If the den is determined to be occupied by a female with young, ground disturbance and construction activity should be avoided within 50 feet of the den until the young have matured and dispersed. If the den is determined to be active, but a female with young are not present, burrow exclusion using passive measures such as one-way doors or equivalent should be attempted for a minimum of three days to discourage their use prior to any project-related ground disturbance. If the biologist determines that the dens have become inactive as a result of the exclusion methods, the dens should be excavated by hand to prevent them from being re-occupied during construction.

3. If ringtail dens with young are determined to be present within the work area, the biologist should establish a clearly marked exclusionary buffer of no less than 50 feet and no ground disturbance should take place within the buffer until the biologist determines the den is no longer active with young.

6.4.2 Special-Status Birds

Raptors

Targeted raptor surveys determined that golden eagle, bald eagle, white-tailed kite, northern harrier and American peregrine falcon nest in or adjacent to portions of the Phase 2/Open Space Study Area. Although it was not observed, suitable habitat for prairie falcon is present and it was determined that the species has a moderate potential to occur in the Phase 2/Open Space Study Area. The Phase 2/Open Space Study Area provides foraging habitat and has the potential to support nesting for each of these species.

Eagle nests are protected by the Bald and Golden Eagle Protection Act, the MBTA, and the CFGC. Direct impacts to nest trees (e.g., trimming or completely removing the nest tree or adjacent trees) while the nest is active may result in death or injury to eggs or young, and potentially adults as well. Additionally, indirect disturbance caused by project related activities (e.g., noise, vibration and/or visual disruption resulting from grading or construction), and introduction of toxic of otherwise harmful chemicals into the prey base of bald and golden eagles have the potential to impact eagle nesting activities. Any direct impacts that result in nest failure or mortality may constitute a violation of the Bald and Golden Eagle Protection Act, as well as potentially the MBTA and multiple sections of the CFGC. White-tailed kite and peregrine falcon nests are also protected by the MBTA and CFGC. Protective exclusion buffers around active raptor nests can vary greatly and may extend up to 0.5 mile. While project-specific impacts may require additional measures, the following programmatic-level measures are recommended to avoid impacts to raptors:

1. Prior to starting construction activities during the nesting season, generally defined as February 1 through August 31, targeted surveys for active raptor nests should be conducted. An active nest contains eggs or young.

2. For construction activities planned within 0.5 miles of a documented eagle or protected falcon species nest, pre-construction surveys should be conducted in accordance with the most current guidance available from USFWS and CDFW.

3. If a non-status raptor nest containing eggs or young is determined to be present within the work area, then a protective buffer should be implemented and no project work should occur within the buffered area until the chicks have fledged and no longer require parental support for survival, or the nest has been determined to be inactive. Buffer size should be determined by the biologist based on species, nest location, planned disturbance footprint, and presence of any visual or auditory buffers.

4. If a special-status raptor nest is determined to be present within the work area, or within 0.5 mile of the work area, consultation with the USFWS and/or CDFW should occur and any measures recommended or required by those agencies should be incorporated into the project design.

Burrowing Owl

Burrowing owl is listed as a species of special concern by the CDFW. While the species was not observed during site assessments, ground squirrels and potentially suitable habitat was present, and suitable burrows may exist in the future. This species is migratory and may occur in portions of the Phase 2/Open Space Study Area. Project activities that would remove or destroy burrows and impact grassland habitat containing suitable burrows, may result in a direct impact to burrowing owl. While project-specific impacts may require additional measures, the following programmatic-level measures are recommended to avoid impacts to burrowing owls:

1. A pre-construction survey should be performed prior to start of ground disturbance activities where ground squirrel burrow complexes are present. This survey should occur regardless of the time of year, as burrowing owls may use the Study Area during the non-nesting season. The survey should be performed according to the standards set forth by the Staff Report for Burrowing Owl Mitigation (CDFW 2012), unless more current guidance has been released.

2. If the species or its sign, which includes feathers, pellets, or whitewash, are found at a burrow during the nesting period, project activities should excluded from within a 250-foot buffer surrounding the occupied burrows occur until the owls are no longer present or the burrows have been abandoned. The nesting period is defined as February 1 through August 31.

3. Passive exclusion techniques, such as one-way doors, can be used to exclude burrowing owl from occupied burrows outside the nesting season or if a burrow is determined not to support an active nest. An active nest include those with eggs or young. Once exclusion is completed, the burrows should be collapsed to avoid attracting owl back to the planned or active work area.

Nesting Birds

In addition to the aforementioned raptor species, the site assessment determined that special status bird species Allen's hummingbird, Nuttall's woodpecker, oak titmouse, yellow-headed blackbird, and yellow warbler are present within or adjacent to the Phase 2/Open Space Study Area. Ten other special status bird species, in addition to burrowing owl previously discussed, were determined to have a moderate to high potential to occur within the Phase active nest include those with eggs or young. Once exclusion is completed, the burrows should be Study Area. A variety of non-status native bird species protected under the MBTA and the CFCG may use the Phase 2/Open Space Study Area for nesting.

Avoidance of nesting birds is considered a general biological resources "best practice" in California and avoids potential enforcement action by the CDFW. Nesting bird pre-construction survey obligations are a common component of various permits and authorizations, including local grading permits, and such, may be deemed applicable to project activities within the Phase 2/Open Space Study Area.

Initial vegetation removal, clearing, grubbing activities, along with building removal and demolition of structures, have the potential to affect nesting migratory birds including: prairie falcon, long-eared owl, least bittern, purple martin, olive-sided flycatcher, Allen's hummingbird, Nuttall's woodpecker, Lewis' woodpecker, loggerhead shrike, oak titmouse, yellow warbler, yellow-breasted chat, black-chinned sparrow grasshopper sparrow, Lawrence's goldfinch, yellow-headed blackbird, and tricolored blackbird. Adverse effects to nesting birds covered by the MBTA and the CFGC, including active nests, eggs and young, would constitute a potential impact that

may occur as a result of these activities. While project-specific impacts may require additional measures, the following programmatic-level measures are recommended to avoid impacts to nesting birds:

1. If vegetation removal, demolition of buildings or work on bridges, or initial ground disturbance activity occur during the nesting season, defined as February 1 through August 31, then a pre-construction nesting bird survey within the work area should be completed by a biologist no more than 14 days (or the time interval set by Department permits issued for the project) prior to the start of work.

2. If active nests (nests with eggs and/or chicks) are observed during the pre-construction survey, project activities should avoid the area as determined by the biologist and resume the protective buffer only after the young have fledged the nest or the nest otherwise becomes inactive. Buffer size should be determined by the biologist based on species, nest location, planned disturbance footprint, and presence of any visual or auditory buffers.

6.4.3 Special-Status Reptiles and Amphibians

This assessment determined that western pond turtle (WPT) and foothill yellow-legged frog (FYLF) are present in the Phase 2/Open Space Study Area. Direct impacts to stream features, floodplains, wetlands, ponds, and reservoirs could result in the loss of suitable habitat or potential take of amphibian and reptile species. WRA recommends the development of project-specific avoidance and minimization measures. Work taking place within any river, stream, or lake in the Phase 2/Open Space Study Area subject to Fish and Wildlife jurisdiction would require a CDFW Lake or Streambed Alteration Agreement (LSAA). Measures that may be included in an LSAA are discussed below.

Western Pond Turtle

This assessment determined that western pond turtle (WPT) and foothill yellow-legged frog (FYLF) are present in the Phase 1 Study Area. Direct impacts to stream features, floodplains, wetlands, ponds, and reservoirs may result in the loss of suitable habitat or potential take of amphibian and reptile species. Work taking place within any river, stream, or lake in the Phase 1 Study Area would require a CDFW Lake or Streambed Alteration Agreement (LSAA). Measures that may be included in an LSAA are discussed below.

1. To the extent possible, initial ground disturbance, vegetation clearing, and associated project activities within 300 feet of ponds, reservoirs, or wetted streams that may support WPT shall occur between July 1 and October 31 to avoid the peak nesting season and winter inactivity periods.

2. No more than 14 days prior to the start of work, pre-construction surveys for WPT should occur within 300 feet of ponds, reservoirs, or wetted streams which may support WPT. If the species is observed, the biologists should provide measures to avoid directly impacting the species based on the planned work; such measures may include a protective no-work buffer, exclusion fencing, monitoring, or coordination with CDFW, if relocation is required.

Foothill Yellow-Legged Frog

Work within streams, riparian areas, and along streamside corridors could impact FYLF by disrupting migratory movements, rearing, or breeding and could result in direct injury or mortality of individuals. Additional impacts may occur from the removal or altering of habitat, such as those associated with the loss of cover or altering localized water flow. Although there is no time of year when complete avoidance of FYLF is possible if working in an area where the species is known to occur, there are periods when encountering the species is less likely (CDFW 2018b). Conducting work outside the typical FYLF breeding season away from wetted features allows for the greatest opportunity for avoidance (CDFW 2018b). While project-specific impacts may require additional measures, the following programmatic-level measures are recommended to avoid impacts to FYLF:

1. Work within 100 feet of any wetted stream feature or associated riparian area where foothill yellow-legged frog (FYLF) has been documented should occur during the dry months (July 1 through October 31) as possible. Timing shall also occur outside of the FYLF breeding season (March 1 to June 30) to the extent possible.

2. Pre-construction surveys for FYLF within any wetted stream feature near a work area should be conducted by a qualified biologist at least 14 days prior to the onset of construction activities. Surveys should cover at least 500 feet upstream and 500 feet downstream of the work area for presence of all life stages. Surveys should be conducted during the day and under optimal conditions for detecting FYLF. Additional pre-construction surveys may be required as determined by the qualified biologist. If FYLF are detected, measures to avoid the species should be implemented. Such measures may include, but are not limited to, a protective no-work buffer, exclusion fencing, monitoring, and/or coordination with CDFW, if relocation is required.

FYLF is currently a candidate species for listing under CESA and as such is afforded the protections conveyed by CESA, including protection from “take” without a permit. The clade that occurs in the Project Area has been evaluated as not warranting listing under CESA at this time by the CDFW Staff Review and the CDFG commission has voted to adopt this finding. While the species is technically still a candidate for listing, the ending of candidacy for this clade is imminent and is not likely to result in listing under CESA. However, this clade will remain a species of special concern and will continue to be considered during CEQA processes and permitting processes administered by CDFW. While the implementation of the above described measures should minimize impacts to the species, there is a potential for incidental take of FYLF to occur during work activities in and adjacent to FYLF habitat and this take would still require an ITP, if it occurs during the candidacy period.

6.3.4 Wildlife Corridors

This assessment determined that portions of the Phase 2/Open Space Study Area may facilitate wildlife movement and may be considered a wildlife corridor. The conversion of raw land, conversion to agriculture or installation of buildings and fencing, and increased prevalence of human disturbance can diminish or eliminate properties that make an area a corridor for native species. Under CEQA, project impacts to wildlife corridors should be assessed and evaluated.

WRA recommends that a wildlife corridor assessment be conducted utilizing GIS-based software or similar accepted method to evaluate topography and biological communities as identified in the Phase 2/Open Space Study Area based on species-specific habitat requirements for wildlife species that utilize corridors for long-distance movement. The assessment will help identify areas where wildlife movement may be facilitated and help identify if avoidance and minimization measures should be implemented.

That being said there is an approximately 3,000 acre protect open space/wildlife corridor and preserved riparian corridors that runs through Phase 1 that provides wildlife passageways.

7.0 REFERENCES

Alexander, E.B., R.G. Coleman, T. Keeler-Wolf, S.P. Harrison. 2007. Serpentine Geoecology of Western North America. Oxford University Press, New York, NY.

Baldwin, BG, DH Goldman, DJ Keil, R Patterson, TJ Rosatti, and DH Wilken (eds.). 2012. The Jepson Manual: Vascular Plants of California, second edition. University of California Press, Berkeley, CA.

Bolster, B.C., editor. 1998. Terrestrial Mammal Species of Special Concern in California Draft Update. Report submitted to California Department of Fish and Game Wildlife Management Division, Nongame Bird and Mammal Conservation Program for Contract No.FG3146WM.

Bourque, R.M. 2008. Spatial ecology of an inland population of the foothill yellow-legged frog (*Rana boylii*) in Tehama County, California. Master's thesis, Humboldt State University, Arcata, CA

Buehler, D. 2000. Bald Eagle (*Haliaeetus leucocephalus*), The Birds of North America (P. G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America: https://birdsna.org/Species-Account/bna/species/baleag.

Calflora. 2019. Calflora: Information on California plants for education, research, and conservation, based on data contributed by dozens of public and private institutions and individuals, including the Consortium of California Herbaria. Berkeley, CA. Available at: http://www.calflora.org/; most recently accessed: May 2019.

[CDFG] California Department of Fish and Game. 2012. Staff Report on Burrowing Owl Mitigation. State of California Natural Resources Agency, Department of Fish and Game.

[CDFW] California Department of Fish and Wildlife. 2018. Considerations for Conserving the Foothill Yellow-Legged Frog. Habitat Conservation Planning Branch, Sacramento, CA.

[CDFW] California Department of Fish and Wildlife. 2019a. California Natural Diversity Database. Wildlife and Habitat Data Analysis Branch, Sacramento, CA. Accessed on multiple dates in 2017, 2018, and 2019.

[CDFW] California Department of Fish and Wildlife. 2019b. California Natural Community List. Biogeographic Data Branch. Vegetation Classification and Mapping Program, Sacramento, CA. January 24.

[CNPS] California Native Plant Society. 2019a. A Manual of California Vegetation, Online Edition. Sacramento, California. Online at: http://vegetation.cnps.org/; accessed on multiple dates in 2017, 2018, and 2019.

[CNPS] California Native Plant Society. 2019b. Inventory of Rare and Endangered Plants (online edition, v8-02). Sacramento, California. Online at: http://rareplants.cnps.org/; accessed on multiple dates in 2017, 2018, and 2019.

Cicero, C. 2000. Oak Titmouse (*Baeolophus inornatus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/485a

Collinge, Sharon K. ; Holyoak, Marcel ; Barr, Cheryl B. ; Marty, Jaymee T./ Riparian habitat fragmentation and population persistence of the threatened valley elderberry longhorn beetle in central California. In: Biological Conservation. 2001 ; Vol. 100, No. 1. pp. 103-113

Cook D. G., S. White, P. White, and E White. 2012. Rana boylii (Foothill Yellow-legged Frog), Upland Movement. Herpetological Review 43(2): 325-326

[CSRL] California Soil Resource Lab. 2019. SoilWeb Earth. Online at: www.casoilresource.lawr.ucdavis.edu; accessed on multiple dates in 2017, 2018, and 2019.

Dolan, RW and LF LaPré. 1989. Taxonomy of *Streptanthus* sect. *biennes,* the *Streptanthus morrisonii* Complex (Brassicaceae). Madroño 36(1): 33-40.

Dunk, JR. 1995. White-tailed Kite (*Elanus leucurus*), The Birds of North America Online (A Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/178.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Department of the Army, Waterways Experiment Station, Vicksburg, Mississippi 39180-0631.

Gonsolin, T.E. 2010. Ecology of foothill yellow-legged frogs in upper Coyote Creek, Santa Clara County, CA. Master's thesis, San Jose State University, San Jose, CA.

Holland, RF. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. Prepared for the California Department of Fish and Game, Sacramento, CA.

Jepson Flora Project (eds.). 2019. Jepson eFlora. Online at: http://ucjeps.berkeley.edu/IJM.html; accessed on multiple dates in 2017, 2018, and 2019.

Kochert, M., K. Steenhof, C. McIntyre, E. Craig. 2002. Golden Eagle (*Aquila chrysaetos*). Pp.1-44 in A. Poole, F. Gill, eds. The Birds of North America, Vol. 684. Philadelphia: The Birds of North America.

Kruckeberg, A.R. 1984. California Serpentines: Flora, Vegetation, Geology, Soils, and Management Problems. University of California Press, Berkeley, CA.

Kupferberg, S.J. 1996. Hydrologic and geomorphic factors affecting conservation of a river-breeding frog (*Rana boylii*). Ecological Applications 6:1332-1344.

Lichvar, R. and S. McColley. 2008. A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States: A Delineation Manual. Cold Regions Research and Engineering Laboratory. ERDC/CRREL TR-08-12.

Lowther, Peter E. 2000. Nuttall's Woodpecker (*Picoides nuttallii*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online:http://bna.birds.cornell.edu/bna/species/555

Mitchell, D.E. 2000. Allen's Hummingbird (*Selasphorus sasin*), The Birds of North America Online (A Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online:http://bna.birds.cornell.edu/bna/species/501.

Moyle, P.B., R.M. Quinones, J.V. Katz, and J. Weaver. 2015. Fish Species of Special Concern in California. California Department of Fish and Wildlife, Sacramento, CA.

Potter, D., H. Bartosh, G. Dangl, J. Yang, R. Bittman, and J. Preece. 2018. Clarifying the Conservation Status of Northern California Black Walnut (*Juglans hindsii*) Using Microsatellite Markers. Madroño 65: 131-140.

Rathbun, GB, NJ Scott, Jr., and TG Murphey. 2002. Terrestrial habitat use by Pacific pond turtles in a Mediterranean climate. The Southwestern Naturalist 47: 225-235.

Rathbun, GB, N Seipel and DC Holland. 1992. Nesting behavior and movements of western pond turtles, *Clemmys marmorata*. The Southwestern Naturalist 37: 319-324.

Safford, H.D., J.H. Viers, and S.P. Harrison. 2005. Serpentine Endemism in the California Flora: A Database of Serpentine Affinity. Madroño, vol52(4): pp. 222-257.

Shuford, W.D., and T. Gardali (eds). 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and CDFG, Sacramento.

Thomson, R.C., A.N. Wright, and H.B. Shaffer. 2016. California Amphibian and Reptile Species of Special Concern. Co-published by the California Department of Fish and Wildlife and University of California Press. Oakland, California.

[USDA] U.S. Department of Agriculture. 1989. Soil Survey of Lake County, California. In cooperation with the University of California Agricultural Experiment Station.

[USDOI] U.S. Dept of the Interior. 2017. “The Migratory Bird Treaty Act Does Not Prohibit Incidental Take.” Memorandum M-37050, from the Principal Deputy Solicitor. December. 41 pp.

[USFWS] U.S. Fish and Wildlife Service. 2019. Information for Conservation and Planning Database. Available online at: https://ecos.fws.gov/ipac/; accessed: May 2019.

[USFWS] United States Fish and Wildlife Service. 2008. Birds of Conservation Concern. Division of Migratory Bird Management. Arlington, Virginia.

[USGS] U.S. Geological Survey. 2015. Lidar Point Cloud Data for Lake County, California. Published November 30, 2017. Available online at: www.sciencebase.gov; accessed April 2019.

[USGS] U.S. Geological Survey. 2017. California Geologic Map Data. Online at: https://mrdata.usgs.gov/geology/state/state.php?state=CA; accessed June 2017.

[WBWG] Western Bat Working Group. 2019. Species Accounts. Prepared by Betsy C. Bolster. Online at: http://wbwg.org/western-bat-species; accessed May 2019.

White, C. M., N. J. Clum, T. J. Cade, and W. G. Hunt (2002). Peregrine Falcon (*Falco peregrinus*), version 2.0. In The Birds of North America (A. F. Poole and F. B. Gill, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA.

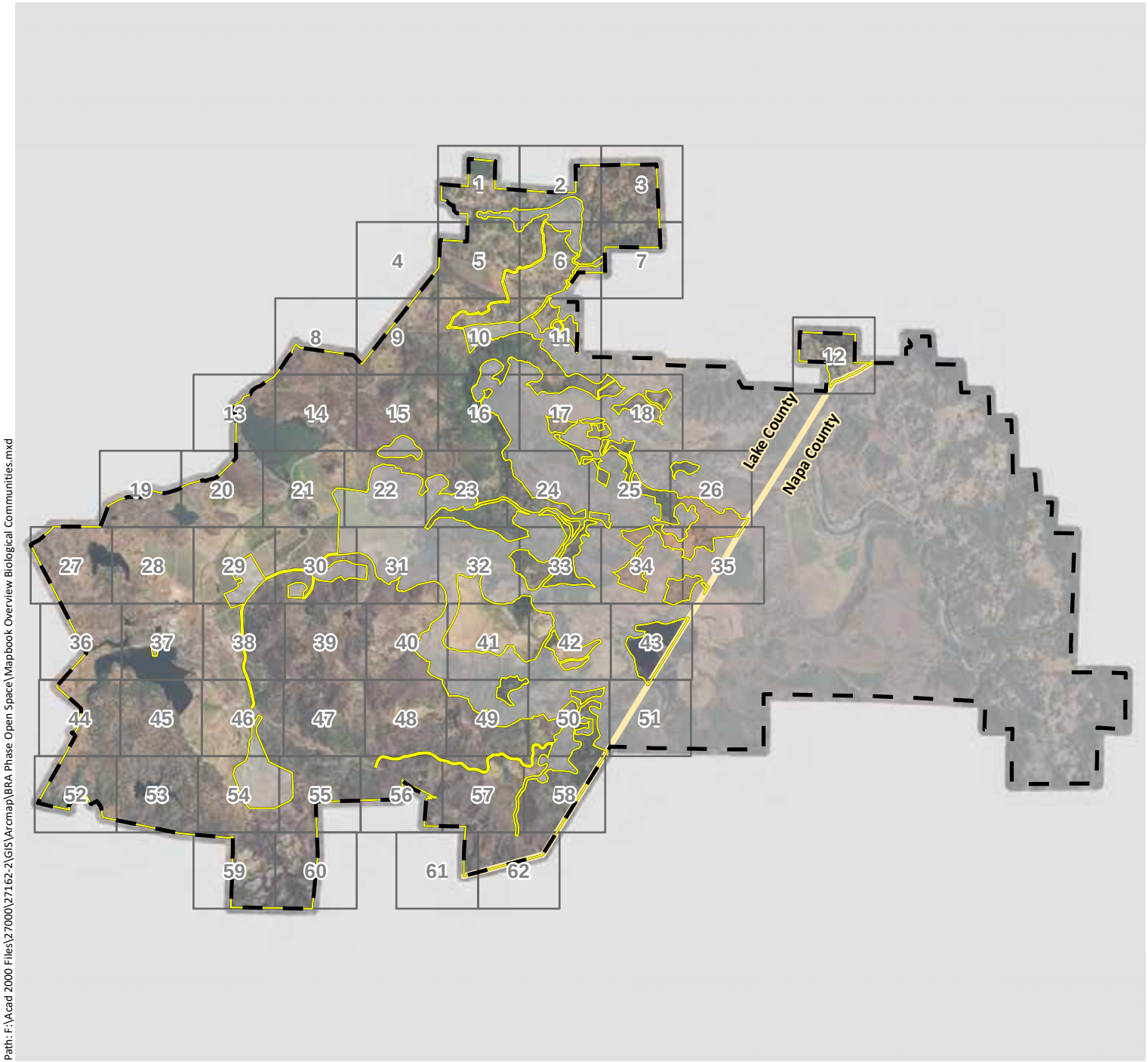
WRA. 2020. Biological Resources Assessment, Maha Resort and Guenoc Valley Development, Phase 1. Prepared for Analytical Environmental Systems.

APPENDIX A

BIOLOGICAL COMMUNITIES MAPPED WITHIN THE PHASE 2/OPEN SPACE STUDY AREA

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Overview)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Property Boundary

Phase 2 and Open Space Study Area

Mapbook Grid

County Boundary

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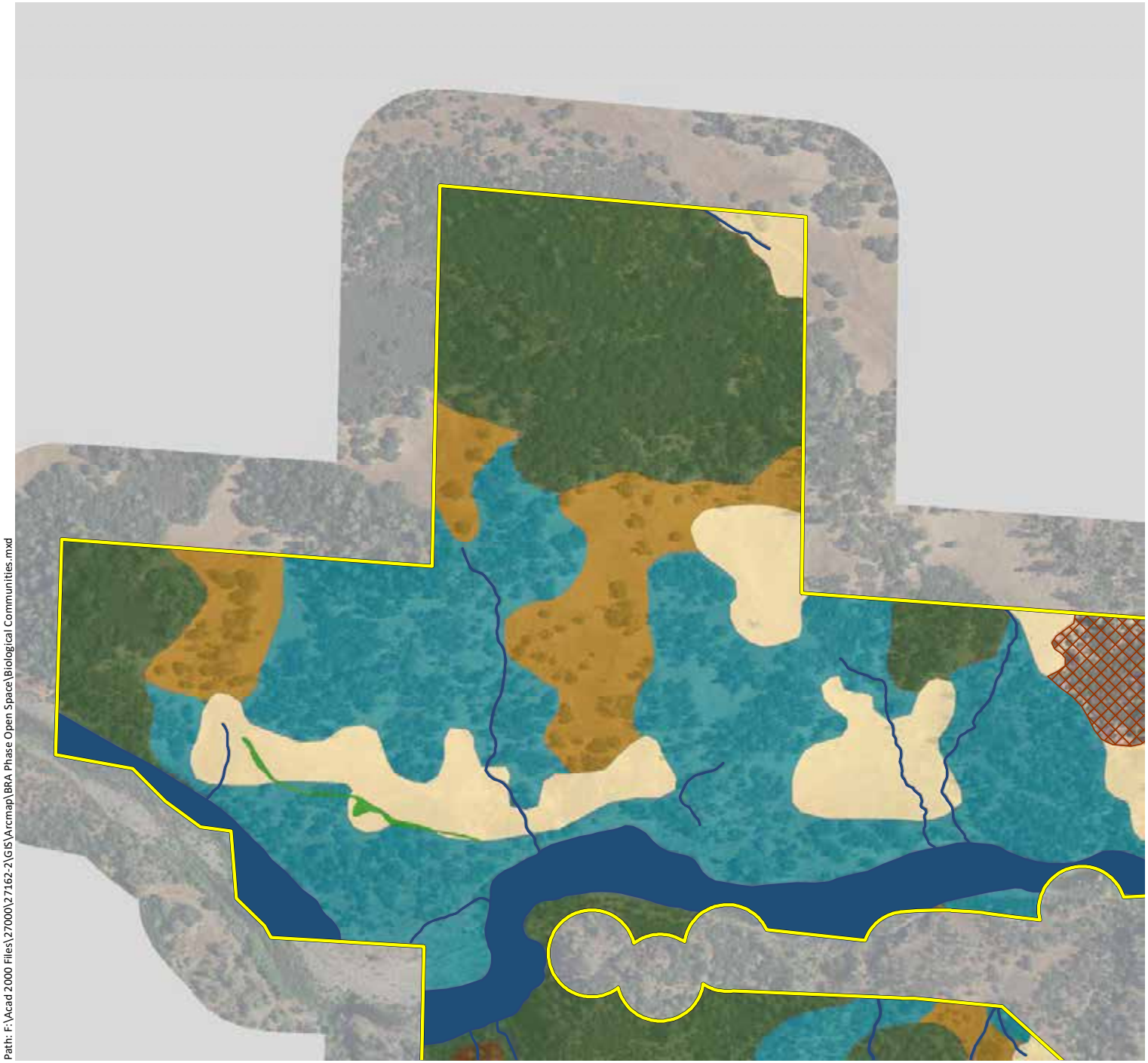
Sources: Hexagon 2016 Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 1)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

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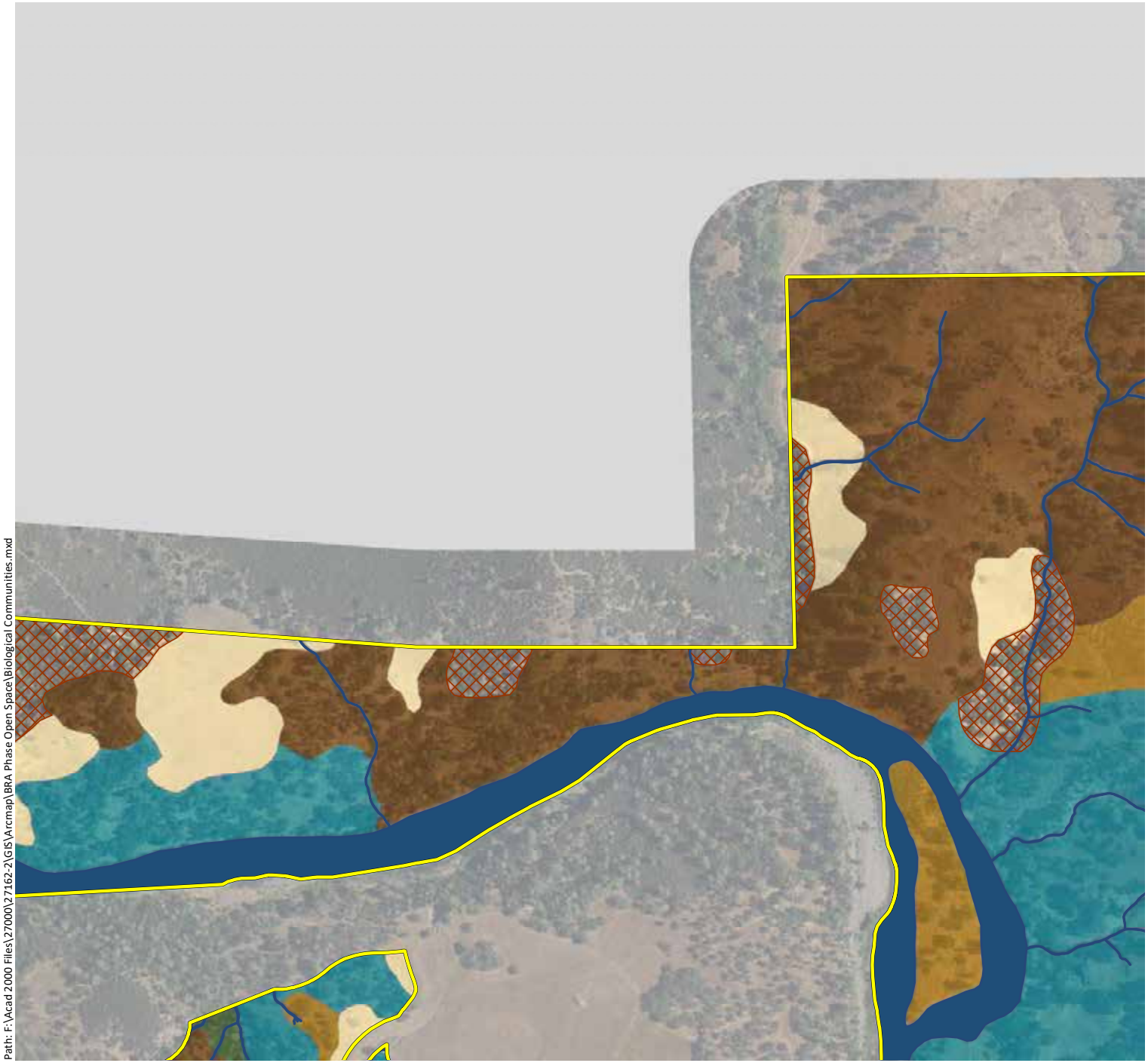
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 2)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

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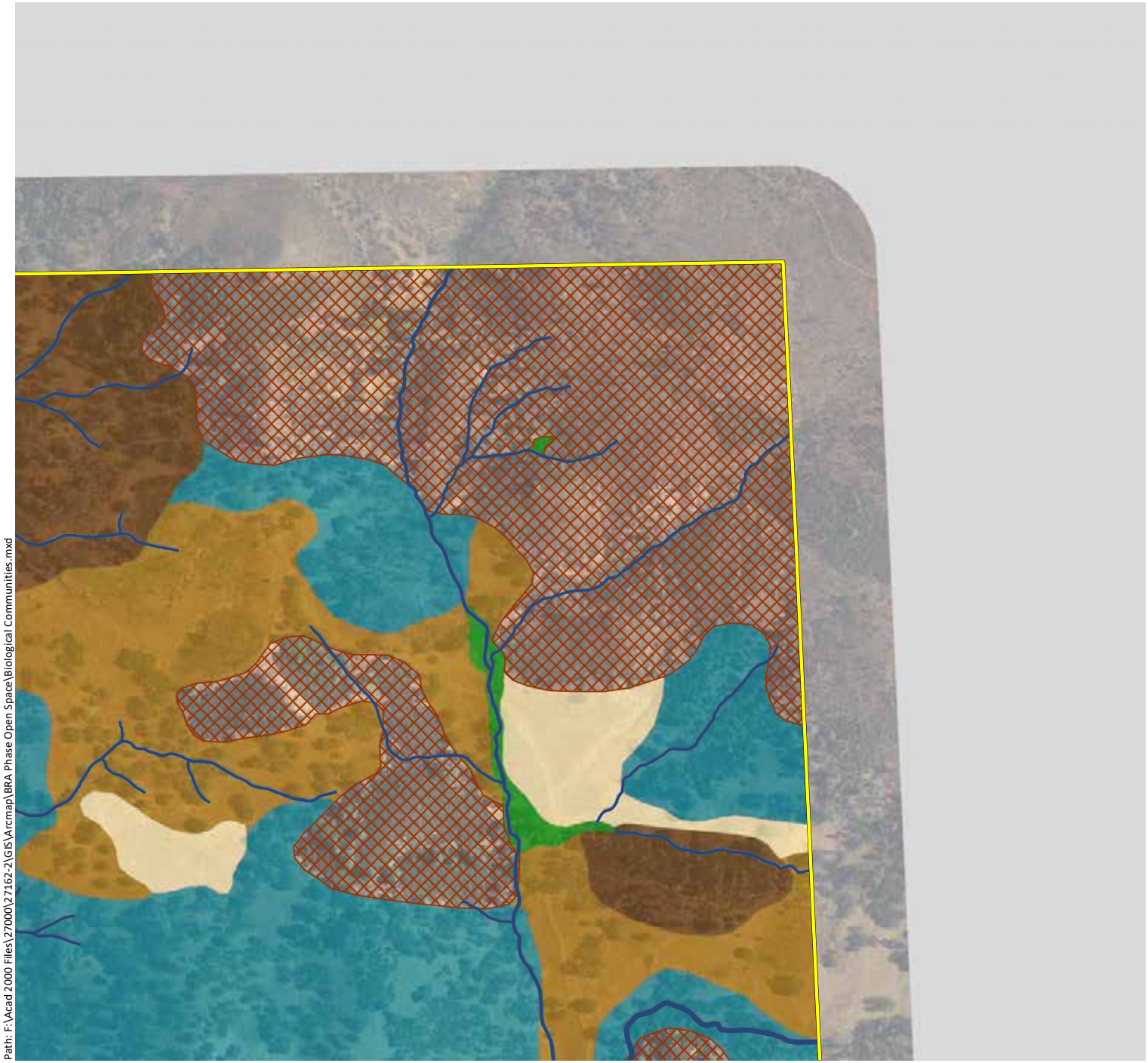
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 3)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 4)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grasssland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

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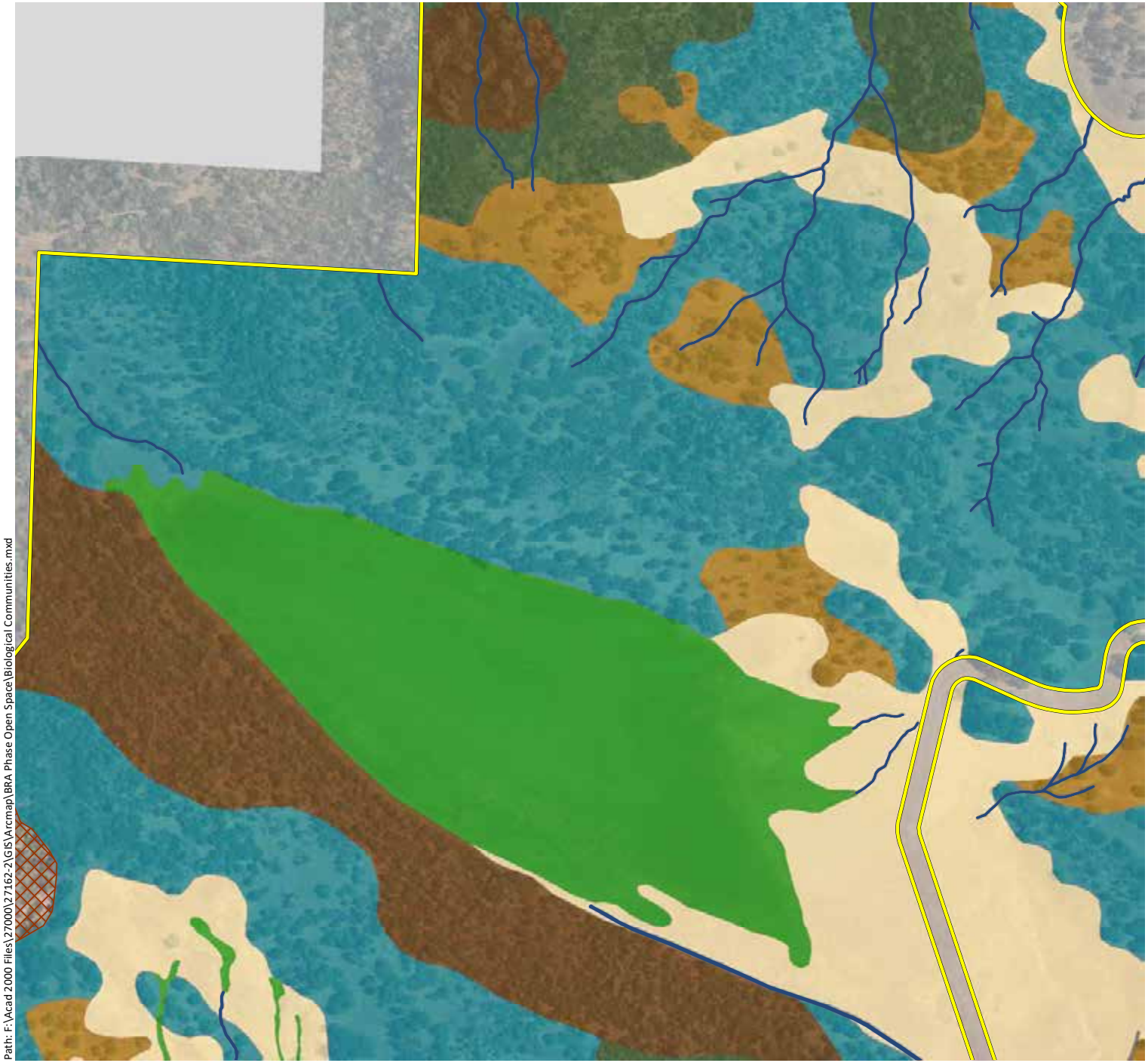
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 5)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

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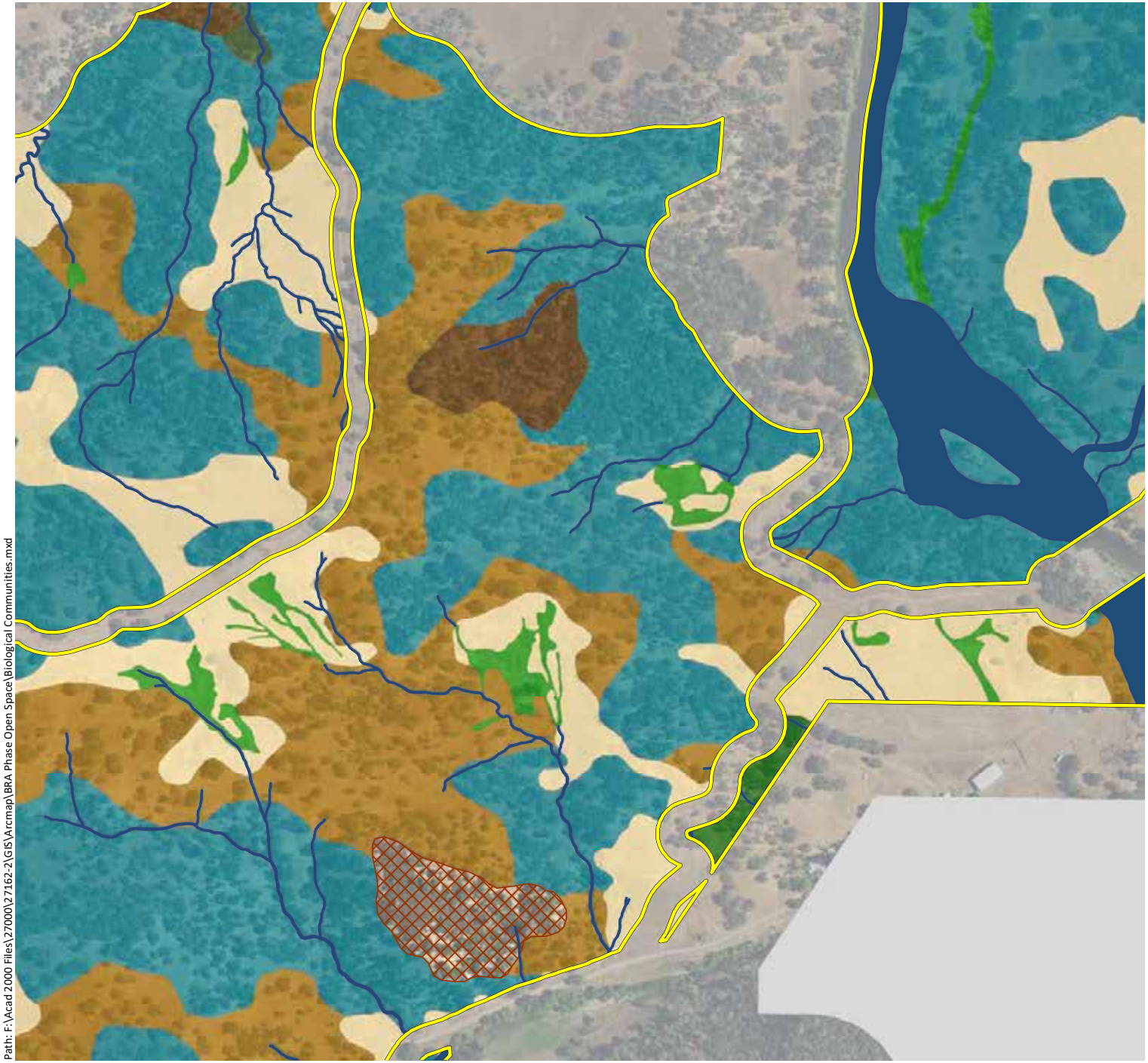
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 6)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

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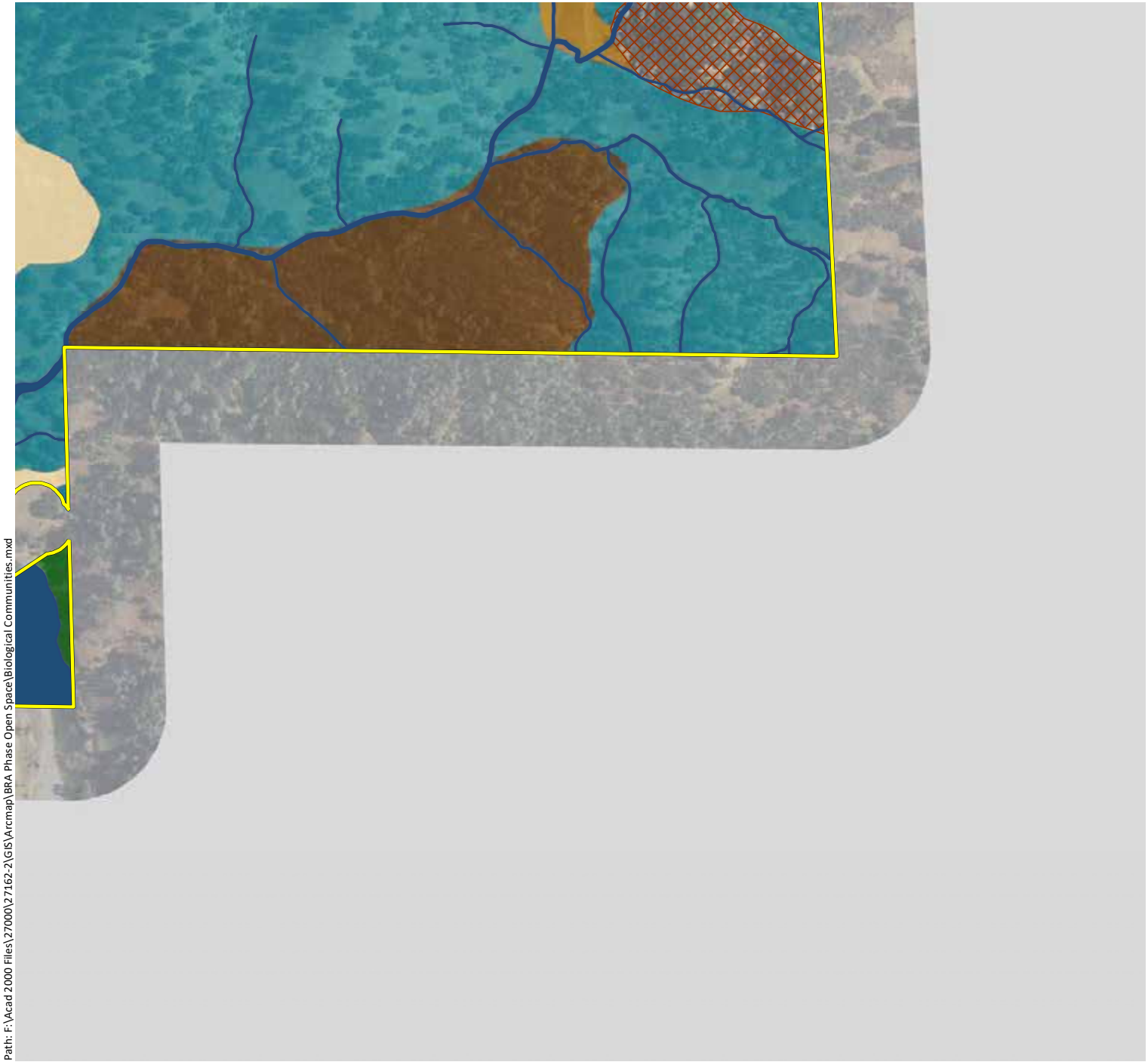

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 7)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

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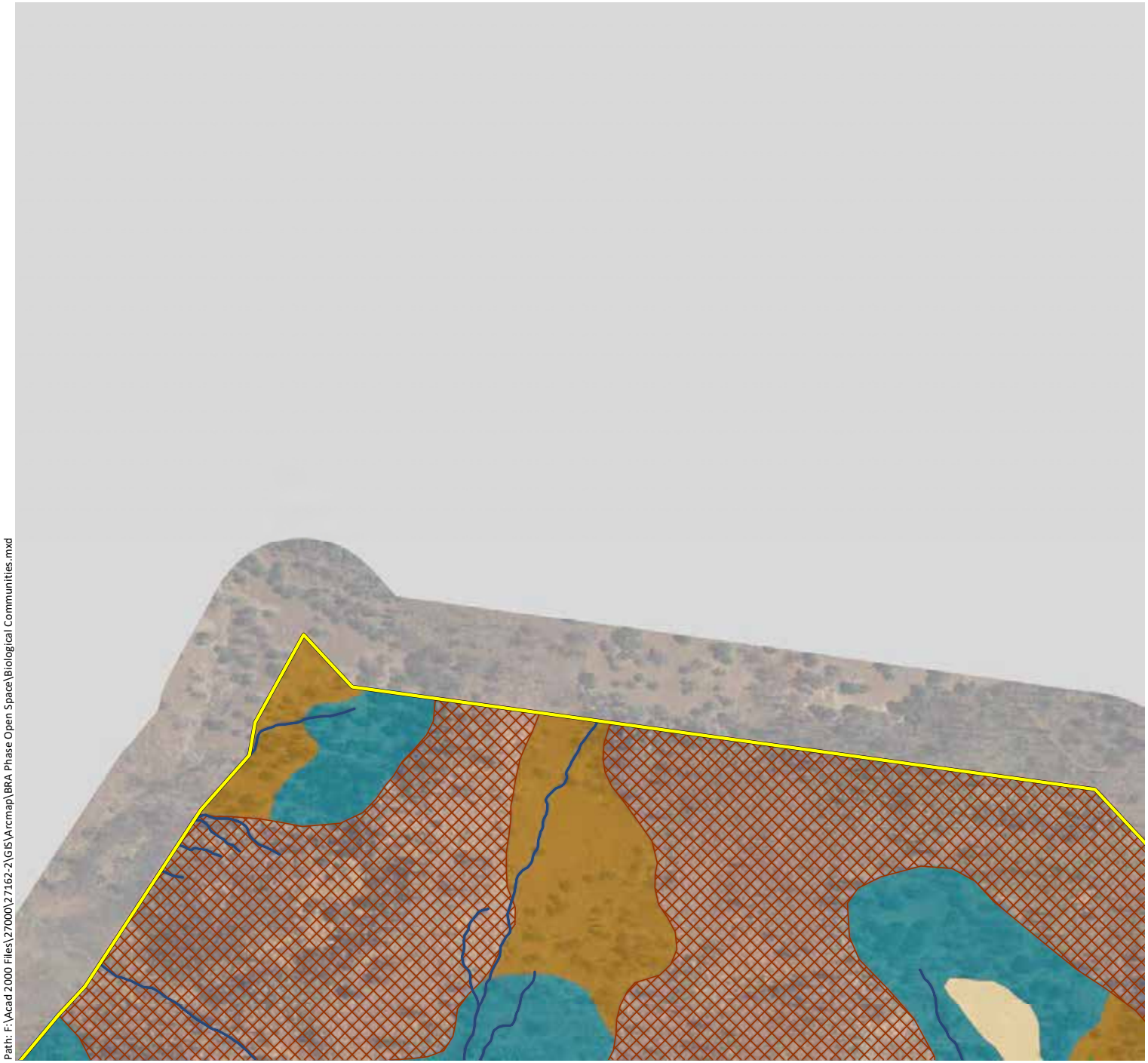
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 8)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

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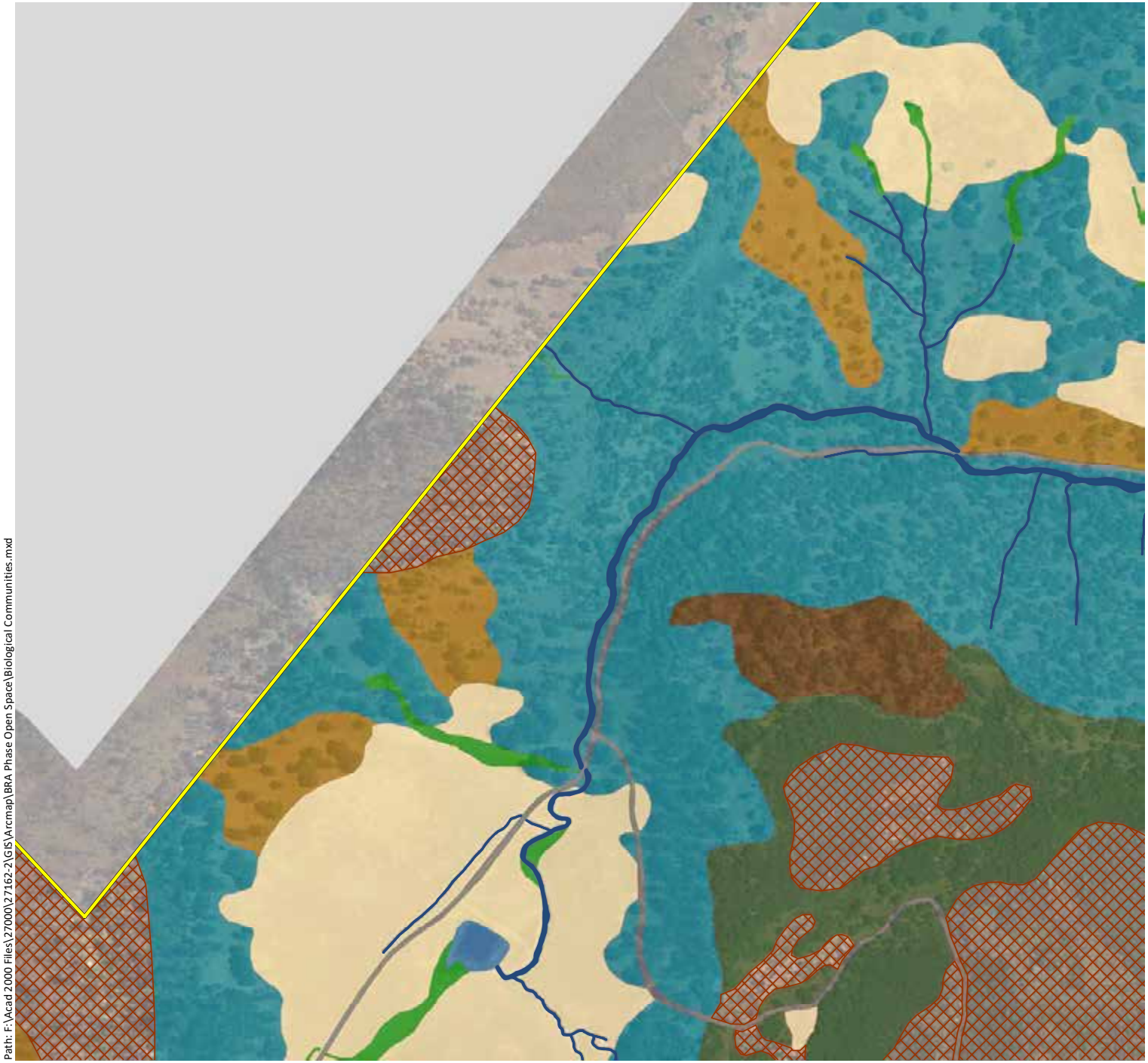

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 9)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

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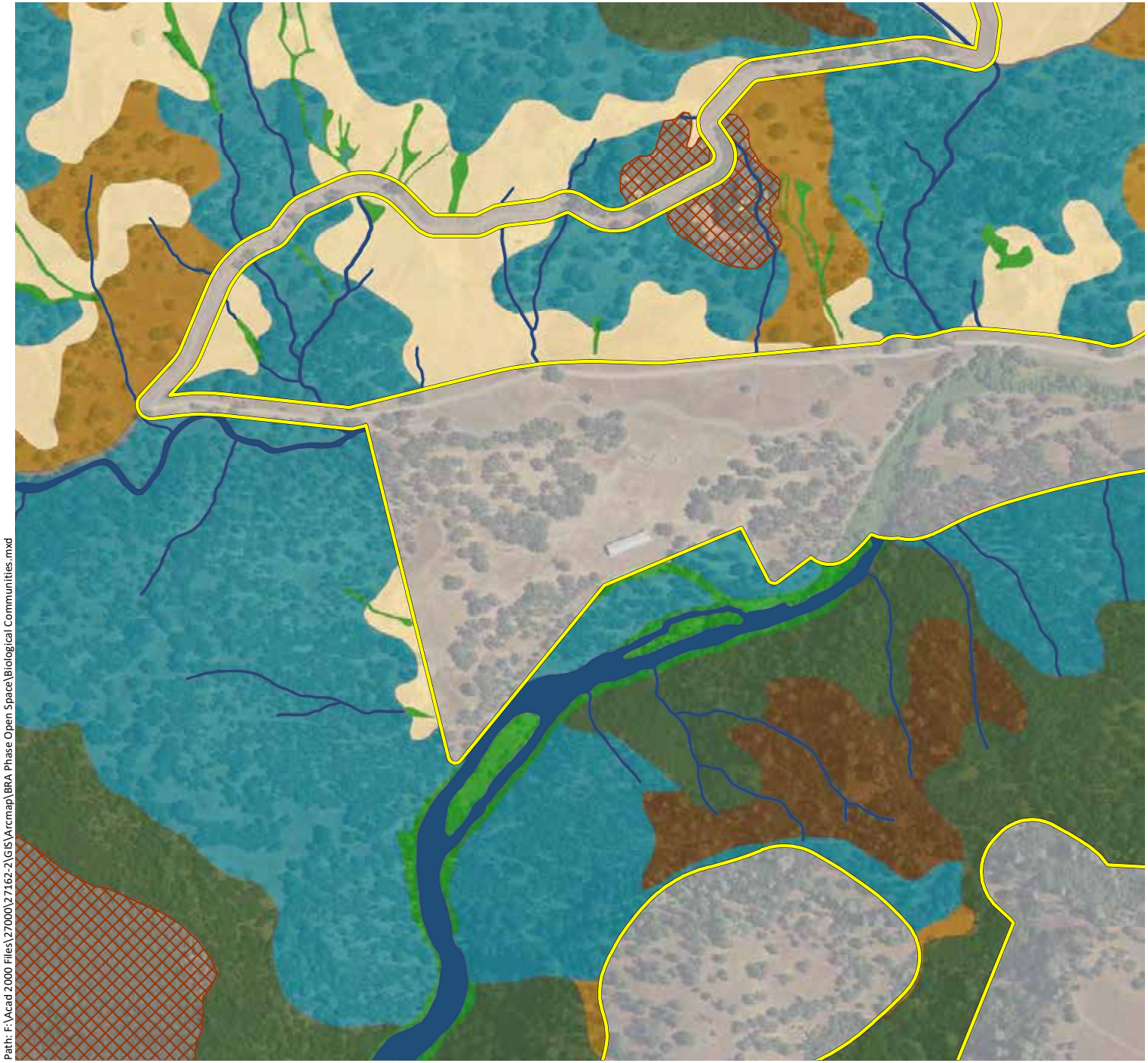
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 10)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

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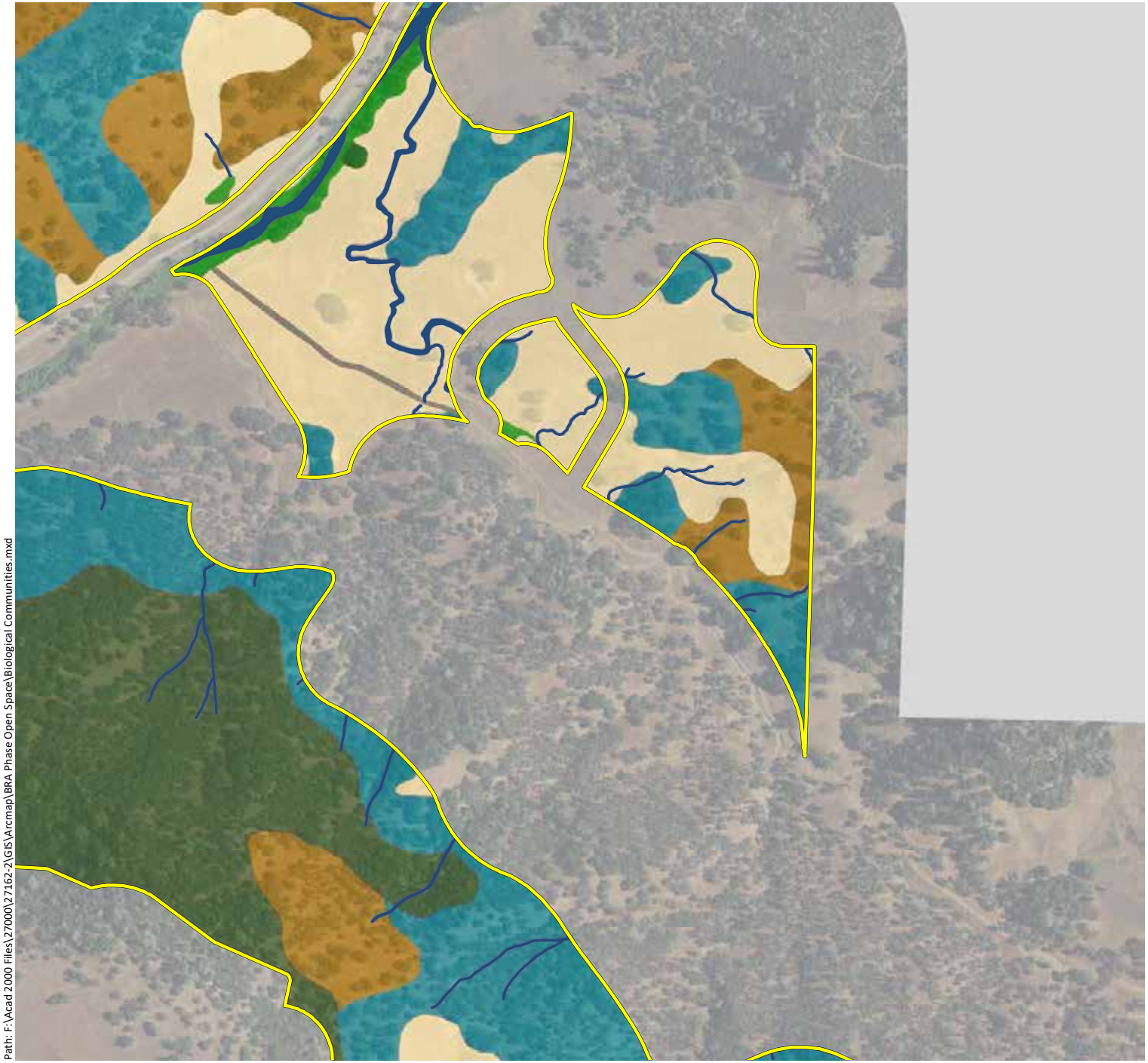
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 11)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

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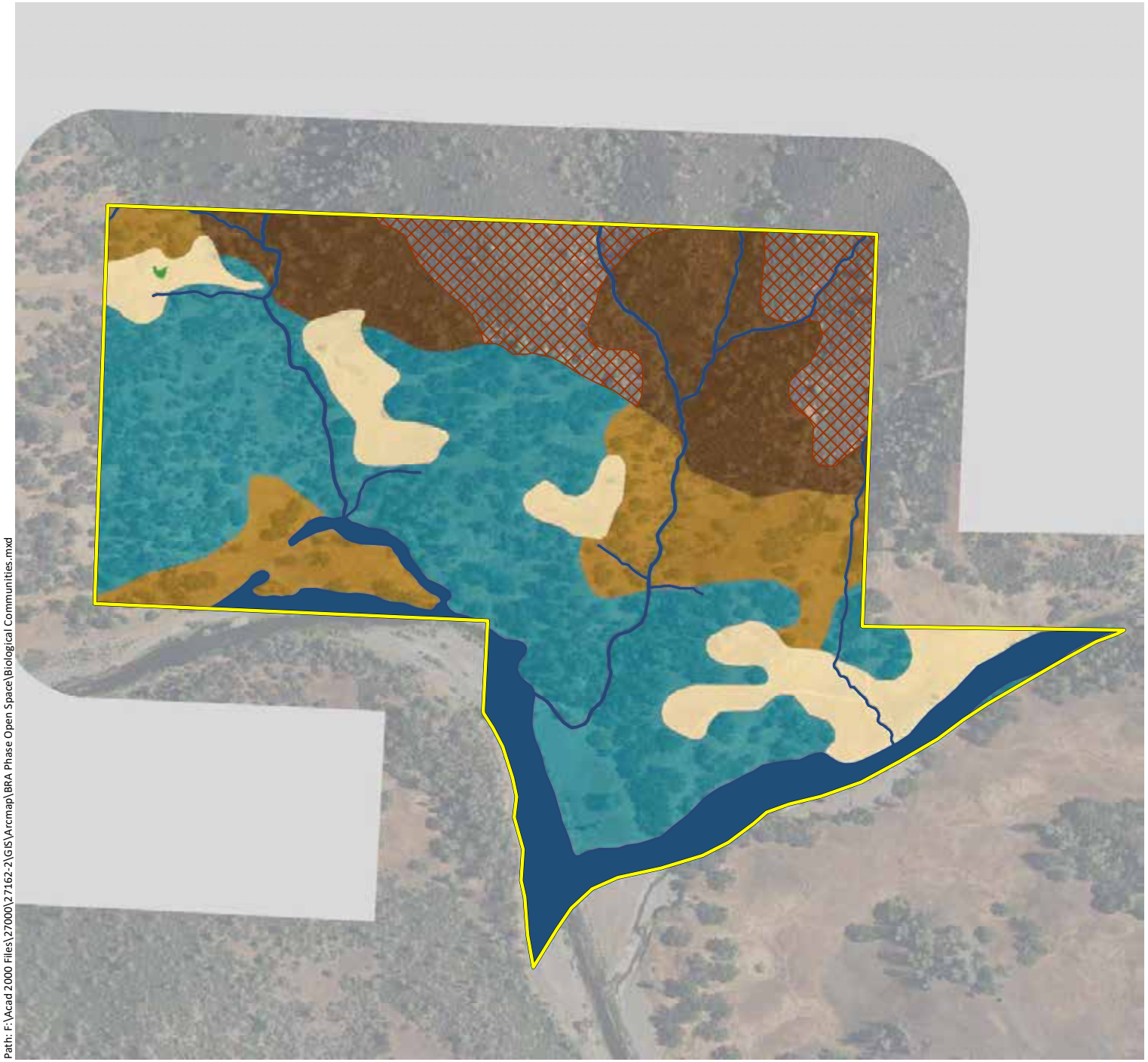
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 12)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

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Feet

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ENVIRONMENTAL CONSULTANTS

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 13)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

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Feet

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 14)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

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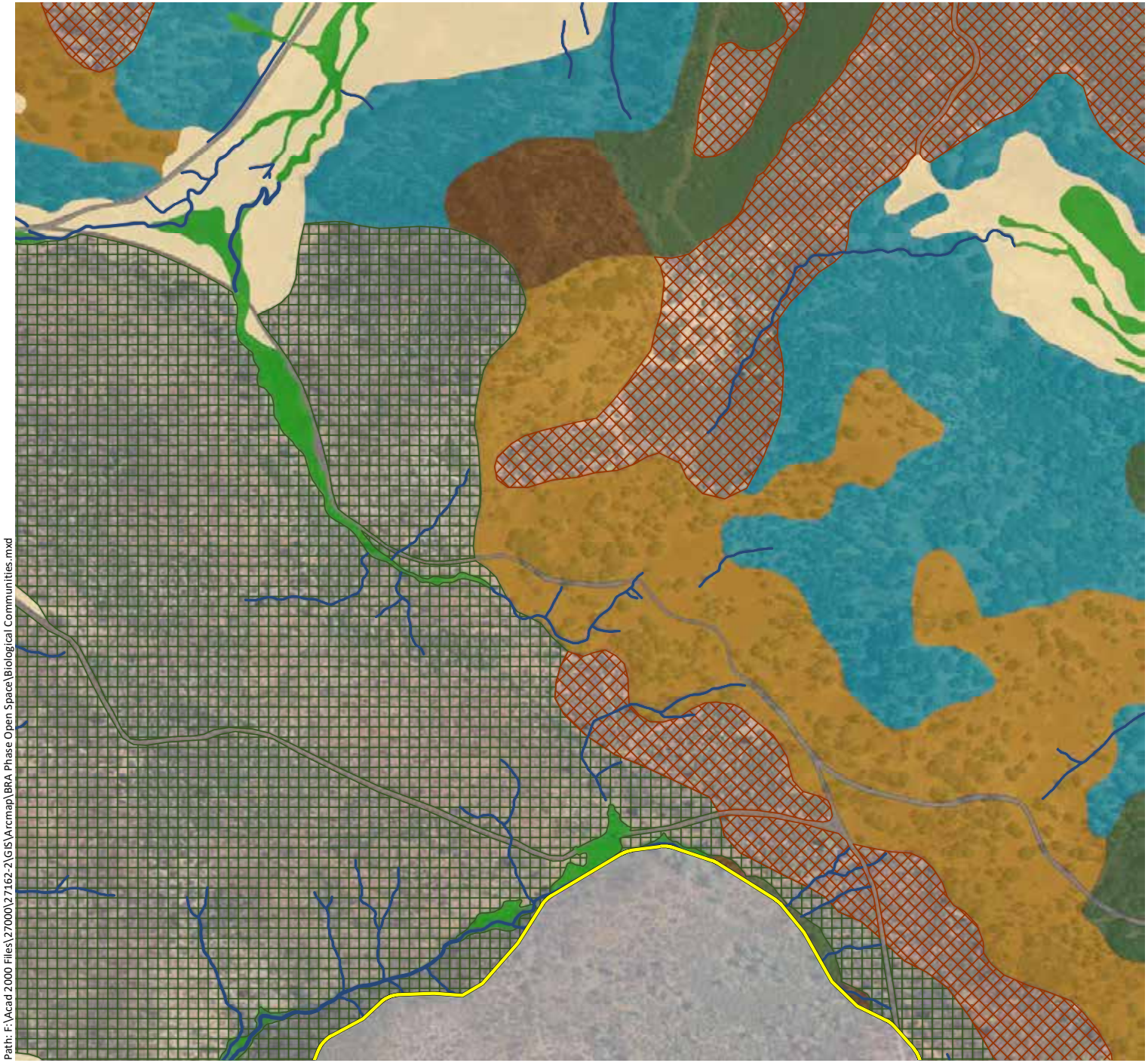
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 15)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

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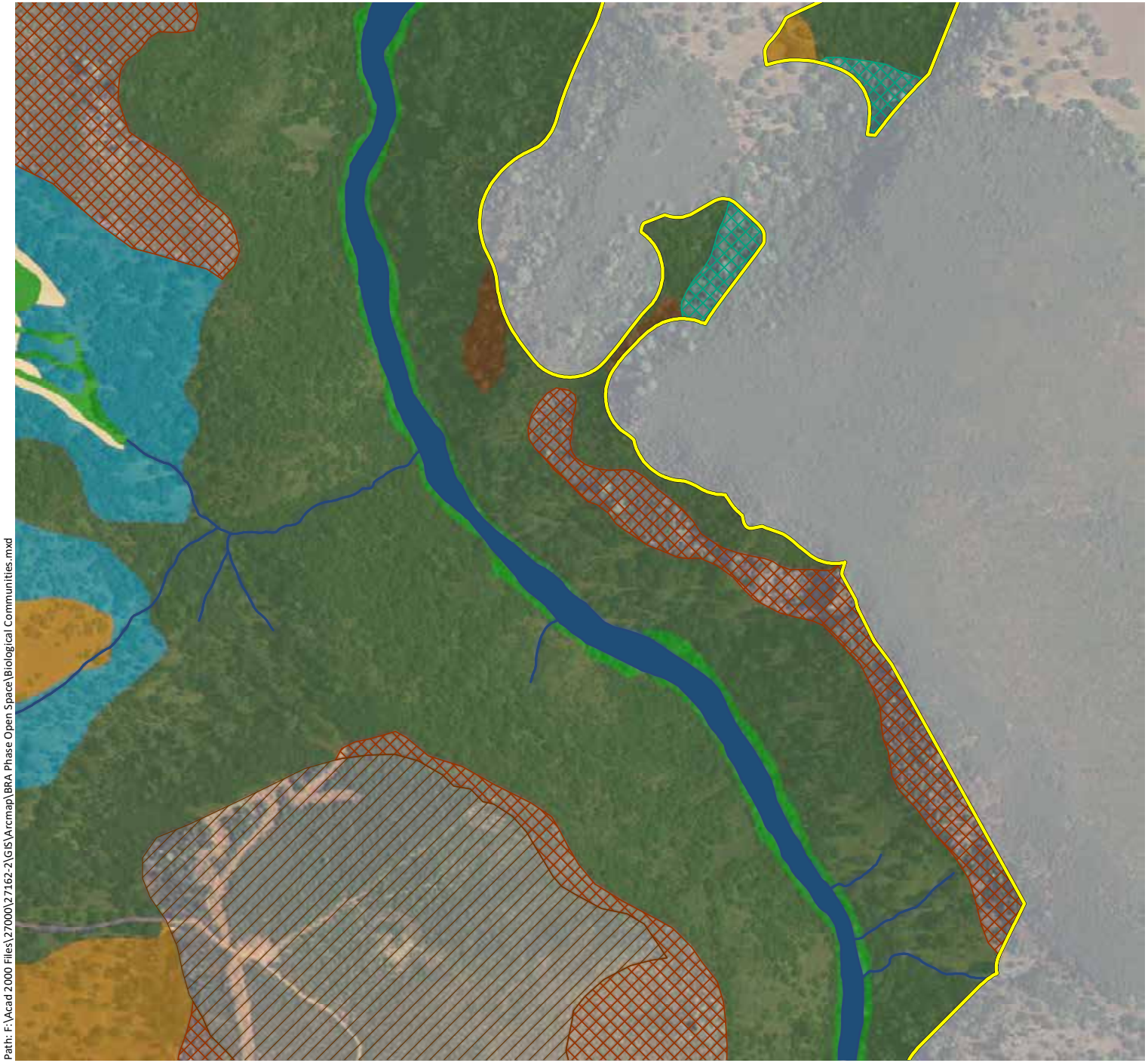
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 16)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

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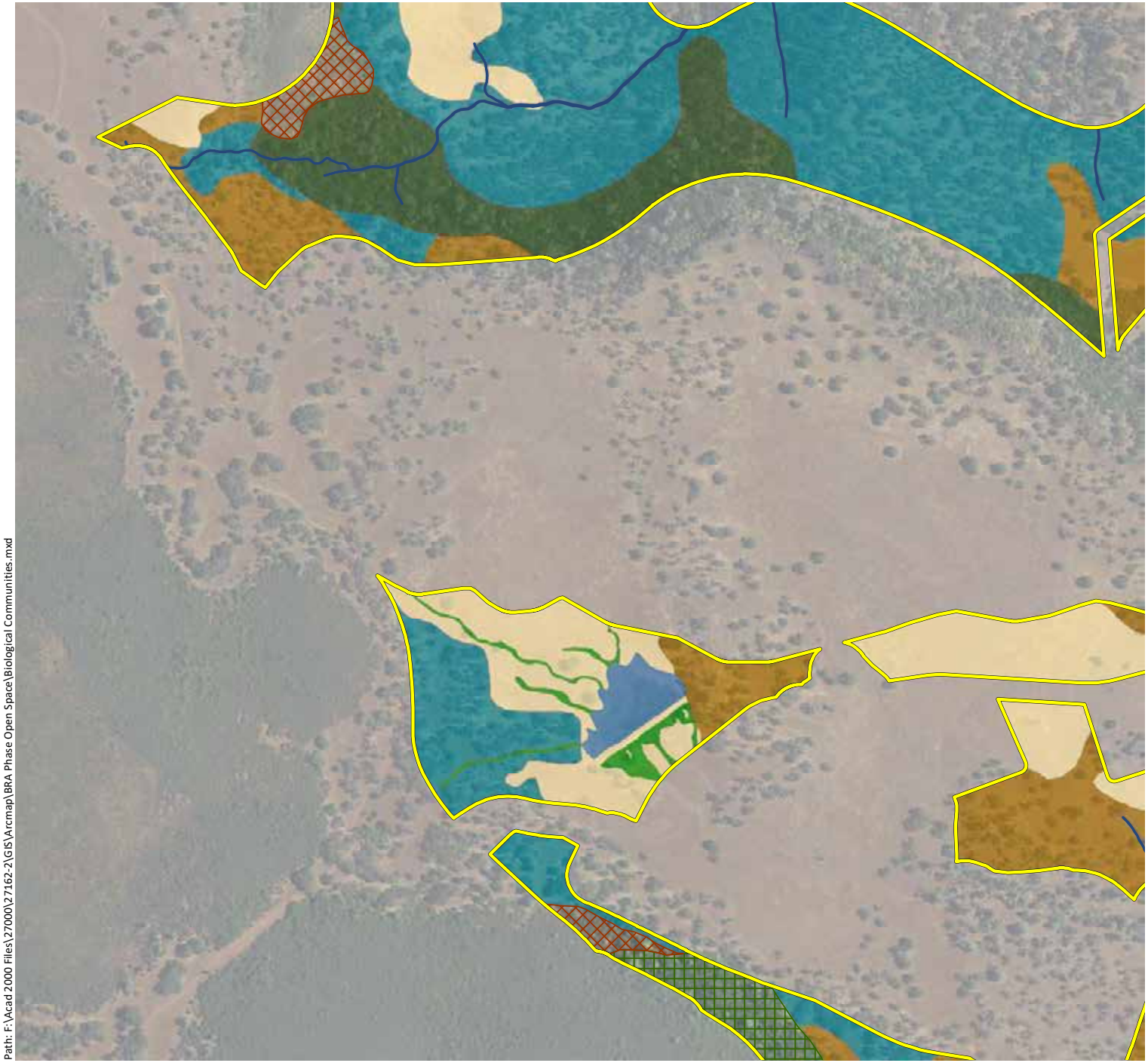
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 17)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

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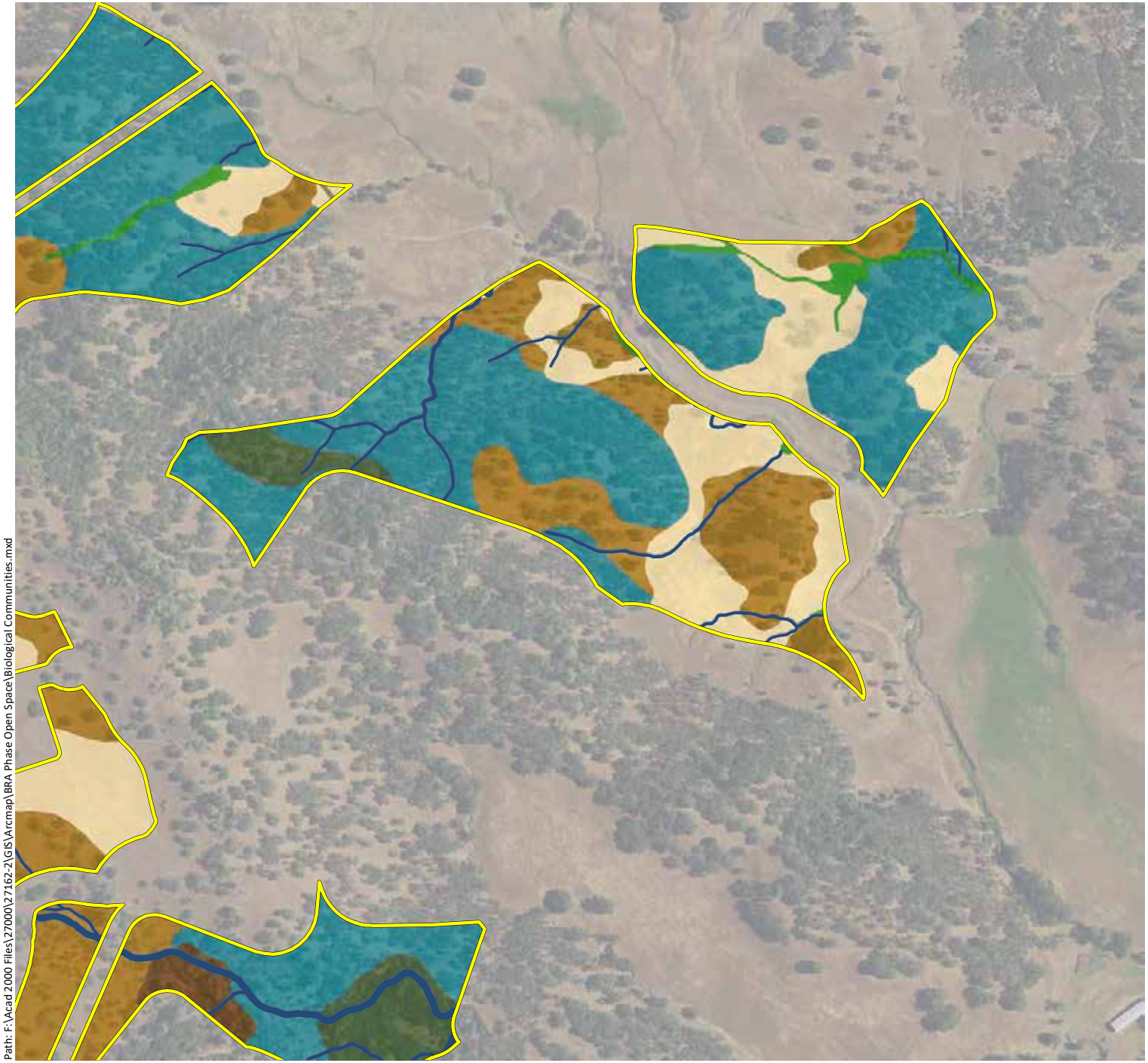
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 18)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

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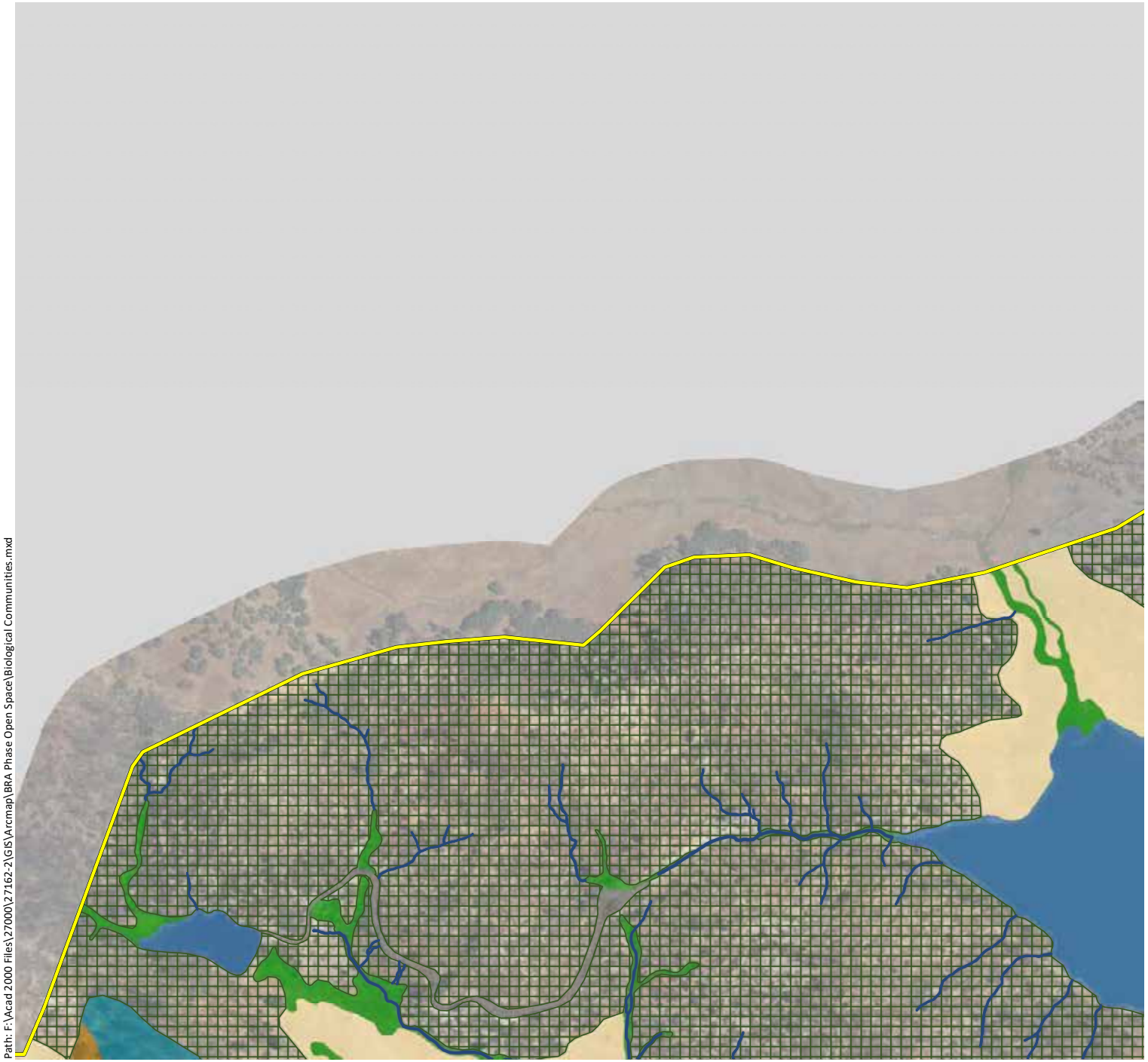
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 19)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

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Feet

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 20)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

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Feet

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ENVIRONMENTAL CONSULTANTS

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 21)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

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Feet

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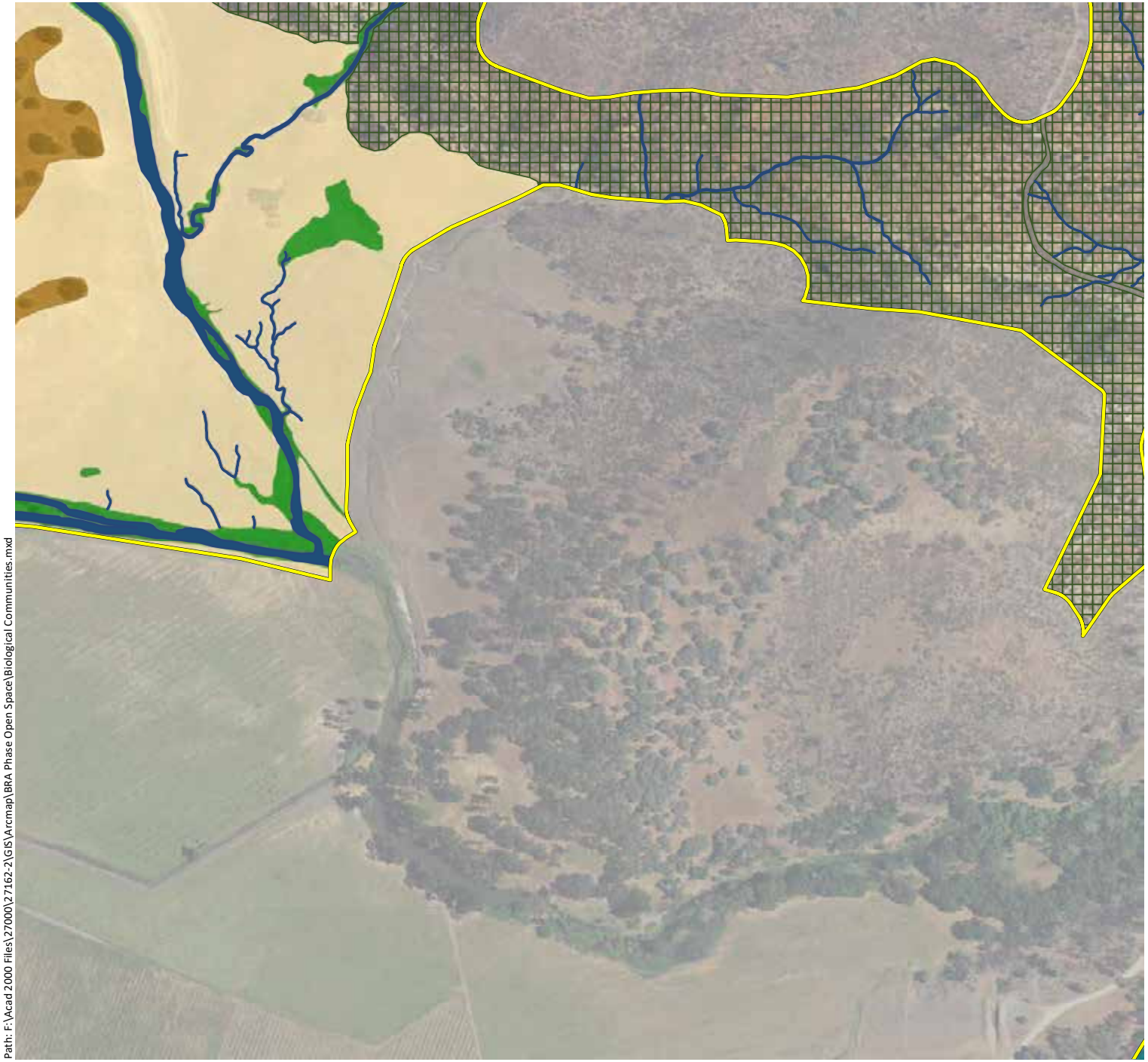
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 22)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

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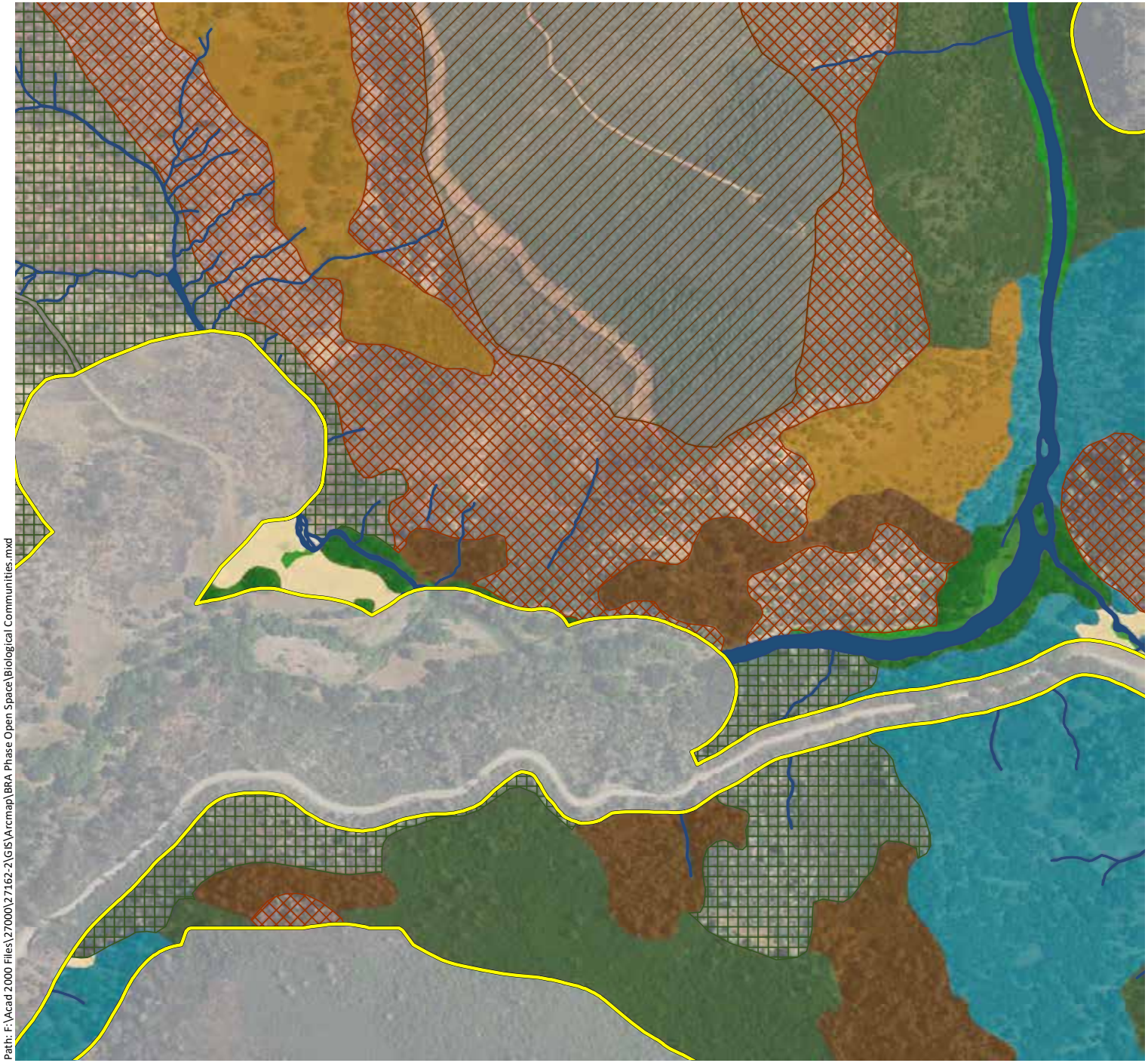
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 23)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

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Feet

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 24)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

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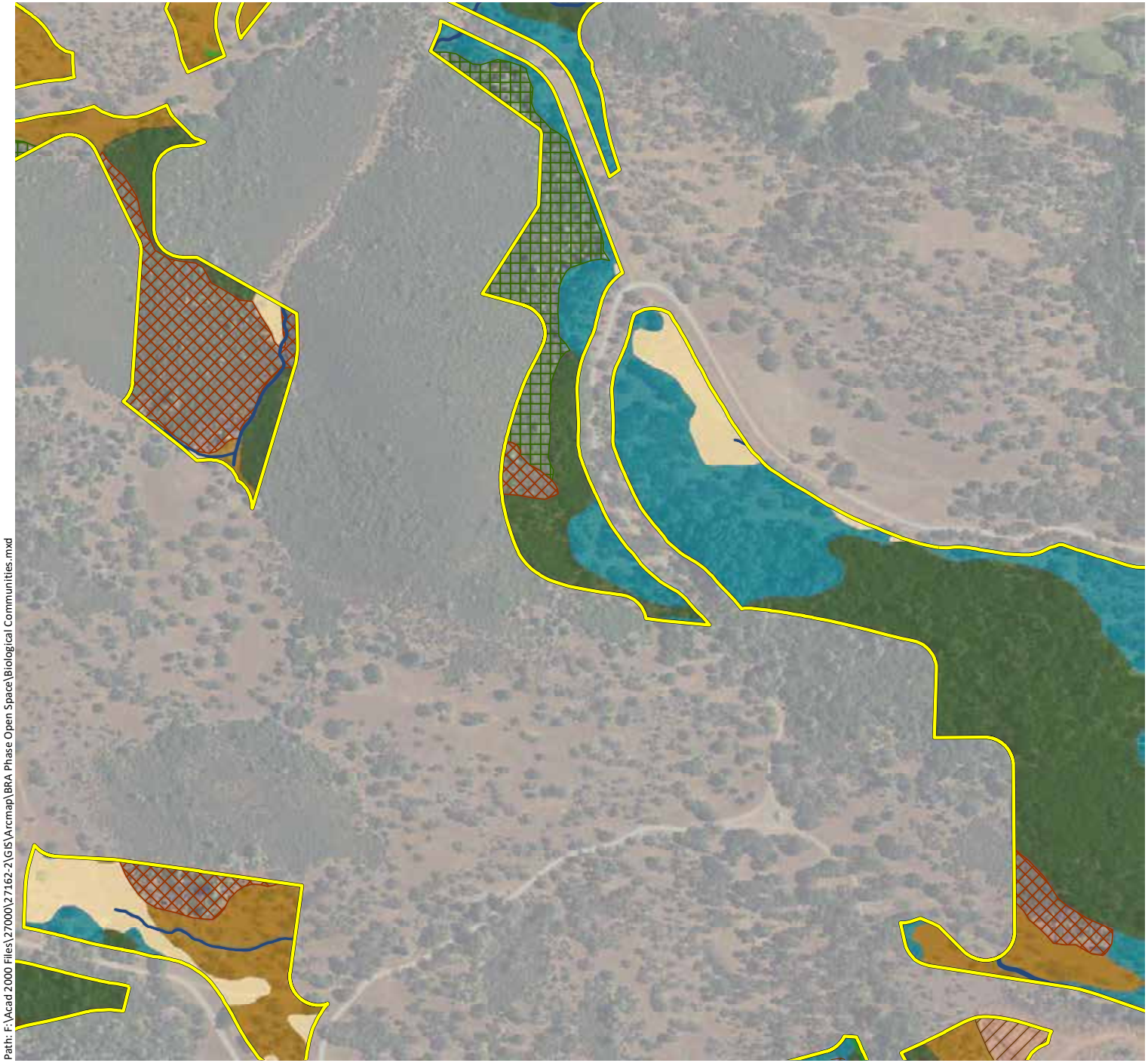
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 25)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

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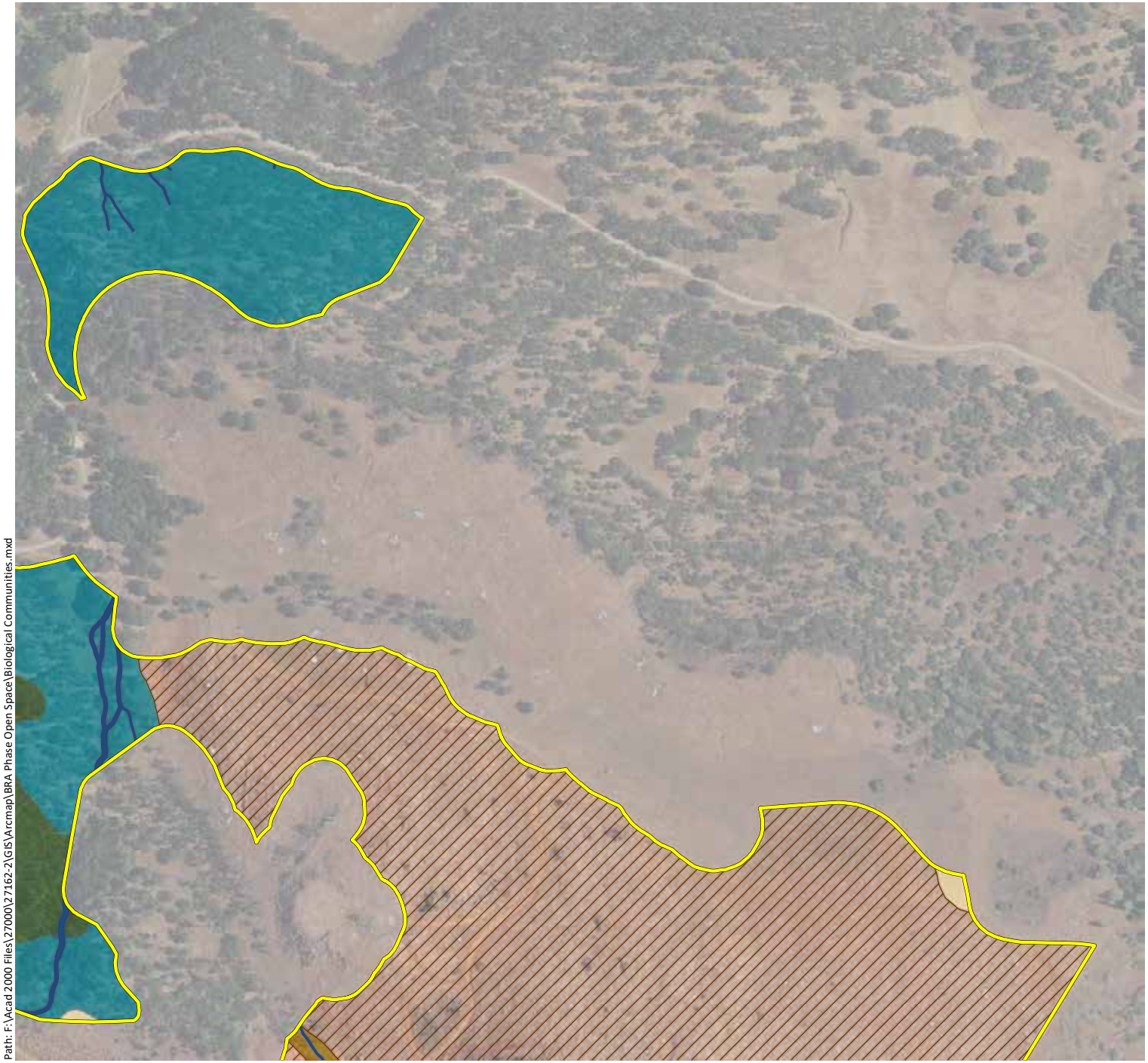
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 26)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

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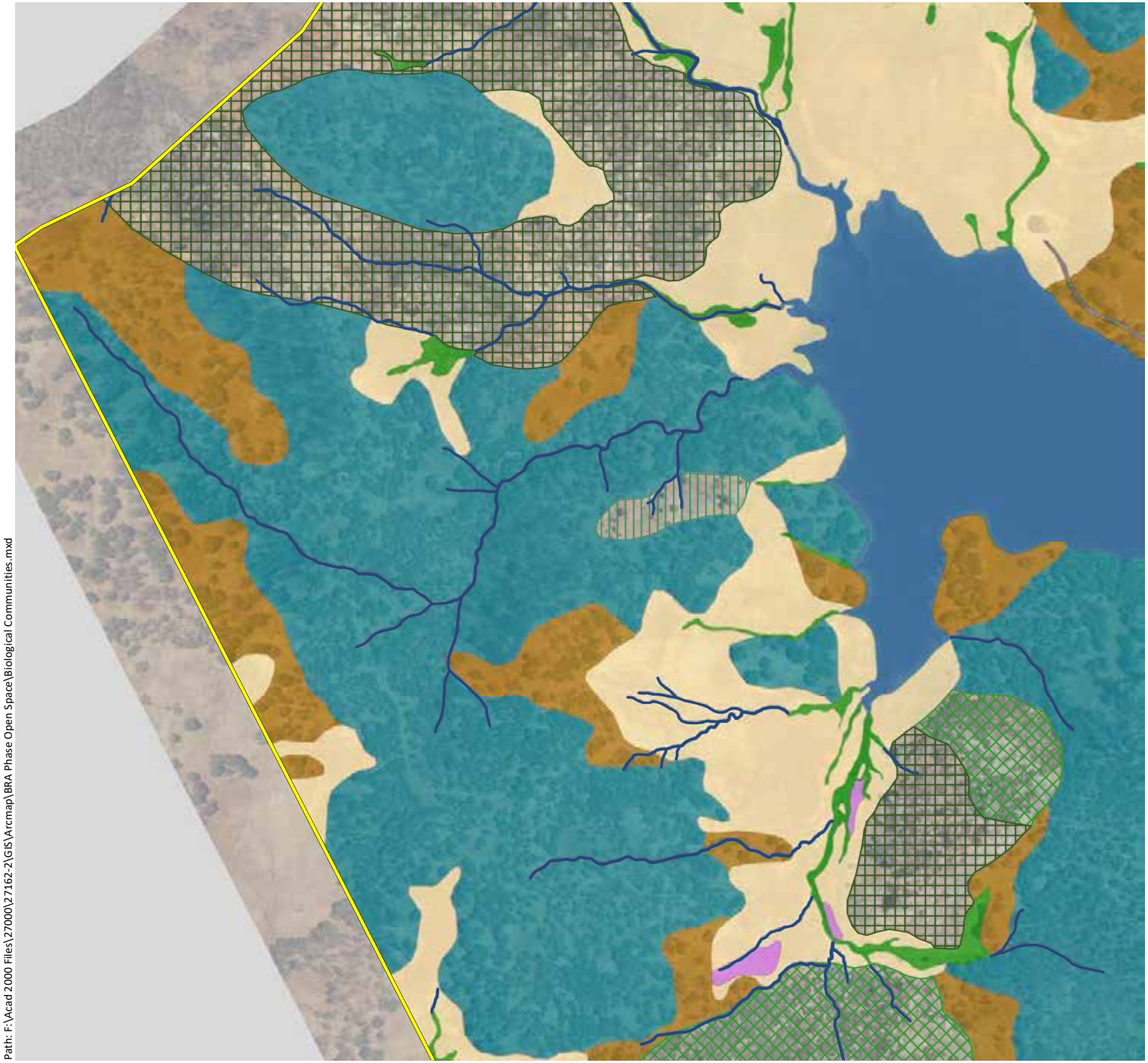
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 27)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 28)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

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Feet

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 29)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

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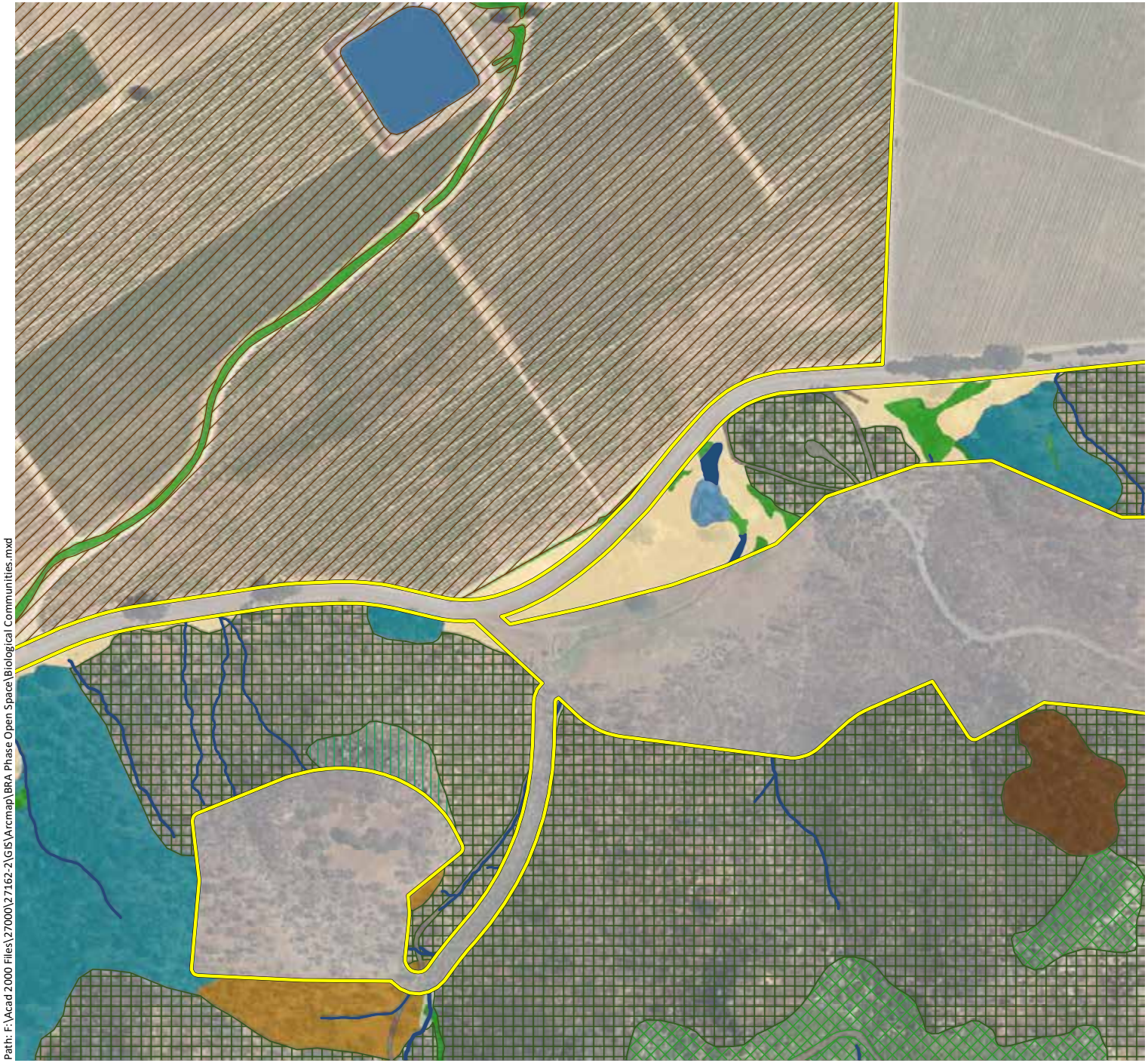
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 30)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

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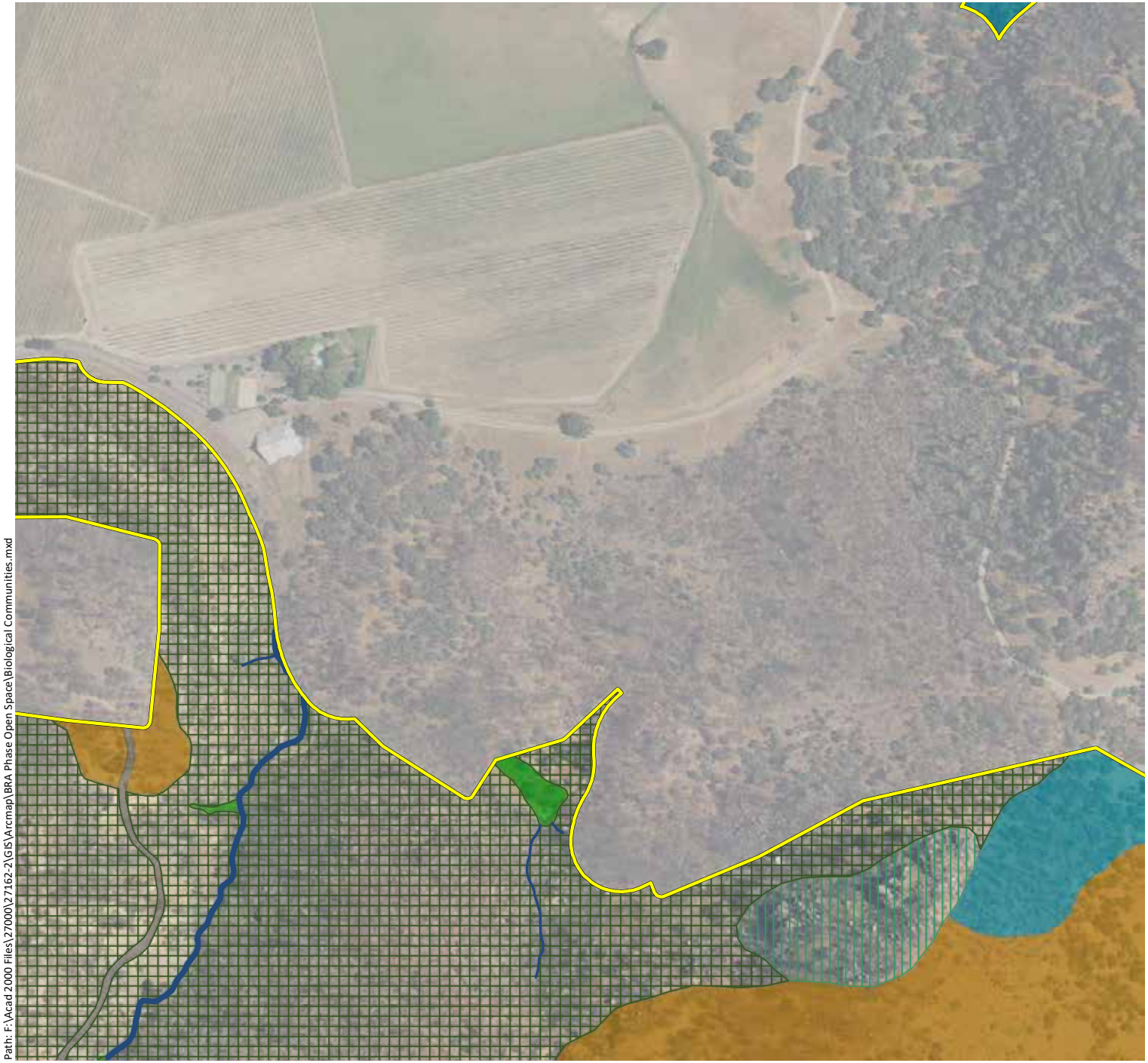
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 31)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

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Feet

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 32)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

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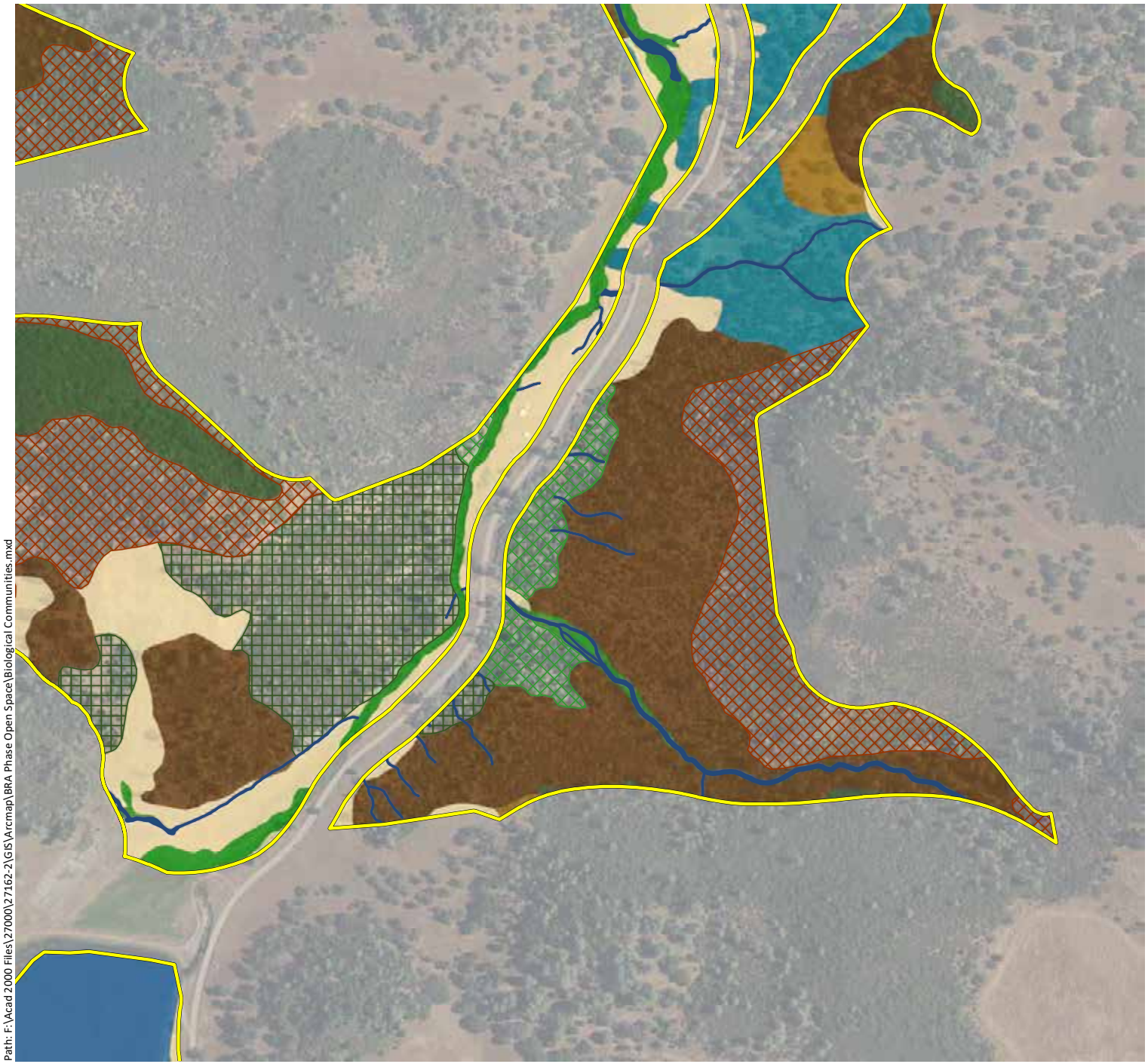
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 33)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
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- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
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- Chamise Chaparral - 445.8 ac.
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- Scrub Oak Chaparral - 9.7 ac.
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- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

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Feet

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 34)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
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- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

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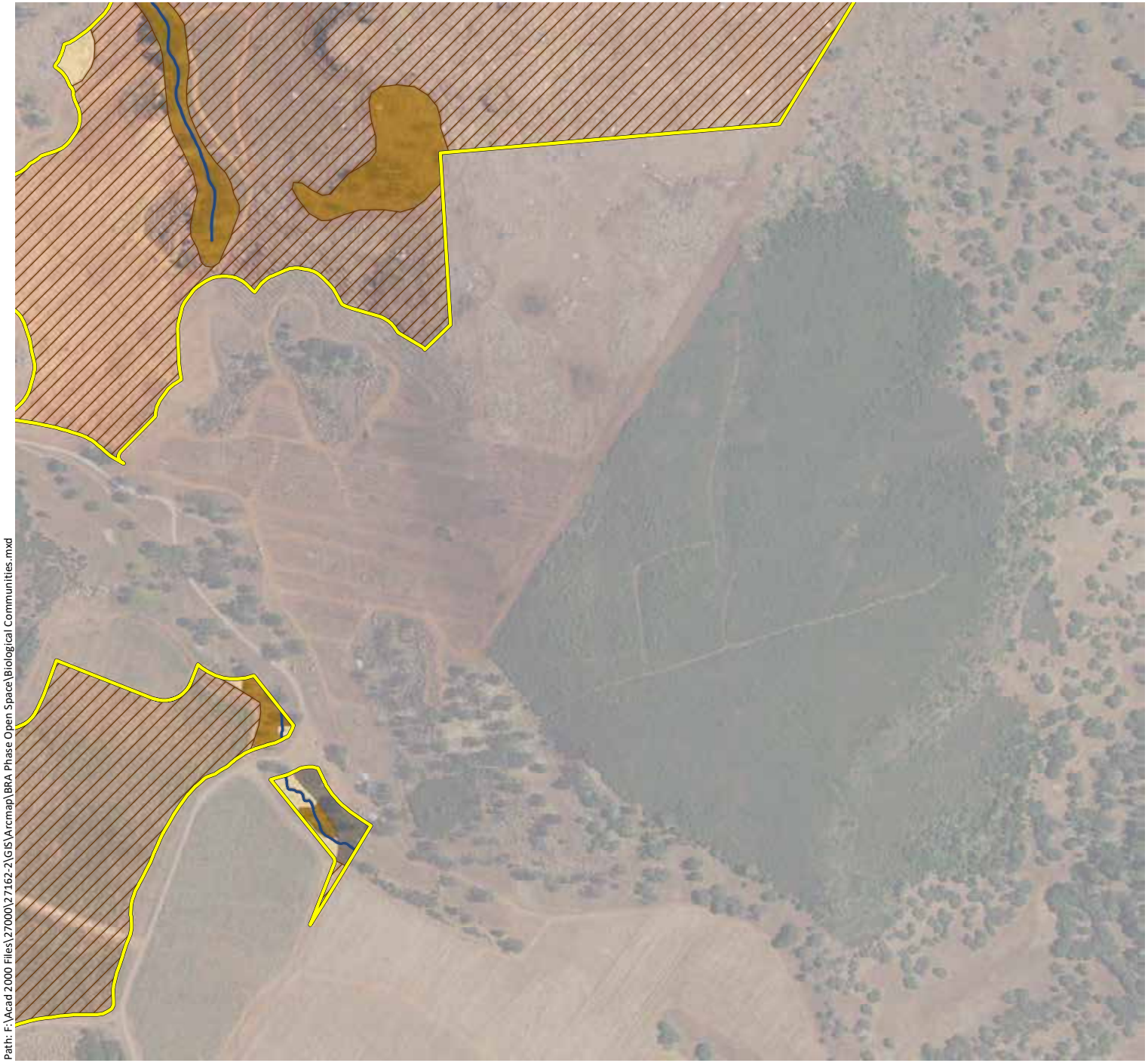
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 35)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
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- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

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Feet

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 36)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
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- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
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- Scrub Oak Chaparral - 9.7 ac.
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- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

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Feet

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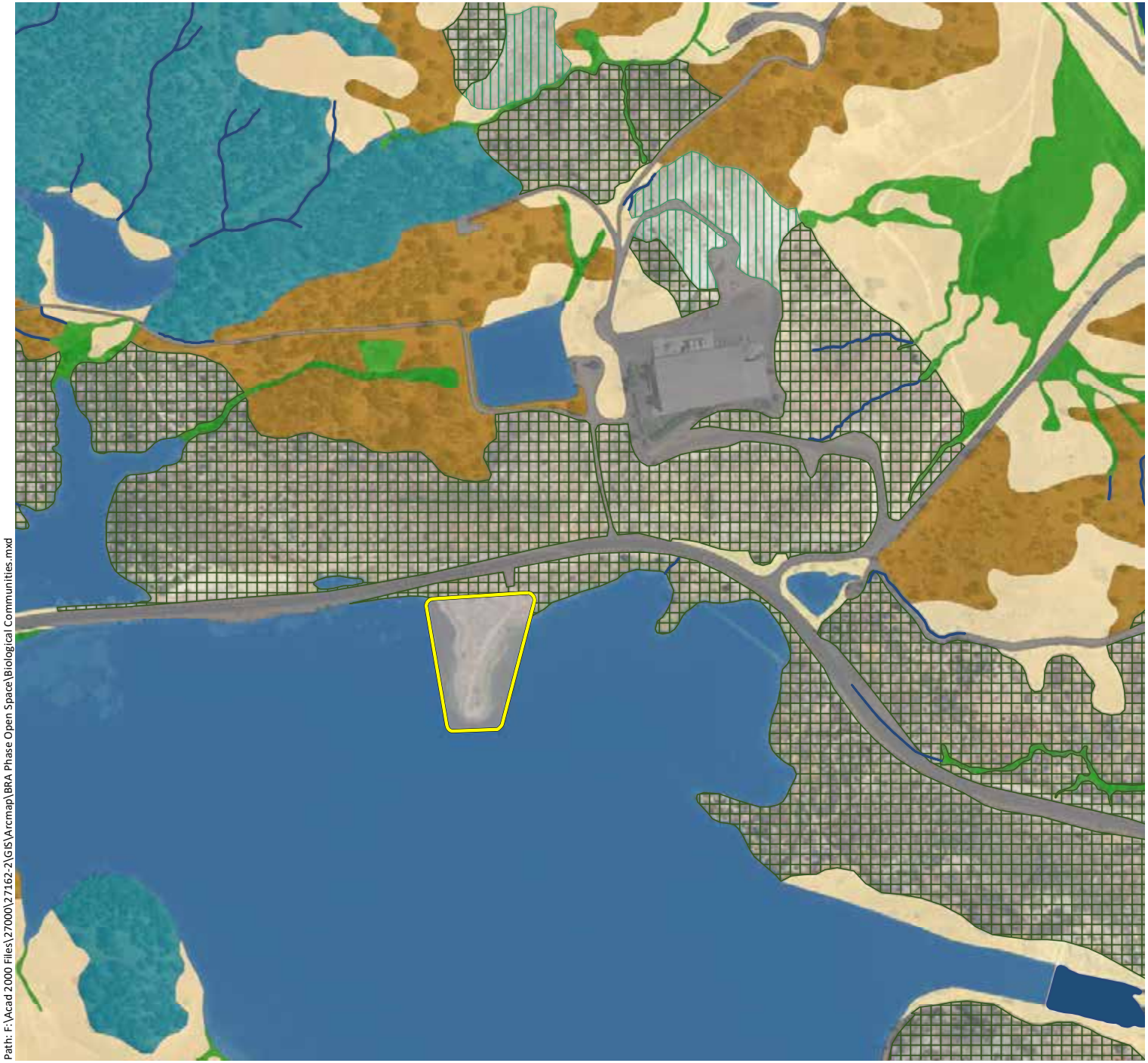
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 37)
Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
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- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

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- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
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- Chamise Chaparral - 445.8 ac.
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- Scrub Oak Chaparral - 9.7 ac.
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- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 38)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

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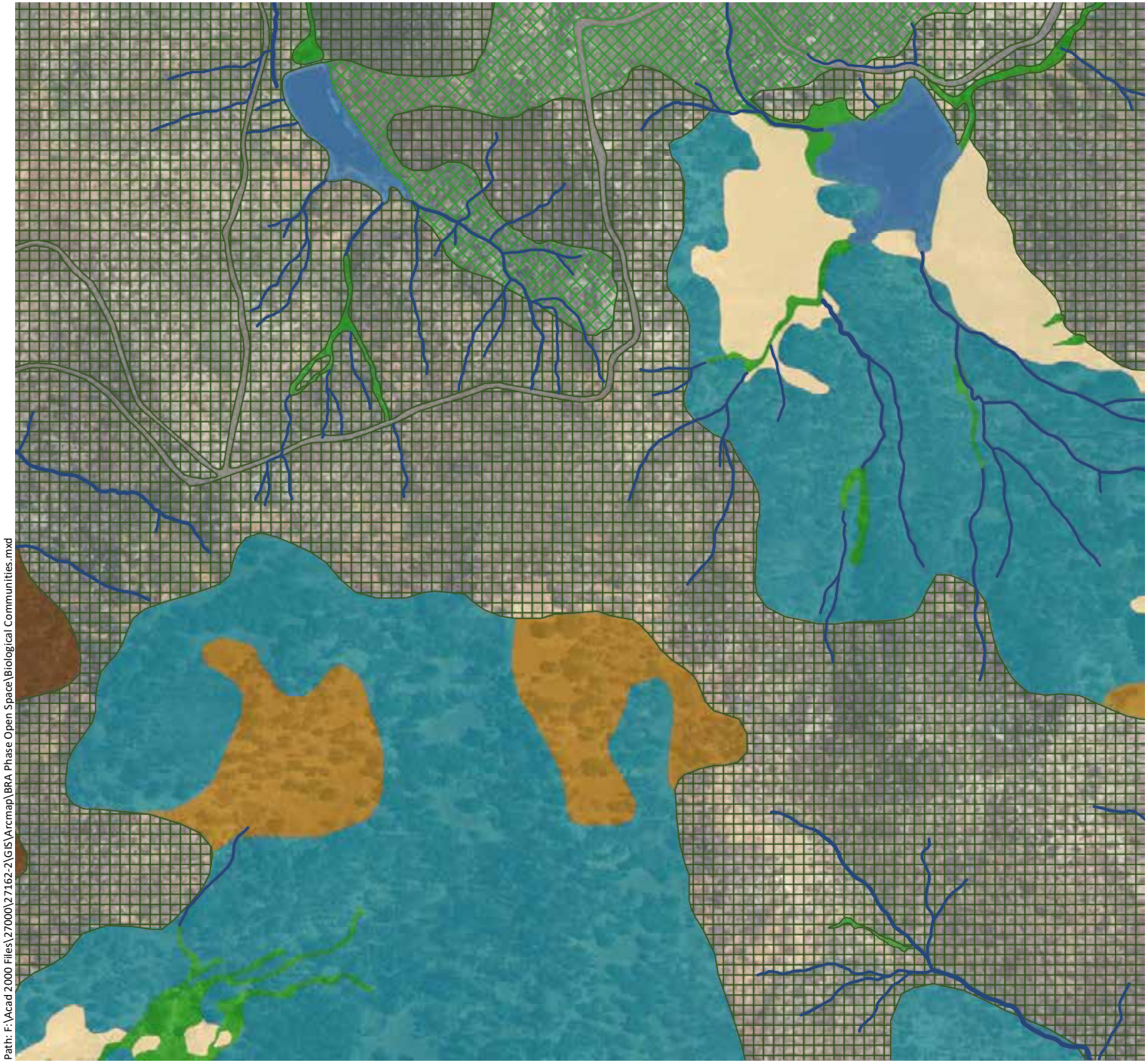
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 39)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

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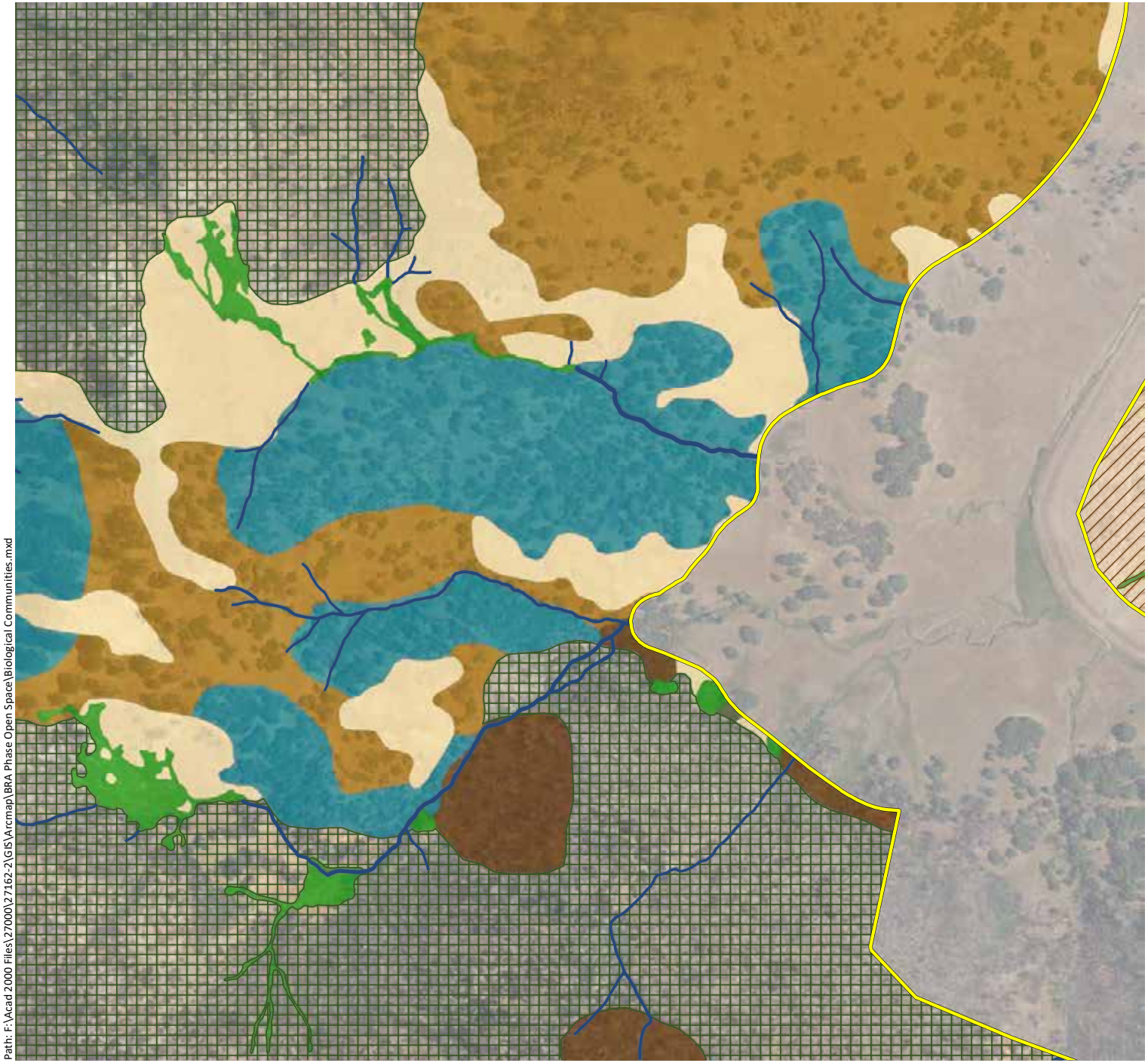
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 40)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 41)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

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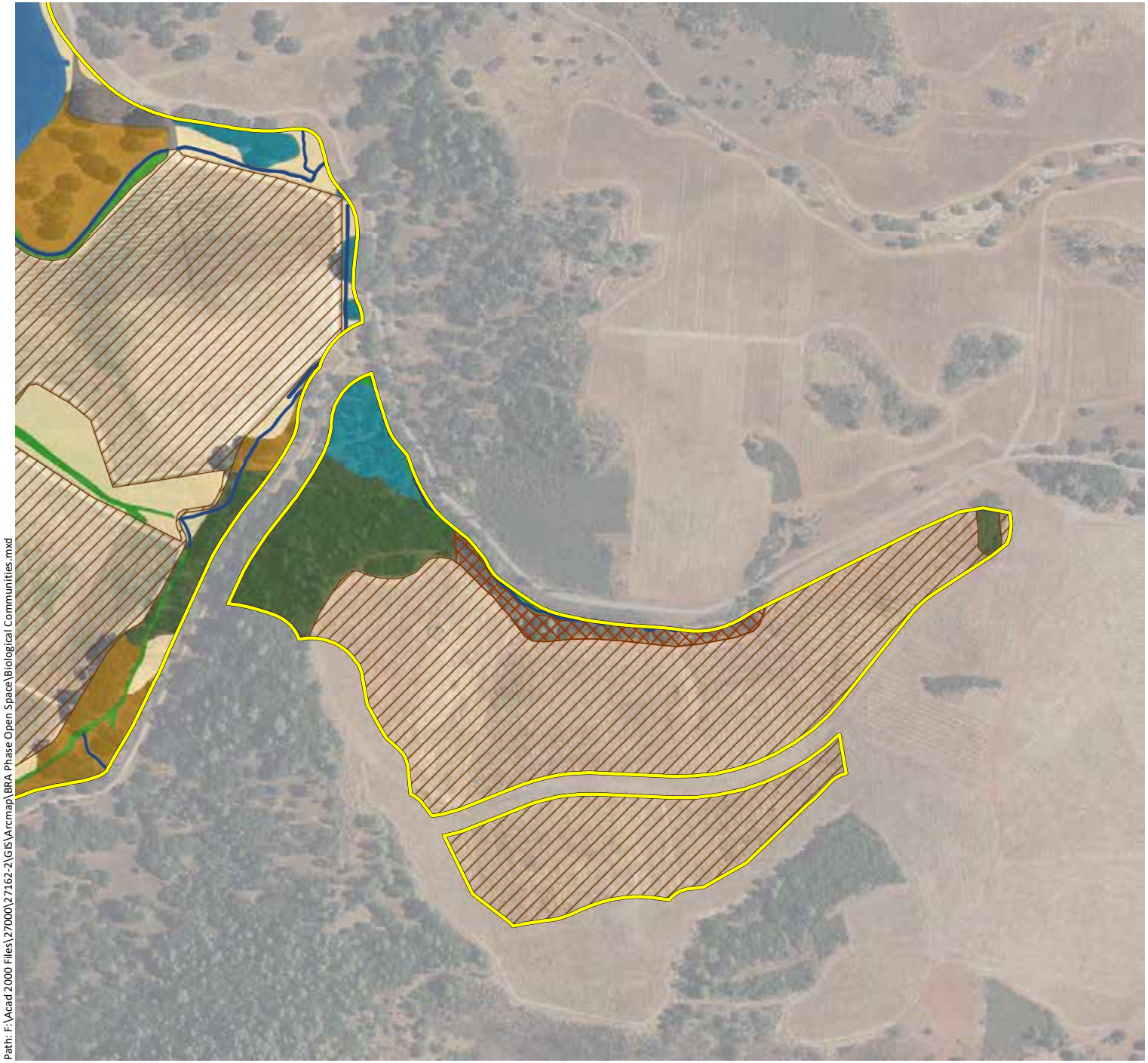
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 42)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 43)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

wra
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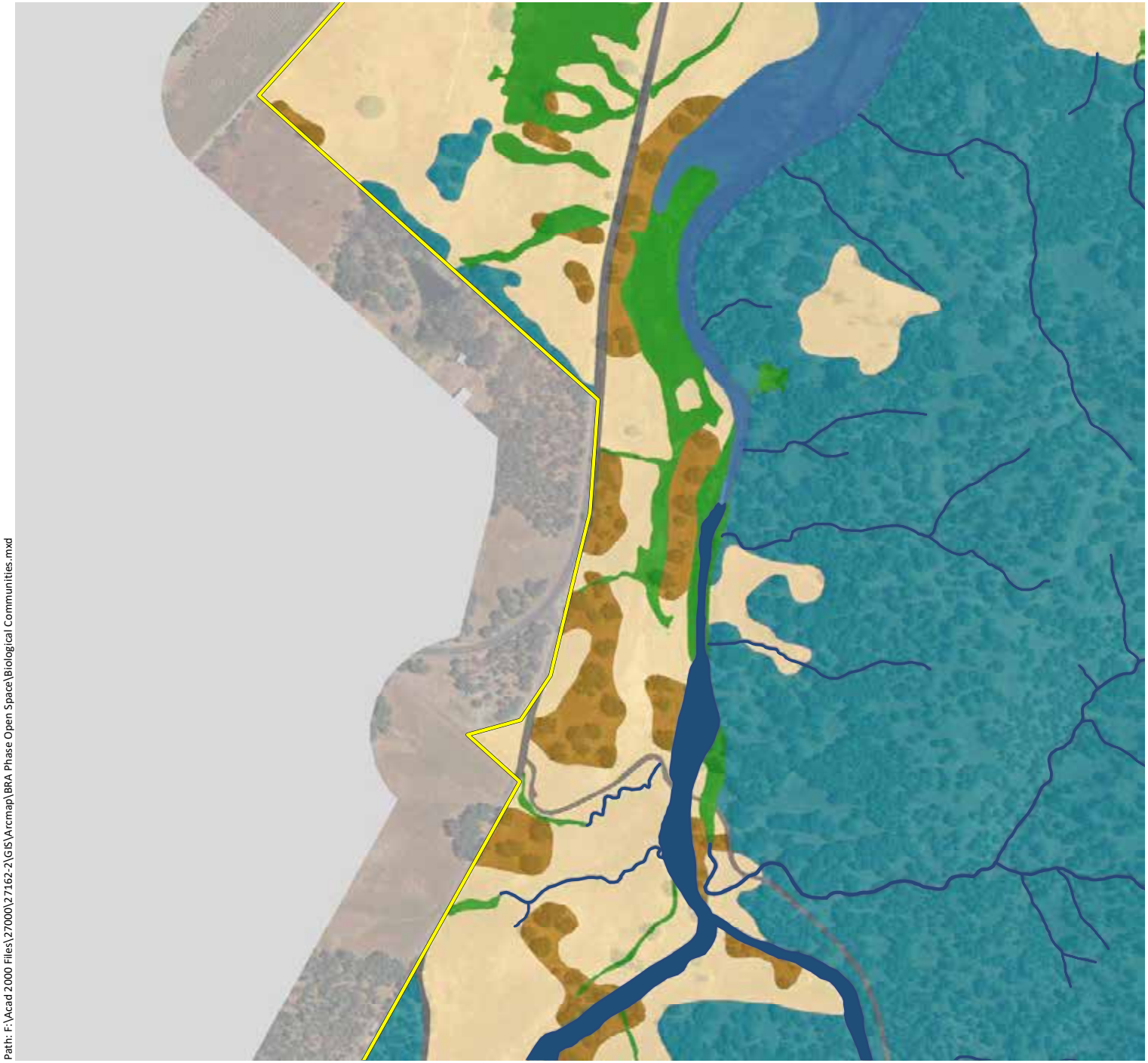
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Biological Communities.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 44)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 45)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

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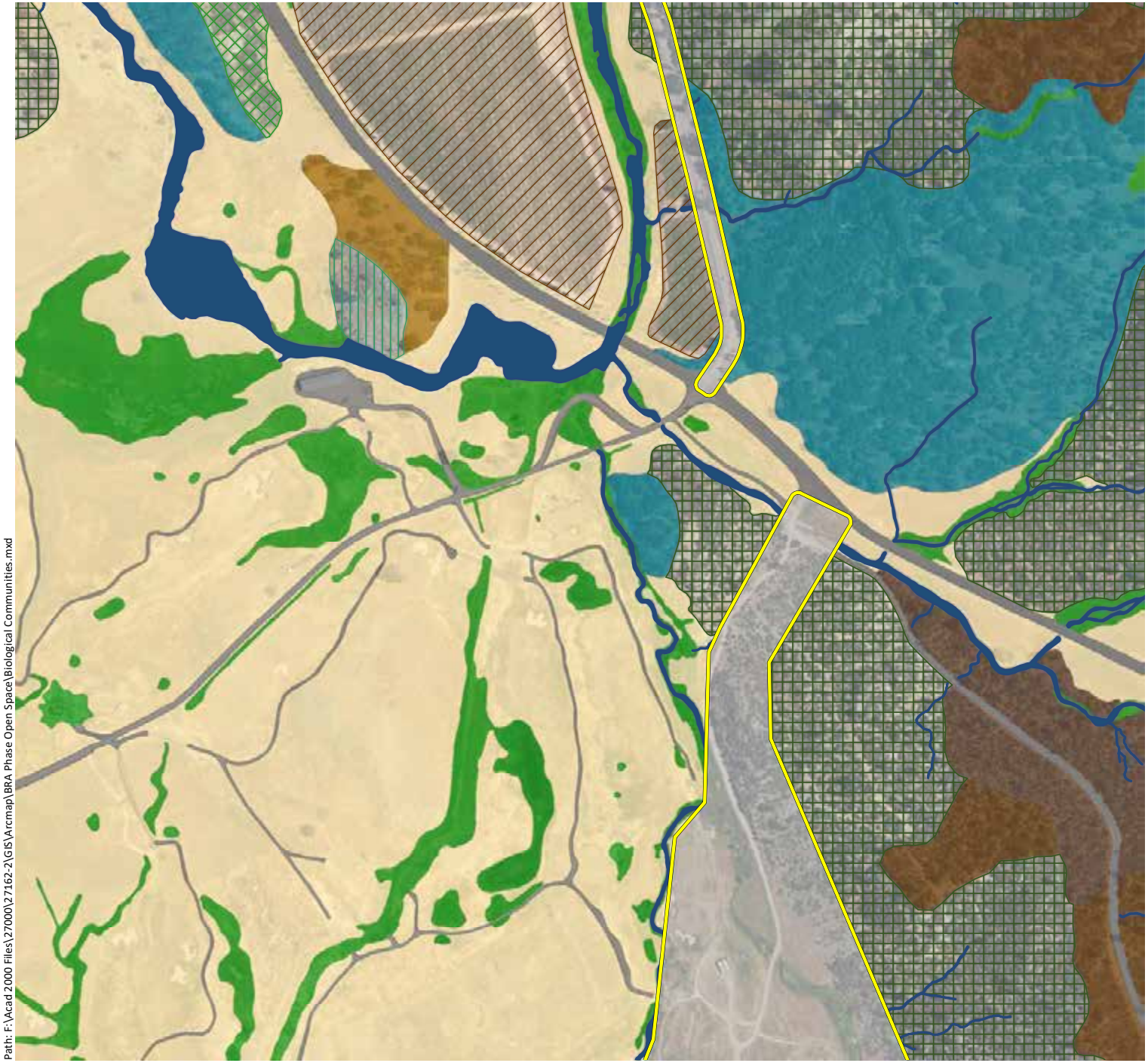
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 46)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 47)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

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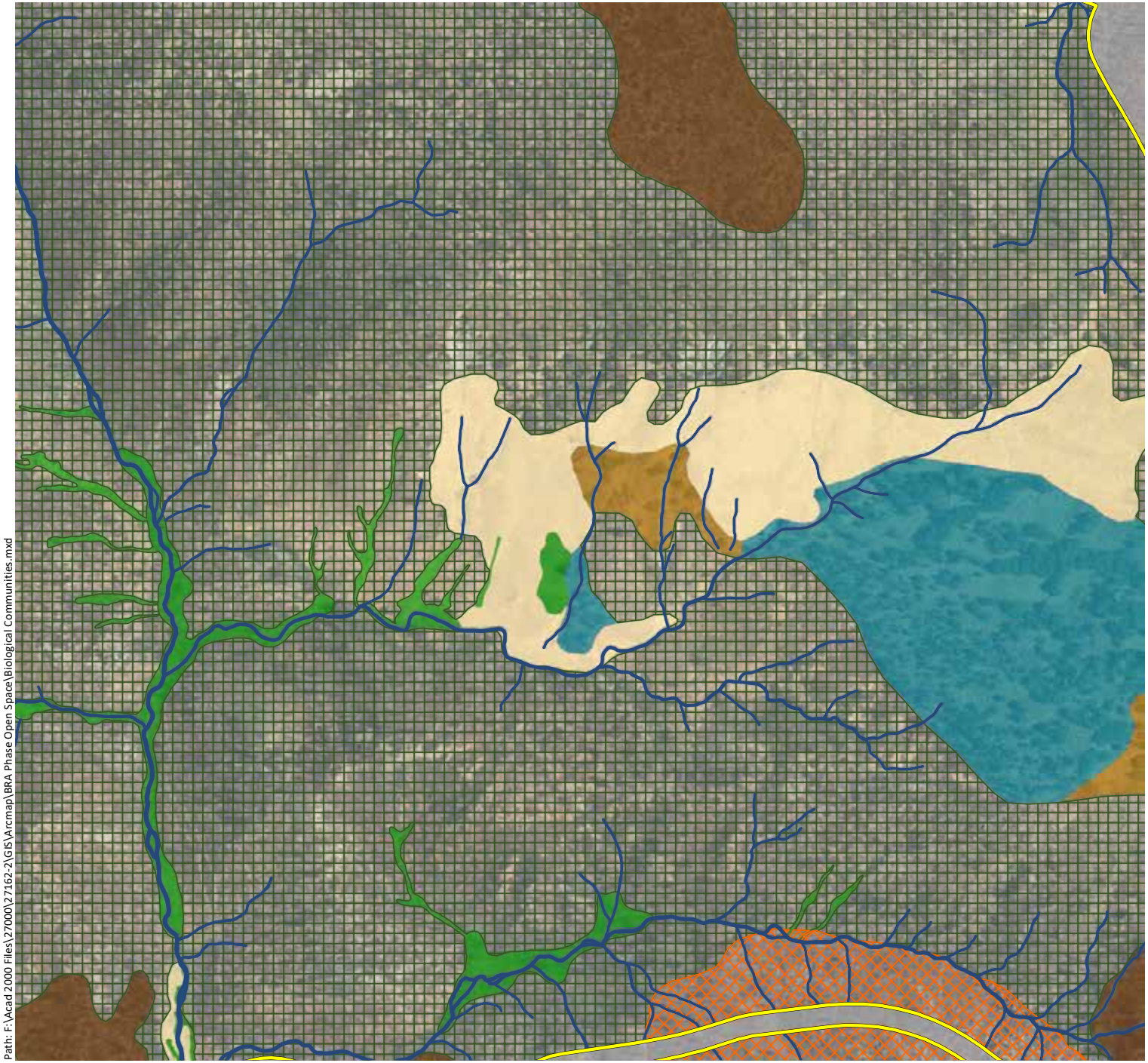
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 48)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

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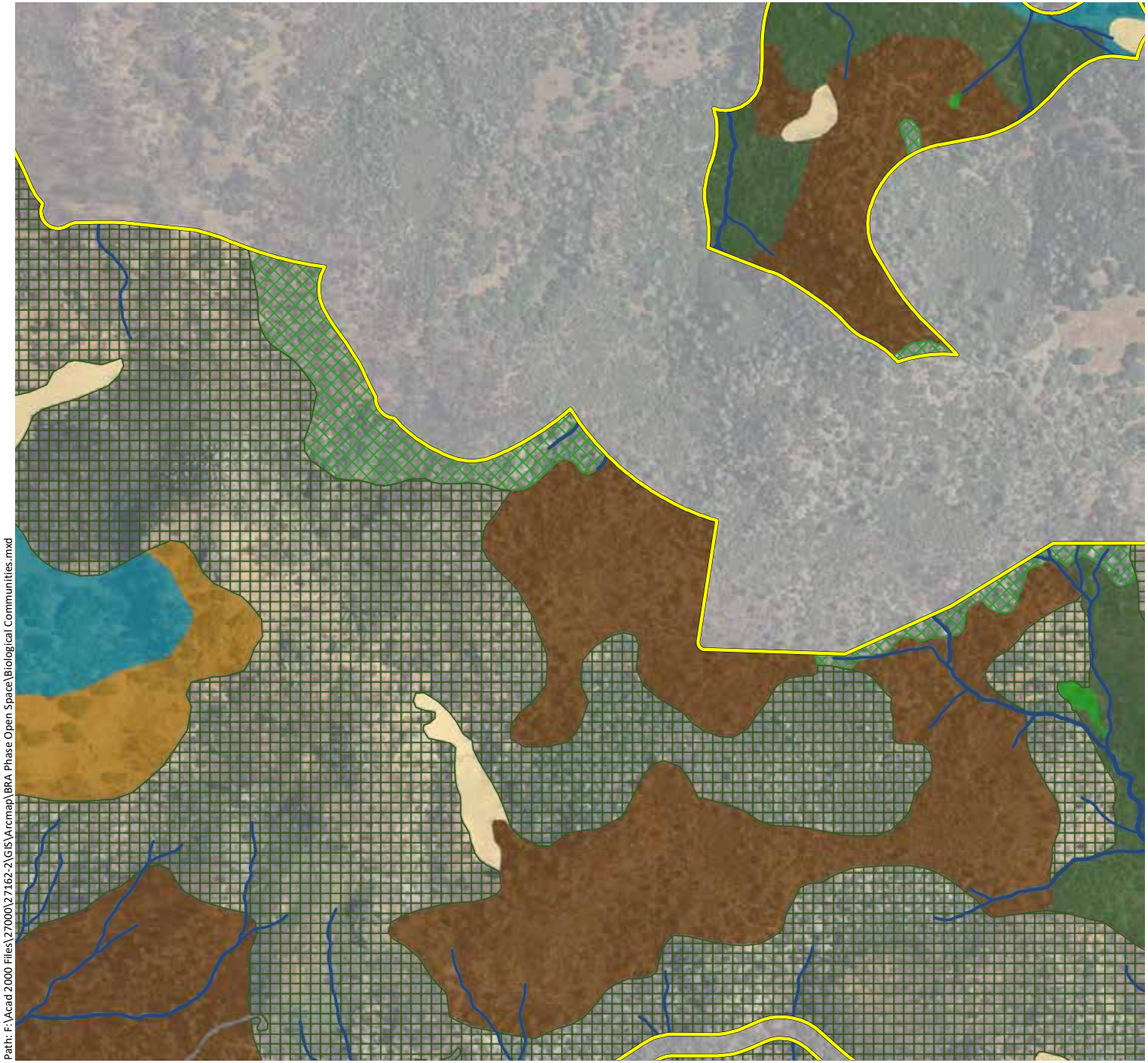
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 49)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

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ENVIRONMENTAL CONSULTANTS

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 50)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Biological Communities.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 51)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grasssland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

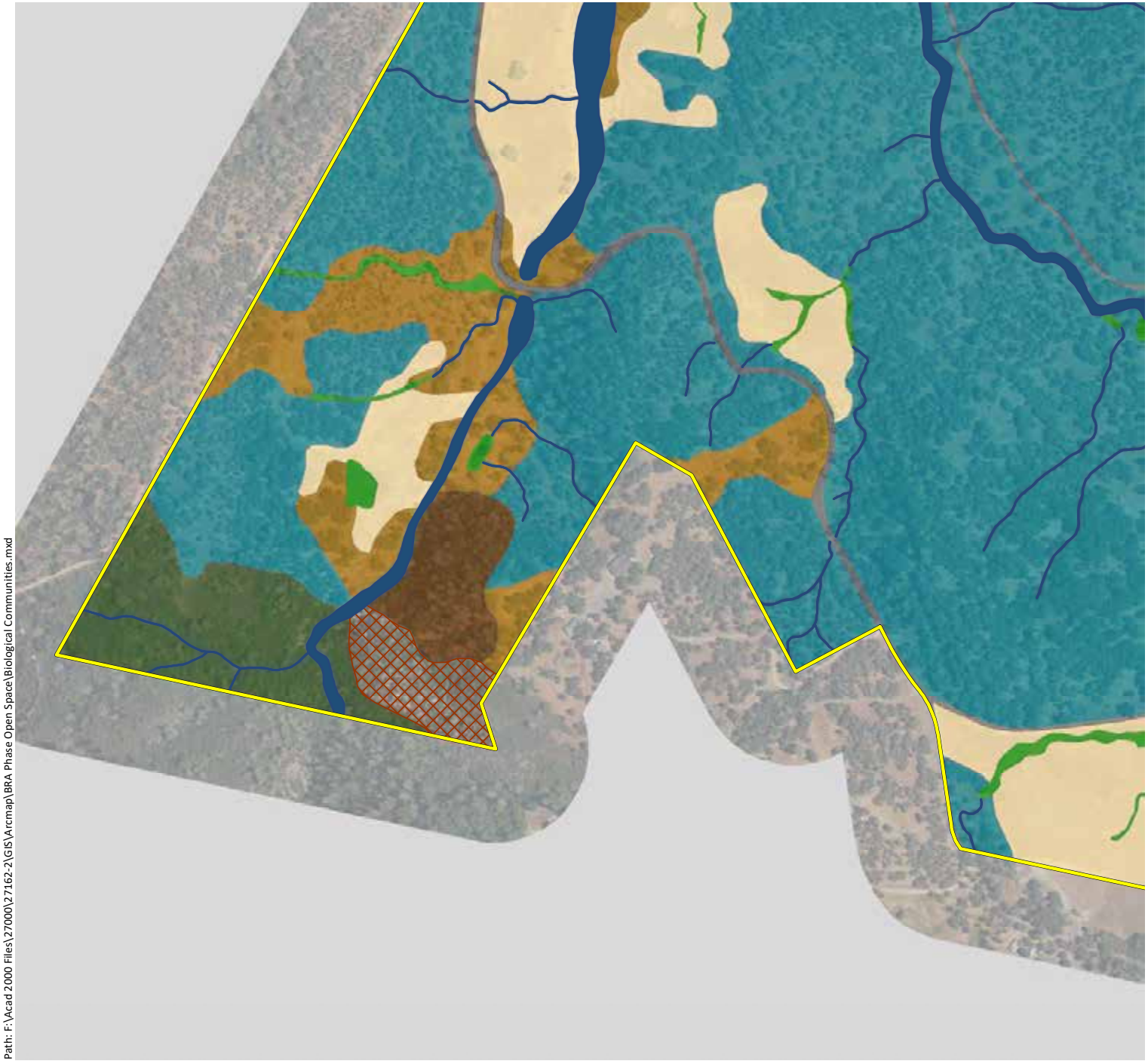
0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Biological Communities.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 52)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Biological Communities.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 53)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

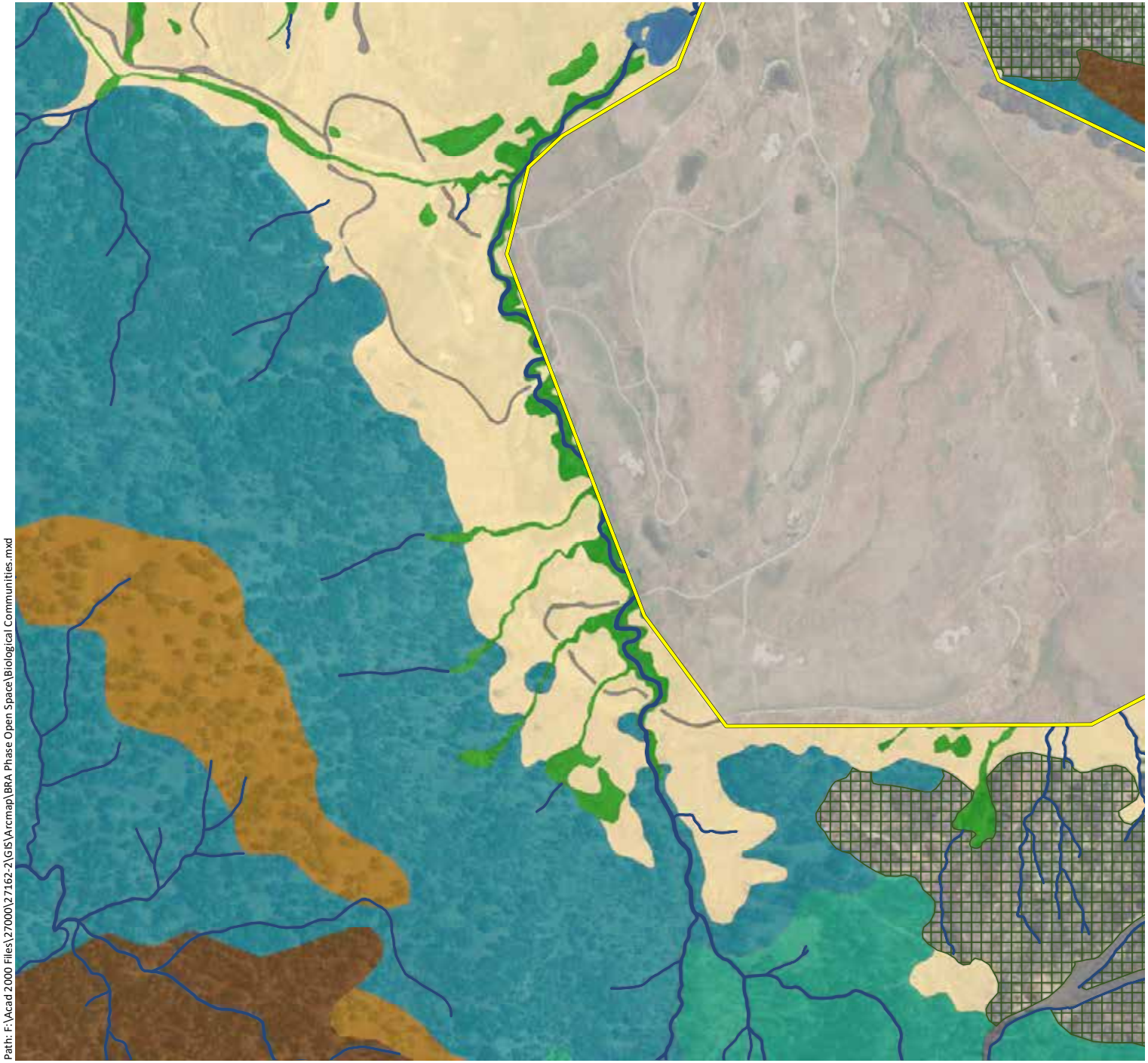
0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Biological Communities.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 54)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Biological Communities.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 55)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

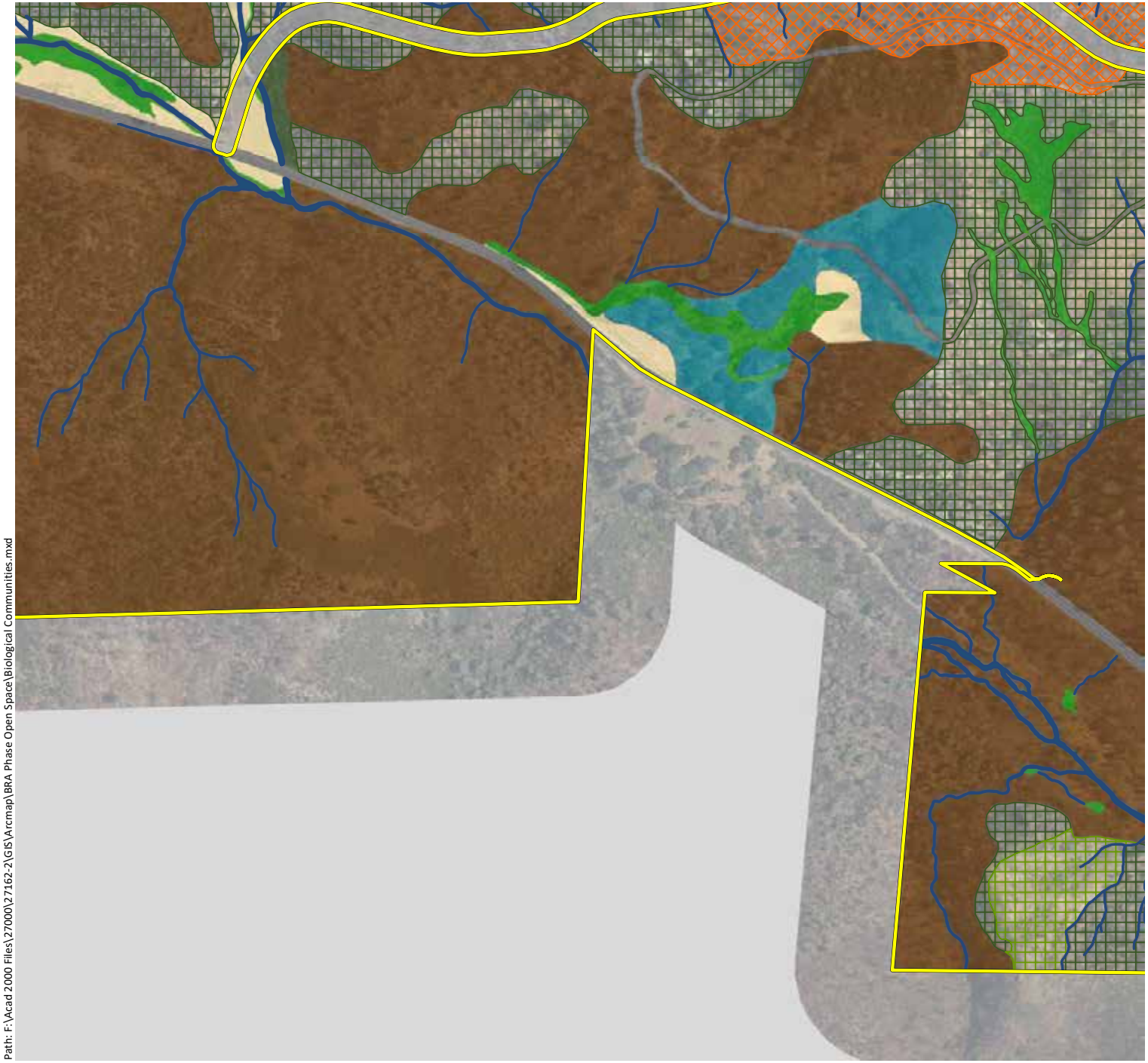
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Biological Communities.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 56)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

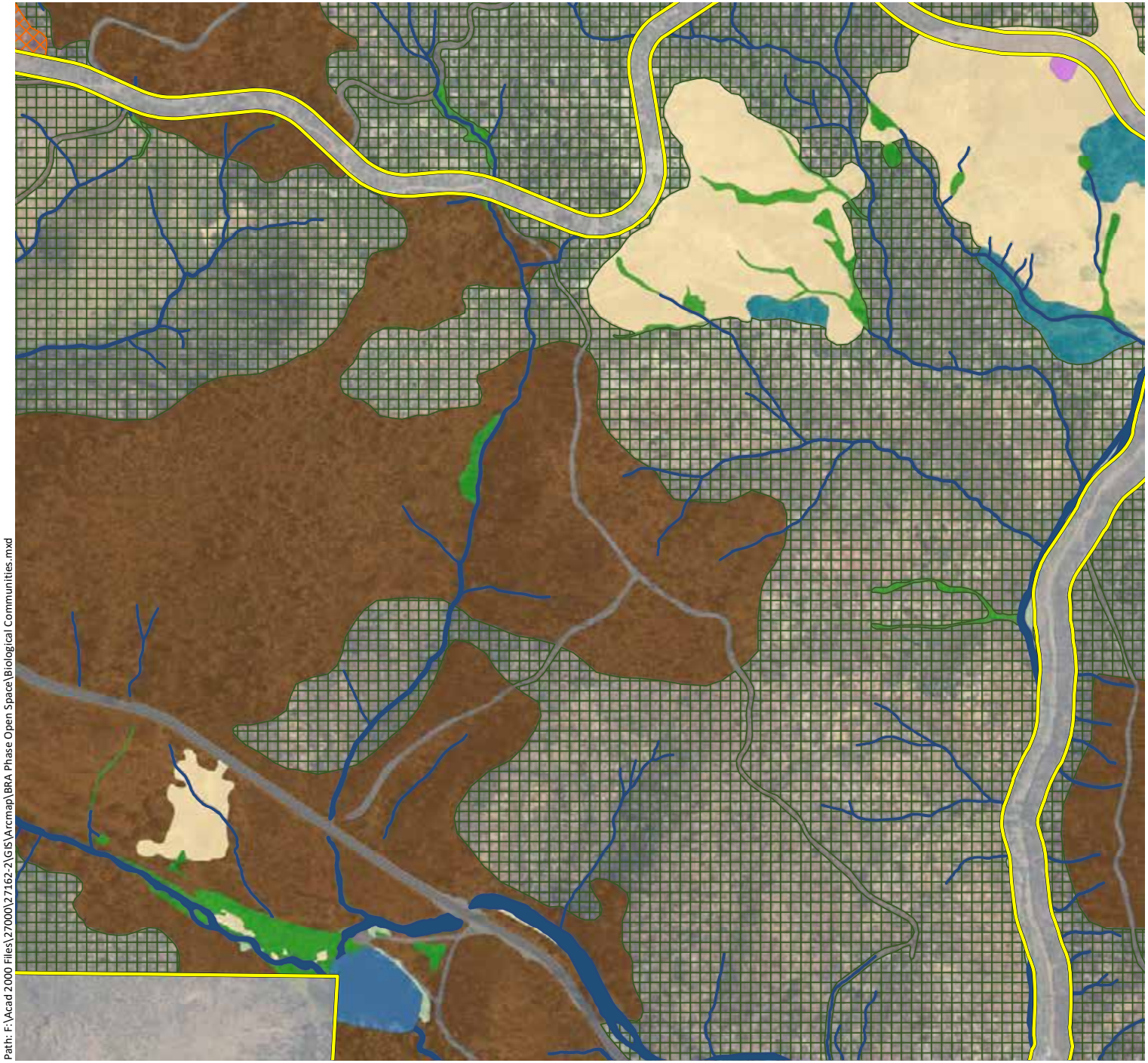
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Biological Communities.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 57)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

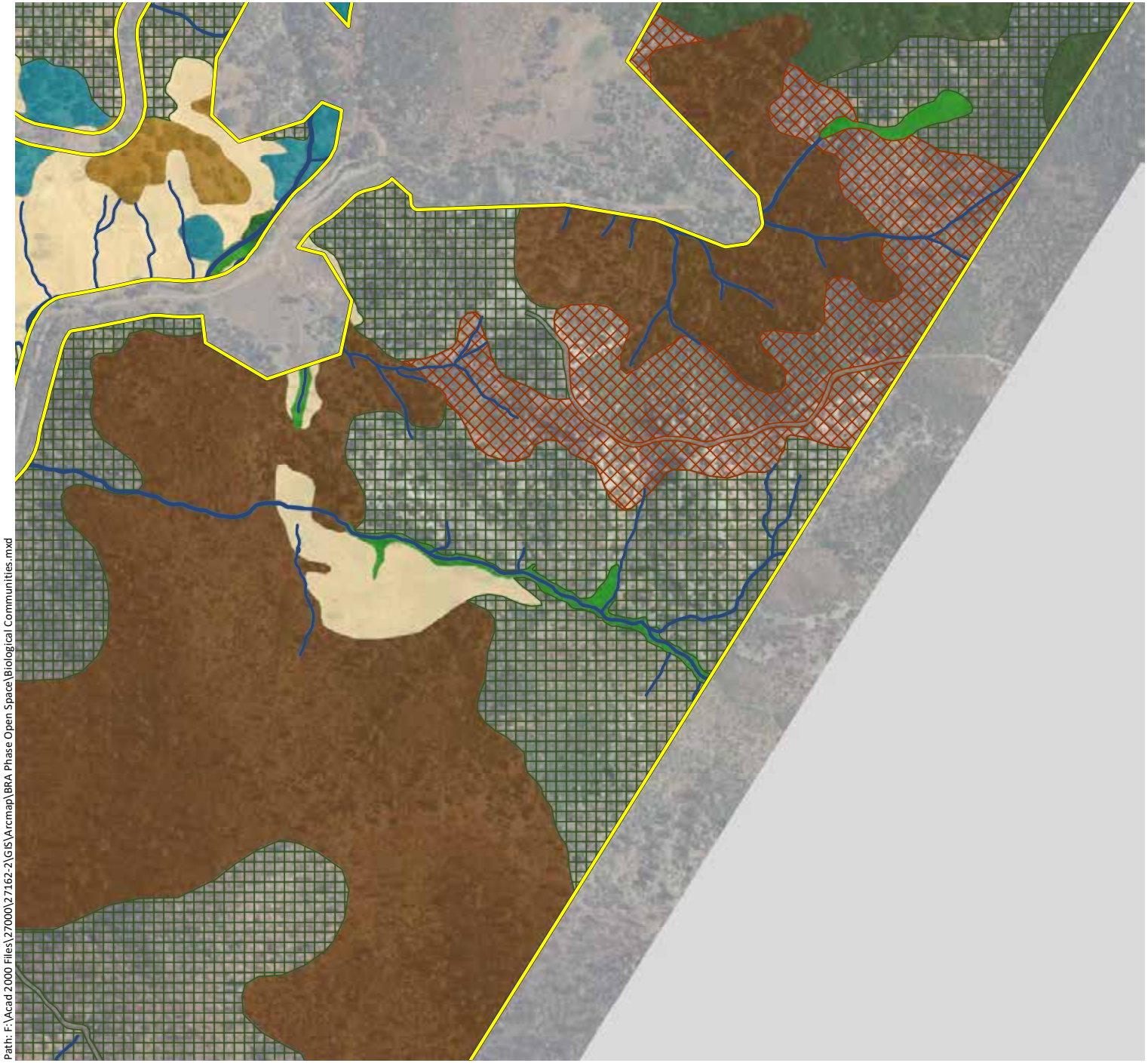
0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Biological Communities.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 58)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

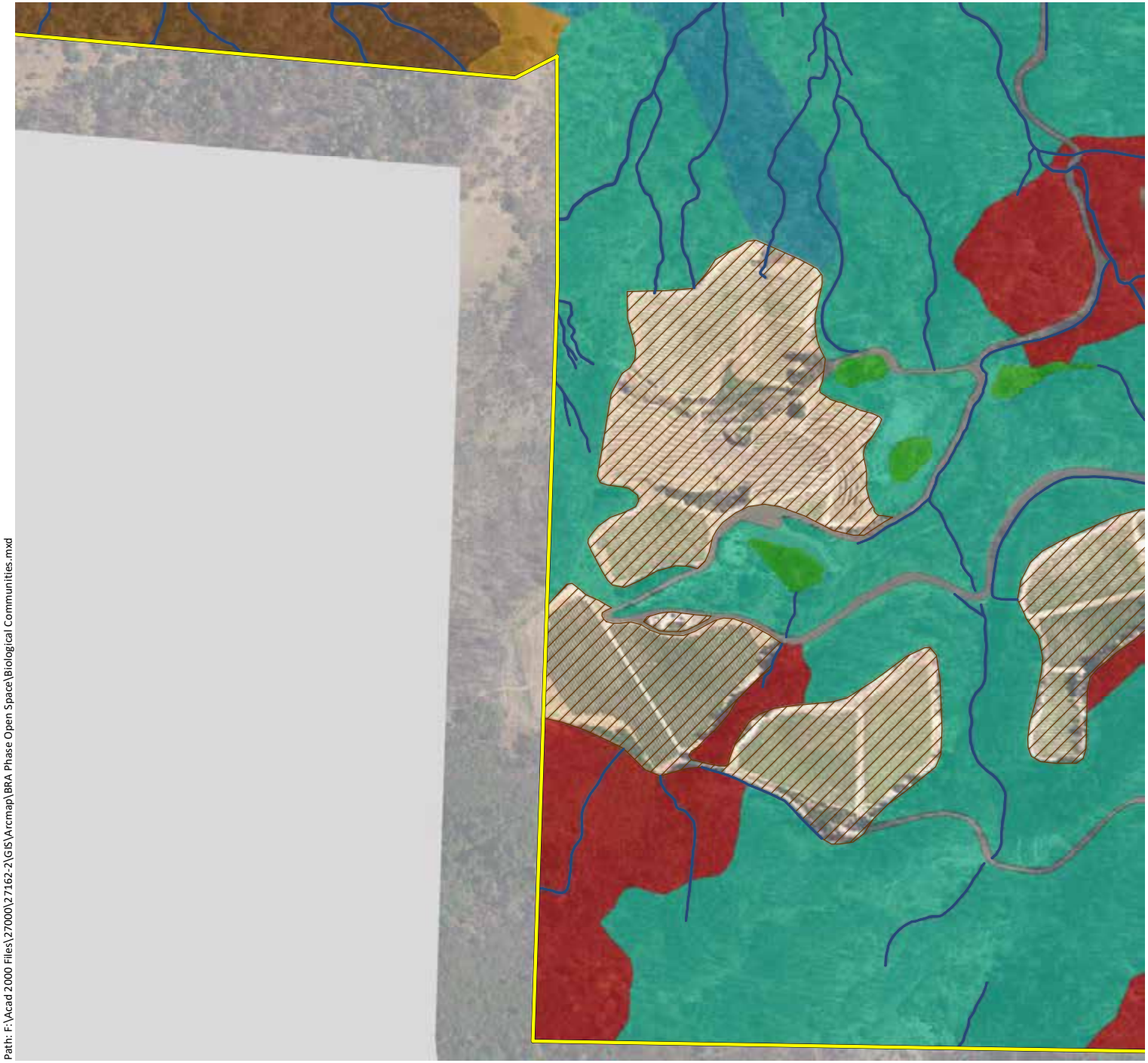
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Biological Communities.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 59)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

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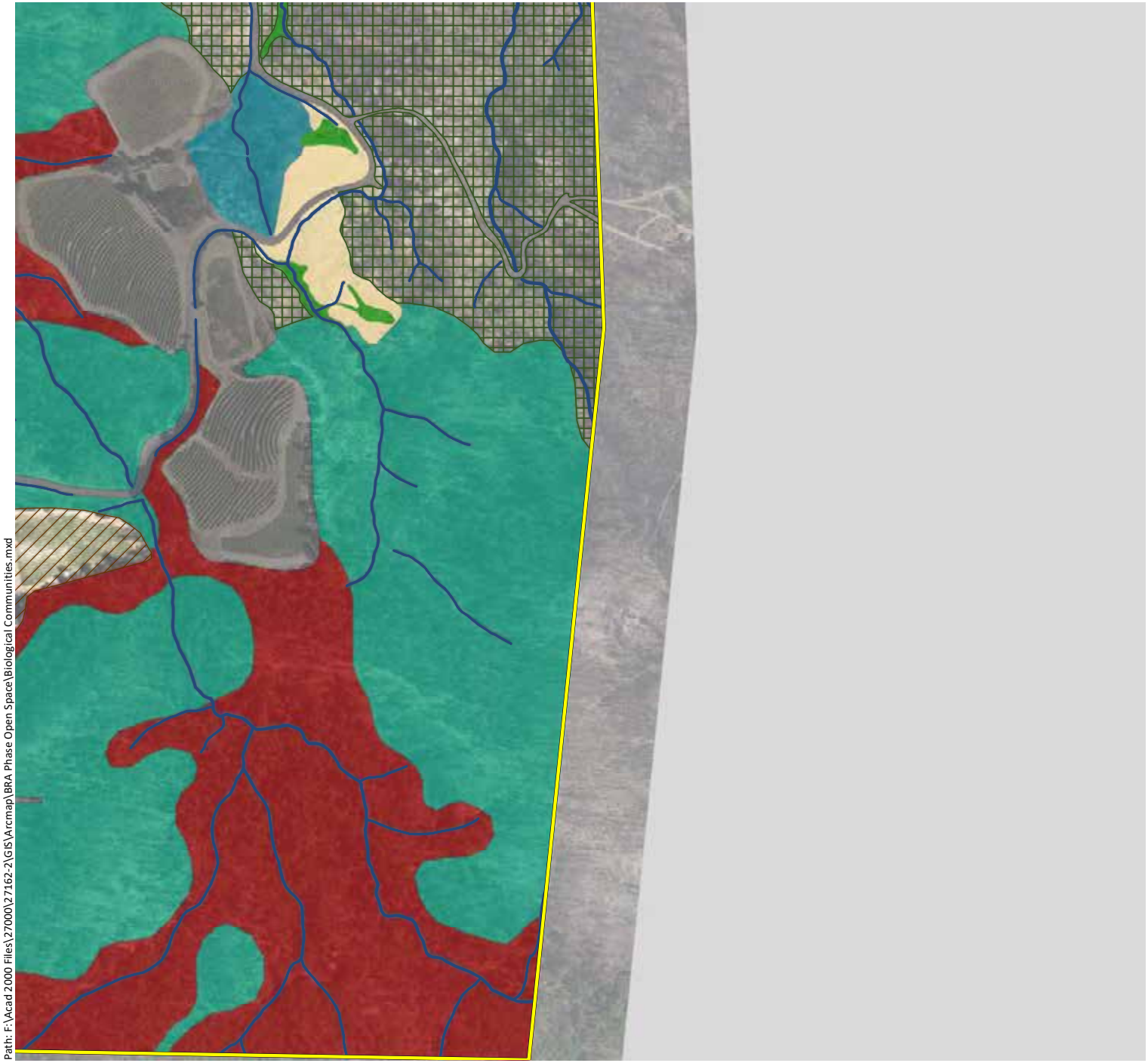
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Biological Communities.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 60)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 61)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

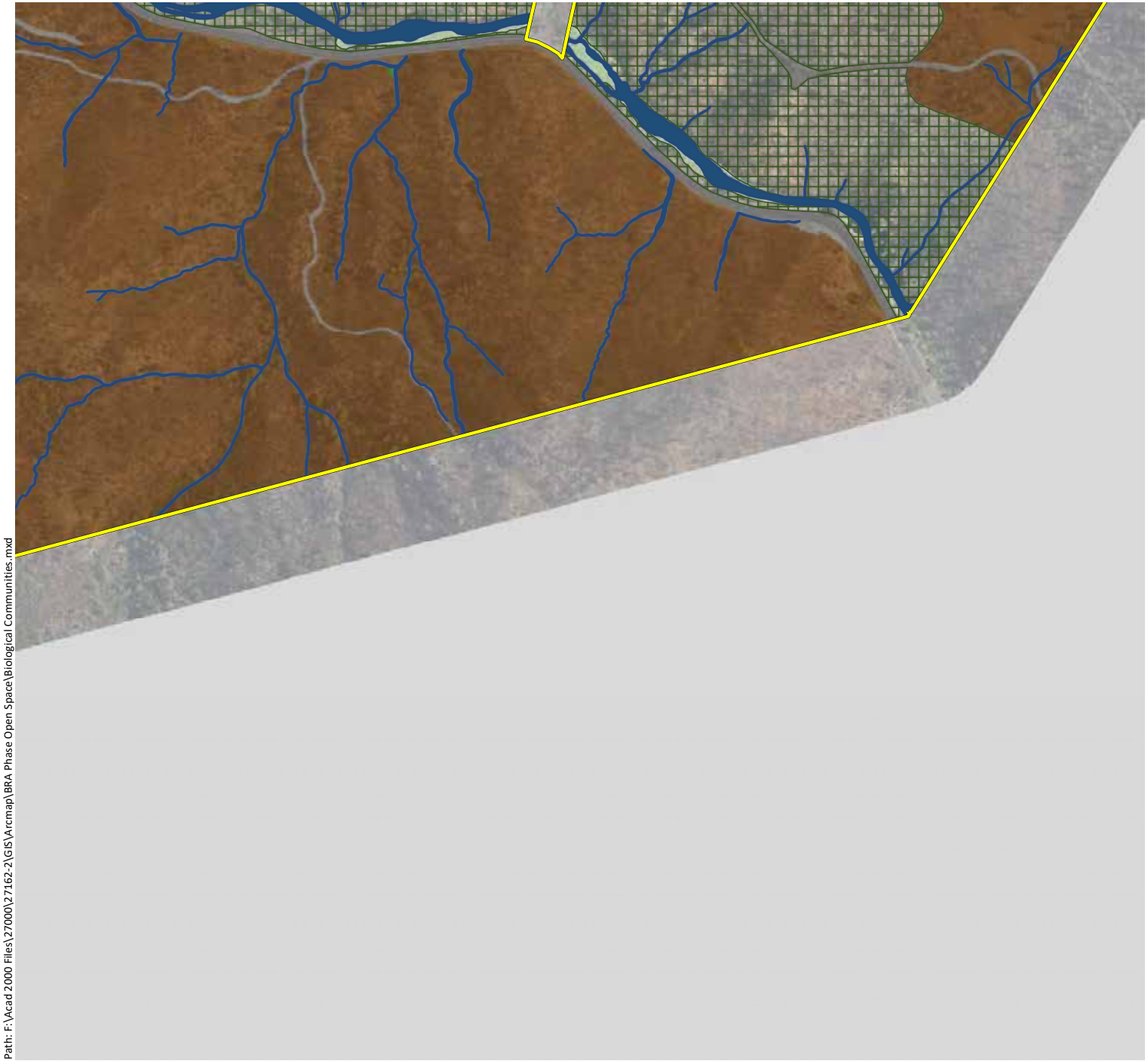
0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Biological Communities.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix A.
Biological Communities Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 62)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.

Sensitive Communities

- Musk Brush Chaparral - 2.0 ac.
- Sargent Cypress Woodland - 10.7 ac.
- Blue Oak Savanna - 752.8 ac.
- Blue Oak Woodland - 2,431.2 ac.
- Mixed Oak Woodland - 174.9 ac.
- Valley Oak Woodland - 6.6 ac.
- Interior Live Oak Woodland - 437.9 ac.
- White Alder Groves - 10.2 ac.
- Brewer Willow Thickets - 1.4 ac.
- Purple Needlegrass Grassland - 0.8 ac.
- Emergent Wetlands - 330.0 ac.
- Ponds and Reservoirs - 626.1 ac.
- Streams - 147.9 ac.

Non-Sensitive Communities

- Foothill Pine Woodland - 1,050.2 ac.
- Douglas Fir Forest - 61.5 ac.
- Deer Weed Scrub - 15.0 ac.
- Chamise Chaparral - 445.8 ac.
- Whiteleaf Manzanita Chaparral - 69.4 ac.
- California Yerba Santa Scrub - 30.2 ac.
- Scrub Oak Chaparral - 9.7 ac.
- Leather Oak Chaparral - 2,256.9 ac.
- Non-native Annual Grasslands - 1,347.9 ac.
- Rock Outcrop - 22.7 ac.
- Agriculture - 1,170.7 ac.
- Developed - 136.8 ac.

N

0 500 1,000

Feet

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Biological Communities.mxd

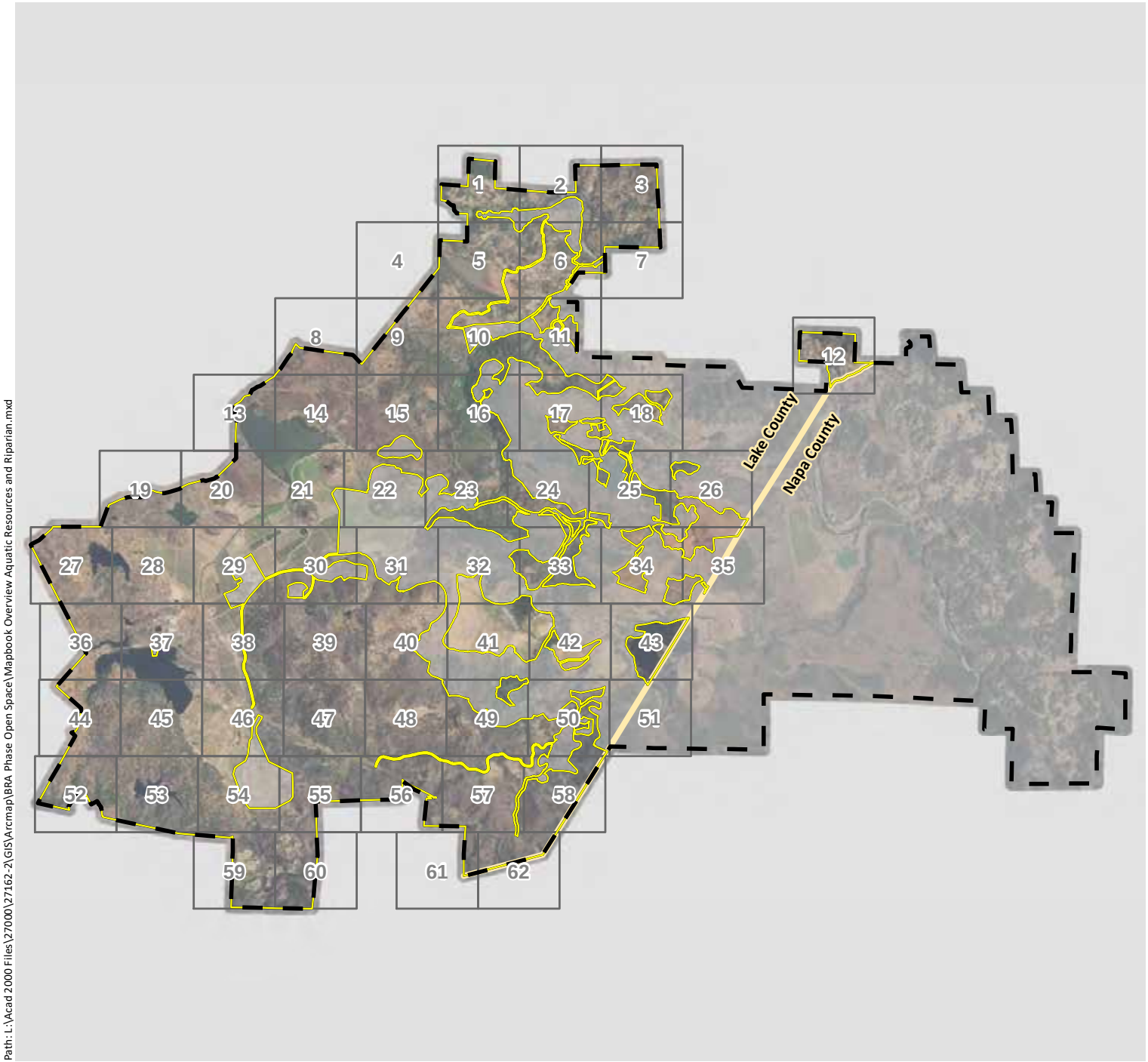
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

APPENDIX B

AQUATIC RESOURCES AND RIPARIAN HABITAT MAPPED WITHIN THE PHASE 2/OPEN SPACE STUDY AREA

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Overview)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Property Boundary

Phase 2 and Open Space Study Area

Mapbook Grid

County Boundary

N

0 1 2

Miles

wra
ENVIRONMENTAL CONSULTANTS

Path: L:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Mapbook Overview Aquatic Resources and Riparian.mxd

Sources: Hexagon 2016 Aerial, WRA | Prepared By: mrochelle, 7/29/2019

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 1)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 1 Study Area - 11,549 ac.

Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 2)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 1 Study Area - 11,549 ac.

Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 3)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 1 Study Area - 11,549 ac.

Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 4)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 1 Study Area - 11,549 ac.

Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 5)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 6)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 7)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 8)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 1 Study Area - 11,549 ac.

Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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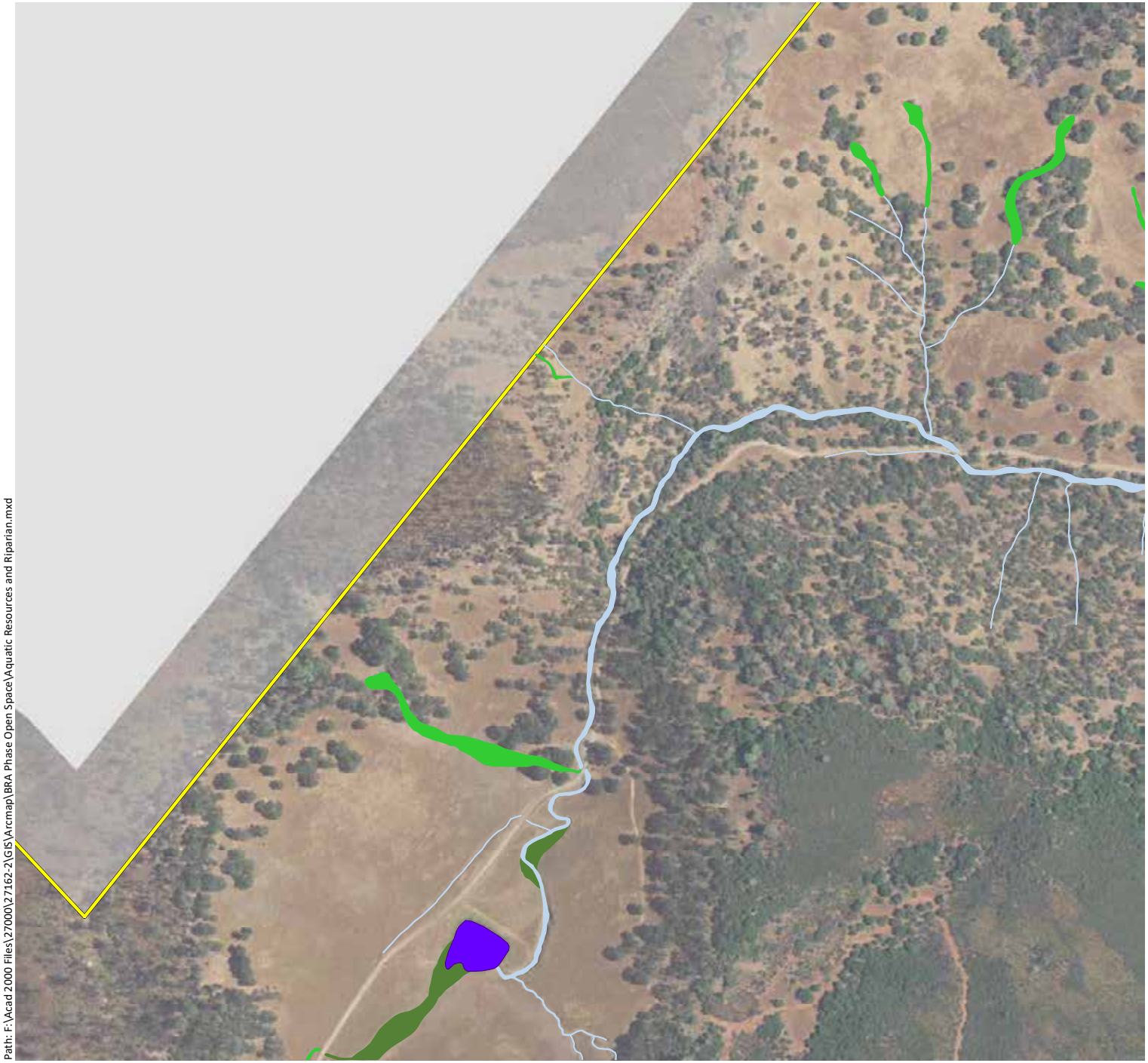
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 9)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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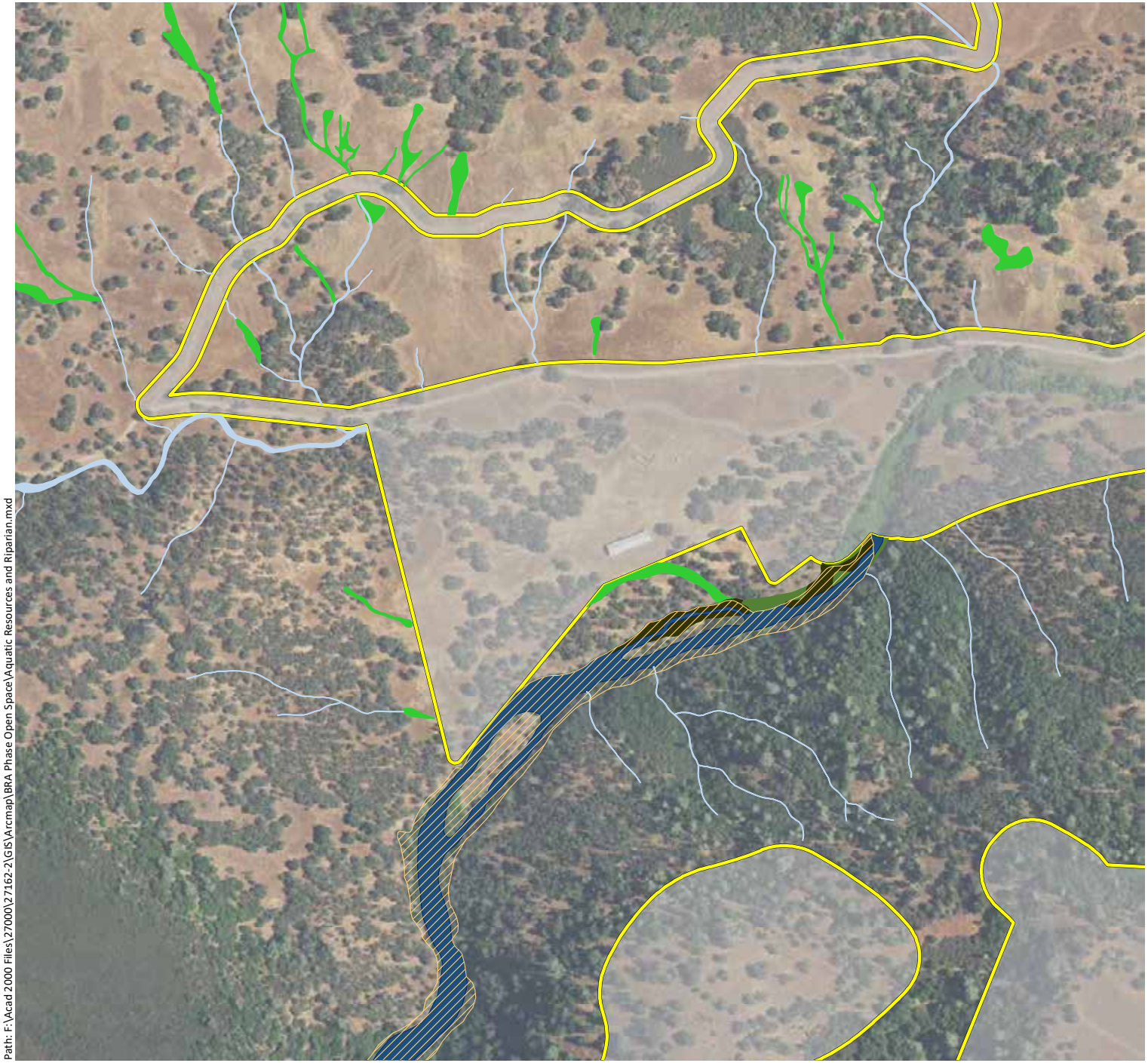
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 10)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 11)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 12)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 1 Study Area - 11,549 ac.

Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 13)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 14)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

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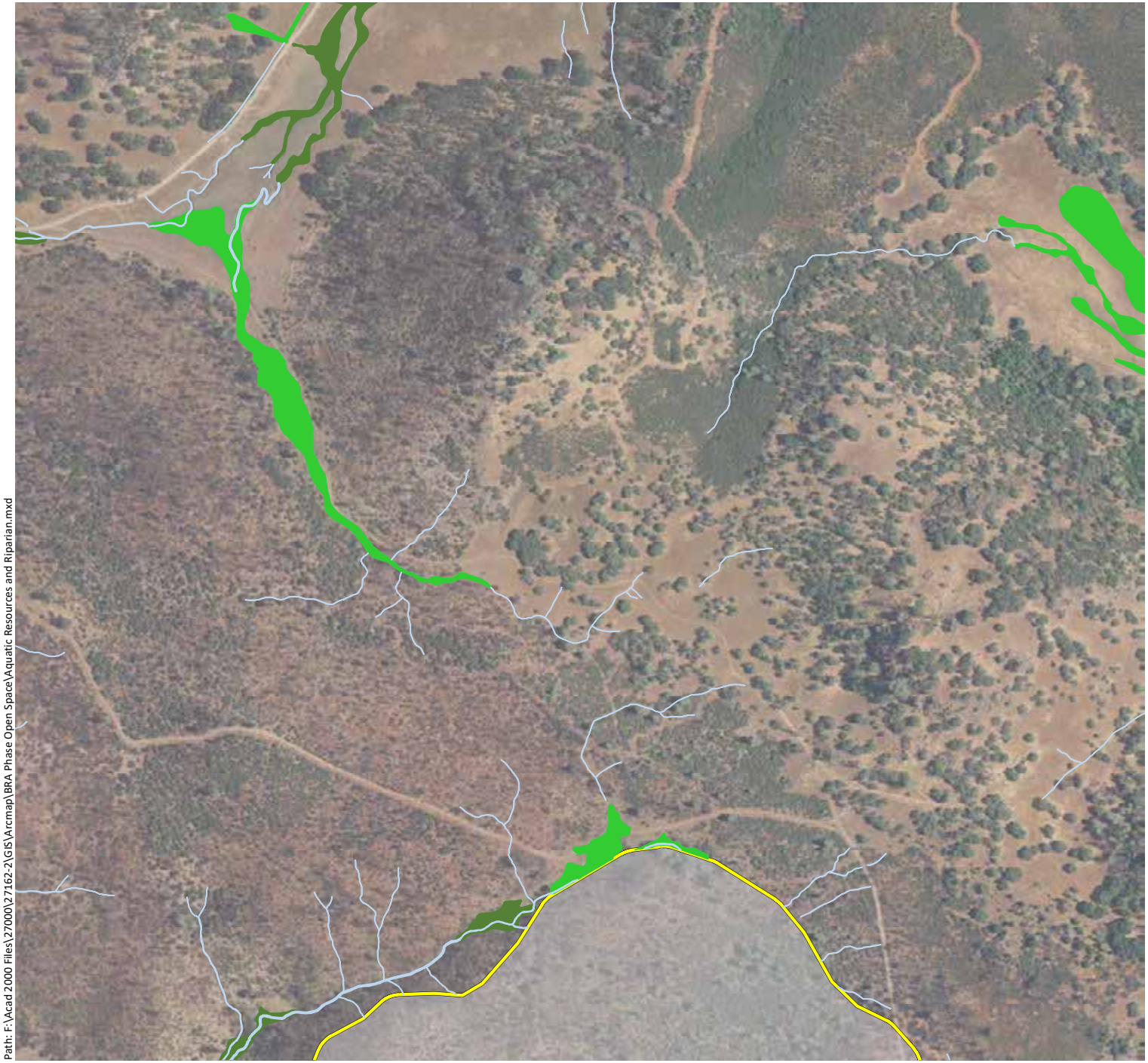
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 15)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

0 500 1,000

Feet

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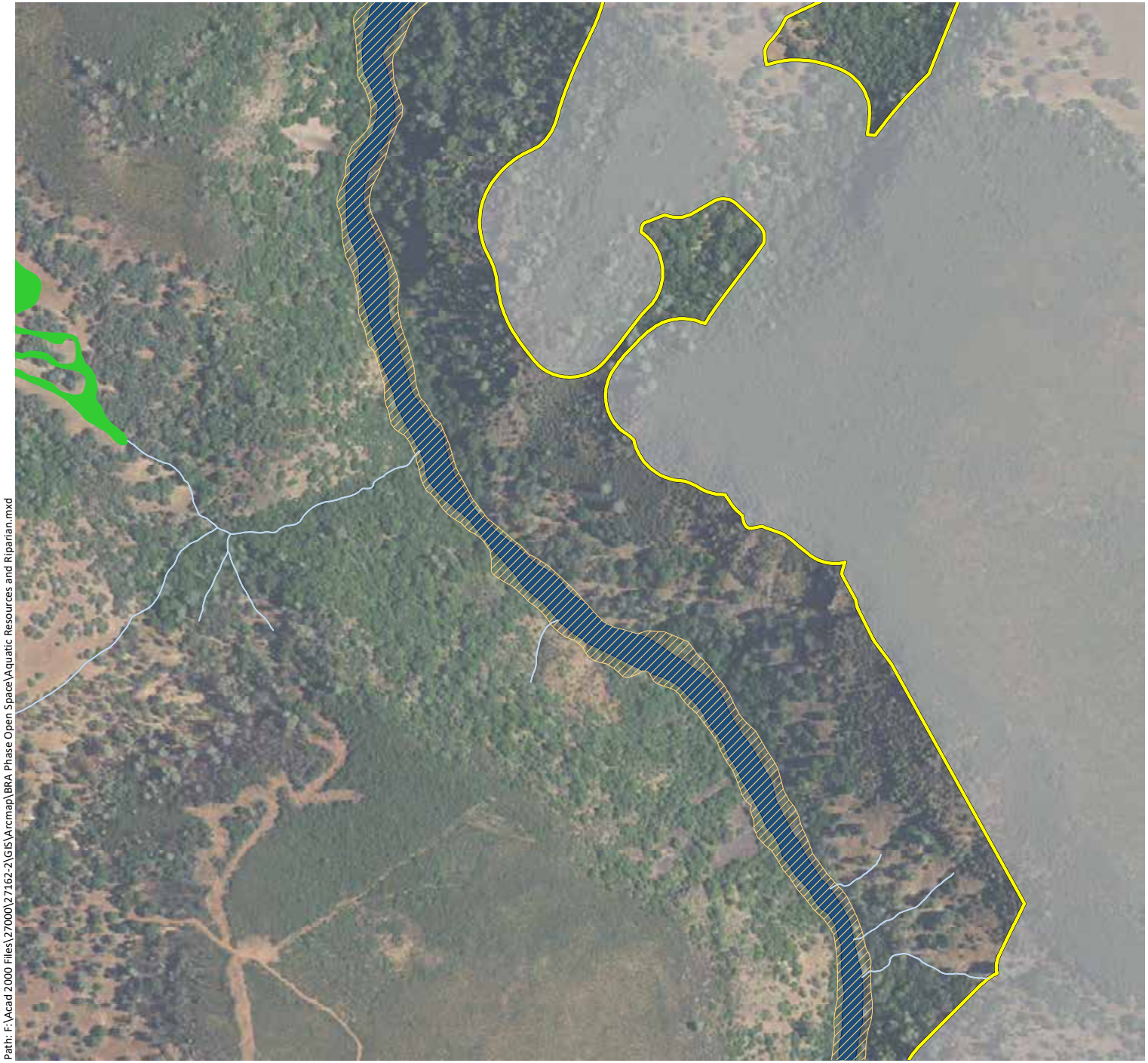
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 16)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

0 500 1,000

Feet

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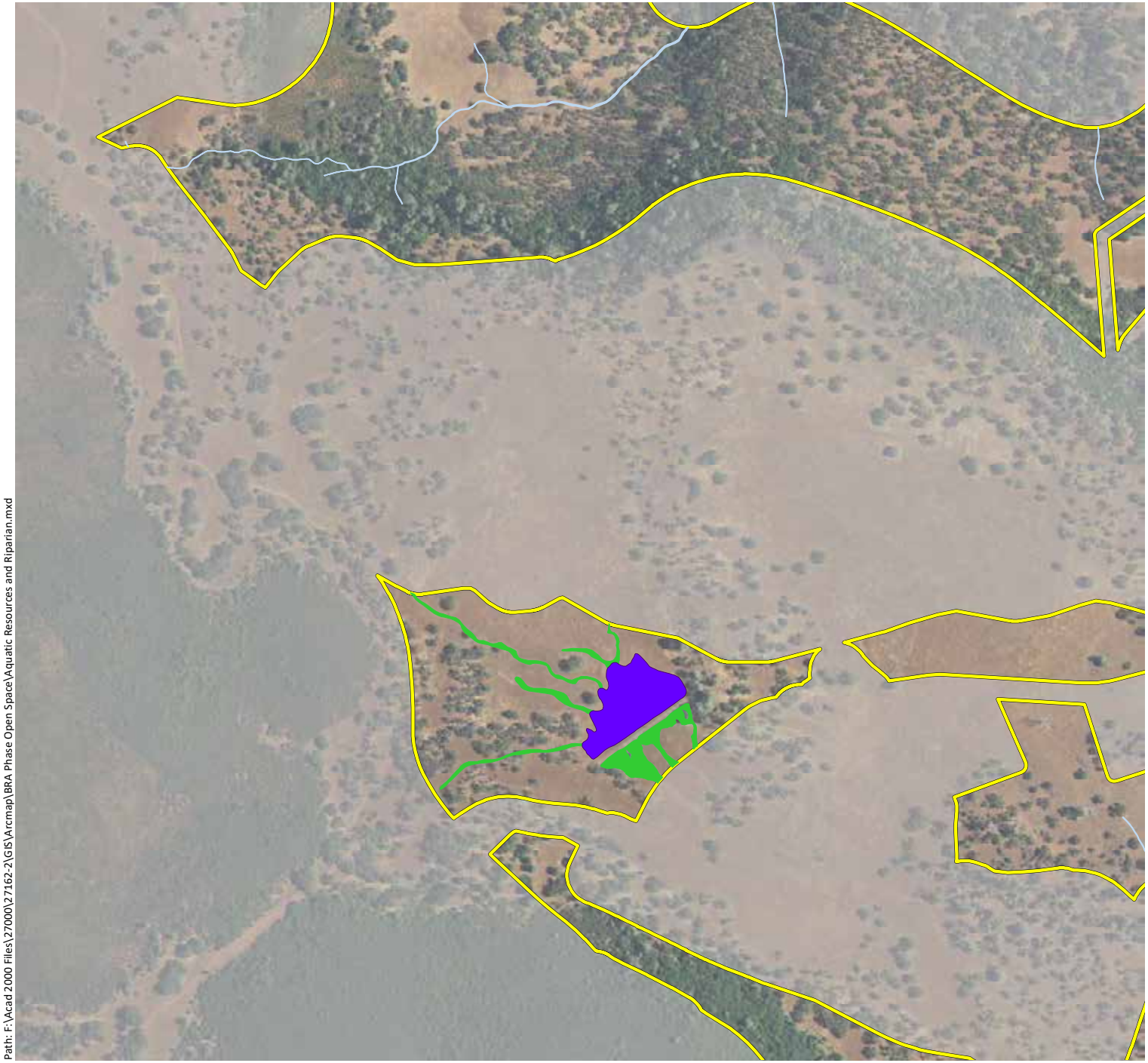
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 17)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

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Feet

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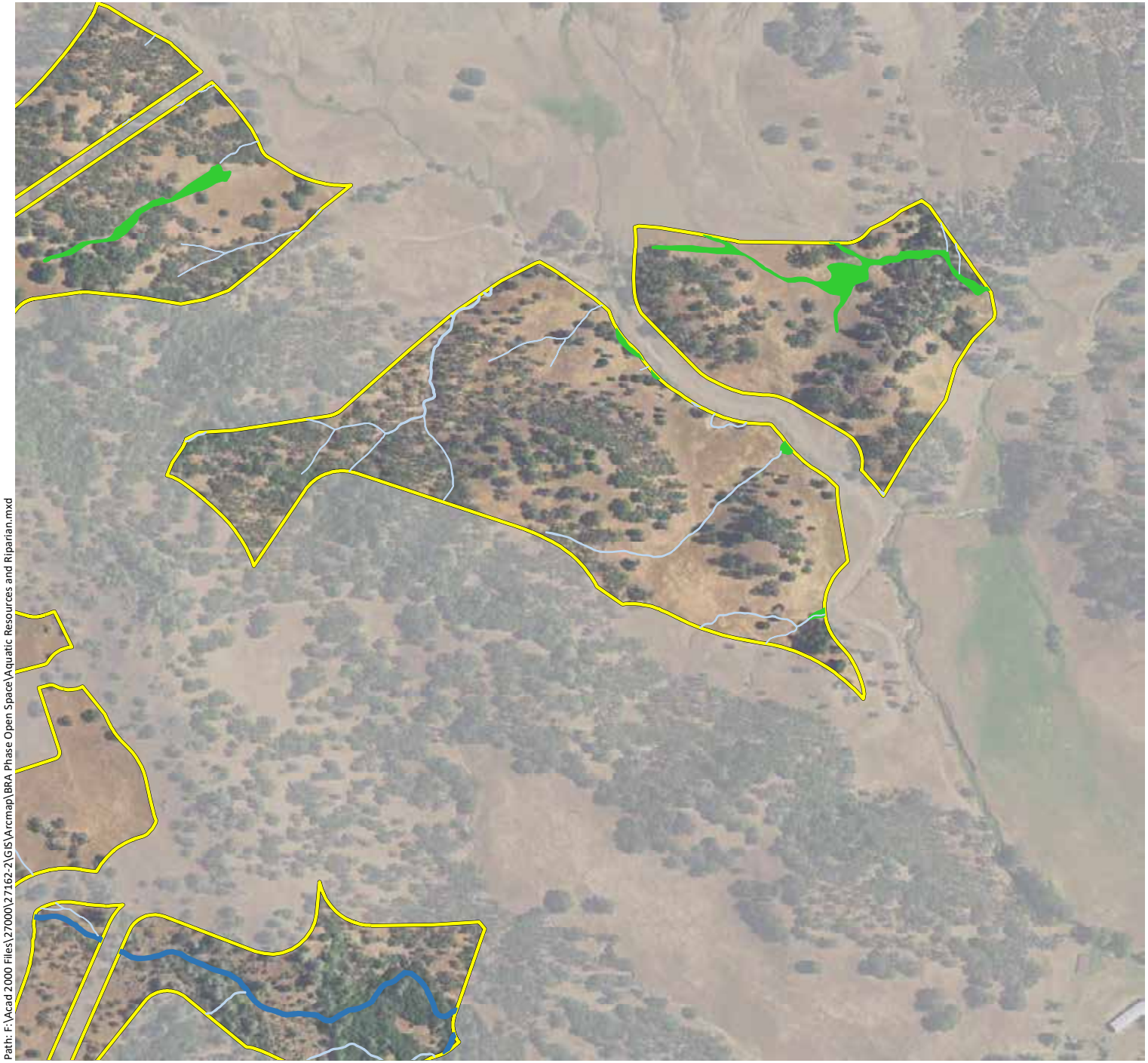
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 18)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 19)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 1 Study Area - 11,549 ac.

Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

0 500 1,000

Feet

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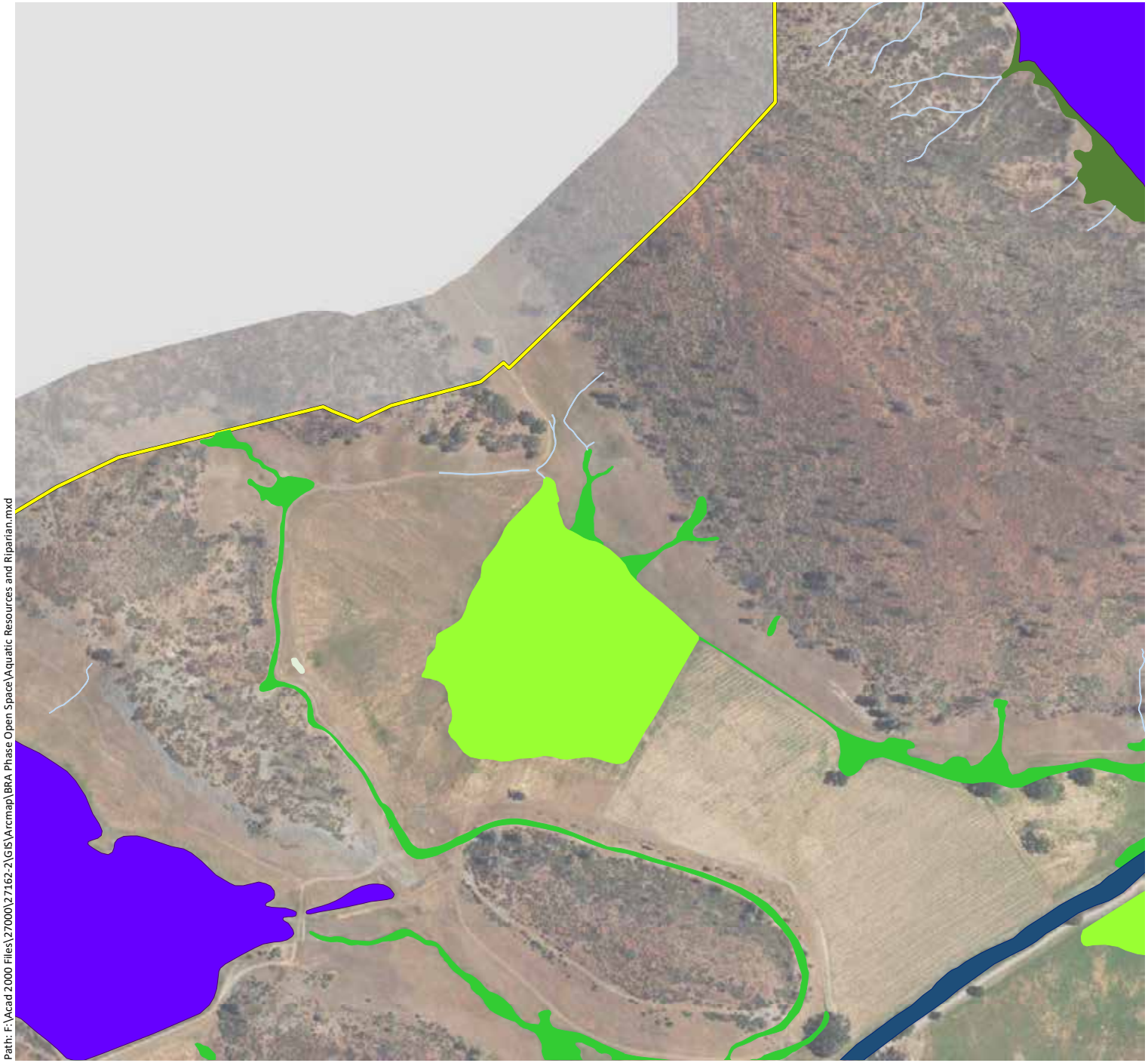
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 20)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 1 Study Area - 11,549 ac.

Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

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Feet

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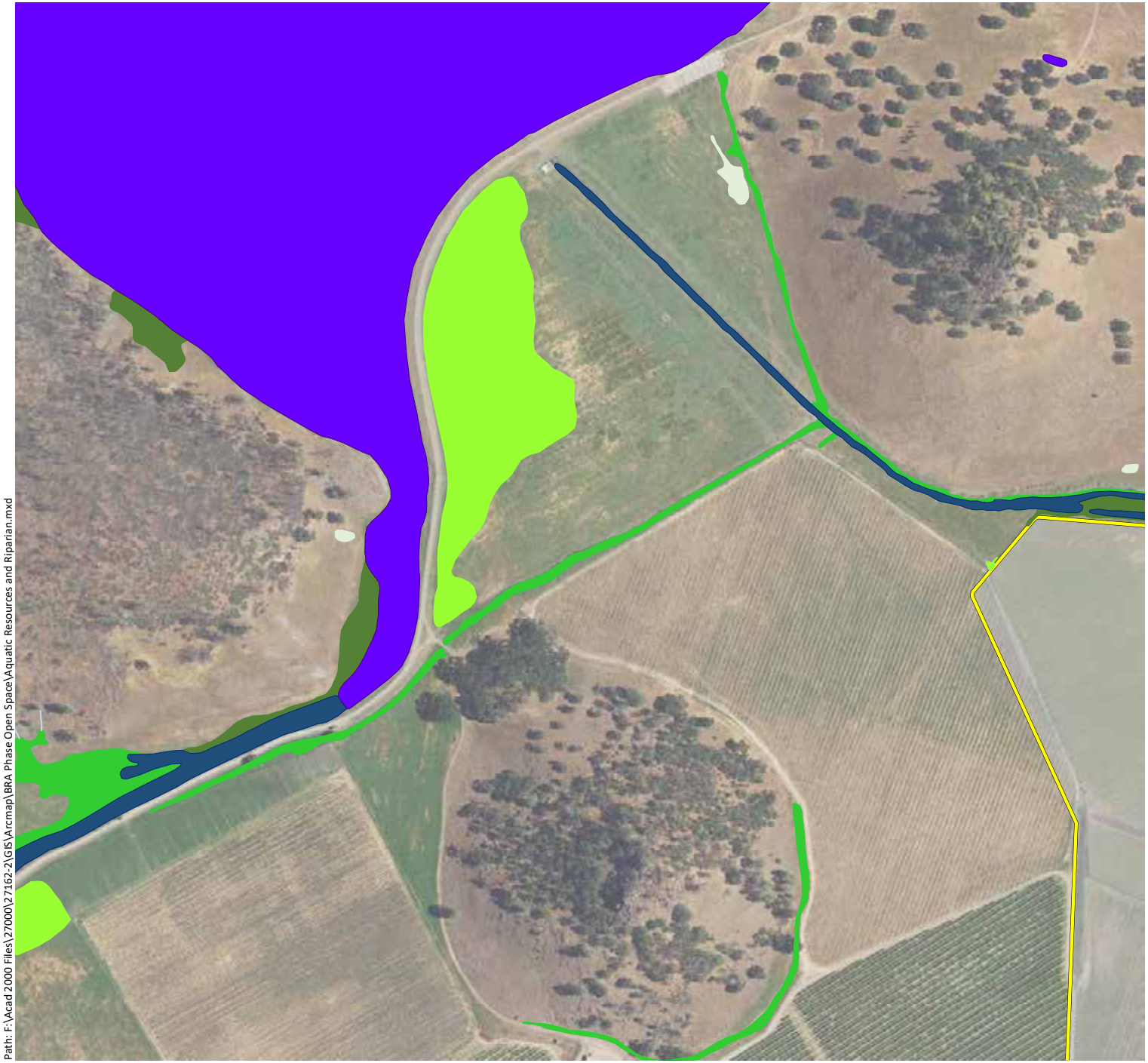
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 21)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 1 Study Area - 11,549 ac.

Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

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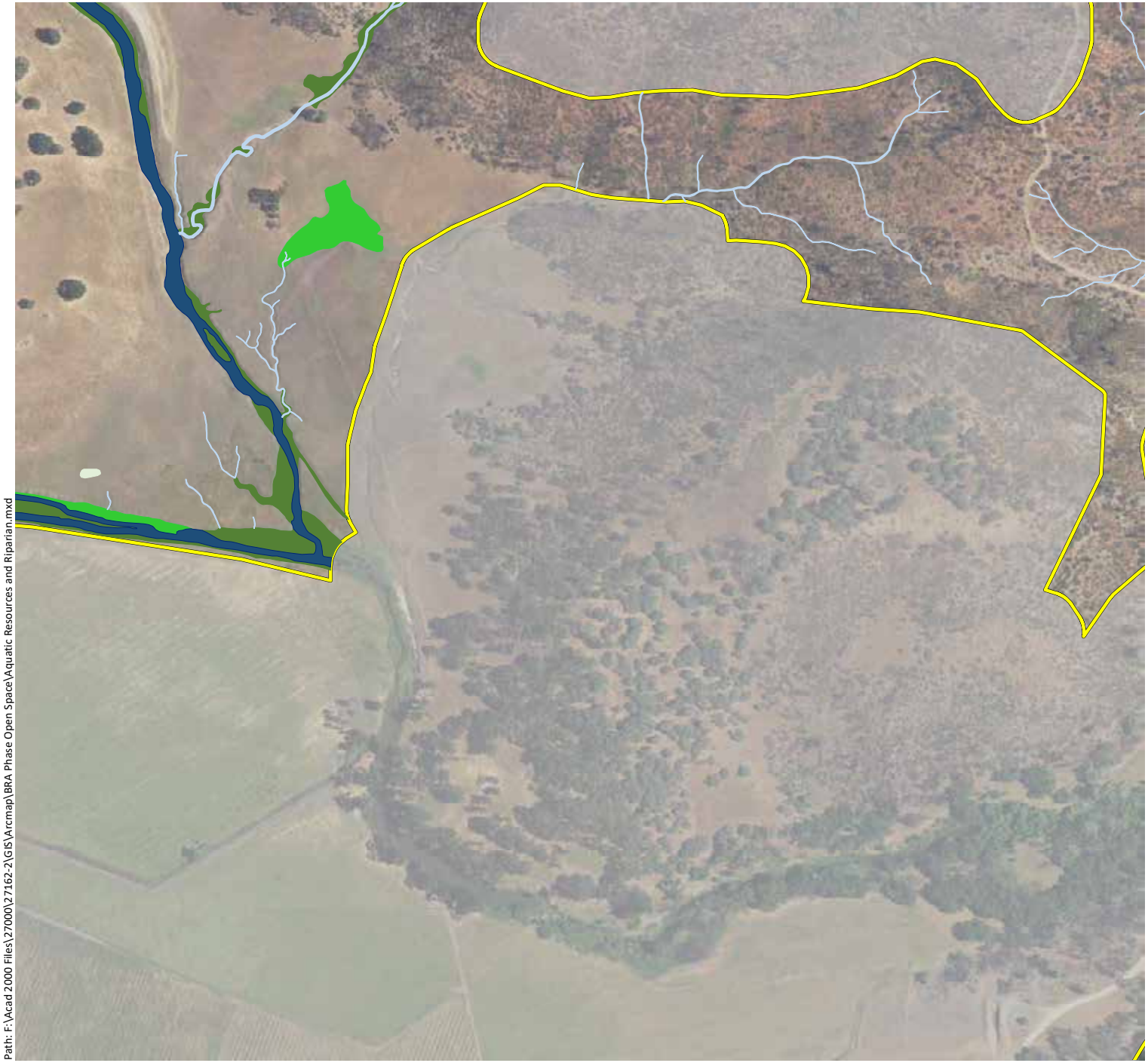
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 22)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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Feet

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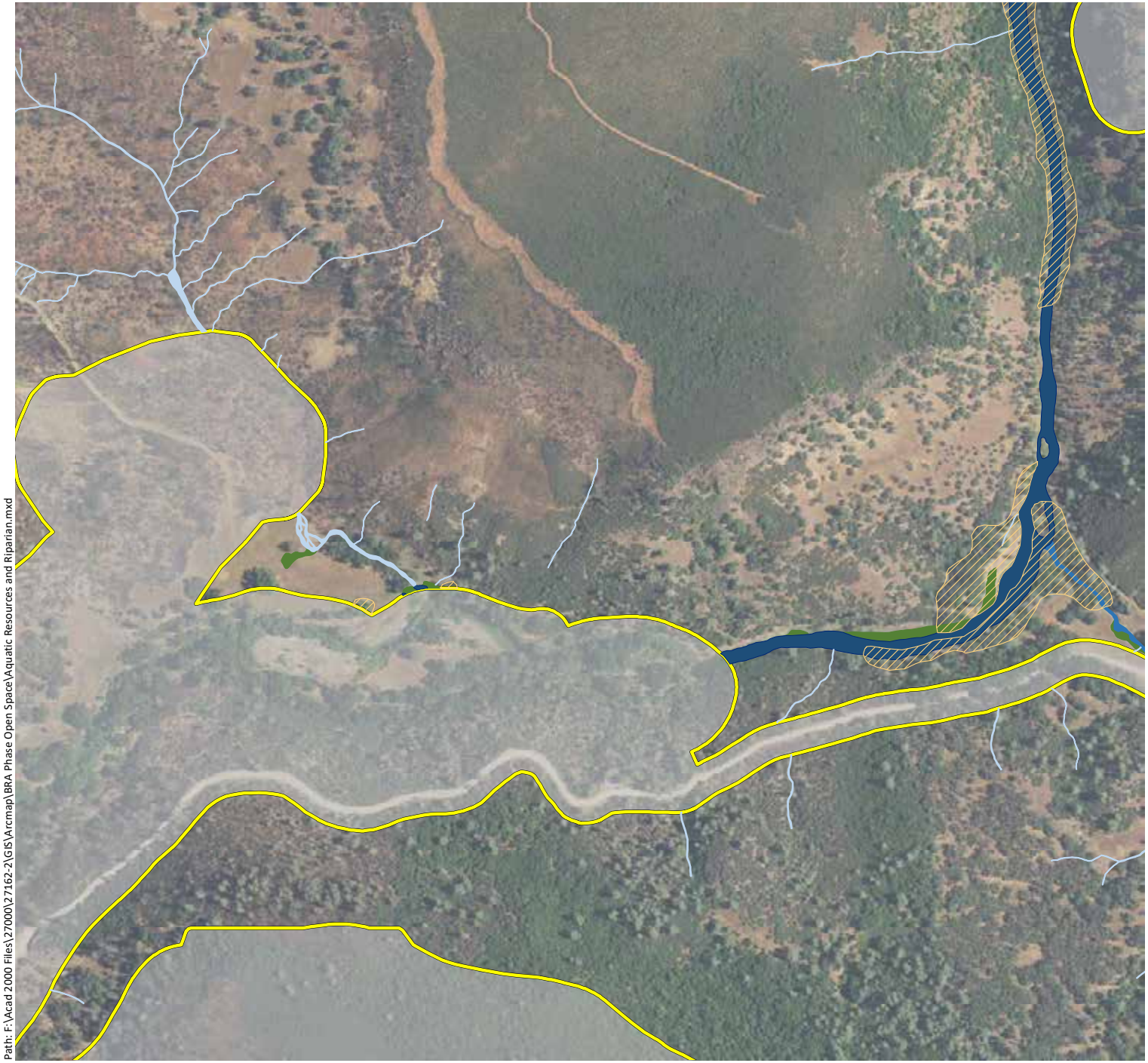
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 23)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 1 Study Area - 11,549 ac.

Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 24)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 1 Study Area - 11,549 ac.

Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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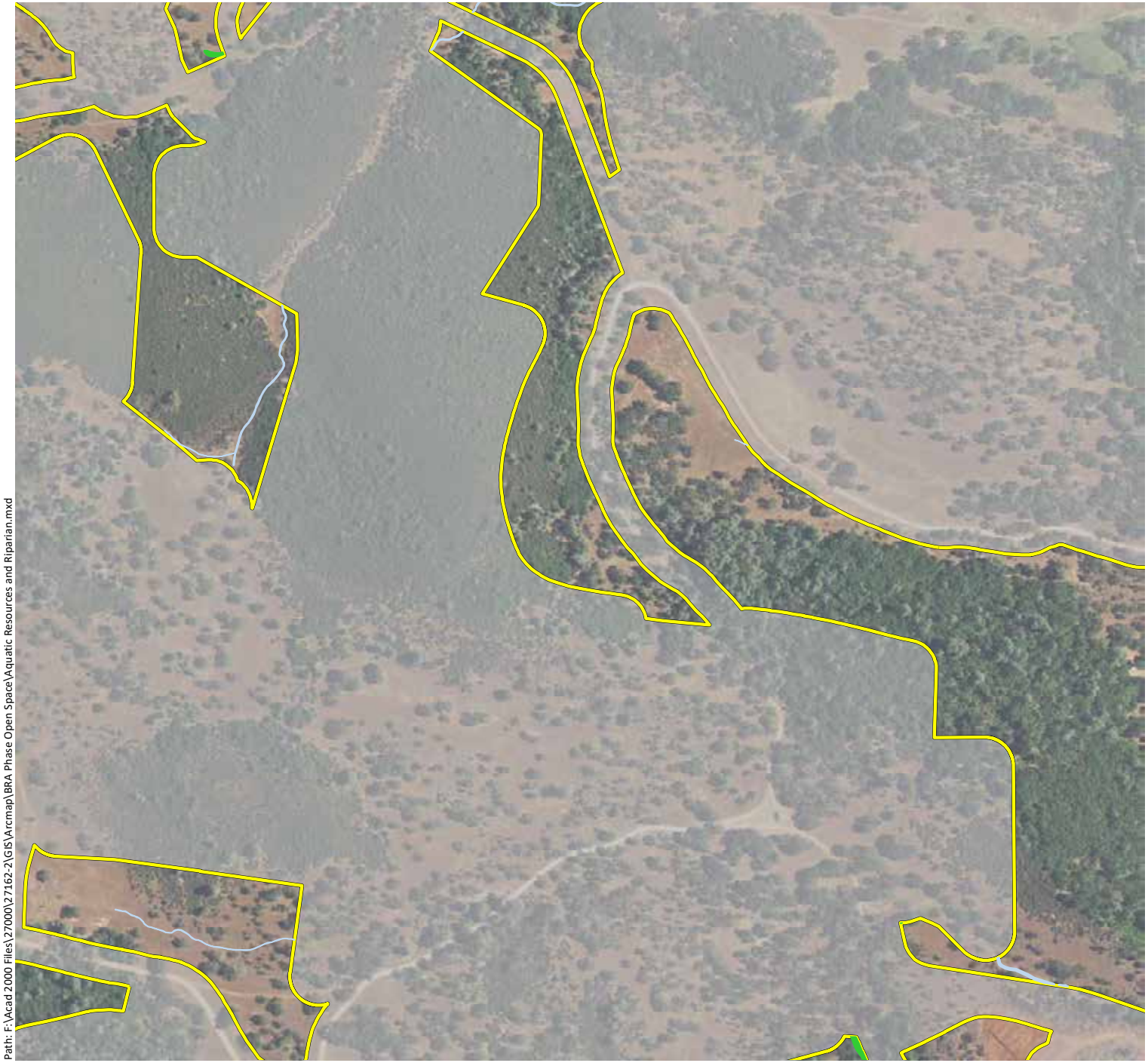
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 25)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 26)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

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Feet

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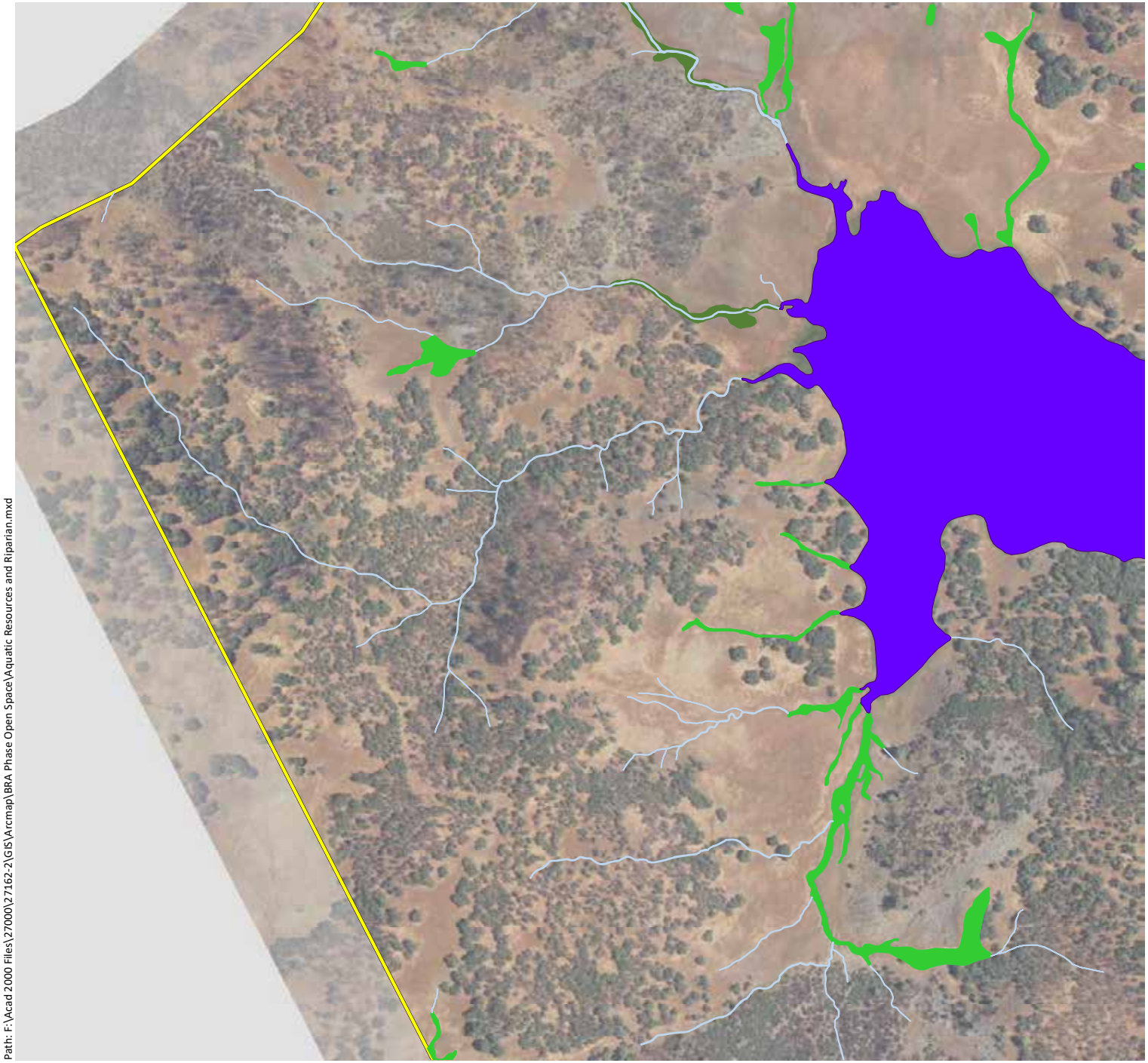
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 27)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 1 Study Area - 11,549 ac.

Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

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Feet

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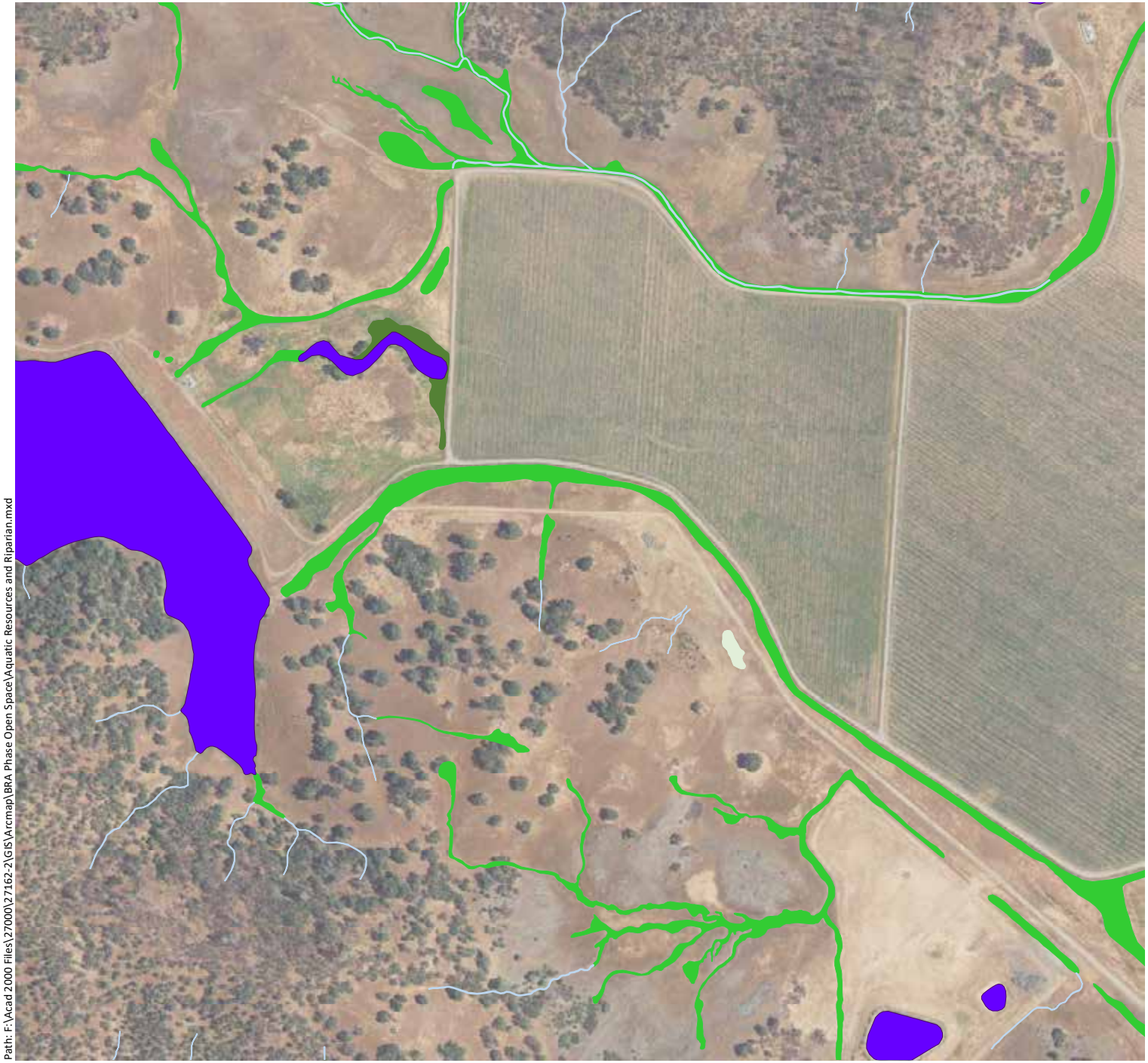
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 28)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

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Feet

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 29)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

0 500 1,000

Feet

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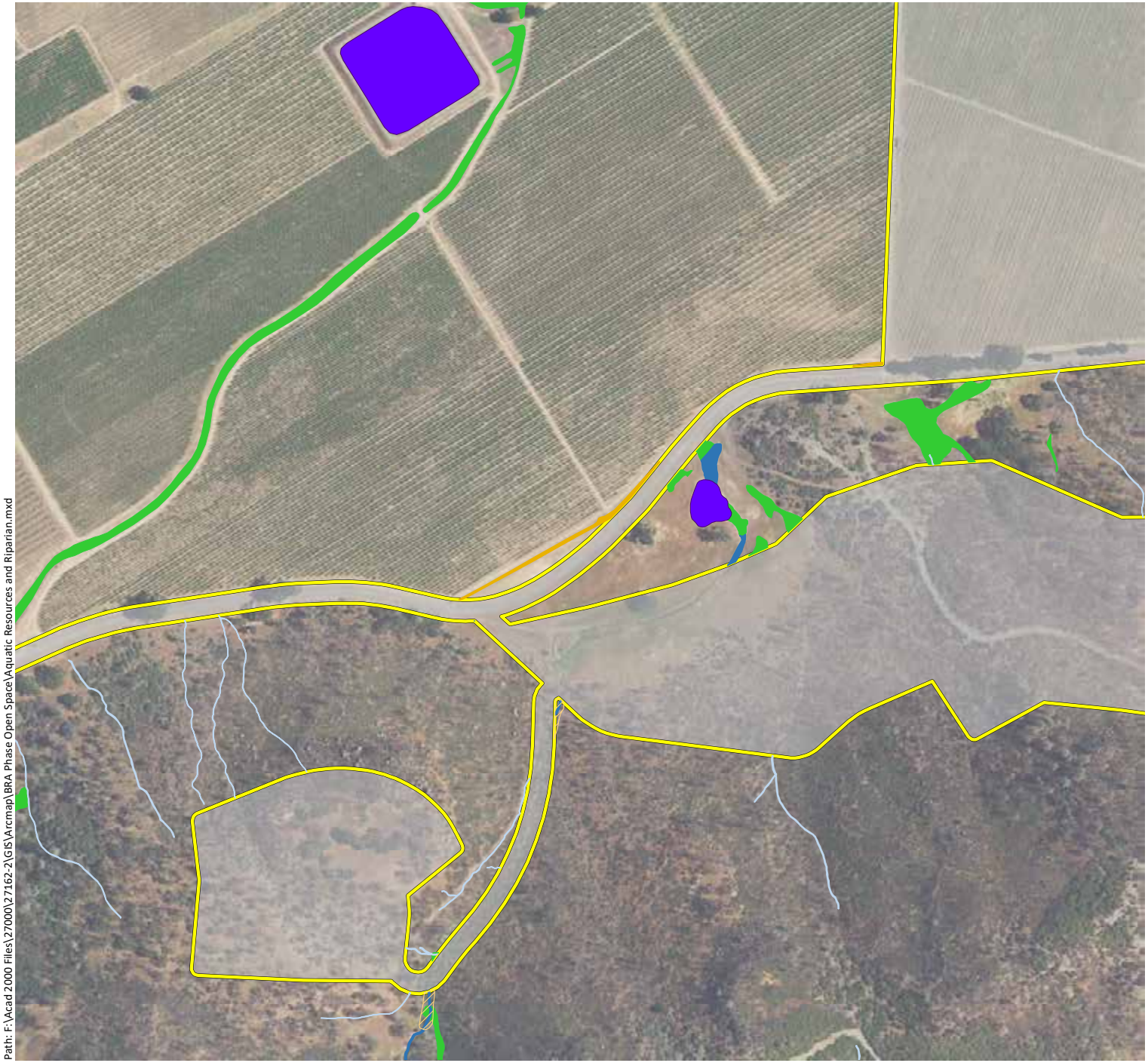
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 30)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 31)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 1 Study Area - 11,549 ac.

Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

0 500 1,000

Feet

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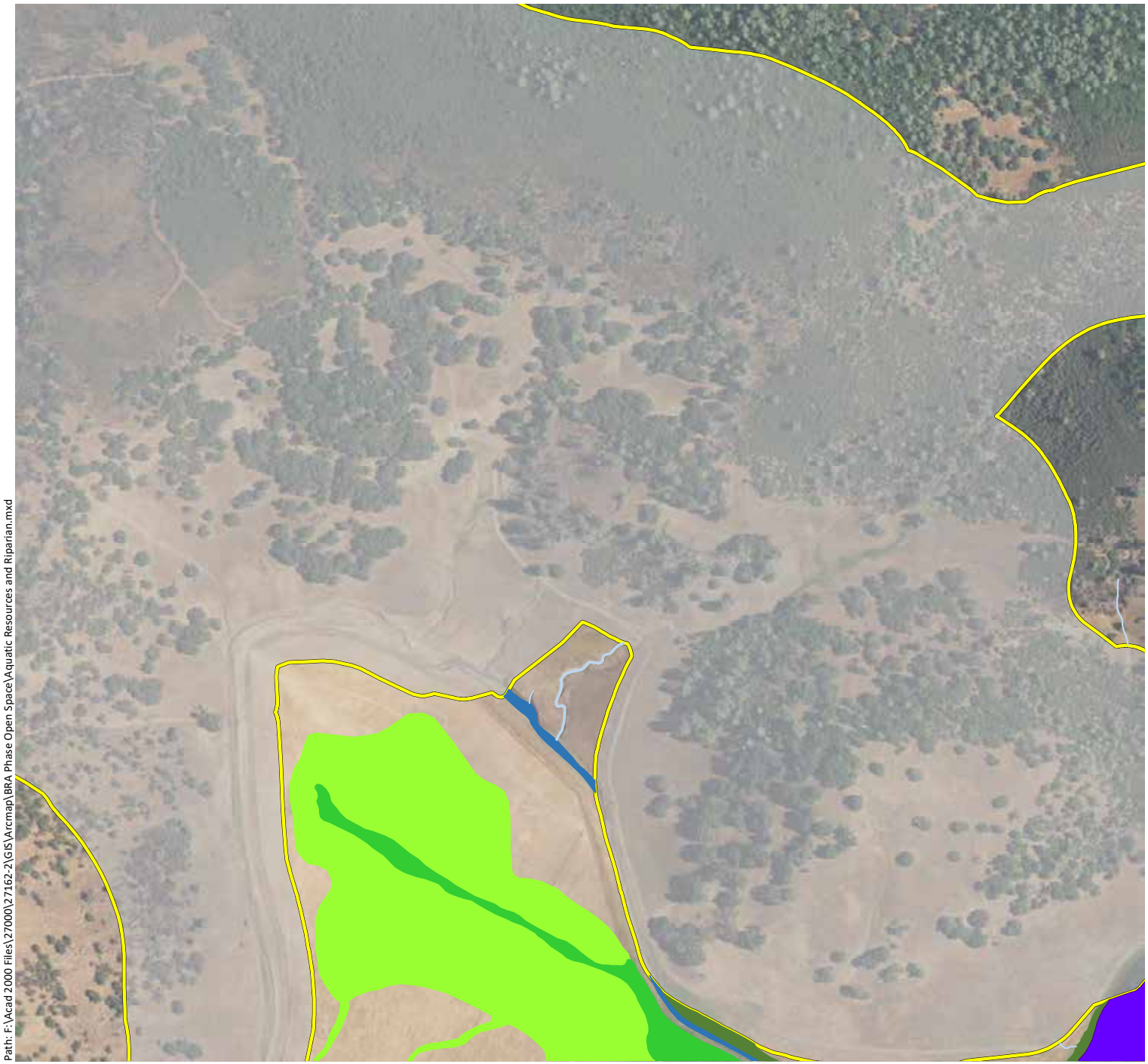
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 32)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

0 500 1,000

Feet

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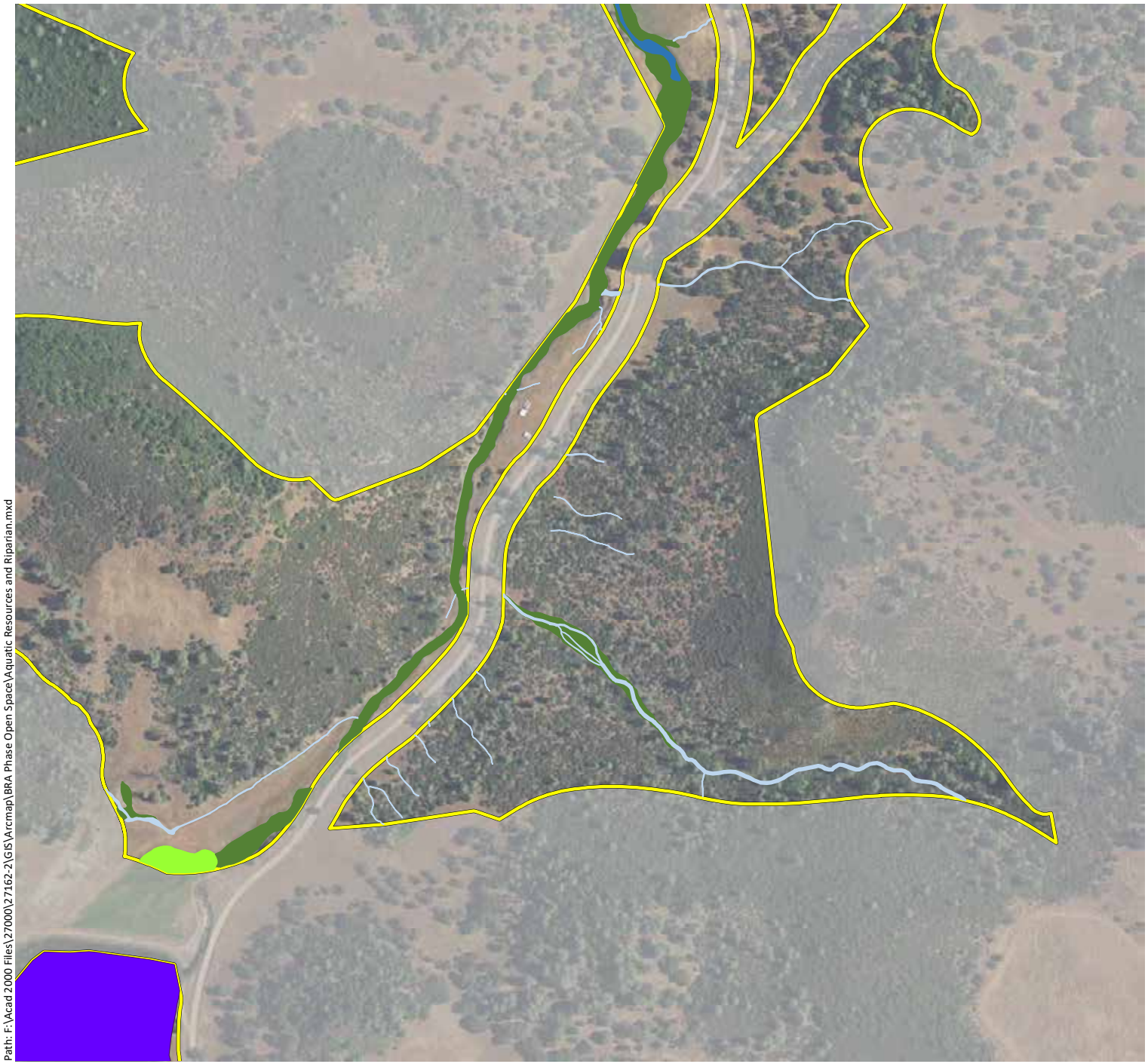
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 33)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

0 500 1,000

Feet

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 34)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

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Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 35)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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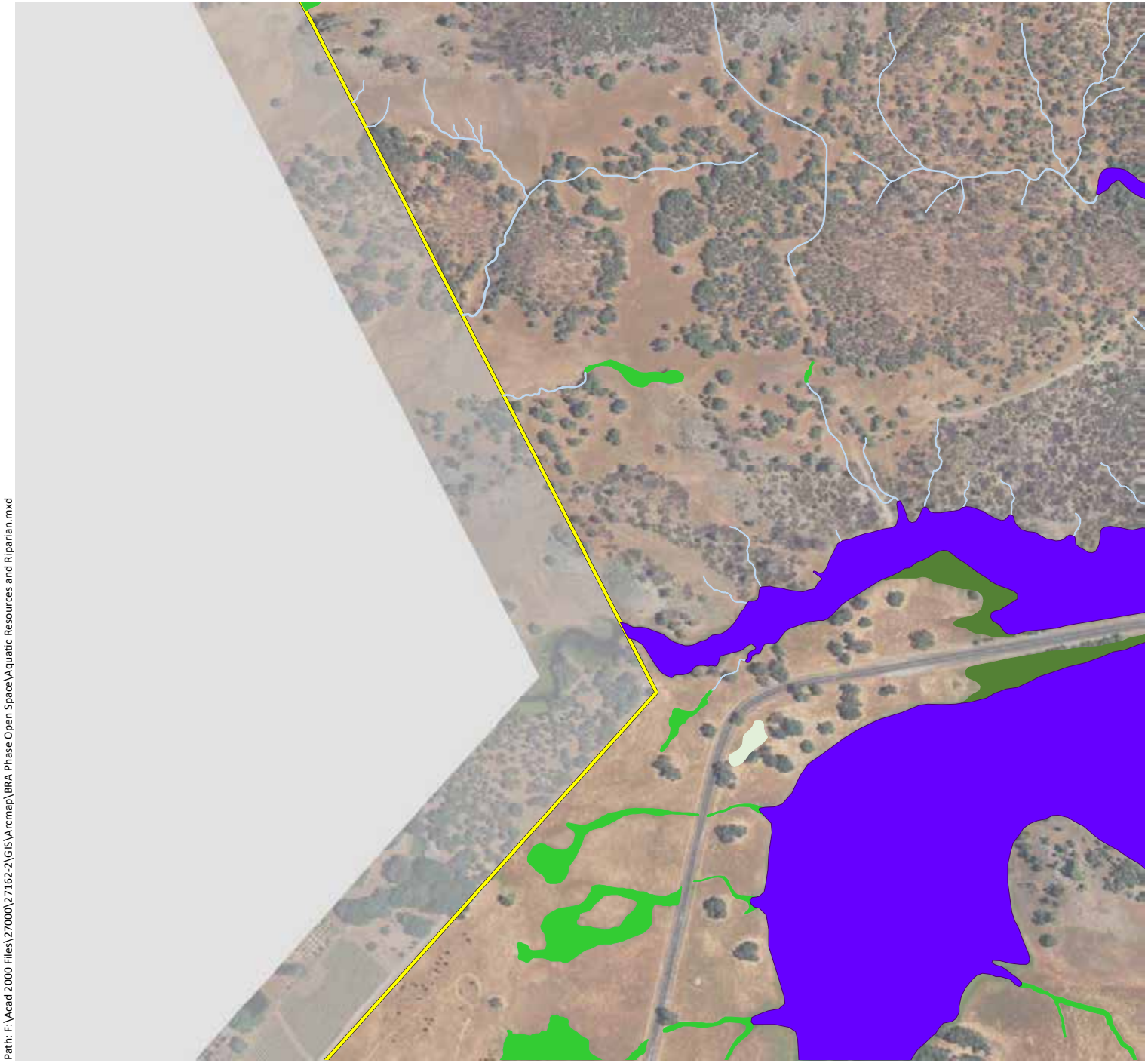
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 36)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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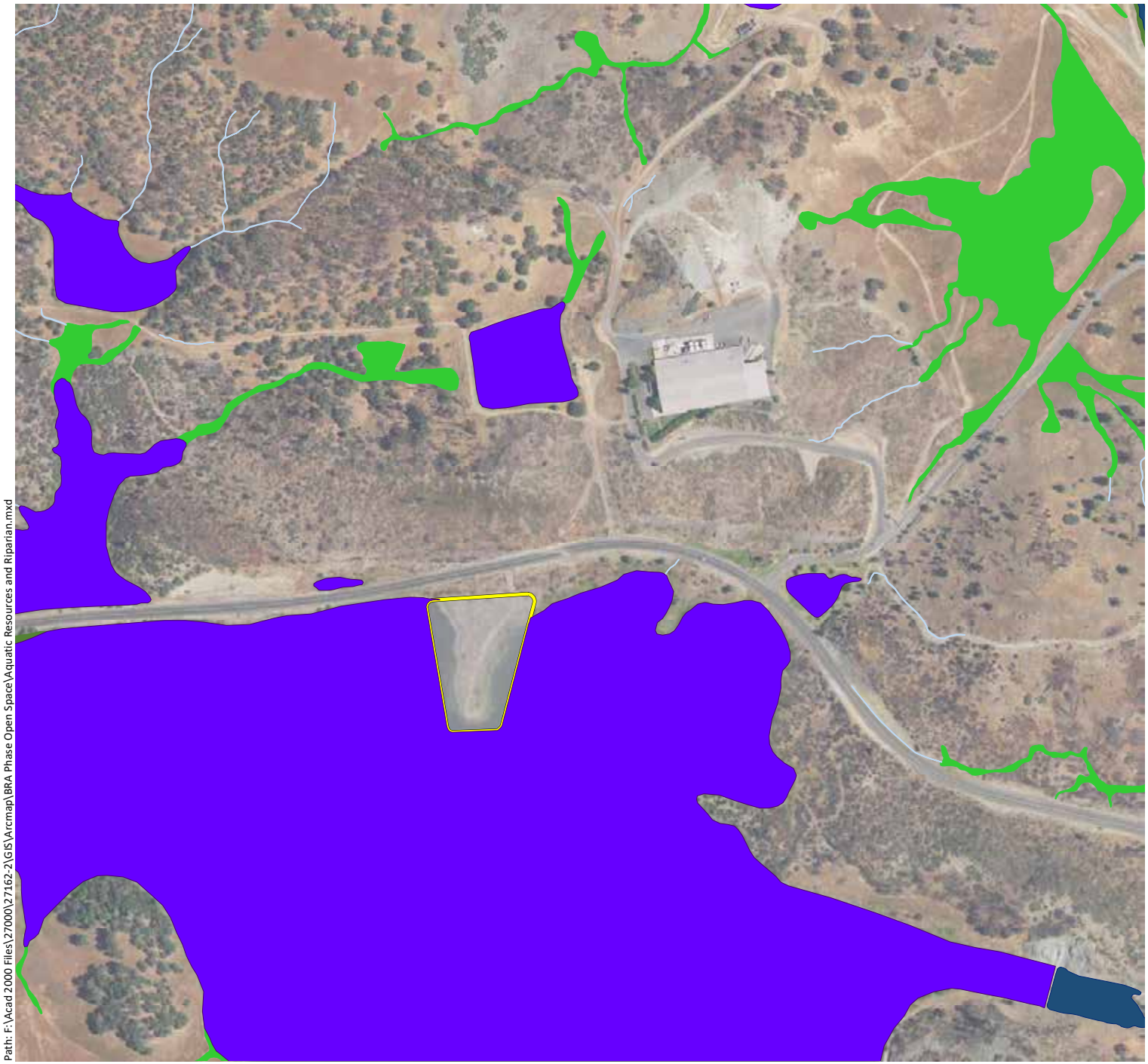
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 37)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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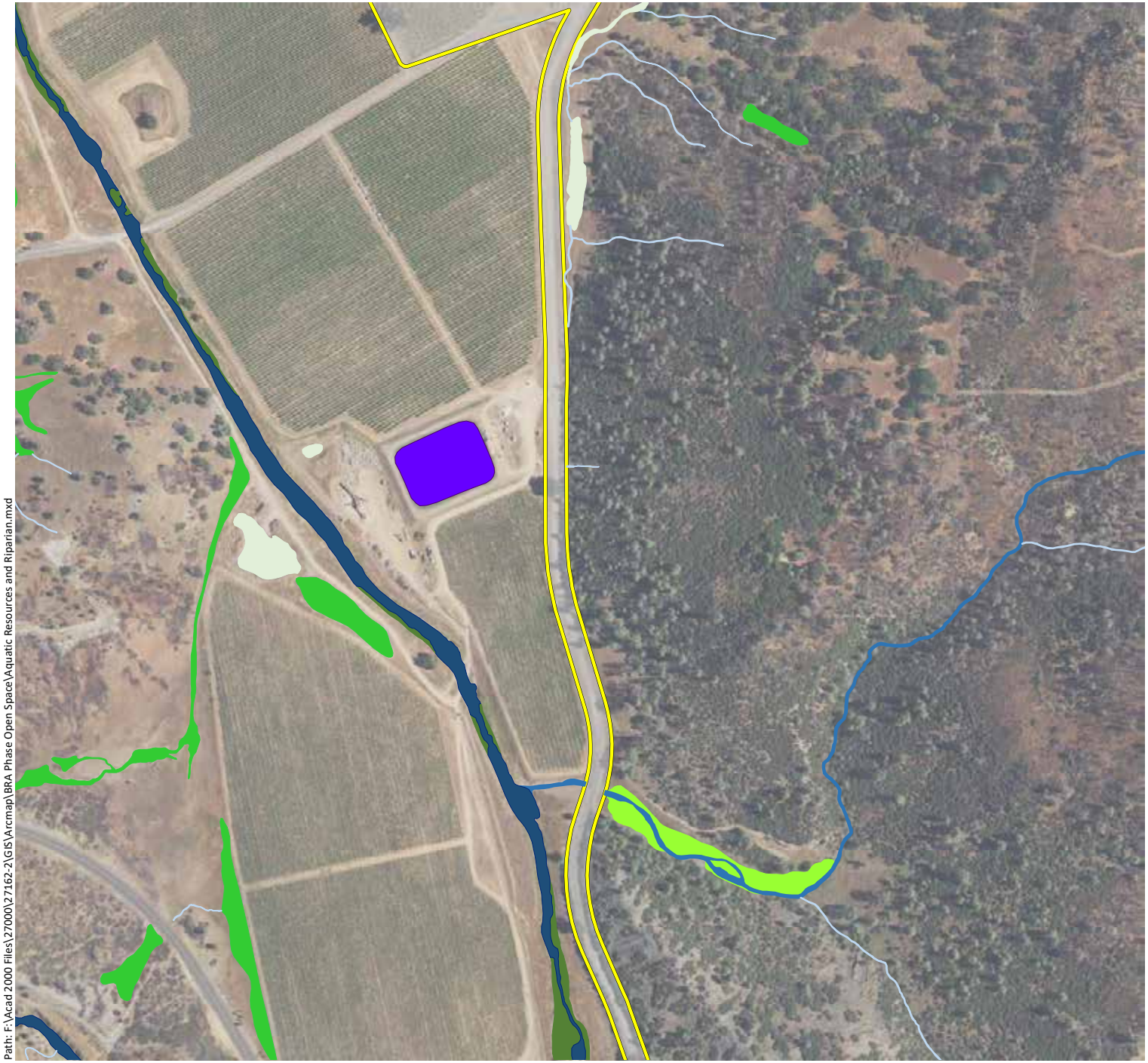
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 38)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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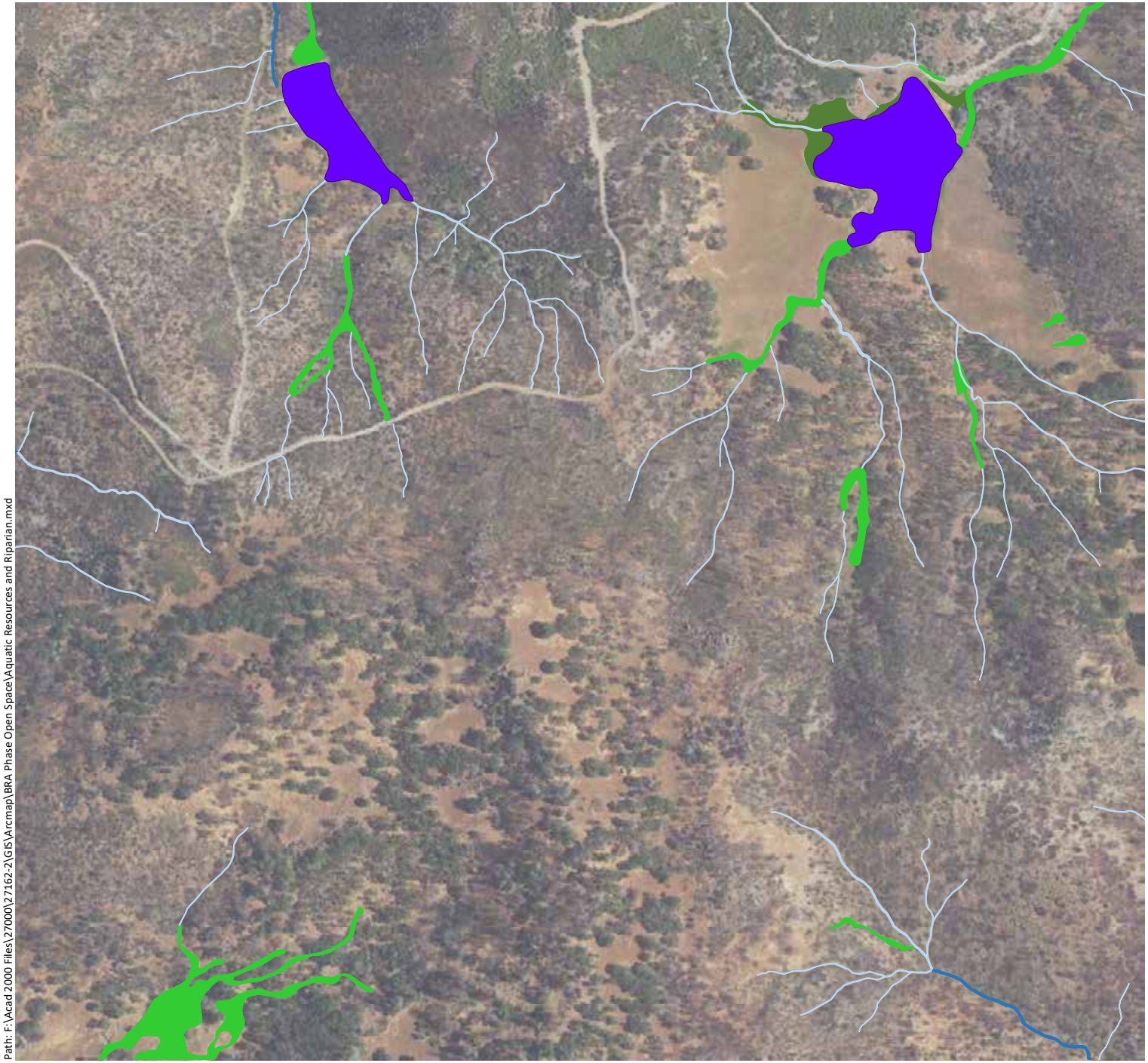
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 39)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 1 Study Area - 11,549 ac.

Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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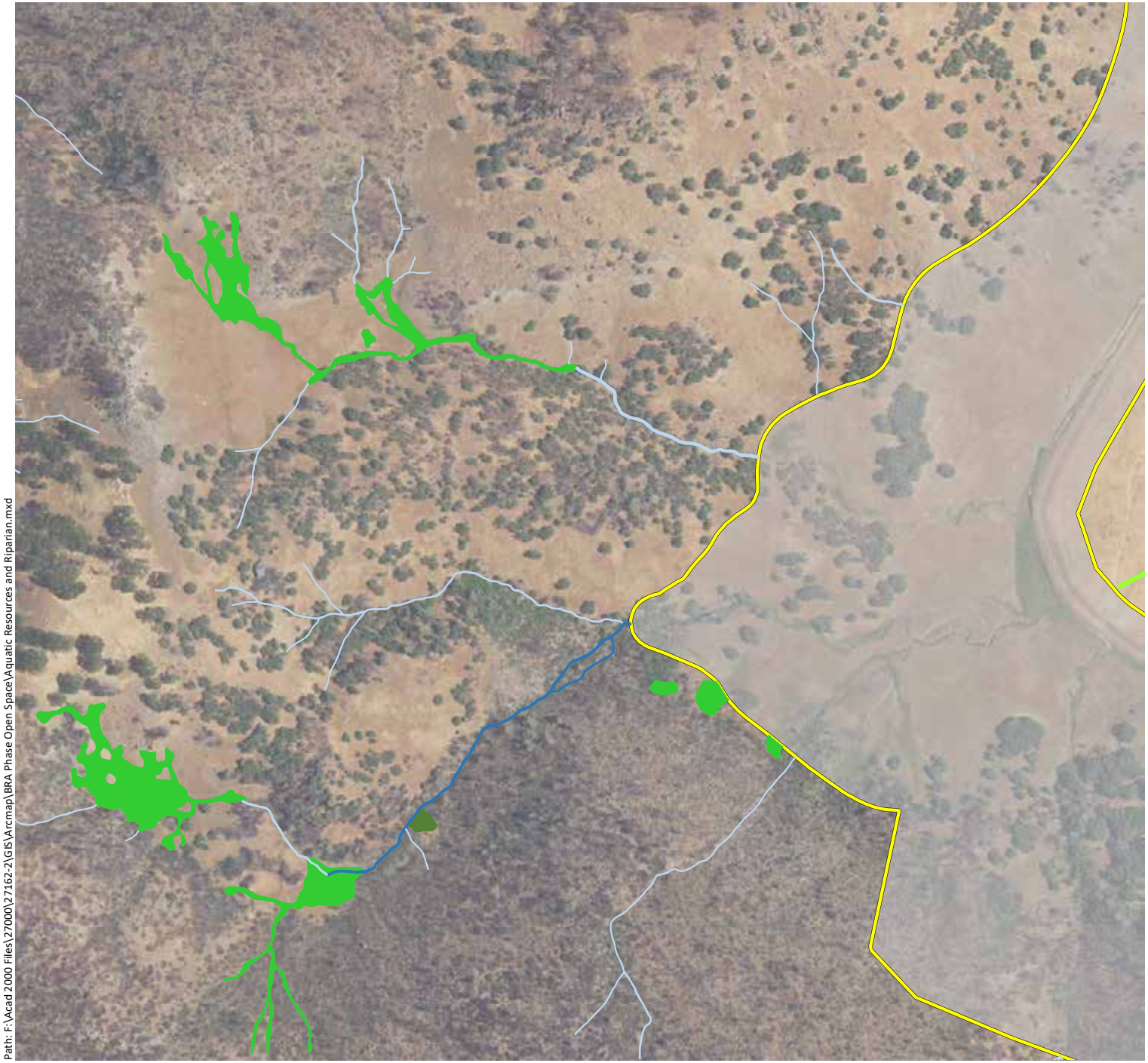
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 40)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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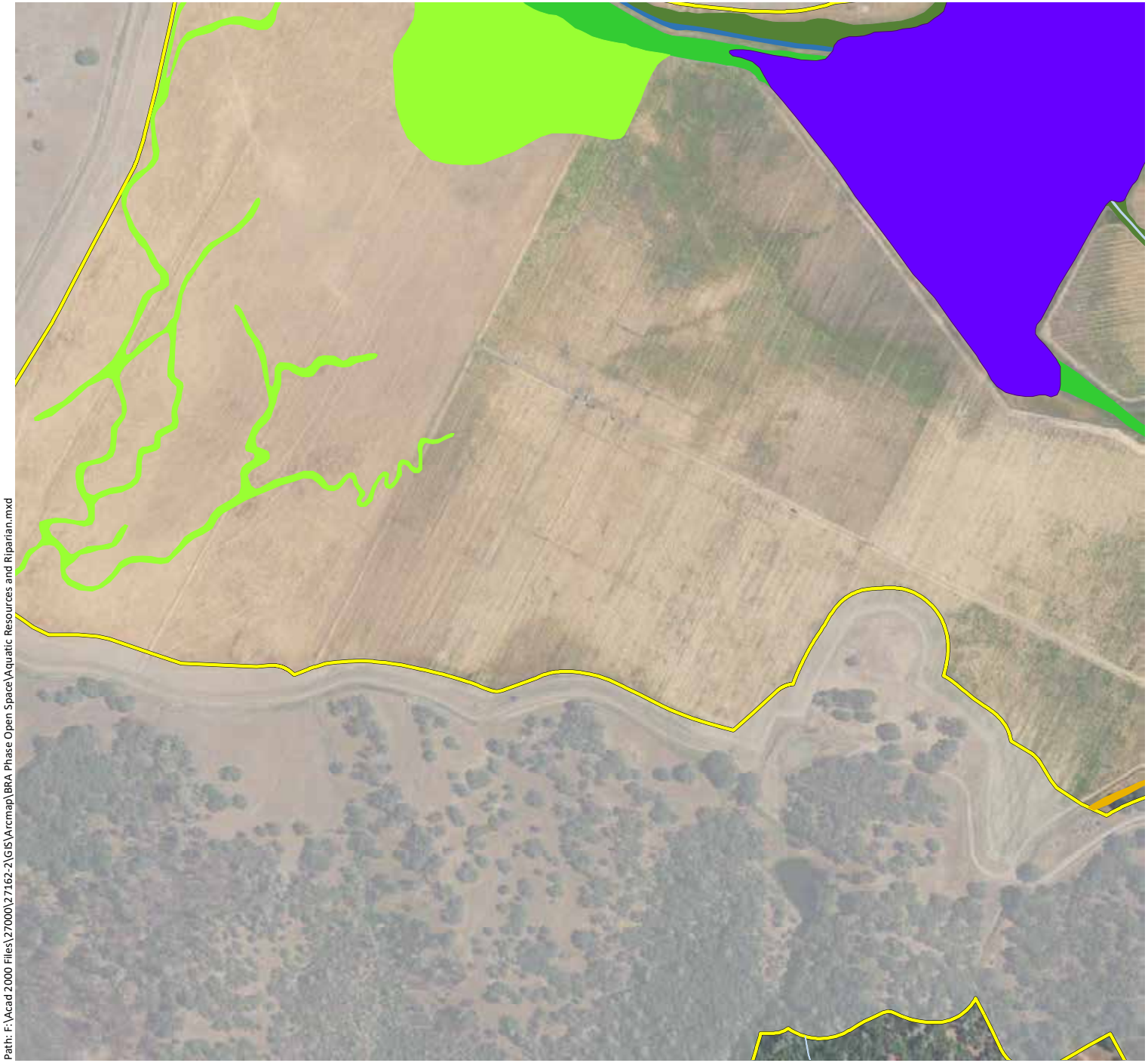
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 41)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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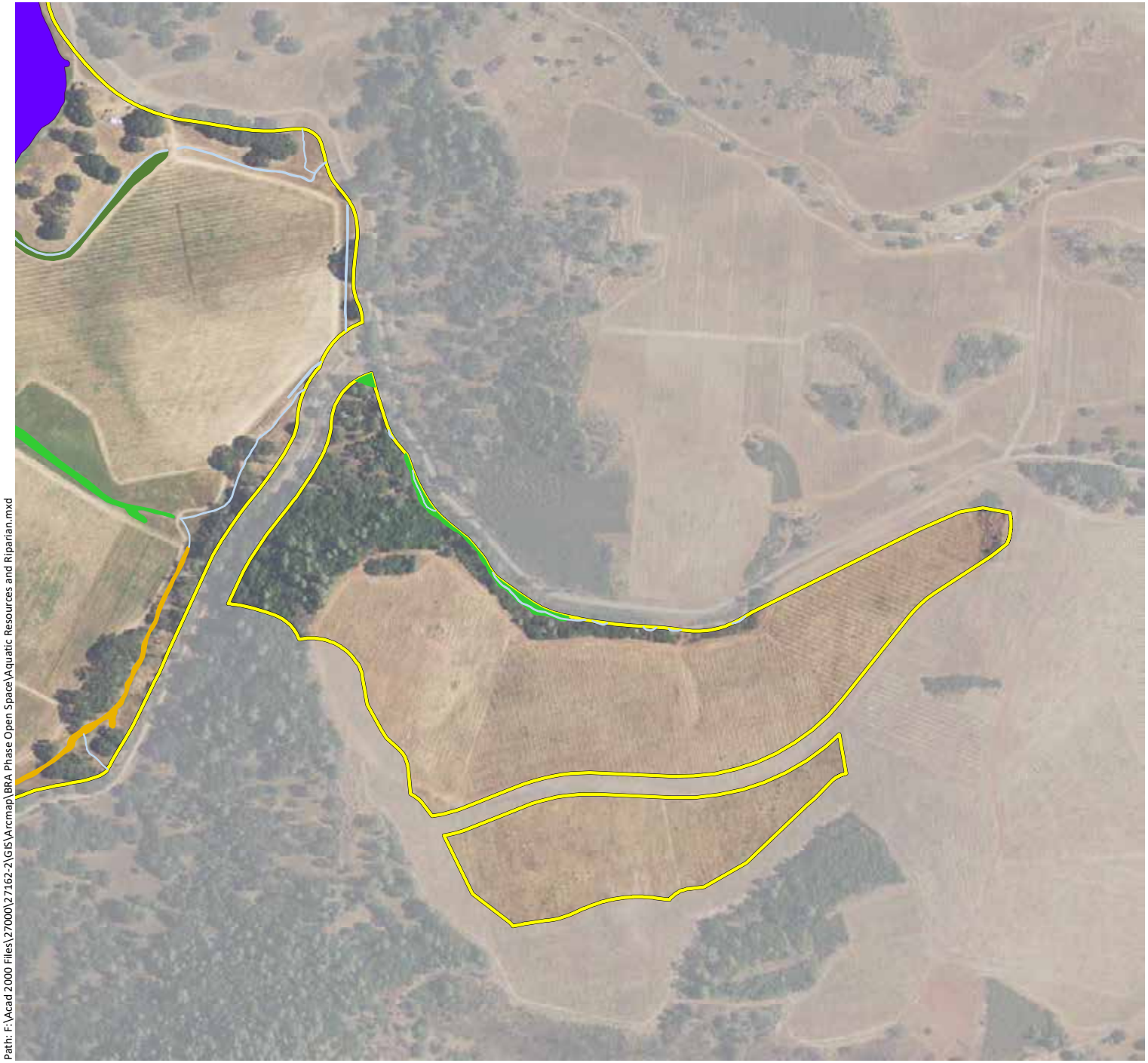
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 42)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

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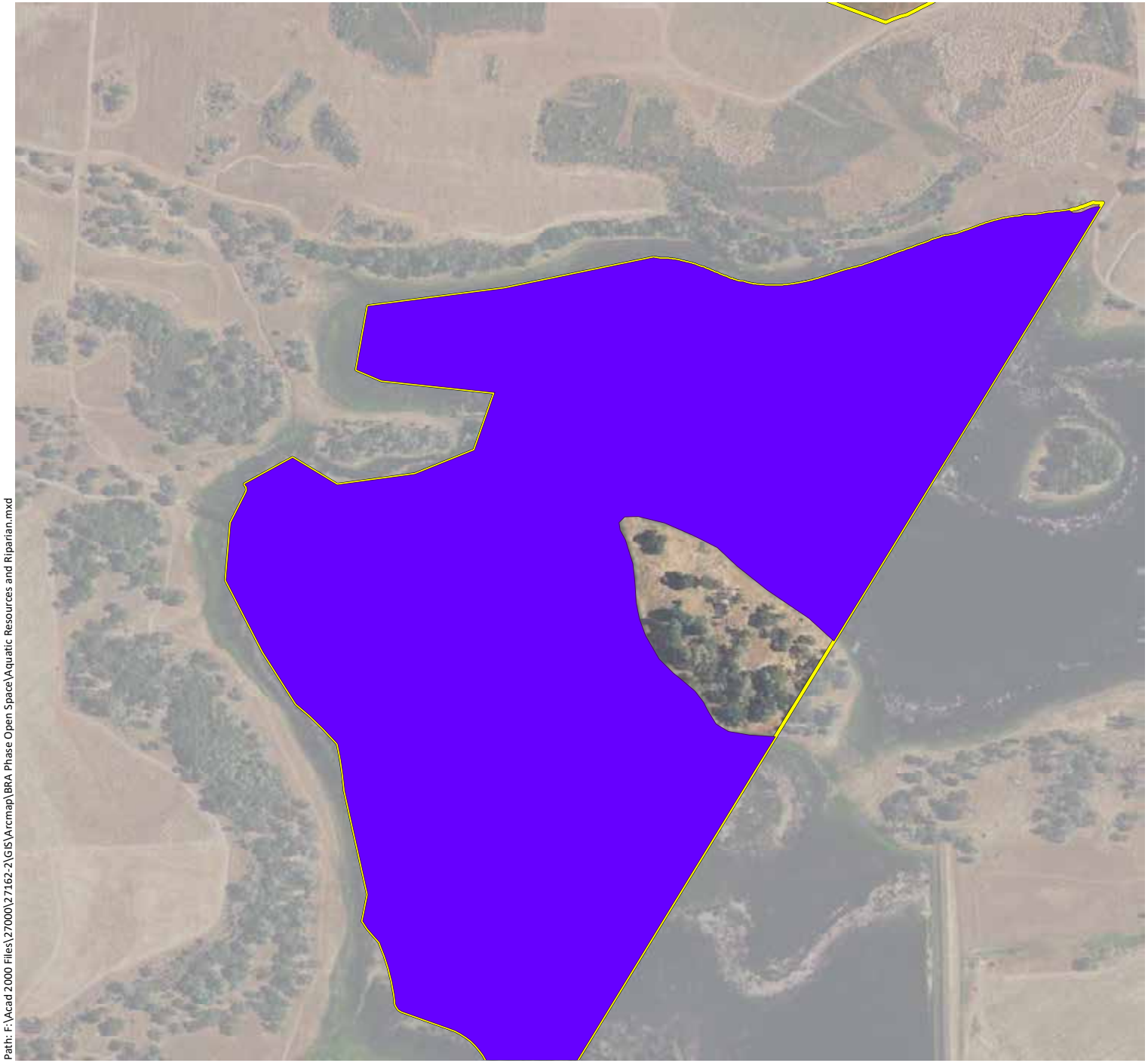
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 43)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

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Feet

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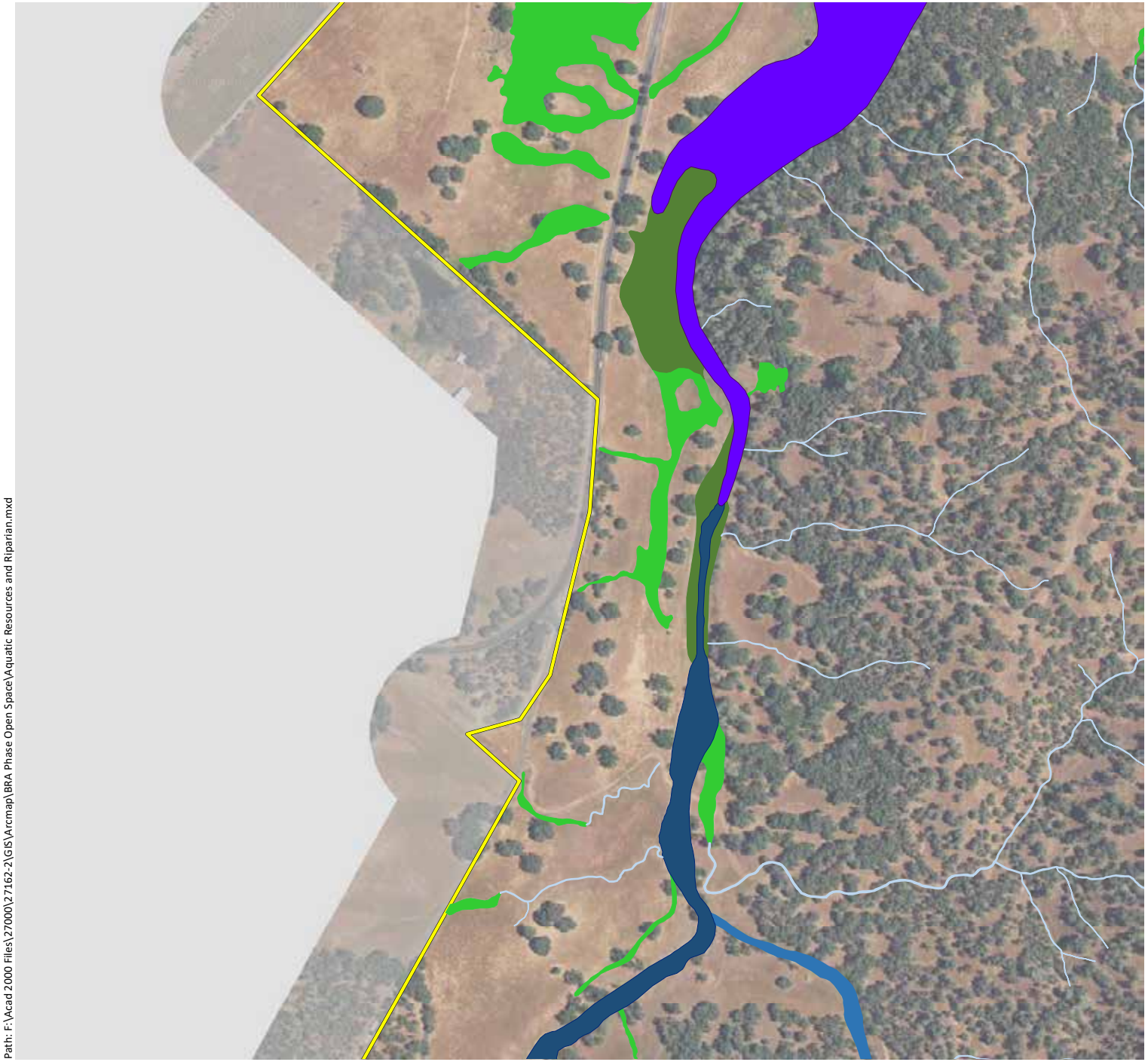
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 44)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 1 Study Area - 11,549 ac.

Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

0 500 1,000

Feet

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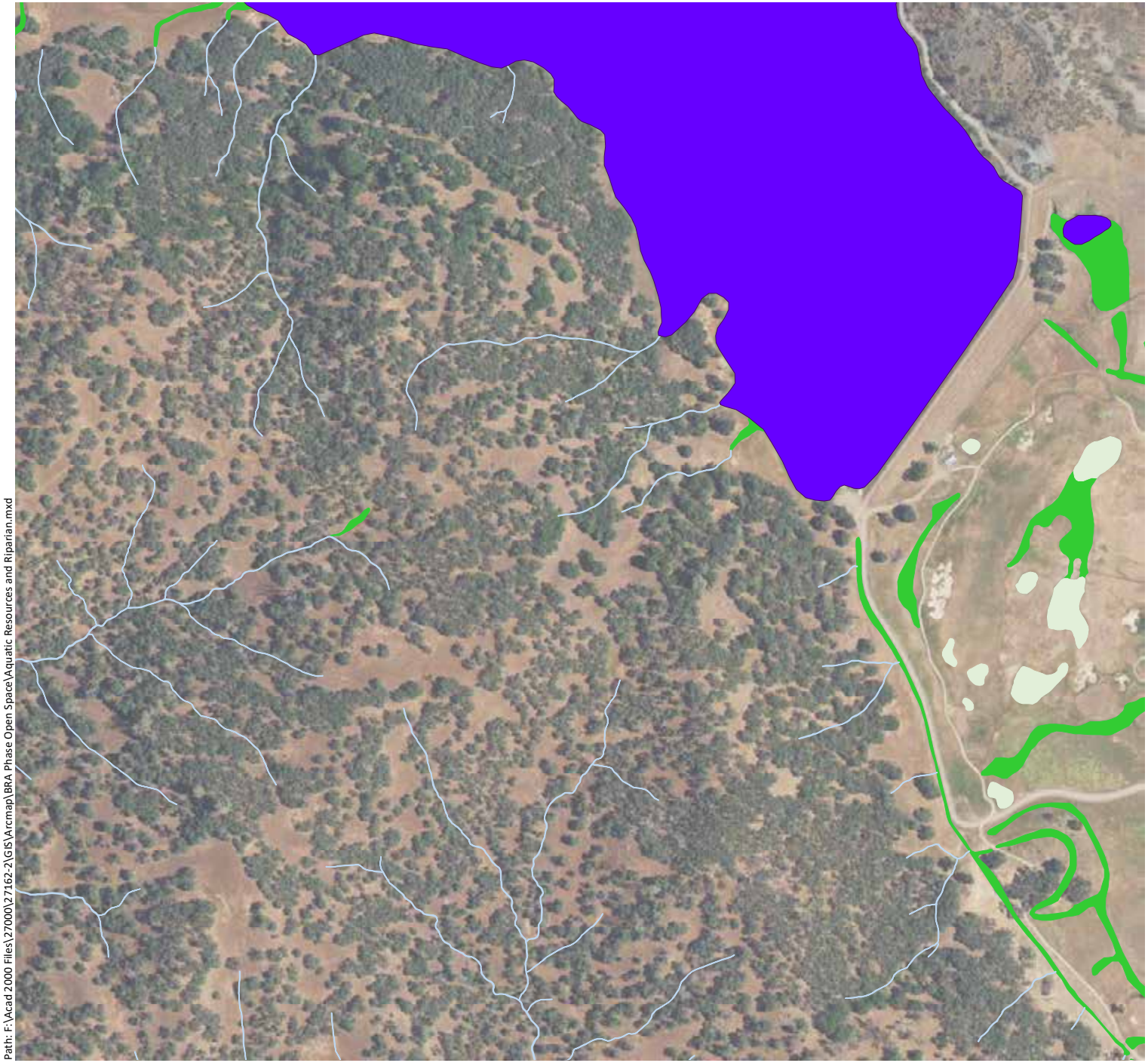
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 45)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

0 500 1,000

Feet

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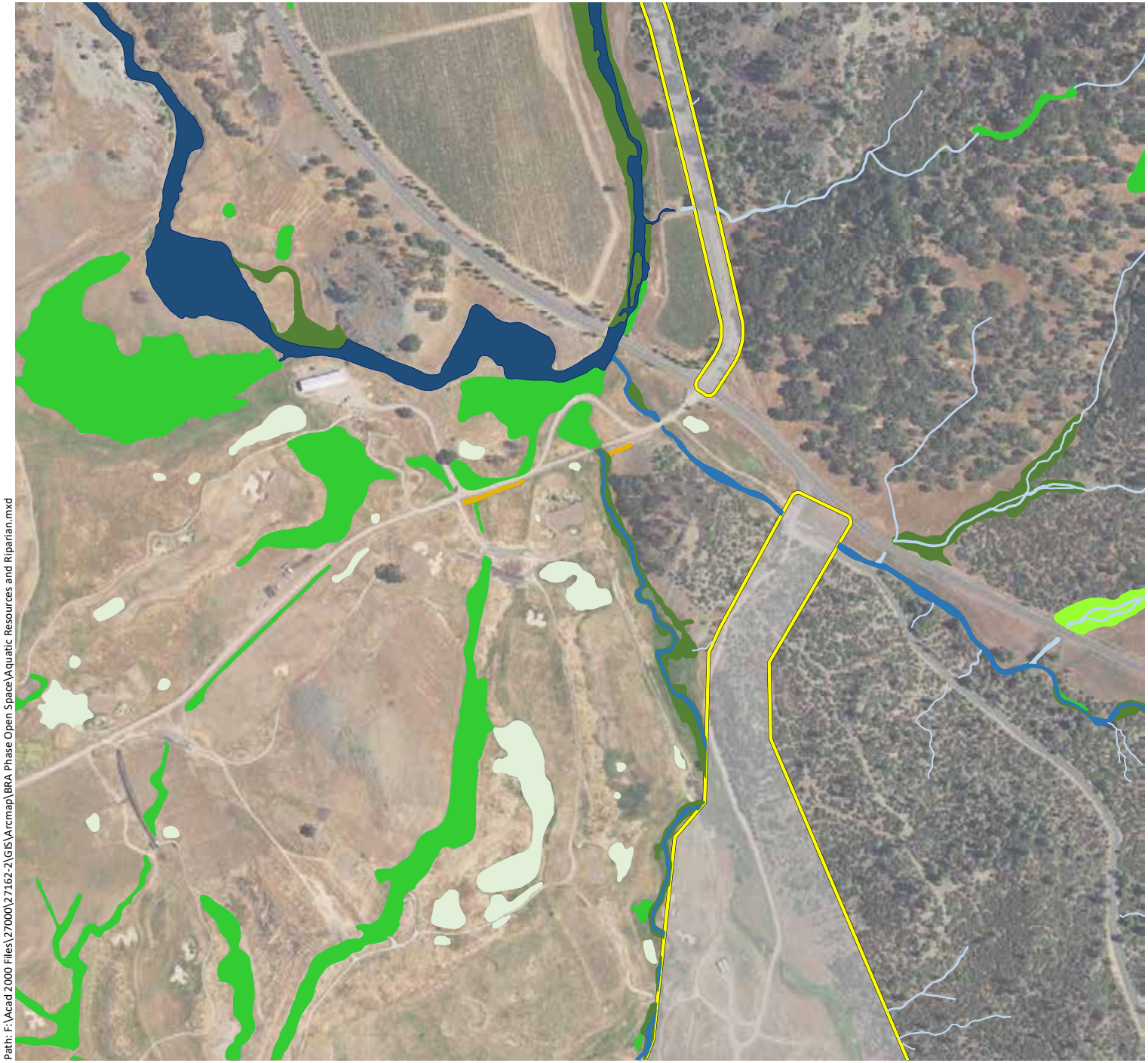
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 46)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

0 500 1,000

Feet

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 47)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

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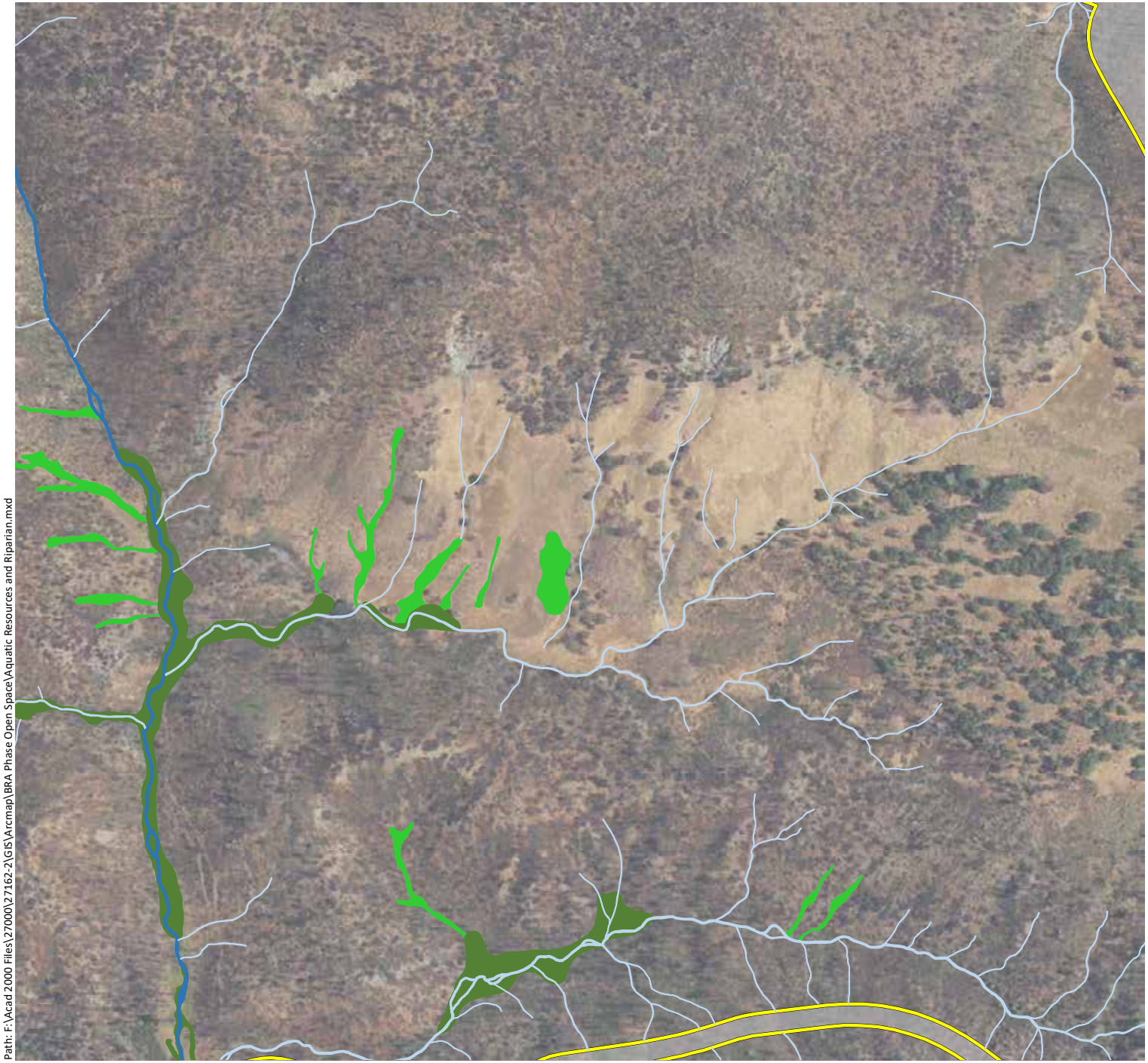
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 48)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

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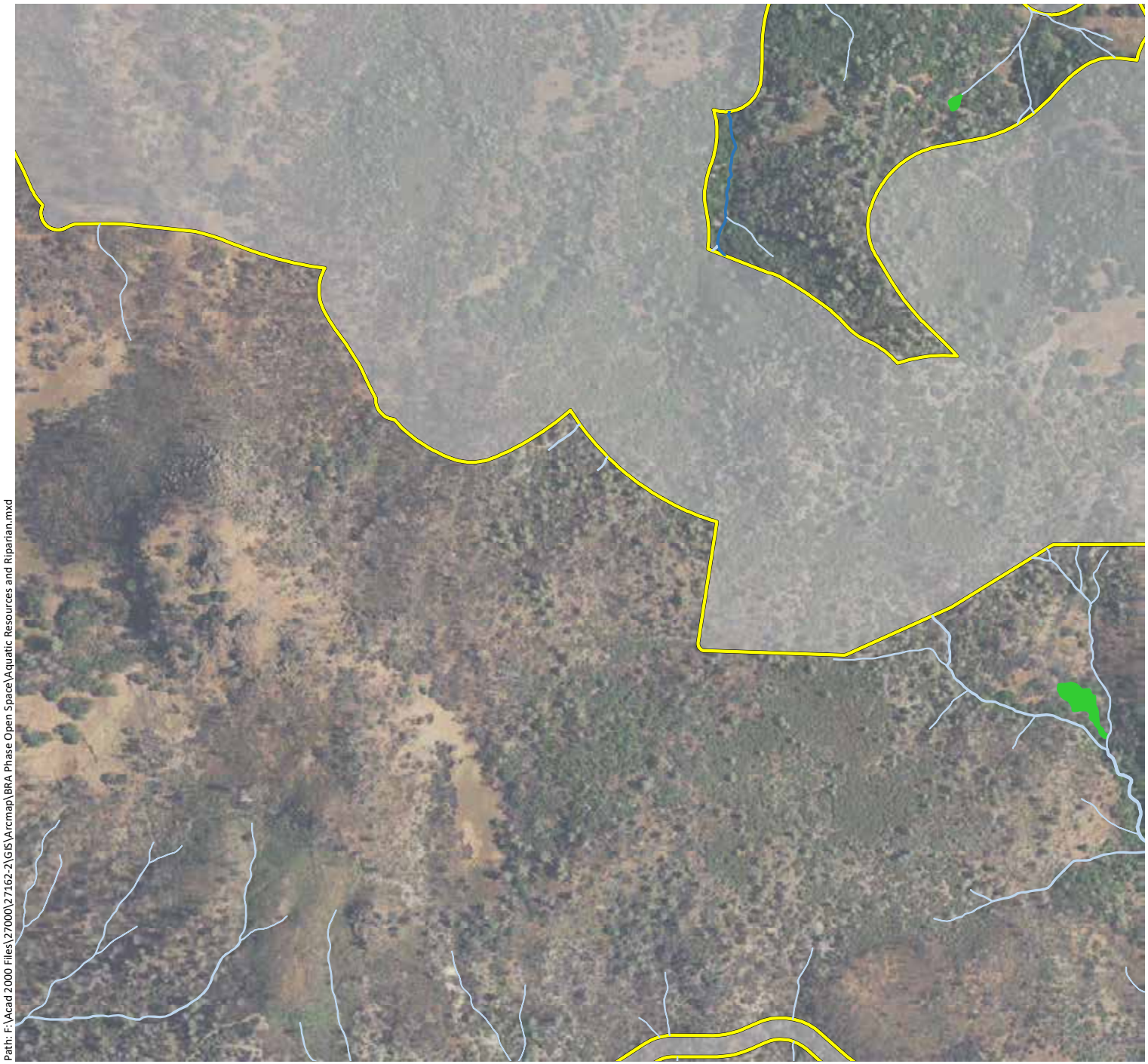
Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 49)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

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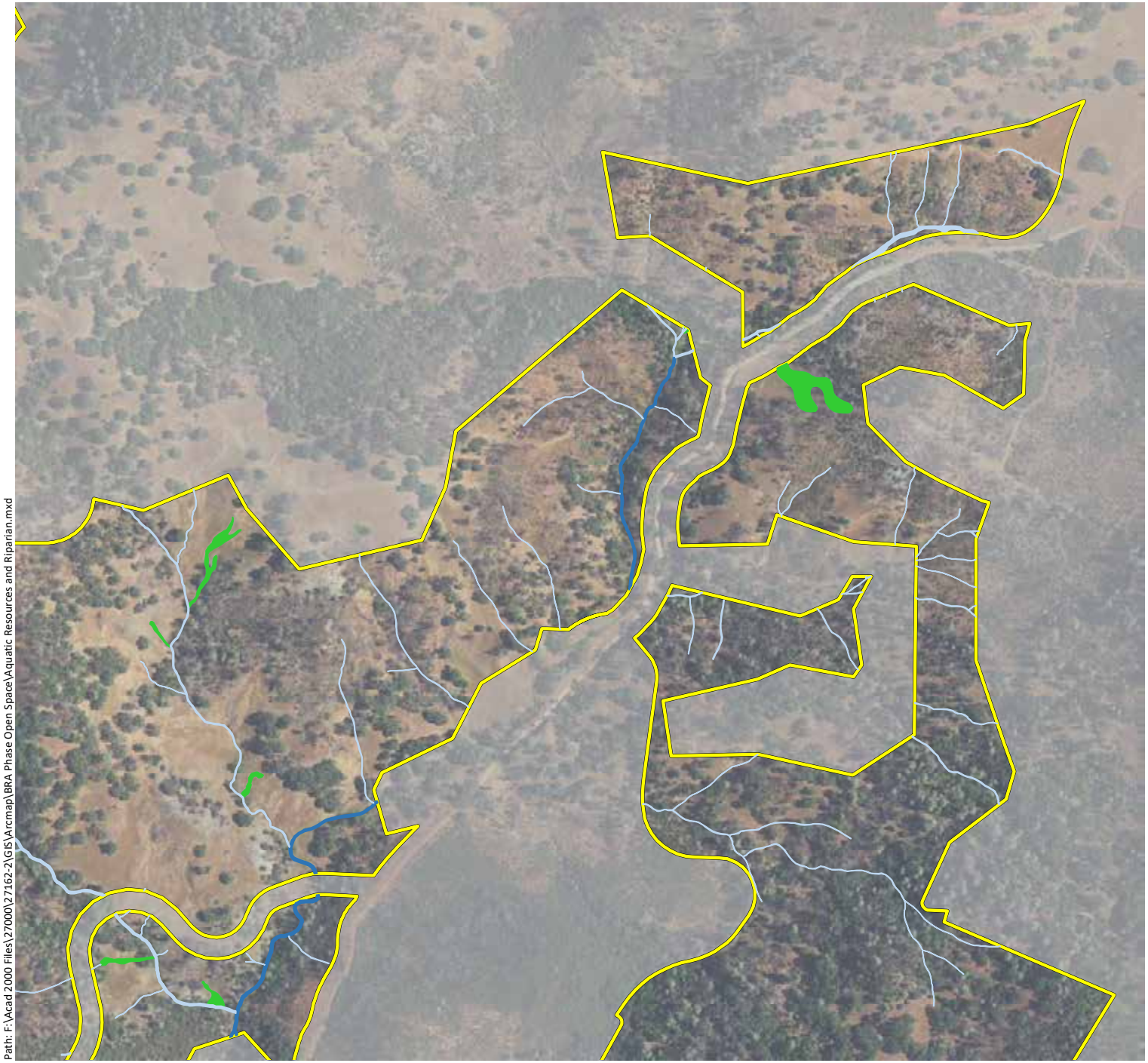
Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 50)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 1 Study Area - 11,549 ac.

Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

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Feet

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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 51)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

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Feet

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 52)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 1 Study Area - 11,549 ac.

Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

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Feet

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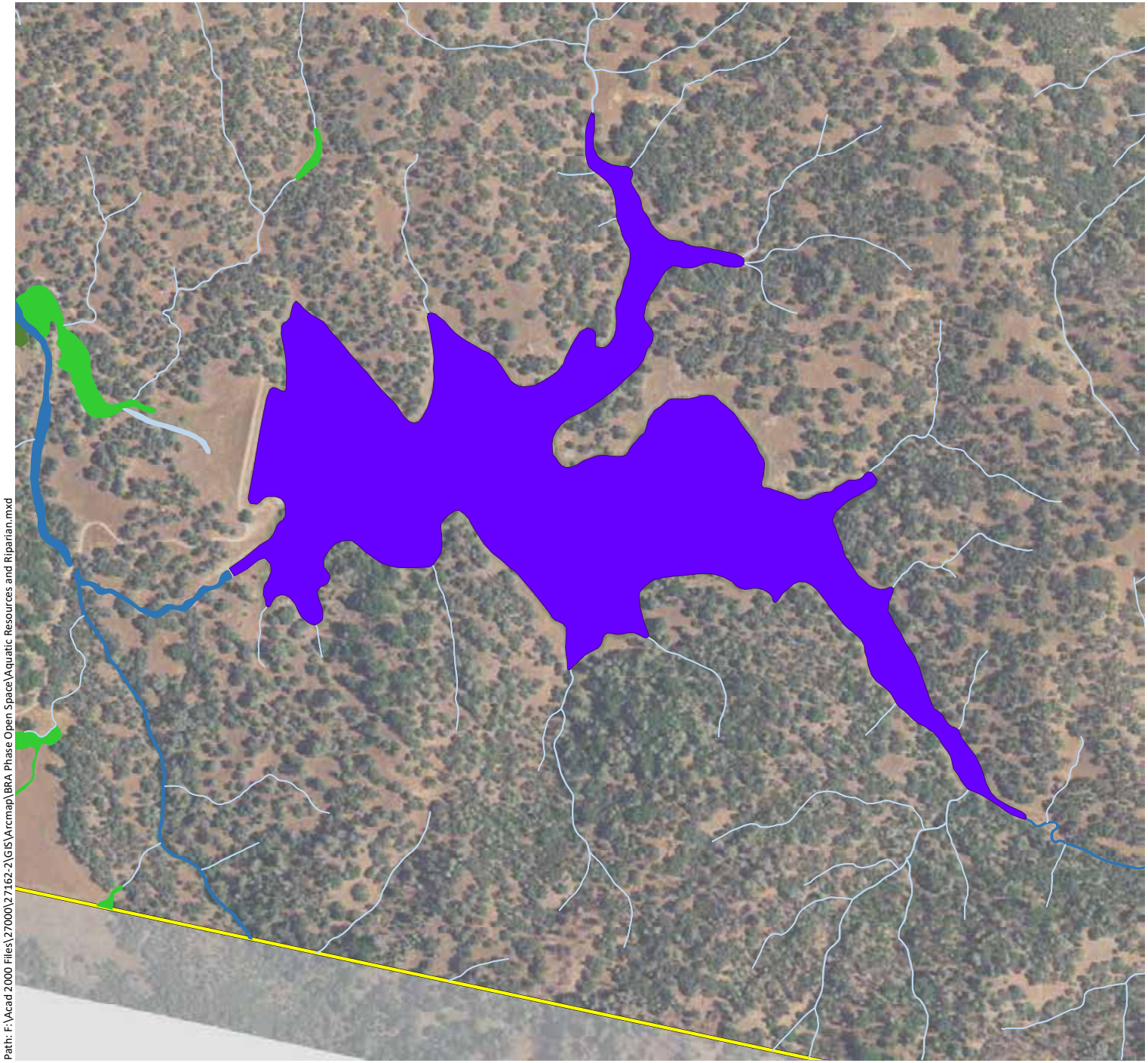
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 53)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 1 Study Area - 11,549 ac.

Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

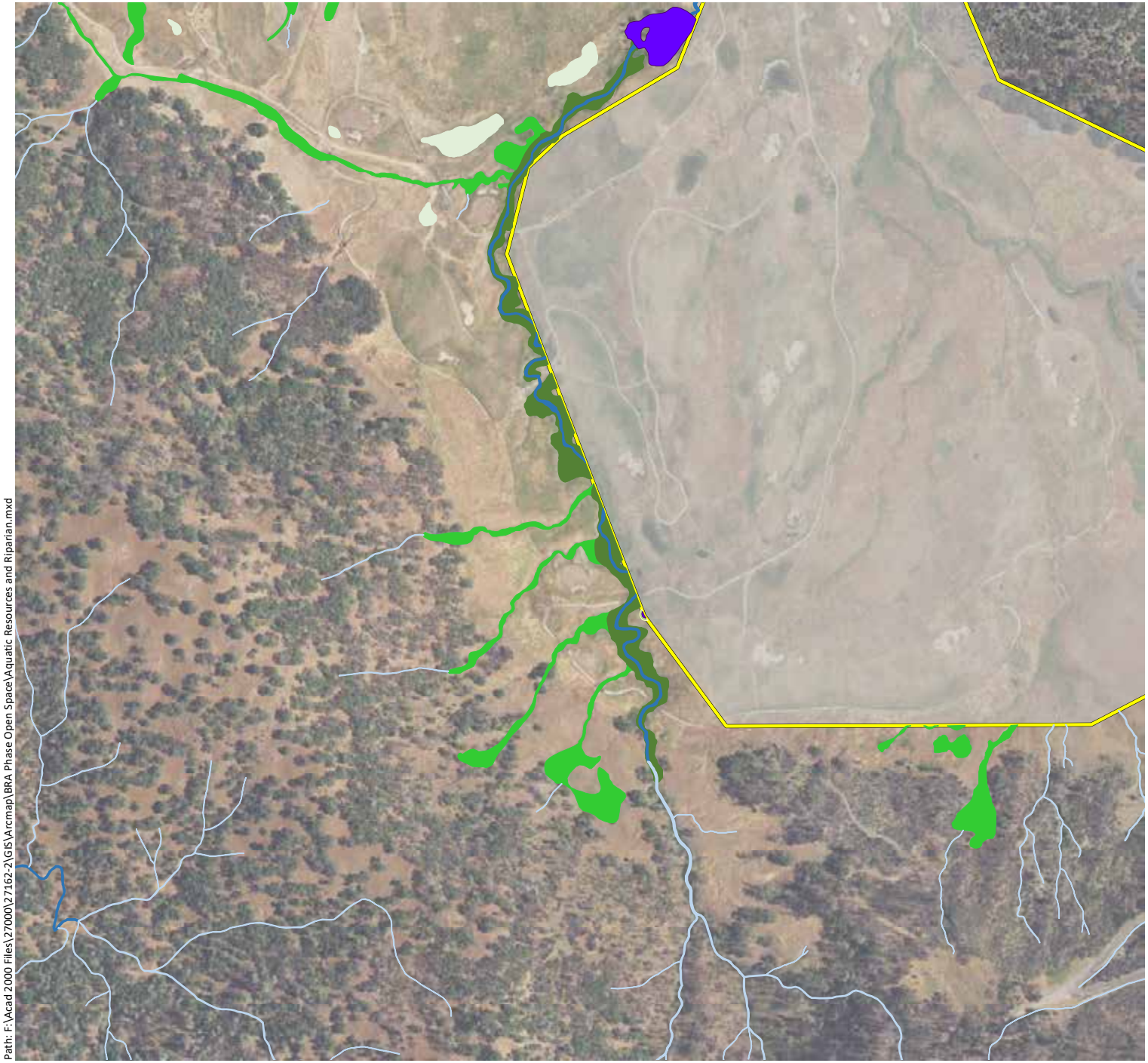
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 54)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

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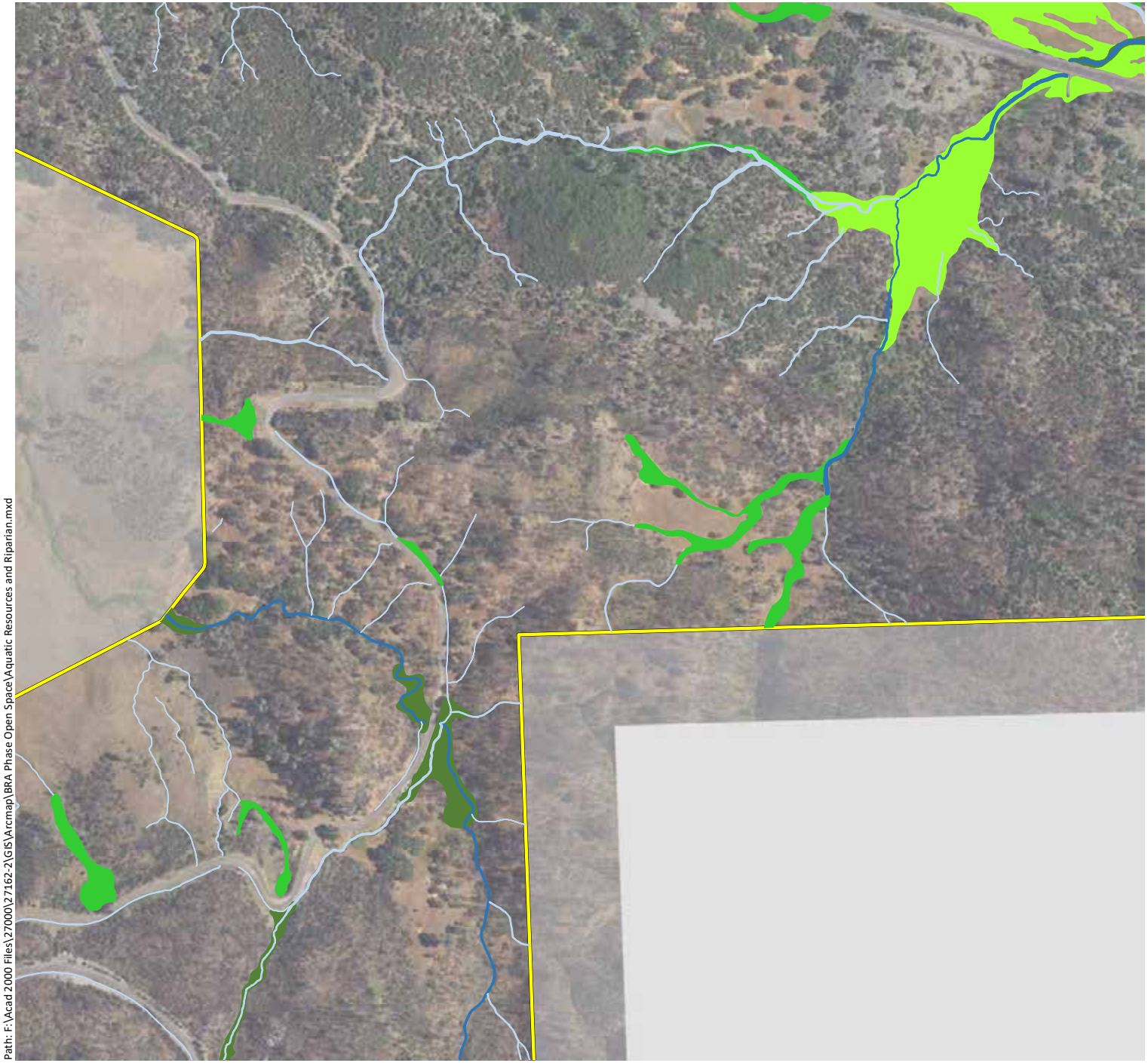
Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 55)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

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Feet

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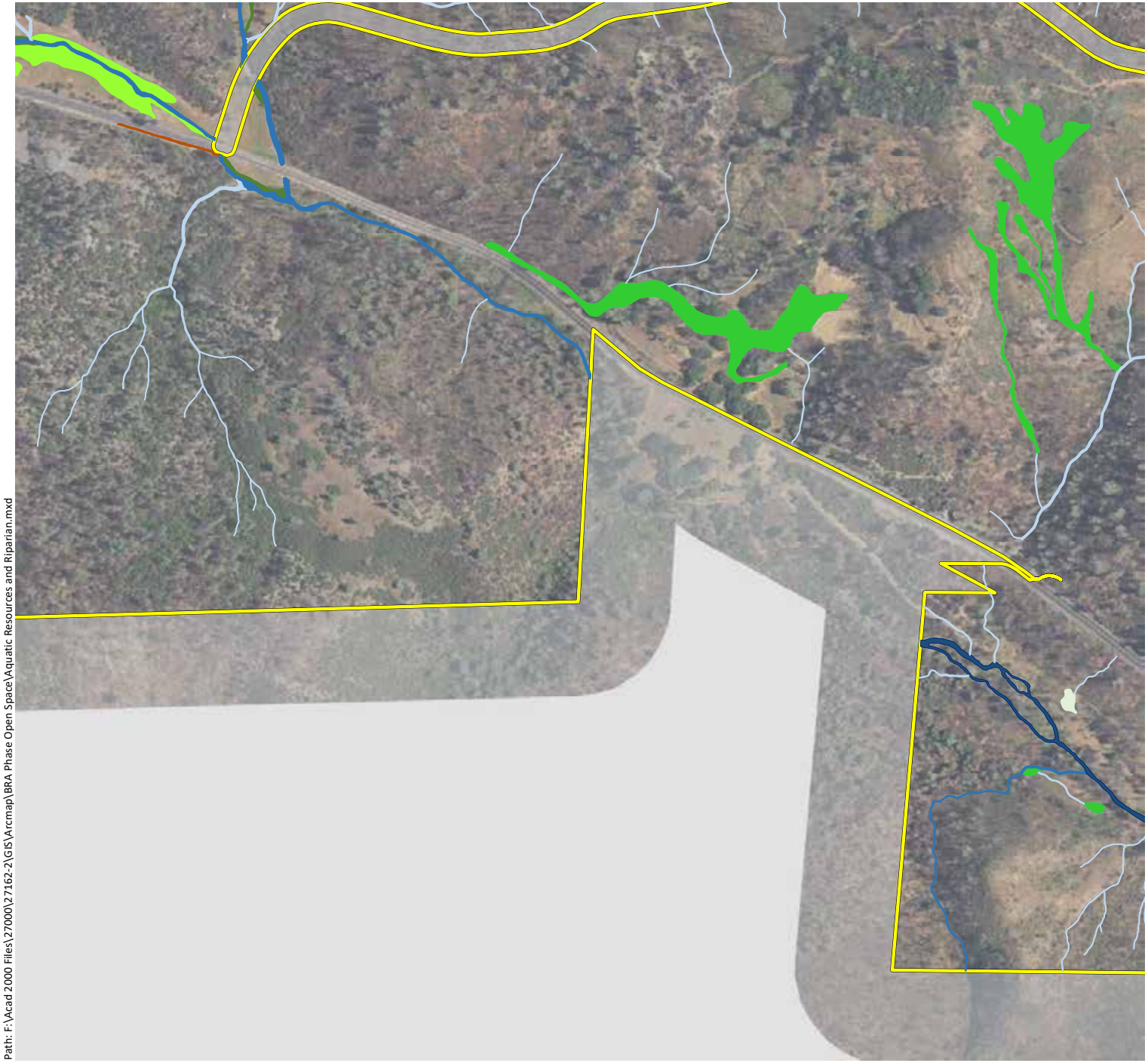
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 56)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

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Feet

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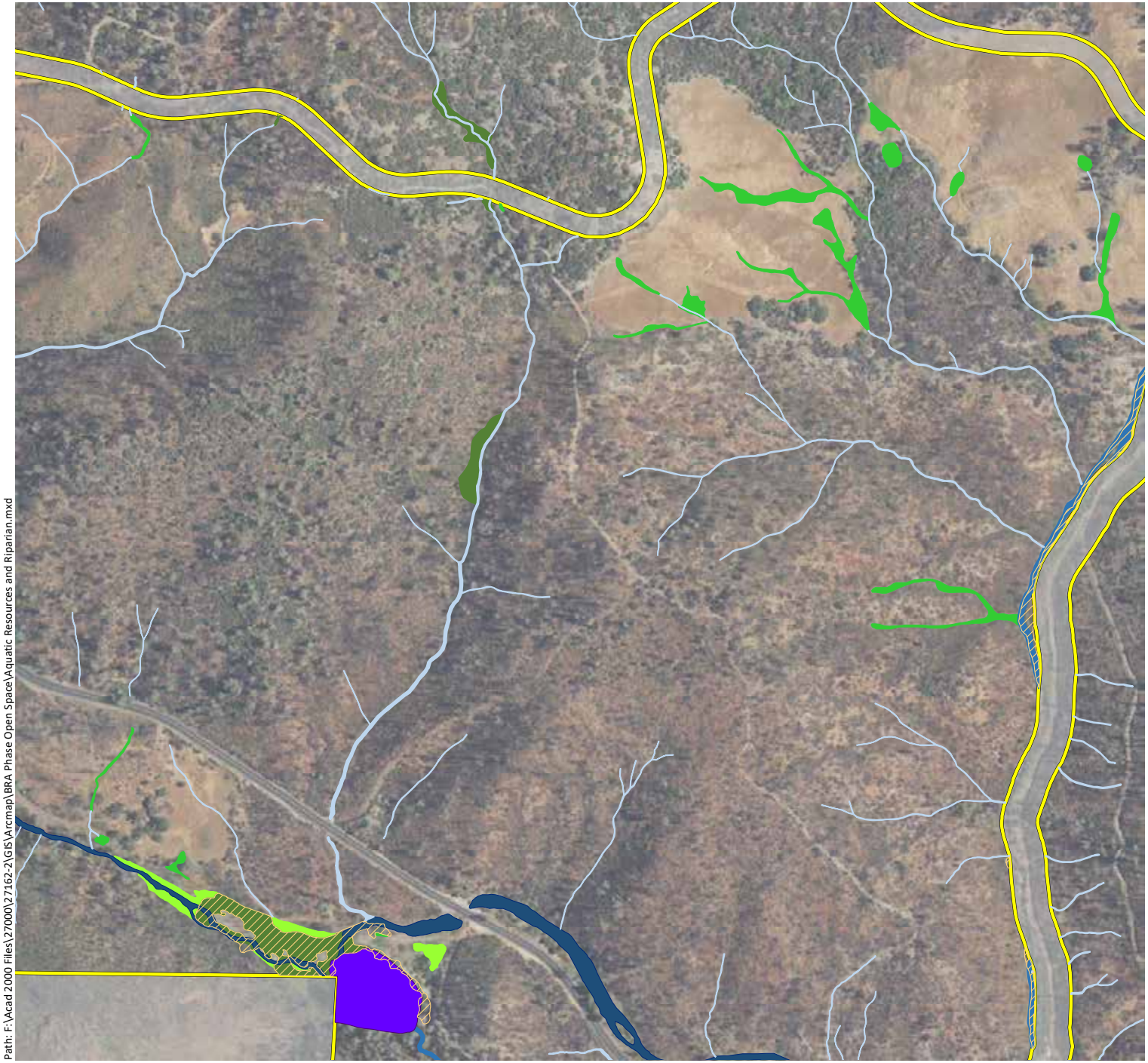
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 57)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 58)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 59)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

0 500 1,000

Feet

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 60)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 1 Study Area - 11,549 ac.

Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 61)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
- Seasonal Wetland Pond Fringes - 0.01 ac.
- Seasonal Wetland Seeps/Swales - 157.86 ac.
- Seasonal Wetland Wet Meadows - 66.11 ac.
- Stream Fringe/In-Stream Wetlands - 49.07 ac.

Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

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Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Aquatic Resources and Riparian Habitat Mapped within the Phase 2 and Open Space Study Area (Mapbook Sheet 62)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 1 Study Area - 11,549 ac.
- Riparian Woodland - 34.11 ac.

Wetlands - 330.00 ac.

- Forested Wetlands - 1.33 ac.
- Scrub-Shrub Wetlands - 1.15 ac.
- Seasonal Wetland Depressions - 53.85 ac.
- Seasonal Wetland Ditches - 0.62 ac.
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Waters* - 773.93 ac. & 735,754 LF

- Ephemeral Ditches - 0.03 ac. & 942 LF
- Ephemeral Streams - 33.35 ac. & 610,691 LF
- Intermittent Streams - 14.93 ac. & 58,059 LF
- Perennial Streams - 99.54 ac. & 66,062 LF
- Open Waters - 626.08 ac.

* The extent of waters shown is based on the location of the ordinary high water mark

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Aquatic Resources and Riparian.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: mrochelle, 1/8/2020

APPENDIX C

LIST OF PLANT SPECIES OBSERVED WITHIN GUENOC RANCH

Appendix C. List of Plant Species Observed within Guenoc Ranch

Surveys were conducted by WRA biologists between 2017 and 2019. Plant nomenclature follows Baldwin et al. (2012) and subsequent revisions by the Jepson Flora Project (2019).

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Acer macrophyllum	Bigleaf maple	native	tree	-	-	FAC	-
Achillea millefolium	Yarrow	native	perennial herb	-	-	FACU	-
Achyrachaena mollis	Blow wives	native	annual herb	-	-	FAC	-
Acmispon americanus var. *americanus*	Spanish lotus	native	annual herb	-	-	UPL	-
Acmispon brachycarpus	Short podded lotus	native	annual herb	-	-	-	-
Acmispon glaber var. *glaber*	Deerweed	native	perennial herb	-	-	-	-
Acmispon parviflorus	Hill lotus	native	annual herb	-	-	-	-
Acmispon wrangelianus	Chilean trefoil	native	annual herb	-	-	-	-
Adenostoma fasciculatum var. *fasciculatum*	Chamise	native	tree, shrub	-	-	-	-
Adiantum jordanii	California maidenhair fern	native	fern	-	-	FAC	-
Aegilops triuncialis	Goatgrass	non-native (invasive)	annual grass	-	High	-	-
Aesculus californica	Buckeye	native	tree	-	-	-	-
Agoseris grandiflora var. *grandiflora*	Giant mountain dandelion	native	perennial herb	-	-	-	-
Agoseris heterophylla var. *cryptopleura*	Mountain dandelion	native	annual herb	-	-	-	-
Agoseris heterophylla var. *heterophylla*	Annual agoseris	native	annual herb	-	-	-	-
Agrostis avenacea	Pacific bentgrass	non-native (invasive)	perennial grass	-	Limited	FACW	-
Agrostis stolonifera	Redtop	non-native (invasive)	perennial grass	-	Limited	FACW	-
Aira caryophyllea	Silvery hairgrass	non-native	annual grass	-	-	FACU	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Alisma lanceolatum	Water plantain	non-native	perennial herb (aquatic)	-	-	OBL	-
Allium amplectens	Narrow leaved onion	native	perennial herb (bulb)	-	-	-	2.3
Allium falcifolium	Sickle leaf onion	native	perennial herb (bulb)	-	-	-	4.2
Allium fimbriatum var. *fimbriatum*	Fringed onion	native	perennial herb (bulb)	-	-	-	-
Allium serra	Jeweled onion	native	perennial herb (bulb)	-	-	-	2.6
Alnus rhombifolia	White alder	native	tree	-	-	FACW	-
Alopecurus pratensis	Meadow foxtail	non-native	perennial grass	-	Watch	FACW	-
Amaranthus retroflexus	Rough pigweed	non-native	annual herb	-	-	FACU	-
Amsinckia intermedia	Common fiddleneck	native	annual herb	-	-	-	-
Amsinckia lycopsoides	Tarweed fiddleneck	native	annual herb	-	-	-	-
Amsinckia menziesii	Fiddleneck	native	annual herb	-	-	-	-
Amsinckia retrorsa	Rigid fiddleneck	native	annual herb	-	-	-	-
Ancistrocarphus filagineus	Woolly fishhooks	native	annual herb	-	-	-	3.3
Angelica californica	California angelica	native	perennial herb	-	-	-	-
Angelica tomentosa	Woolly angelica	native	perennial herb	-	-	-	2.7
Anisocarpus madioides	Woodland madia	native	perennial herb	-	-	-	-
Anthemis cotula	Dog fennel	non-native	annual herb	-	-	FACU	-
Antirrhinum vexillocalyculatum ssp. *vexillocalyculatum*	Wiry snapdragon	native	annual herb	-	-	-	-
Antirrhinum virga	Tall snapdragon	native	perennial herb	Rank 4.3	-	-	2.8
Aphanes occidentalis	Ladie's mantle	native	annual, perennial herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Apiastrum angustifolium	Wild celery	native	annual herb	-	-	UPL	1.5
Aphyllon fasciculatum	Clustered broomrape	native	perennial herb (parasitic)	-	-	-	-
Apocynum cannabinum	Indian hemp	native	perennial herb	-	-	FAC	-
Aquilegia eximia	Serpentine columbine	native	perennial herb	-	-	OBL	4.2
Arbutus menziesii	Madrone	native	tree	-	-	-	-
Arceuthobium campylopodum	Pine dwarf mistletoe	native	perennial herb (parasitic)	-	-	-	-
Arctostaphylos glandulosa ssp. *cushingiana*	Cushing manzanita	native	shrub	-	-	-	-
Arctostaphylos manzanita ssp. *elegans*	Konocti manzanita	native	shrub	Rank 1B.3	-	-	-
Arctostaphylos manzanita ssp. *manzanita*	Common manzanita	native	shrub	-	-	-	-
Arctostaphylos viscida ssp. *pulchella*	White leaf manzanita	native	tree, shrub	-	-	-	5
Arctostaphylos viscida ssp. *viscida*	Smooth white leaf manzanita	native	tree, shrub	-	-	-	2.2
Arnica discoidea	Rayless arnica	native	perennial herb	-	-	-	-
Artemisia douglasiana	California mugwort	native	perennial herb	-	-	FAC	-
Asclepias cordifolia	Purple milkweed	native	perennial herb	-	-	-	-
Asclepias eriocarpa	Indian milkweed	native	perennial herb	-	-	-	-
Asclepias fascicularis	Milkweed	native	perennial herb	-	-	FAC	-
Aspidotis densa	Lace fern	native	fern	-	-	-	3.4
Astragalus breweri	Brewer's milk vetch	native	annual herb	Rank 4.2	-	-	3.2
Astragalus clevelandii	Cleveland's milk vetch	native	perennial herb	Rank 4.3	-	FAC	6.1
Astragalus gambelianus	Gambel's dwarf milk vetch	native	annual herb	-	-	-	-
Astragalus rattanii var. *jepsonianus*	Jepson's milk vetch	native	annual herb	Rank 1B.2	-	-	4.3

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Athyrium filix-femina var. *cyclosorum*	Western lady fern	native	fern	-	-	FAC	-
Athysanus pusillus	Dwarf athysanus	native	annual herb	-	-	-	-
Avena barbata	Slim oat	non-native (invasive)	annual, perennial grass	-	Moderate	-	-
Avena fatua	Wildoats	non-native (invasive)	annual grass	-	Moderate	-	-
Baccharis pilularis ssp. *consanguinea*	Coyote brush	native	shrub	-	-	-	-
Baccharis salicifolia ssp. *salicifolia*	Mule fat	native	shrub	-	-	FAC	-
Balsamorhiza macrolepis	Big scale balsam root	native	perennial herb	Rank 1B.2	-	-	-
Barbarea vulgaris	Yellow rocket	non-native	perennial herb	-	-	FAC	-
Bellardia trixago	Mediterranean lineseed	non-native (invasive)	annual herb	-	Limited	-	-
Brickellia californica	California brickellia	native	perennial herb	-	-	FACU	-
Briza maxima	Rattlesnake grass	non-native (invasive)	annual grass	-	Limited	-	-
Briza minor	Little rattlesnake grass	non-native	annual grass	-	-	FAC	-
Brodiaea elegans ssp. *elegans*	Harvest brodiaea	native	perennial herb	-	-	FACU	-
Brodiaea leptandra	Narrow-anthered brodiaea	native	perennial herb	Rank 1B.2	-	-	-
Bromus carinatus var. *carinatus*	California brome	native	perennial grass	-	-	-	-
Bromus diandrus	Ripgut brome	non-native (invasive)	annual grass	-	Moderate	-	-
Bromus hordeaceus	Soft chess	non-native (invasive)	annual grass	-	Limited	FACU	-
Bromus laevipes	Narrow flowered brome	native	annual, perennial grass	-	-	-	1.7

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Bromus madritensis ssp. *madritensis*	Foxtail chess	non-native	annual grass	-	-	UPL	-
Bromus madritensis ssp. *rubens*	Foxtail brome	non-native (invasive)	annual grass	-	High	UPL	-
Calandrinia menziesii	Red maids	native	annual herb	-	-	FACU	-
Callitriche heterophylla var. *bolanderi*	Bolander's water starwort	native	annual herb	-	-	OBL	-
Calochortus amabilis	Golden fairy lantern	native	perennial herb	-	-	-	-
Calochortus luteus	Yellow mariposa	native	perennial herb	-	-	-	-
Calochortus splendens	Splendid mariposa	native	perennial herb	-	-	-	-
Calochortus tolmiei	Hairy star tulip	native	perennial herb	-	-	-	-
Calochortus uniflorus	Large flowered star tulip	native	perennial herb	Rank 4.2	-	FACW	1.7
Calochortus vestae	Yellow mariposa	native	perennial herb	-	-	-	2
Calycadenia fremontii	Fremont's calycadenia	native	annual herb	-	-	-	-
Calycadenia pauciflora	Small flowered calycadenia	native	annual herb	-	-	-	5.3
Calycanthus occidentalis	Spicebush	native	shrub	-	-	FAC	-
Calystegia collina ssp. *collina*	Hillside morning glory	native	perennial herb	-	-	-	4.7
Calystegia collina ssp. *oxyphylla*	Mt. Saint Helena morning glory	native	perennial herb (rhizomatous)	Rank 4.2	-	-	5.6
Calystegia occidentalis ssp. *occidentalis*	Modoc morning glory	native	perennial herb	-	-	-	-
Calystegia purpurata ssp. *purpurata*	Smooth western morning glory	native	perennial herb	-	-	-	-
Camissoniopsis intermedia	Intermediate sun cups	native	annual herb	-	-	-	-
Campanula angustiflora	Eastwood's harebell	native	annual herb	-	-	-	3.9
Capsella bursa-pastoris	Shepherd's purse	non-native	annual herb	-	-	FACU	-
Cardamine hirsuta	Hairy bitter cress	non-native	annual herb	-	-	FACU	-

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Cardamine oligosperma	Idaho bittercress	native	annual, perennial herb	-	-	FAC	-
Carduus pycnocephalus ssp. *pycnocephalus*	Italian thistle	non-native (invasive)	annual herb	-	Moderate	-	-
Carex barbarae	Valley sedge	native	perennial grasslike herb	-	-	FAC	-
Carex densa	Dense sedge	native	perennial grasslike herb	-	-	OBL	-
Carex multicaulis	Forest sedge	native	perennial grasslike herb	-	-	-	-
Carex nudata	Torrent sedge	native	perennial grasslike herb	-	-	FACW	-
Carex pellita	Woolly sedge	native	perennial grasslike herb	-	-	OBL	-
Carex praegracilis	Field sedge	native	perennial grasslike herb	-	-	FACW	-
Carex serratodens	Bifid sedge	native	perennial grasslike herb	-	-	FACW	4.9
Carex tumulicola	Split awn sedge	native	perennial grasslike herb	-	-	FACU	-
Castilleja affinis ssp. *affinis*	Coast Indian paint brush	native	perennial herb	-	-	-	-
Castilleja applegatei ssp. *martinii*	Martin's paintbrush	native	perennial herb	-	-	-	-
Castilleja attenuata	Narrow leaved owl's clover	native	annual herb	-	-	-	-
Castilleja densiflora ssp. *densiflora*	Dense flower owl's clover	native	annual herb	-	-	-	-
Castilleja exserta ssp. *exserta*	Purple owl's clover	native	annual herb	-	-	-	-
Castilleja foliolosa	Texas paintbrush	native	perennial herb	-	-	-	2.3
Castilleja minor	Little paintbrush	native	annual herb	-	-	OBL	-
Castilleja rubicundula ssp. *lithospermoides*	Cream sacs	native	annual herb	-	-	-	2.4
Caulanthus lasiophyllus	California mustard	native	annual herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Ceanothus cuneatus var. *cuneatus*	Buck brush	native	shrub	-	-	-	1.5
Ceanothus foliosus var. *foliosus*	Wavy leaved ceanothus	native	shrub	-	-	-	-
Ceanothus integerrimus var. *macrothyrsus*	Deerbrush	native	shrub	-	-	-	-
Ceanothus jepsonii	Musk brush	native	shrub	-	-	-	6
Centaurea calcitrapa	Purple star thistle	non-native (invasive)	annual, perennial herb	-	Moderate	-	-
Centaurea melitensis	Tocalote	non-native (invasive)	annual herb	-	Moderate	-	-
Centaurea solstitialis	Yellow starthistle	non-native (invasive)	annual herb	-	High	-	-
Centromadia fitchii	Spikeweed	native	annual herb	-	-	FACU	-
Cephalanthus occidentalis	Common buttonbush	native	shrub	-	-	OBL	-
Cerastium glomeratum	Large mouse ears	non-native	annual herb	-	-	UPL	-
Cercis occidentalis	Western redbud	native	tree, shrub	-	-	-	-
Cercocarpus betuloides var. *betuloides*	Birch leaf mountain mahogany	native	tree, shrub	-	-	-	-
Chaenactis glabriuscula var. *heterocarpha*	Variable fruited yellow chaenactis	native	annual herb	-	-	-	2.5
Chenopodium album	Lambs quarters	non-native	annual herb	-	-	FACU	-
Chlorogalum pomeridianum var. *pomeridianum*	Common soaproot	native	perennial herb	-	-	-	-
Chorizanthe membranacea	Pink spineflower	native	annual herb	-	-	-	-
Chorizanthe polygonoides var. *polygonoides*	Knotweed spineflower	native	annual herb	-	-	-	-
Cichorium intybus	Chicory	non-native	perennial herb	-	-	FACU	-
Cirsium cymosum var. *cymosum*	Peregrine thistle	native	perennial herb	-	-	-	-
Cirsium douglasii	Swamp thistle	native	perennial herb	-	-	OBL	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Cirsium occidentale var. *venustum*	Coulter's thistle	native	perennial herb	-	-	-	-
Cirsium vulgare	Bullthistle	non-native (invasive)	perennial herb	-	Moderate	FACU	-
Clarkia amoena ssp. *huntiana*	Farewell to spring	native	annual herb	-	-	-	-
Clarkia concinna ssp. *concinna*	Red ribbons	native	annual herb	-	-	-	-
Clarkia gracilis ssp. *tracyi*	Tracy's clarkia	native	annual herb	Rank 4.2	-	-	5
Clarkia purpurea ssp. *quadrivulnera*	Purple clarkia	native	annual herb	-	-	-	-
Clarkia rhomboidea	Tongue clarkia	native	annual herb	-	-	-	-
Clarkia unguiculata	Woodland clarkia	native	annual herb	-	-	-	-
Claytonia exigua ssp. *exigua*	Serpentine springbeauty	native	annual herb	-	-	-	3.4
Claytonia parviflora ssp. *parviflora*	Miner'slettuce	native	annual herb	-	-	FACU	-
Claytonia perfoliata ssp. *perfoliata*	Miner's lettuce	native	annual herb	-	-	FAC	-
Clematis lasiantha	Pipestem	native	perennial herb, vine	-	-	-	-
Clematis ligusticifolia	Creek clematis	native	perennial herb, vine	-	-	FAC	-
Collinsia greenei	Greene's collinsia	native	annual herb	-	-	-	5.2
Collinsia heterophylla var. *heterophylla*	Purple chinese houses	native	annual herb	-	-	-	-
Collinsia sparsiflora var. *sparsiflora*	Few flowered collinsia	native	annual herb	-	-	-	-
Collomia diversifolia	Serpentine collomia	native	annual herb	Rank 4.3	-	-	5.6
Collomia heterophylla	Varied leaved collomia	native	annual herb	-	-	-	-
Convolvulus arvensis	Field bindweed	non-native	perennial herb, vine	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Cordylanthus pilosus ssp. *pilosus*	Hairy bird's beak	native	annual herb	-	-	-	-
Cordylanthus tenuis ssp. *brunneus*	Serpentine bird's beak	native	annual herb (hemiparasitic)	Rank 4.3	-	-	5.1
Cornus nuttallii	Mountain dogwood	native	shrub	-	-	FACU	-
Cornus sericea ssp. *occidentalis*	Western dogwood	native	shrub	-	-	FACW	-
Crassula aquatica	Aquatic pygmy weed	native	annual herb	-	-	OBL	-
Crassula connata	Sand pygmy weed	native	annual herb	-	-	FAC	-
Crassula tillaea	Mediterranean pygmy weed	non-native	annual herb	-	-	FACU	-
Crocanthemum scoparium	Peak rush-rose	native	shrub	-	-	-	-
Croton setiger	Turkey-mullein	native	perennial herb	-	-	-	-
Crypsis sp.	Prickle grass	non-native	annual grass	-	-	FACW-OBL-	-
Cryptantha flaccida	Beaked cryptantha	native	annual herb	-	-	-	1.6
Cryptantha hispidula	Napa cryptantha	native	annual herb	-	-	-	6
Cuscuta brachycalyx	San joaquin dodder	native	annual herb, vine (parasitic)	-	-	-	-
Cynodon dactylon	Bermuda grass	non-native (invasive)	perennial grass	-	Moderate	FACU	-
Cynoglossum grande	Houndstongue	native	perennial herb	-	-	-	-
Cynosurus echinatus	Dogtail grass	non-native (invasive)	annual grass	-	Moderate	-	-
Cyperus eragrostis	Tall cyperus	native	perennial grasslike herb	-	-	FACW	-
Cytisus scoparius	Scotch broom	non-native (invasive)	shrub	-	High	-	-
Dactylis glomerata	Orchardgrass	non-native (invasive)	perennial grass	-	Limited	FACU	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Damasonium californicum	California damsonium	native	perennial herb (aquatic)	-	-	OBL	-
Danthonia californica	California oatgrass	native	perennial grass	-	-	FAC	-
Datisca glomerata	Durango root	native	perennial herb	-	-	FACW	-
Datura stramonium	Jimson weed	non-native	annual herb	-	-	-	-
Daucus pusillus	Wild carrot	native	annual herb	-	-	-	-
Delphinium hesperium ssp. *pallescens*	Western larkspur	native	perennial herb	-	-	FAC	-
Delphinium nudicaule	Canyon larkspur	native	perennial herb	-	-	-	-
Delphinium uliginosum	Swamp larkspur	native	perennial herb	Rank 4.2	-	OBL	5.7
Delphinium variegatum ssp. *variegatum*	Royal larkspur	native	perennial herb	-	-	-	-
Dendromecon rigida	Bush poppy	native	shrub	-	-	-	-
Deschampsia cespitosa ssp. *cespitosa*	Tufted hairgrass	native	perennial grass	-	-	FACW	-
Deschampsia danthonioides	Annual hairgrass	native	annual grass	-	-	FACW	-
Dichelostemma capitatum ssp. *capitatum*	Wild hyacinth	native	perennial herb	-	-	FACU	-
Dichelostemma congestum	Fork toothed ookow	native	perennial herb	-	-	-	-
Digitaria sanguinalis	Crabgrass	non-native	annual grass	-	-	FACU	-
Diplacus aurantiacus	Sticky monkeyflower	native	shrub	-	-	FACU	-
Diplacus congdonii	Congdon's monkeyflower	native	annual herb	-	-	FAC	-
Diplacus douglasii	Purple mouse ears	native	annual herb	-	-	FACW	2.7
Diplacus kelloggii	Kellogg's monkeyflower	native	annual herb	-	-	-	-
Diplacus tricolor	Tricolor monkeyflower	native	annual herb	-	-	OBL	-
Downingia concolor var. *concolor*	Spotted throat downingia	native	annual herb	-	-	OBL	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Downingia cuspidata	Toothed downingia	native	annual herb	-	-	OBL	-
Drymocallis glandulosa	Sticky cinquefoil	native	perennial herb	-	-	FAC	-
Dryopteris arguta	Wood fern	native	fern	-	-	-	-
Dudleya cymosa ssp. *cymosa*	Canyon dudleya	native	perennial herb	-	-	-	-
Echinochloa crus-galli	Barnyard grass	non-native	annual grass	-	-	FACW	-
Ehrendorferia chrysantha	Golden eardrops	native	perennial herb	-	-	-	1.1
Eleocharis acicularis	Needle spikerush	native	perennial grasslike herb	-	-	OBL	-
Eleocharis macrostachya	Spike rush	native	perennial grasslike herb	-	-	OBL	-
Elymus caput-medusae	Medusa head	non-native (invasive)	annual grass	-	High	-	-
Elymus elymoides var. *elymoides*	Squirrel tail grass	native	perennial grass	-	-	FACU	-
Elymus glaucus ssp. *glaucus*	Blue wild rye	native	perennial grass	-	-	FACU	-
Elymus multisetus	Big squirreltail grass	native	perennial grass	-	-	-	-
Elymus triticoides	Beardless wild rye	native	perennial grass	-	-	FAC	-
Epilobium brachycarpum	Willow herb	native	annual herb	-	-	-	-
Epilobium campestre	Smooth boisduvalia	native	annual herb	-	-	OBL	-
Epilobium canum ssp. *canum*	California fuchsia	native	perennial herb	-	-	-	-
Epilobium ciliatum	Slender willow herb	native	perennial herb	-	-	FACW	-
Epilobium densiflorum	Willow herb	native	annual herb	-	-	FACW	-
Epilobium minutum	Minute willowherb	native	annual herb	-	-	FACU	2
Epilobium torreyi	Narrow boisduvalia	native	annual herb	-	-	FACW	-
Epipactis gigantea	Stream orchid	native	perennial herb	-	-	OBL	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Equisetum hyemale ssp. *affine*	Giant scouring rush	native	fern	-	-	FACW	-
Equisetum laevigatum	Smooth scouring rush	native	fern	-	-	FACW	-
Ericameria arborescens	Golden fleece	native	shrub	-	-	-	1.3
Erigeron canadensis	Canada horseweed	native	annual herb	-	-	FACU	-
Erigeron greenei	Greene's narrow-leaved daisy	native	perennial herb	Rank 1B.2	-	-	-
Erigeron philadelphicus var. *philadelphicus*	Philadelphia fleabane	native	perennial herb	-	-	FACU	-
Eriodictyon californicum	Yerba santa	native	shrub	-	-	-	-
Eriogonum luteolum var. *luteolum*	Golden buckwheat	native	annual herb	-	-	-	3.8
Eriogonum nudum var. *nudum*	Nude buckwheat	native	shrub	-	-	-	-
Eriophyllum lanatum var. *achilleoides*	Yarrow leaved woolly sunflower	native	perennial herb	-	-	-	-
Erodium botrys	Big heron bill	non-native	annual herb	-	-	FACU	-
Erodium brachycarpum	White stemmed filaree	non-native	annual herb	-	-	-	-
Erodium cicutarium	Red stemmed filaree	non-native (invasive)	annual herb	-	Limited	-	-
Erodium moschatum	Whitestem filaree	non-native	annual herb	-	-	-	-
Eryngium aristulatum var. *aristulatum*	Jepson's button celery	native	perennial herb	-	-	OBL	-
Erythranthe guttata	Seep monkeyflower	native	perennial herb (rhizomatous)	-	-	OBL	-
Erythranthe latidens	Broad toothed monkeyflower	native	annual herb	-	-	OBL	-
Erythranthe microphylla	Seep monkeyflower	native	annual herb	-	-	OBL	-
Erythranthe nudata	Bare monkeyflower	native	annual herb	Rank 4.3	-	OBL	5.6
Erythronium helenae	St. Helena fawn lily	native	perennial herb (bulb)	Rank 4.2	-	-	4.5
Eschscholzia caespitosa	Tufted poppy	native	annual herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Eschscholzia californica	California poppy	native	annual, perennial herb	-	-	-	-
Eucalyptus camaldulensis	Red gum	non-native (invasive)	tree	-	Limited	FAC	-
Euphorbia serpyllifolia	Thyme-leaved spurge	native	annual herb	-	-	-	-
Euphorbia spathulata	Reticulate seeded spurge	native	annual herb	-	-	FAC	-
Eurybia radulina	Roughleaf aster	native	perennial herb				
Euthamia occidentalis	Western goldenrod	native	perennial herb	-	-	FACW	-
Festuca arundinacea	Reed fescue	non-native (invasive)	perennial grass	-	Moderate	FACU	-
Festuca bromoides	Brome fescue	non-native	annual grass	-	-	FACU	-
Festuca californica	California fescue	native	perennial grass	-	-	FACU	2.4
Festuca idahoensis	Blue fescue	native	perennial grass	-	-	FACU	1.3
Festuca microstachys	Small fescue	native	annual grass	-	-	-	-
Festuca myuros	Rattail sixweeks grass	non-native (invasive)	annual grass	-	Moderate	FACU	-
Festuca perennis	Italian rye grass	non-native (invasive)	annual, perennial grass	-	Moderate	FAC	-
Ficus carica	Common fig	non-native (invasive)	tree	-	Moderate	FACU	-
Frangula californica ssp. *tomentella*	Hoary coffeeberry	native	shrub	-	-	-	1.5
Fraxinus dipetala	Two petaled ash	native	tree, shrub	-	-	-	-
Fraxinus latifolia	Oregon ash	native	tree	-	-	FACW	-
Fritillaria affinis	Checker lily	native	perennial herb (bulb)	-	-	-	2
Fritillaria purdyi	Purdy's fritillary	native	perennial herb (bulb)	Rank 4.3	-	-	4.5

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Fritillaria recurva	Scarlet fritillary	native	perennial herb	-	-	-	-
Galium andrewsii ssp. *andrewsii*	Phlox leaved bedstraw	native	perennial herb	-	-	-	3.2
Galium aparine	Cleavers	native	annual herb	-	-	FACU	-
Galium bolanderi	Bolander's bedstraw	native	perennial herb	-	-	-	-
Galium californicum	California bedstraw	native	perennial herb	-	-	-	-
Galium murale	Tiny bedstraw	non-native	annual herb	-	-	-	-
Galium parisiense	Wall bedstraw	non-native	annual herb	-	-	UPL	-
Galium porrigens var. *porrigens*	Graceful bedstraw	native	vine, shrub	-	-	-	-
Galium porrigens var. *tenue*	Graceful bedstraw	native	vine, shrub	-	-	-	-
Garrya congdonii	Silk tassel	native	shrub	-	-	-	5
Gastridium phleoides	Nit grass	non-native	annual grass	-	-	FACU	-
Genista monspessulana	French broom	non-native (invasive)	shrub	-	High	-	-
Geranium dissectum	Wild geranium	non-native (invasive)	annual herb	-	Limited	-	-
Geranium molle	Crane's bill geranium	non-native	annual, perennial herb	-	-	-	-
Gilia capitata ssp. *capitata*	Blue field gilia	native	annual herb	-	-	-	1.6
Gilia clivorum	Purple spot gilia	native	annual herb	-	-	-	-
Gilia tricolor ssp. *diffusa*	Bird's eyes	native	annual herb	-	-	-	-
Githopsis specularioides	Venus' looking glass	native	annual herb	-	-	FACU	-
Glyceria declinata	Waxy mannagrass	non-native (invasive)	perennial grass	-	Moderate	FACW	-
Glycyrrhiza glabra	Licorice	non-native	perennial herb	-	-	-	-
Glycyrrhiza lepidota	American licorice	native	perennial herb	-	-	FAC	-
Gnaphalium palustre	Lowland cudweed	native	annual herb	-	-	FACW	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Gratiola ebracteata	Common hedge hyssop	native	annual herb	-	-	OBL	-
Grindelia hirsutula	Gumweed	native	perennial herb	-	-	FACW	1.4
Helenium bigelovii	Bigelow's sneezeweed	native	perennial herb	-	-	FACW	2.9
Helenium puberulum	Sneezeweed	native	perennial herb	-	-	FACW	-
Helianthella californica var. *californica*	California helianthella	native	perennial herb	-	-	-	-
Helianthus exilis	Serpentine sunflower	native	annual herb	Rank 4.2	-	FACU	5.7
Heliotropium curassavicum var. *oculatum*	Seaside heliotrope	native	perennial herb	-	-	FACU	-
Helminthotheca echioides	Bristly ox-tongue	non-native (invasive)	annual, perennial herb	-	Limited	FAC	-
Hemizonia congesta ssp. *clevelandii*	Cleveland's tarweed	native	annual herb	-	-	-	-
Hesperevax sparsiflora var. *sparsiflora*	Few flowered evax	native	annual herb	-	-	FACU	1.8
Hesperocyparis sargentii	Sargent cypress	native	tree, shrub	-	-	-	4.9
Hesperolinon bicarpellatum	Two carpellate western flax	native	annual herb	Rank 1B.2	-	-	6.2
Hesperolinon californicum	California western flax	native	annual herb	-	-	-	2.8
Hesperolinon didymocarpum	Lake County western flax	native	annual herb	SE, Rank 1B.2	-	-	6.2
Hesperolinon disjunctum	Coast range western flax	native	annual herb	-	-	-	6
Hesperolinon micranthum	Small flower western flax	native	annual herb	-	-	-	2.4
Hesperolinon spergulinum	Slender western flax	native	annual herb	-	-	-	4.7
Heterocodon rariflorum	Heterocodon	native	annual herb	-	-	FACW	-
Heteromeles arbutifolia	Toyon	native	shrub	-	-	-	-
Heterotheca oregona	Oregon golden aster	native	perennial herb	-	-	FACU	-
Hirschfeldia incana	Short-podded mustard	non-native (invasive)	perennial herb	-	Moderate	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Hoita macrostachya	California hemp	native	perennial herb	-	-	OBL	-
Holocarpha virgata ssp. *virgata*	Narrow tarplant	native	annual herb	-	-	-	-
Hordeum brachyantherum ssp. *brachyantherum*	Meadow barley	native	perennial grass	-	-	FACW	-
Hordeum brachyantherum ssp. *californicum*	Meadow barley	native	perennial grass	-	-	FACW	3.1
Hordeum marinum ssp. *gussoneanum*	Mediterranean barley	non-native (invasive)	annual grass	-	Moderate	FAC	-
Hordeum murinum ssp. *glaucum*	Foxtail	non-native (invasive)	annual grass	-	Moderate	FACU	-
Hordeum murinum ssp. *leporinum*	Farmer's foxtail	non-native (invasive)	annual grass	-	Moderate	FACU	-
Hypericum concinnum	Gold wire	native	perennial herb	-	-	-	-
Hypericum perforatum ssp. *perforatum*	Klamathweed	non-native	perennial herb	-	Moderate	FACU	-
Hypochaeris glabra	Smooth cats ear	non-native (invasive)	annual herb	-	Limited	-	-
Hypochaeris radicata	Hairy cats ear	non-native (invasive)	perennial herb	-	Moderate	FACU	-
Iris fernaldii	Fernald's iris	native	perennial herb	-	-	-	-
Iris macrosiphon	Ground iris	native	perennial herb	-	-	-	1.1
Juglans hindsii	Northern California black walnut	native	tree	Rank 1B.1	-	FAC	-
Juncus balticus ssp. *ater*	Baltic rush	native	perennial grasslike herb	-	-	FACW	-
Juncus bufonius	Common toad rush	native	annual grasslike herb	-	-	FACW	-
Juncus effusus ssp. *pacificus*	Pacific rush	native	perennial grasslike herb	-	-	FACW	-
Juncus mexicanus	Mexican rush	native	perennial grasslike herb	-	-	FACW	-
Juncus occidentalis	Western rush	native	perennial grasslike herb	-	-	FACW	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Juncus patens	Common rush	native	perennial grasslike herb	-	-	FACW	-
Juncus phaeocephalus var. *phaeocephalus*	Brown headed rush	native	perennial grasslike herb	-	-	FACW	-
Juncus tenuis	Slender rush	native	perennial grasslike herb	-	-	FACW	-
Juncus xiphioides	Iris leaved rush	native	perennial grasslike herb	-	-	OBL	-
Keckiella breviflora var. *glabrisepala*	Hairless gaping keckiella	native	shrub	-	-	-	-
Kickxia elatine	Sharp point fluellin	non-native	perennial herb	-	-	UPL	-
Koeleria macrantha	June grass	native	perennial grass	-	-	-	-
Lactuca saligna	Willow lettuce	non-native	annual herb	-	-	UPL	-
Lactuca serriola	Prickly lettuce	non-native	annual herb	-	-	FACU	-
Lagophylla minor	Little hareleaf	native	annual herb	-	-	-	4.7
Lagophylla ramosissima	Common hareleaf	native	annual herb	-	-	-	-
Lamium amplexicaule	Henbit	non-native	annual herb	-	-	-	-
Lasthenia californica ssp. *californica*	California goldfields	native	annual herb	-	-	FACU	-
Lasthenia glaberrima	Smooth goldfields	native	annual herb	-	-	OBL	-
Lasthenia glabrata ssp. *glabrata*	Yellow rayed goldfields	native	annual herb	-	-	FACW	-
Lasthenia gracilis	Needle goldfields	native	annual herb	-	-	-	-
Lathyrus cicera	Red peavine	non-native	annual herb	-	-	-	-
Lathyrus hirsutus	Caley pea	non-native	annual herb	-	-	FAC	-
Lathyrus tingitanus	Tangier pea	non-native	annual herb	-	-	-	-
Lathyrus vestitus var. *vestitus*	Hillside pea	native	perennial herb	-	-	-	1.8
Layia chrysanthemoides	Smooth tidy tips	native	annual herb	-	-	FACW	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Layia septentrionalis	Colusa layia	native	annual herb	Rank 1B.2	-	-	3.2
Leontodon saxatilis ssp. *longirostris*	Hawkbit	non-native	annual herb	-	-	FACU	-
Lepechinia calycina	Pitcher sage	native	shrub	-	-	-	-
Lepidium latifolium	Perennial pepperweed	non-native (invasive)	perennial herb	-	High	FAC	-
Lepidium nitidum	Shining pepper grass	native	annual herb	-	-	FAC	-
Lepidium strictum	Peppergrass	native	annual herb	-	-	-	-
Leptosiphon bicolor	True babystars	native	annual herb	-	-	UPL	-
Leptosiphon ciliatus	Whiskerbrush	native	annual herb	-	-	-	-
Leptosiphon parviflorus	Variable linanthus	native	annual herb	-	-	-	-
Lessingia ramulosa	Sonoma lessingia	native	annual herb	-	-	-	5.4
Lewisia rediviva var. *rediviva*	Bitter root	native	perennial herb	-	-	-	-
Limnanthes douglasii ssp. *nivea*	Douglas' meadowfoam	native	annual herb	-	-	OBL	-
Linanthus dichotomus ssp. *meridianus*	Evening snow	native	annual herb	-	-	-	-
Lithophragma affine	Common woodland star	native	perennial herb	-	-	-	-
Lithophragma heterophyllum	Woodland star	native	perennial herb	-	-	-	-
Logfia filaginoides	California cottonrose	native	annual herb	-	-	-	-
Logfia gallica	Narrowleaf cottonrose	non-native	annual herb	-	-	-	-
Lomatium californicum	Celery weed	native	perennial herb	-	-	-	-
Lomatium dasycarpum ssp. *tomentosum*	Woolly fruited lomatium	native	perennial herb	-	-	-	-
Lomatium hooveri	Hoover's lomatium	native	perennial herb	Rank 4.3	-	-	5.9
Lomatium marginatum var. *marginatum*	Hartweg's lomatium	native	perennial herb	-	-	-	-
Lomatium marginatum var. *purpureum*	Jepson's lomatium	native	perennial herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Lomatium utriculatum	Hog fennel	native	perennial herb	-	-	-	1.7
Lonicera hispidula	Pink honeysuckle	native	vine, shrub	-	-	FACU	-
Lonicera interrupta	Chaparral honeysuckle	native	vine, shrub	-	-	-	-
Lotus corniculatus	Bird's foot trefoil	non-native	perennial herb	-	-	FAC	-
Lotus tenuis	Narrow-leaf bird’s foot trefoil	non-native	perennial herb	-	-	FACU	-
Lupinus albifrons var. *albifrons*	Silver bush lupine	native	shrub	-	-	-	-
Lupinus albifrons var. *collinus*	Silver bush lupine	native	shrub	-	-	-	-
Lupinus bicolor	Miniature lupine	native	annual, perennial herb	-	-	-	-
Lupinus latifolius var. *latifolius*	Broad leaf lupine	native	perennial herb	-	-	FACW	-
Lupinus microcarpus var. *densiflorus*	Dense-flowered chick lupine	native	annual herb	-	-	-	-
Lupinus microcarpus var. *microcarpus*	Chick lupine	native	annual herb	-	-	-	-
Lupinus nanus	Sky lupine	native	annual herb	-	-	-	-
Lupinus succulentus	Arroyo lupine	native	annual herb	-	-	-	-
Luzula comosa var. *comosa*	Hairy wood rush	native	perennial grasslike herb	-	-	FAC	-
Lysimachia arvensis	Scarlet pimpernel	non-native	annual herb	-	-	FAC	-
Lysimachia latifolia	Pacific starflower	native	perennial herb	-	-	FAC	-
Lythrum hyssopifolia	Hyssop loosestrife	non-native (invasive)	annual, perennial herb	-	Limited	OBL	-
Madia elegans	Common madia	native	annual herb	-	-	-	-
Madia exigua	Small tarweed	native	annual herb	-	-	-	1.8
Madia gracilis	Gumweed	native	annual herb	-	-	-	-
Malacothrix floccifera	Woolly malacothrix	native	annual herb	-	-	-	2.1
Malva nicaeensis	Bull mallow	non-native	annual herb	-	-	-	-

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Malva parviflora	Cheeseweed	non-native	annual herb	-	-	-	-
Malvella leprosa	Alkali mallow	native	perennial herb	-	-	FACU	-
Marah watsonii	Watson's wild cucumber	native	perennial herb, vine	-	-	-	-
Marrubium vulgare	White horehound	non-native (invasive)	perennial herb	-	Limited	FACU	-
Marsilea vestita ssp. *vestita*	Hairy pepperwort	native	fern	-	-	OBL	-
Matricaria discoidea	Pineapple weed	native	annual herb	-	-	FACU	-
Medicago polymorpha	California burclover	non-native (invasive)	annual herb	-	Limited	FACU	-
Melica californica	California melic	native	perennial grass	-	-	-	-
Melica torreyana	Torrey's melica	native	perennial grass	-	-	-	-
Melilotus albus	White sweetclover	non-native	annual, biennial herb	-	-	-	-
Melilotus indicus	Annual yellow sweetclover	non-native	annual herb	-	-	FACU	-
Mentha pulegium	Pennyroyal	non-native (invasive)	perennial herb	-	Moderate	OBL	-
Micranthes integrifolia	Smooth leaf saxifrage	native	perennial herb	-	-	FACW	-
Micropus californicus var. *californicus*	Slender cottonweed	native	annual herb	-	-	FACU	-
Microseris douglasii ssp. *douglasii*	Douglas' microseris	native	annual herb	-	-	FACU	-
Microseris elegans	Elegant silverpuffs	native	annual herb	-	-	-	-
Mimetanthe pilosa	Snouted monkey flower	native	annual herb	-	-	FACW	-
Minuartia californica	Sandwort	native	annual herb	-	-	FACU	1.7
Minuartia douglasii	Douglas' sandwort	native	annual herb	-	-	-	3
Monardella villosa ssp. *villosa*	Coyote mint	native	perennial herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Monardella viridis	Green monardella	native	perennial herb	Rank 4.3	-	-	1
Montia fontana	Water montia	native	annual herb	-	-	OBL	-
Morus alba	Mulberry	non-native	tree	-	-	FACU	-
Muhlenbergia rigens	Deergrass	native	perennial grass	-	-	FAC	-
Myriophyllum sp.	Water-milfoil	non-native	perennial herb	-	-	OBL	-
Myriopteris covillei	Coville's lip fern	native	fern	-	-	-	-
Narcissus pseudonarcissus	Daffodil	non-native	perennial herb (bulb)	-	-	-	-
Navarretia atractyloides	Holly leaf navarretia	native	annual herb	-	-	-	-
Navarretia cotulifolia	Cotula navarretia	native	annual herb	Rank 4.2	-	OBL	-
Navarretia intertexta	Interwoven navarretia	native	annual herb	-	-	FACW	-
Navarretia jepsonii	Jepson's navarretia	native	annual herb	Rank 4.3	-	FACW	5.6
Navarretia leucocephala ssp. *leucocephala*	White headed navarretia	native	annual herb	-	-	OBL	-
Navarretia mellita	Skunk navarretia	native	annual herb	-	-	FAC	-
Navarretia pubescens	Purple navarretia	native	annual herb	-	-	-	2
Navarretia squarrosa	Skunkweed	native	annual herb	-	-	FACU	-
Nemacladus montanus	Mountain nemacladus	native	annual herb	-	-	-	6
Nemophila heterophylla	Canyon nemophila	native	annual herb	-	-	-	-
Nemophila menziesii var. *atomaria*	Baby blue eyes	native	annual herb	-	-	-	-
Nemophila menziesii var. *menziesii*	Baby blue eyes	native	annual herb	-	-	-	-
Nemophila parviflora var. *parviflora*	Small flowered nemophila	native	annual herb	-	-	-	-
Nicotiana acuminata var. *multiflora*	Many flowered tobacco	non-native	annual herb	-	-	-	-

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Oemleria cerasiformis	Oso berry	native	shrub	-	-	FACU	-
Packera eurycephala var. *eurycephala*	Widehead groundsel	native	perennial herb	-	-	-	-
Packera greenei	Flame ragwort	native	perennial herb	-	-	-	-
Parentucellia viscosa	Yellow glandweed	non-native (invasive)	annual herb	-	Limited	FAC	-
Paspalum dilatatum	Dallis grass	non-native	perennial grass	-	-	FAC	-
Pectocarya pusilla	Little pectocarya	native	annual herb	-	-	-	1.3
Pedicularis densiflora	Indian warrior	native	perennial herb	-	-	-	-
Pellaea andromedifolia	Coffee fern	native	fern	-	-	-	-
Pellaea mucronata var. *mucronata*	Bird's foot fern	native	fern	-	-	-	-
Penstemon heterophyllus var. *heterophyllus*	Foothill penstemon	native	perennial herb	-	-	-	-
Penstemon heterophyllus var. *purdyi*	Purdy's foothill penstemon	native	perennial herb	-	-	-	-
Pentagramma triangularis	Gold back fern	native	fern	-	-	-	-
Perideridia gairdneri ssp. *borealis*	Northern Gairdner's yampah	native	perennial herb	-	-	FAC	-
Perideridia kelloggii	Kellogg's yampah	native	perennial herb	-	-	-	2.1
Persicaria amphibia	Water smartweed	native	perennial herb (aquatic)	-	-	OBL	-
Persicaria maculosa	Spotted ladysthumb	non-native	annual herb	-	-	FACW	-
Persicaria punctata	Dotted smartweed	native	perennial herb	-	-	OBL	-
Petrorhagia dubia	Windmill pink	non-native	annual herb	-	-	-	-
Phacelia distans	Common phacelia	native	annual herb	-	-	OBL	1.1
Phacelia imbricata var. *imbricata*	Imbricate phacelia	native	annual herb	-	-	-	-

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Phalaris aquatica	Harding grass	non-native (invasive)	perennial grass	-	Moderate	FACU	-
Phalaris lemmonii	Lemmon's canarygrass	native	annual grass	-	-	FACW	-
Phalaris minor	Mediterranean canarygrass	non-native	annual grass	-	-	-	-
Phalaris paradoxa	Hood canarygrass	non-native	annual grass	-	-	FAC	-
Phoradendron bolleanum	Bollean mistletoe	native	shrub (parasitic)	-	-	-	-
Phoradendron leucarpum ssp. *tomentosum*	Mistletoe	native	shrub (parasitic)	-	-	-	-
Phyla nodiflora	Common lippia	native	perennial herb	-	-	FACW	-
Physalis lanceifolia	Narrow leaf tomatillo	non-native	annual herb	-	-	UPL	-
Pickeringia montana var. *montana*	Chaparral pea	native	shrub	-	-	-	-
Pinus attenuata	Knobcone pine	native	tree	-	-	-	2.5
Pinus ponderosa var. *pacifica*	Pacific ponderosa pine	native	tree	-	-	FACU	-
Pinus sabiniana	Bull pine	native	tree	-	-	-	1.4
Piperia transversa	Mountain piperia	native	perennial herb	-	-	-	-
Plagiobothrys bracteatus	Bracted allocarya	native	annual herb	-	-	FACW	-
Plagiobothrys fulvus var. *campestris*	Tawny popcorn flower	native	annual herb	-	-	-	-
Plagiobothrys glyptocarpus var. *glyptocarpus*	Sculptured allocarya	native	annual herb	-	-	FACW	-
Plagiobothrys greenei	Greene's allocarya	native	annual herb	-	-	FACW	-
Plagiobothrys nothofulvus	Rusty haired popcorn flower	native	annual herb	-	-	FAC	-
Plagiobothrys stipitatus var. *micranthus*	Common vernal pool allocarya	native	annual herb	-	-	FACW	-
Plantago coronopus	Cut leaf plantain	non-native	annual herb	-	-	FAC	-
Plantago erecta	California plantain	native	annual herb	-	-	-	1

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Plantago lanceolata	Ribwort	non-native (invasive)	perennial herb	-	Limited	FAC	-
Plantago patagonica	Patagonia plantain	native	annual herb	-	-	-	-
Platanus ×hispanica	London plane tree	non-native	tree	-	-	-	-
Platystemon californicus	Cream cups	native	annual herb	-	-	-	1.7
Plectritis ciliosa	Long spurred plectritis	native	annual herb	-	-	FACU	-
Plectritis macrocera	Plectritis	native	annual herb	-	-	FACU	-
Pleuropogon californicus var. *californicus*	Annual semaphoregrass	native	annual grass	-	-	OBL	-
Poa annua	Annual blue grass	non-native	annual grass	-	-	FAC	-
Poa bulbosa ssp. *bulbosa*	Bulbous blue grass	non-native	perennial grass	-	-	FACU	-
Poa pratensis ssp. *pratensis*	Kentucky blue grass	non-native (invasive)	perennial grass	-	Limited	FAC	-
Poa secunda ssp. *secunda*	Sandberg's bluegrass	native	perennial grass	-	-	FACU	-
Pogogyne douglasii	Douglas' pogogyne	native	annual herb	-	-	OBL	-
Pogogyne zizyphoroides	Sacramento mint	native	annual herb	-	-	OBL	-
Polygala californica	Milkwort	native	perennial herb	-	-	-	-
Polygonum aviculare ssp. *aviculare*	Prostrate knotweed	non-native	annual, perennial herb	-	-	FACW	-
Polypodium californicum	California polypody	native	fern	-	-	-	-
Polypodium calirhiza	Licorice fern	native	fern	-	-	-	-
Polypogon interruptus	Ditch beard grass	non-native	perennial grass	-	-	FACW	-
Polypogon maritimus	Mediterranean beard grass	non-native	annual grass	-	-	OBL	-
Polypogon monspeliensis	Annual beard grass	non-native (invasive)	annual grass	-	Limited	FACW	-
Populus fremontii ssp. *fremontii*	Cottonwood	native	tree	-	-	FAC	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Portulaca oleracea	Common purslane	non-native	annual herb	-	-	FAC	-
Primula hendersonii	Mosquito bill	native	perennial herb	-	-	-	-
Prunus cerasifera	Cherry plum	non-native (invasive)	tree	-	Limited	-	-
Pseudognaphalium californicum	Ladies' tobacco	native	annual, perennial herb	-	-	-	-
Pseudognaphalium luteoalbum	Jersey cudweed	non-native	annual herb	-	-	FAC	-
Pseudotsuga menziesii var. *menziesii*	Douglas fir	native	tree	-	-	FACU	-
Psilocarphus brevissimus var. *brevissimus*	Woolly heads	native	annual herb	-	-	FACW	-
Psilocarphus chilensis	Round woolly marbles	native	annual herb	-	-	FACW	-
Pteridium aquilinum var. *pubescens*	Western bracken fern	native	fern	-	-	FACU	-
Pterostegia drymarioides	Fairy mist	native	annual herb	-	-	-	-
Quercus ×morehus	Oracle oak	native	tree	-	-	-	-
Quercus berberidifolia	Inland scrub oak	native	tree	-	-	-	-
Quercus chrysolepis	Gold cup live oak	native	tree	-	-	-	-
Quercus douglasii	Blue oak	native	tree	-	-	-	-
Quercus durata var. *durata*	Leather oak	native	shrub	-	-	-	5.8
Quercus kelloggii	California black oak	native	tree	-	-	-	-
Quercus lobata	Valley oak	native	tree	-	-	FACU	-
Quercus wislizeni var. *wislizeni*	Interior live oak	native	tree, shrub	-	-	-	-
Rafinesquia californica	California chicory	native	annual herb	-	-	-	-
Ranunculus aquatilis var. *aquatilis*	Whitewater crowfoot	native	perennial herb (aquatic)	-	-	OBL	-
Ranunculus californicus var. *californicus*	Common buttercup	native	perennial herb	-	-	FACU	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Ranunculus hebecarpus	Pubescent fruited buttercup	native	annual herb	-	-	-	-
Ranunculus muricatus	Buttercup	non-native	annual, perennial herb	-	-	FACW	-
Ranunculus occidentalis var. *occidentalis*	Western buttercup	native	perennial herb	-	-	FAC	-
Raphanus raphanistrum	Jointed charlock	non-native	annual, perennial herb	-	-	-	-
Raphanus sativus	Wild radish	non-native (invasive)	annual, biennial herb	-	Limited	-	-
Rhamnus ilicifolia	Evergreen buckthorn	native	shrub	-	-	-	-
Rhododendron occidentale	Western azalea	native	tree, shrub	-	-	FAC	-
Rhus aromatica	Fragrant sumac	native	shrub	-	-	FACU	-
Ribes malvaceum var. *malvaceum*	Chaparral currant	native	shrub	-	-	-	-
Rigiopappus leptocladus	Wire weed	native	annual herb	-	-	-	1.9
Robinia pseudoacacia	Black locust	non-native (invasive)	tree	-	Limited	FACU	-
Rosa californica	California wild rose	native	shrub	-	-	FAC	-
Rubus armeniacus	Himalayan blackberry	non-native (invasive)	shrub	-	High	FAC	-
Rumex crispus	Curly dock	non-native (invasive)	perennial herb	-	Limited	FAC	-
Rumex pulcher	Fiddleleaf dock	non-native	perennial herb	-	-	FAC	-
Salix breweri	Serpentine willow	native	shrub	-	-	FAC	6
Salix exigua var. *hindsiana*	Sandbar willow	native	tree, shrub	-	-	FACW	-
Salix gooddingii	Gooding's willow	native	tree	-	-	FACW	-
Salix laevigata	Polished willow	native	tree	-	-	FACW	-
Salix lasiolepis	Arroyo willow	native	tree, shrub	-	-	FACW	-
Salsola sp.	Russian thistle	non-native	annual herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Salvia columbariae	Chia sage	native	annual herb	-	-	-	-
Salvia sonomensis	Sonoma sage	native	perennial herb	-	-	-	1.6
Sambucus nigra ssp. *caerulea*	Blue elderberry	native	shrub	-	-	FAC	-
Sanicula bipinnata	Poison sanicle	native	perennial herb	-	-	-	-
Sanicula bipinnatifida	Purple sanicle	native	perennial herb	-	-	-	1.8
Sanicula crassicaulis	Pacific sanicle	native	perennial herb	-	-	-	-
Sanicula tuberosa	Turkey pea	native	perennial herb	-	-	-	1.3
Schoenoplectus acutus var. *occidentalis*	Tule	native	perennial grasslike herb	-	-	OBL	-
Schoenoplectus tabernaemontani	Softstem bulrush	native	perennial grasslike herb	-	-	OBL	-
Scleranthus annuus ssp. *annuus*	German knotgrass	non-native	annual herb	-	-	FACU	-
Scrophularia californica	California bee plant	native	perennial herb	-	-	FAC	-
Scutellaria antirrhinoides	Snapdragon skullcap	native	perennial herb	-	-	-	2.3
Scutellaria californica	California skullcap	native	perennial herb	-	-	-	-
Scutellaria siphocampyloides	Gray leaved skullcap	native	perennial herb	-	-	FACU	-
Scutellaria tuberosa	Dannie's skullcap	native	perennial herb	-	-	-	-
Senecio aronicoides	Butterweed	native	perennial herb	-	-	-	-
Senecio clevelandii var. *clevelandii*	Cleveland's ragwort	native	perennial herb	Rank 4.3	-	-	-
Senecio vulgaris	Common groundsel	non-native	annual herb	-	-	FACU	-
Sherardia arvensis	Field madder	non-native	annual herb	-	-	-	-
Sidalcea diploscypha	Fringed checker mallow	native	annual herb	-	-	-	2.6
Sidalcea hartwegii	Hartweg's checkerbloom	native	annual herb	-	-	-	1.6
Sidalcea hirsuta	Hairy checkerbloom	native	annual herb	-	-	OBL	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Sidalcea keckii	Keck's checkerbloom	native	annual herb	FE, Rank 1B.1	-	-	3
Silene gallica	Common catchfly	non-native	annual herb	-	-	-	-
Silene laciniata ssp. *californica*	California indian pink	native	perennial herb	-	-	-	-
Silybum marianum	Milk thistle	non-native (invasive)	annual, perennial herb	-	Limited	-	-
Sisymbrium irio	London rocket	non-native (invasive)	annual herb	-	Moderate	-	-
Sisymbrium officinale	Hedge mustard	non-native	annual herb	-	-	-	-
Sisyrinchium bellum	Blue eyed grass	native	perennial herb	-	-	FACW	-
Solanum parishii	Parish's purple nightshade	native	shrub	-	-	-	-
Solanum xanti	Nightshade	native	perennial herb, shrub	-	-	-	-
Solidago elongata	West coast canada goldenrod	native	perennial herb	-	-	FACU	-
Soliva sessilis	South american soliva	non-native	annual herb	-	-	FACU	-
Sonchus asper ssp. *asper*	Prickly sow thistle	non-native	annual herb	-	-	FAC	-
Sonchus oleraceus	Common sow thistle	non-native	annual herb	-	-	UPL	-
Sorghum halepense	Johnsongrass	non-native	perennial grass	-	-	FACU	-
Spartium junceum	Spanish broom	non-native (invasive)	shrub	-	High	-	-
Spergularia rubra	Purple sand spurry	non-native	annual, perennial herb	-	-	FAC	-
Spiranthes porrifolia	Western ladies tresses	native	perennial herb	-	-	FACW	-
Stachys albens	Cobwebby hedge nettle	native	perennial herb	-	-	OBL	-
Stachys rigida var. *quercetorum*	Rough hedgenettle	native	perennial herb	-	-	FACW	-
Stebbinsoseris heterocarpa	Grassland stebbinsoseris	native	annual herb	-	-	-	-
Stellaria media	Chickweed	non-native	annual herb	-	-	FACU	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Stephanomeria virgata ssp. *pleurocarpa*	Tall stephanomeria	native	annual herb	-	-	-	-
Stipa cernua	Nodding needle grass	native	perennial grass	-	-	-	-
Stipa lepida	Foothill needle grass	native	perennial grass	-	-	-	-
Stipa miliacea var. *miliacea*	Smilo grass	non-native (invasive)	perennial grass	-	Limited	-	-
Stipa pulchra	Purple needle grass	native	perennial grass	-	-	-	-
Streptanthus breweri	Brewer's jewelflower	native	annual herb	-	-	-	5.7
Streptanthus glandulosus ssp. *glandulosus*	Jewelflower	native	annual herb	-	-	-	-
Streptanthus hesperidis	Green jewel-flower	native	annual herb	Rank 1B.2	-	-	-
Streptanthus morrisonii	Morrison's jewelflower	native	perennial herb	Rank 1B.2	-	-	6.1
Symphoricarpos albus var. *laevigatus*	Common snowberry	native	shrub	-	-	FACU	-
Symphoricarpos mollis	Creeping snowberry	native	shrub	-	-	FACU	-
Tamarix parviflora	Tamarisk	non-native (invasive)	tree, shrub	-	High	FAC	-
Taraxacum officinale	Red seeded dandelion	non-native	perennial herb	-	-	FACU	-
Taraxia ovata	Sun cup	native	perennial herb	-	-	-	-
Tetrapteron graciliflorum	Hill sun cup	native	annual herb	-	-	-	-
Thalictrum fendleri var. *polycarpum*	Torrey's meadow rue	native	perennial herb	-	-	FAC	-
Thermopsis californica var. *californica*	California goldenbanner	native	perennial herb (rhizomatous)	-	-	-	-
Thysanocarpus curvipes ssp. *curvipes*	Fringe pod	native	annual herb	-	-	-	-
Torilis arvensis	Field hedge parsley	non-native (invasive)	annual herb	-	Moderate	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Torilis nodosa	Wild parsley	non-native	annual herb	-	-	-	-
Toxicodendron diversilobum	Poison oak	native	vine, shrub	-	-	FACU	-
Toxicoscordion fontanum	Marsh zigadenus	native	perennial herb	Rank 4.2	-	OBL	-
Toxicoscordion fremontii	Fremont's star lily	native	perennial herb	-	-	-	-
Toxicoscordion micranthum	Small flowered star lily	native	perennial herb	-	-	OBL	-
Tragopogon porrifolius	Salsify	non-native	perennial herb	-	-	-	-
Tribulus terrestris	Puncture vine	non-native (invasive)	annual herb	-	Limited	-	-
Trichostema lanceolatum	Vinegarweed	native	annual herb	-	-	FACU	-
Trichostema laxum	Turpentine weed	native	annual herb	-	-	-	4
Trifolium albopurpureum	Indian clover	native	annual herb	-	-	FACU	-
Trifolium bifidum var. *bifidum*	Pinole clover	native	annual herb	-	-	-	-
Trifolium campestre	Hop clover	non-native	annual herb	-	-	-	-
Trifolium ciliolatum	Tree clover	native	annual herb	-	-	-	-
Trifolium depauperatum var. *depauperatum*	Dwarf sack clover	native	annual herb	-	-	FAC	-
Trifolium depauperatum var. *truncatum*	Dwarf sack clover	native	annual herb	-	-	FAC	-
Trifolium dichotomum	Branched indian clover	native	annual herb	-	-	-	-
Trifolium dubium	Shamrock	non-native	annual herb	-	-	UPL	-
Trifolium fucatum	Bull clover	native	annual herb	-	-	FACU	1.3
Trifolium glomeratum	Clustered clover	non-native	annual herb	-	-	-	-
Trifolium gracilentum	Pin point clover	native	annual herb	-	-	-	1
Trifolium hirtum	Rose clover	non-native (invasive)	annual herb	-	Limited	-	-
Trifolium incarnatum	Crimson clover	non-native	annual herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Trifolium microcephalum	Small head clover	native	annual herb	-	-	FAC	1.4
Trifolium microdon	Valparaiso clover	native	annual herb	-	-	-	-
Trifolium pratense	Red clover	non-native	perennial herb	-	-	FACU	-
Trifolium subterraneum	Subterranean clover	non-native	annual herb	-	-	-	-
Trifolium tomentosum	Woolly clover	non-native	annual herb	-	-	-	-
Trifolium variegatum var. *geminiflorum*	Small-flowered variegated clover	native	annual herb	-	-	FAC	-
Trifolium variegatum var. *major*	Large variegated clover	native	annual herb	-	-	FAC	-
Trifolium variegatum var. *variegatum*	Variegated clover	native	annual herb	-	-	FAC	-
Trifolium willdenovii	Tomcat clover	native	annual herb	-	-	FACW	1.3
Triglochin scilloides	Flowering-quillwort	native	annual herb (aquatic)	-	-	OBL	-
Triphysaria eriantha ssp. *eriantha*	Butter 'n' eggs	native	annual herb	-	-	-	-
Triphysaria pusilla	Little owl's clover	native	annual herb	-	-	-	-
Triphysaria versicolor ssp. *faucibarbata*	Yellow owl's clover	native	annual herb	-	-	-	-
Triteleia hyacinthina	Wild hyacinth	native	perennial herb	-	-	FAC	-
Triteleia laxa	Ithuriel's spear	native	perennial herb	-	-	-	-
Triteleia lugens	Dark-mouthed triteleia	native	perennial herb	Rank 4.3	-	-	-
Triteleia peduncularis	Marsh triteleia	native	perennial herb	-	-	FACW	3.8
Typha angustifolia	Narrow leaf cattail	non-native	perennial herb (aquatic)	-	-	OBL	-
Typha latifolia	Broadleaf cattail	native	perennial herb (aquatic)	-	-	OBL	-
Ulmus pumila	Siberian elm	non-native	tree	-	-	UPL	-
Umbellularia californica	California bay	native	tree	-	-	FAC	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Uropappus lindleyi	Silver puffs	native	annual herb	-	-	-	-
Urtica dioica ssp. *holosericea*	Stinging nettle	native	perennial herb	-	-	FAC	-
Velezia rigida	Velezia	non-native	annual herb	-	-	-	-
Verbascum blattaria	Moth mullein	non-native	perennial herb	-	-	UPL	-
Verbascum thapsus	Woolly mullein	non-native (invasive)	perennial herb	-	Limited	FACU	-
Verbena lasiostachys var. *scabrida*	Robust vervain	native	perennial herb	-	-	FAC	-
Veronica anagallis-aquatica	Water speedwell	non-native	perennial herb	-	-	OBL	-
Veronica peregrina ssp. *xalapensis*	Speedwell	native	annual herb	-	-	FAC	-
Vicia benghalensis	Purple vetch	non-native	annual herb, vine	-	-	-	-
Vicia sativa ssp. *nigra*	Smaller common vetch	non-native	annual herb, vine	-	-	FACU	-
Vicia sativa ssp. *sativa*	Common vetch	non-native	annual herb, vine	-	-	FACU	-
Vicia villosa ssp. *varia*	Smooth vetch	non-native	annual herb, vine	-	-	-	-
Vicia villosa ssp. *villosa*	Hairy vetch	non-native	annual herb, vine	-	-	-	-
Viola douglasii	Douglas' violet	native	perennial herb	-	-	-	2.8
Viola purpurea ssp. *quercetorum*	Goosefoot yellow violet	native	perennial herb	-	-	-	-
Vitis californica	California wild grape	native	vine, shrub	-	-	FACU	-
Vitis vinifera	Cultivated grape	non-native	vine, shrub	-	-	-	-
Whipplea modesta	Modesty	native	vine, shrub	-	-	-	-
Woodwardia fimbriata	Western chain fern	native	fern	-	-	OBL	-
Wyethia angustifolia	Narrow leaved mule ears	native	perennial herb	-	-	FACU	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Wyethia glabra	Smooth mule ears	native	perennial herb	-	-	-	-
Wyethia helenioides	Gray mule ears	native	perennial herb	-	-	-	-
Xanthium strumarium	Cocklebur	native	annual herb	-	-	FAC	-
Zannichellia palustris	Horned pondweed	native	perennial herb	-	-	OBL	-
Zeltnera muehlenbergii	Muehlenberg's centaury	native	annual herb	-	-	FAC	-
Zeltnera trichantha	Alkali centaury	native	annual herb	-	-	FAC	-

[1]Key to Conservation Status (CNPS 2019a):

FE	Federal Endangered
FT	Federal Threatened
SE	State Endangered
ST	State Threatened
Rank 1A	CNPS Rank 1A: Presumed extirpated in California and either rare or extinct elsewhere
Rank 1B.1	CNPS Rank 1B.1: Rare, threatened, or endangered in California and elsewhere (seriously threatened in California)
Rank 1B.2	CNPS Rank 1B.2: Rare, threatened, or endangered in California and elsewhere (moderately threatened in California)
Rank 1B.3	CNPS Rank 1B.3: Rare, threatened, or endangered in California and elsewhere (not very threatened in California)
Rank 2A	CNPS Rank 2A: Presumed extirpated in California, but more common elsewhere
Rank 2B.1	CNPS Rank 2B.1: Rare, threatened, or endangered in California, but more common elsewhere (seriously threatened in California)
Rank 2B.2	CNPS Rank 2B.2: Rare, threatened, or endangered in California, but more common elsewhere (moderately threatened in California)
Rank 2B.3	CNPS Rank 2B.3: Rare, threatened, or endangered in California, but more common elsewhere (not very threatened in California)
Rank 3.1	CNPS Rank 3.1: Plants about which more information is needed - A review list (seriously threatened in California)
Rank 3.2	CNPS Rank 3.2: Plants about which more information is needed - A review list (moderately threatened in California)
Rank 3.3	CNPS Rank 3.3: Plants about which more information is needed - A review list (not very threatened in California)
Rank 4.1	CNPS Rank 4.1: Plants of limited distribution - A watch list (seriously threatened in California)
Rank 4.2	CNPS Rank 4.2: Plants of limited distribution - A watch list (moderately threatened in California)
Rank 4.3	CNPS Rank 4.3: Plants of limited distribution - A watch list (not very threatened in California)

[2]Key to Cal-IPC Status (Cal-IPC 2019):

High: These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

Moderate: These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited: These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

[3]Key to Wetland Status (Lichvar et al. 2016):

OBL Obligate plant; almost always occurs in wetlands.
FACW Facultative wetland plant; usually occurs in wetlands, but may occur in non-wetlands.
FAC Facultative plant; occurs in wetlands and nonwetlands.
FACU Facultative upland plant; usually occurs in non-wetlands, but may occur in wetlands.
UPL Upland plant; almost never occur in wetlands.

[4]Key to Serpentine Affinity (Safford et al. 2005):

6 95–100% of records occur on ultramafics
5 85–94% of records occur on ultramafics
4 75–84% of records occur on ultramafics
3 65–74% of records occur on ultramafics
2 55–64% of records occur on ultramafics
1 45–54% of records occur on ultramafics
0.75 35–44% of records occur on ultramafics
0.5 25–34% of records occur on ultramafics
0.25 15–24% of records occur on ultramafics
0.1 0–14% of records occur on ultramafics
0 0% of records occur on ultramafics

APPENDIX D

POTENTIAL FOR SPECIAL-STATUS PLANT SPECIES TO OCCUR WITHIN THE PHASE 2/OPEN SPACE STUDY AREA

Appendix D. Potential for Special-Status Plant Species to occur within the Phase 2/Open Space Study Area

List compiled from database searches focused on the following 7.5-minute USGS quadrangles: Aetna Springs, Calistoga, Chiles Valley, Clearlake Highlands, Detert Reservoir, Glascock Mountain, Jericho Valley, Knoxville, Lower Lake, Mark West Springs, Middletown, Mount Saint Helena, Saint Helena, Walter Springs, Whispering Pines, and Wilson Valley (CNPS 2019a, CDFW 2019a).

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Purdy's onion *Allium fimbriatum var. purdyi*	Rank 4.3	Chaparral, cismontane woodland. Elevation ranges from 980 to 1970 feet (300 to 600 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable rocky, serpentine substrate in chaparral, foothill pine woodland, and Sargent cypress woodland habitats exists within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Napa false indigo *Amorpha californica var. napensis*	Rank 1B.2	Broadleaved upland forest (openings), chaparral, cismontane woodland. Elevation ranges from 390 to 6560 feet (120 to 2000 meters). Blooms Apr-Jul.	**Moderate Potential.** Potentially suitable, cool, forested habitat on north-facing slopes and/or along draws exists within the Phase 2/Open Space Study Area, and the species is known from a nearby occurrence.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
bent-flowered fiddleneck *Amsinckia lunaris*	Rank 1B.2	Coastal bluff scrub, cismontane woodland, valley and foothill grassland. Elevation ranges from 5 to 1640 feet (3 to 500 meters). Blooms Mar-Jun.	**Moderate Potential.** Potentially suitable grassland, chaparral, and scrub habitats exist within the Phase 2/Open Space Study Area, and the species is known from nearby occurrences.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
dimorphic snapdragon *Antirrhinum subcordatum*	Rank 4.3	Chaparral, lower montane coniferous forest. Elevation ranges from 605 to 2625 feet (185 to 800 meters). Blooms Apr-Jul.	**Moderate Potential.** Potentially suitable chaparral, foothill pine woodland, and blue oak woodland on serpentine substrate exists within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
twig-like snapdragon *Antirrhinum virga*	Rank 4.3	Chaparral, lower montane coniferous forest. Elevation ranges from 325 to 6610 feet (100 to 2015 meters). Blooms Jun-Jul.	**Present.** This species was observed in two locations within the Phase 2/Open Space Study Area on rhyolite substrates in chaparral habitat. It has also been observed within the Phase 1 Phase 2/Open Space Study Area in deerweed scrub habitat.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
modest rockcress *Arabis modesta*	Rank 4.3	Chaparral, lower montane coniferous forest. Elevation ranges from 390 to 2625 feet (120 to 800 meters). Blooms Mar-Jul.	**Moderate Potential.** Potentially suitable rocky chaparral, Sargent cypress, and Douglas fir forest habitats exist within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Oregon rockcress *Arabis oregana*	Rank 4.3	Chaparral, lower montane coniferous forest. Elevation ranges from 1965 to 6005 feet (600 to 1830 meters). Blooms May.	**Moderate Potential.** Potentially suitable rocky chaparral, Sargent cypress, and Douglas fir forest habitats exist within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Konocti manzanita *Arctostaphylos manzanita ssp. elegans*	Rank 1B.3	Chaparral, cismontane woodland, lower montane coniferous forest. Elevation ranges from 1295 to 5300 feet (395 to 1615 meters). Blooms (Jan)Mar-May(Jul).	**Present.** This species was observed at two locations within the Phase 2/Open Space Study Area, in openings in blue oak woodland, on soils mapped as being derived from sandstone and shale, south of Detert Reservoir.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
Rincon Ridge manzanita *Arctostaphylos stanfordiana ssp. decumbens*	Rank 1B.1	Chaparral (rhyolitic), cismontane woodland. Elevation ranges from 245 to 1215 feet (75 to 370 meters). Blooms Feb-Apr(May).	**Unlikely.** The species is limited to volcanic mudflows in the Mayacama Mountains, which is located outside of the Phase 2/Open Space Study Area.	No further actions are recommended for this species.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Raiche's manzanita *Arctostaphylos stanfordiana ssp. raichei*	Rank 1B.1	Chaparral, lower montane coniferous forest (openings). Elevation ranges from 1475 to 3395 feet (450 to 1035 meters). Blooms Feb-Apr.	**Unlikely.** The Phase 2/Open Space Study Area is well outside of the known range of this species, which is known only from near the Lake/Mendocino County boundary west of Clear Lake and from far northern Mendocino County. The nearest known occurrence is approximately 15 miles northwest of the Phase 2/Open Space Study Area.	No further actions are recommended for this species.
serpentine milkweed *Asclepias solanoana*	Rank 4.2	Chaparral, cismontane woodland, lower montane coniferous forest. Elevation ranges from 750 to 6100 feet (230 to 1860 meters). Blooms May-Jul(Aug).	**Moderate Potential.** Potentially suitable rocky, serpentine barrens exist within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Brewer's milk-vetch *Astragalus breweri*	Rank 4.2	Chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland (open, often gravelly). Elevation ranges from 295 to 2395 feet (90 to 730 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable chaparral, foothill pine woodland, Sargent cypress woodland, and grassland habitats on serpentine and volcanic substrates exist within the Phase 2/Open Space Study Area. This species was observed in a small number of locations in the central portion of the Phase 1 Phase 2/Open Space Study Area on rocky and fine-textured serpentine substrates in chaparral and grassland habitats.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Clara Hunt's milk-vetch *Astragalus claranus*	FE, ST, Rank 1B.1	Chaparral (openings), cismontane woodland, valley and foothill grassland. Elevation ranges from 245 to 900 feet (75 to 275 meters). Blooms Mar-May.	**Moderate Potential.** Potentially suitable thin, volcanic, seasonally moist clay soils exist within the Phase 2/Open Space Study Area, and this species is known from within the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Cleveland's milk-vetch *Astragalus clevelandii*	Rank 4.3	Chaparral, cismontane woodland, riparian forest. Elevation ranges from 655 to 4920 feet (200 to 1500 meters). Blooms Jun-Sep.	**Present.** This species was observed in several locations within the Phase 2/Open Space Study Area in and along ephemeral to intermittent streams on serpentine substrate.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
Jepson's milk-vetch *Astragalus rattanii var. jepsonianus*	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 965 to 2295 feet (295 to 700 meters). Blooms Mar-Jun.	**High Potential.** Potentially suitable grassland or chaparral habitat on serpentine substrate exists within the Phase 2/Open Space Study Area. This taxon was observed within the Phase 1 Phase 2/Open Space Study Area at a single location on gravelly serpentine berms along an intermittent stream at the intersection of Butts Canyon Road and an unnamed paved road leading to the vineyards on the south side of Butts Canyon Road.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
big-scale balsamroot *Balsamorhiza macrolepis*	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 145 to 5100 feet (45 to 1555 meters). Blooms Mar-Jun.	**Moderate Potential.** Potentially suitable chaparral, grassland, and woodland habitats on serpentine and volcanic substrates exists within the Phase 2/Open Space Study Area. This species was observed in one location in the far northern portion of the Phase 1 Phase 2/Open Space Study Area in blue oak woodland.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
watershield *Brasenia schreberi*	Rank 2B.3	Marshes and swamps (freshwater). Elevation ranges from 95 to 7220 feet (30 to 2200 meters). Blooms Jun-Sep.	**Moderate Potential.** Potentially suitable lake and reservoir habitat exists within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
narrow-anthered brodiaea *Brodiaea leptandra*	Rank 1B.2	Broadleaved upland forest, chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 360 to 3000 feet (110 to 915 meters). Blooms May-Jul.	**Present.** This species was observed in one location in volcanic chaparral in the western portion of the Phase 1 Phase 2/Open Space Study Area.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
Indian Valley brodiaea *Brodiaea rosea ssp. rosea*	SE, Rank 3.1	Closed-cone coniferous forest, chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 1095 to 4755 feet (335 to 1450 meters). Blooms May-Jun.	**Unlikely.** The Phase 2/Open Space Study Area is well outside of the known range of this species. Although the Phase 2/Open Space Study Area contains serpentine substrate, the nearest documented occurrence is approximately 16 miles north-northwest of the Phase 2/Open Space Study Area.	No further actions are recommended for this species.
serpentine reed grass *Calamagrostis ophitidis*	Rank 4.3	Chaparral (open, often north-facing slopes), lower montane coniferous forest, meadows and seeps, valley and foothill grassland. Elevation ranges from 295 to 3495 feet (90 to 1065 meters). Blooms Apr-Jul.	**Moderate Potential.** Potentially suitable rocky, serpentine habitat exists within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
pink star-tulip *Calochortus uniflorus*	Rank 4.2	Coastal prairie, coastal scrub, meadows and seeps, north coast coniferous forest. Elevation ranges from 30 to 3510 feet (10 to 1070 meters). Blooms Apr-Jun.	**Present.** This species was observed at one location in the northern portion of the Phase 2/Open Space Study Area in a seasonally wet area on serpentine substrate.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
four-petaled pussypaws *Calyptridium quadripetalum*	Rank 4.3	Chaparral, lower montane coniferous forest. Elevation ranges from 1030 to 6695 feet (315 to 2040 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable sandy or gravelly serpentine substrate exists within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Mt. Saint Helena morning-glory *Calystegia collina ssp. oxyphylla*	Rank 4.2	Chaparral, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 915 to 3315 feet (279 to 1010 meters). Blooms Apr-Jun.	**Present.** This taxon has been observed in numerous locations within the Phase 2/Open Space Study Area on rocky, serpentine substrate.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
South Coast Range morning-glory *Calystegia collina ssp. venusta*	Rank 4.3	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 1390 to 4890 feet (425 to 1490 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable rocky, serpentine areas exist within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
northern meadow sedge *Carex praticola*	Rank 2B.2	Meadows and seeps (mesic). Elevation ranges from 0 to 10500 feet (0 to 3200 meters). Blooms May-Jul.	**Unlikely.** Although the Phase 2/Open Space Study Area contains meadows and seeps, there is only one documented occurrence of this species in the region (approximately 6 miles west of the Phase 2/Open Space Study Area), and the identity of this occurrence is uncertain. The Phase 2/Open Space Study Area is otherwise well outside the known region of the species.	No further actions are recommended for this species.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
johnny-nip *Castilleja ambigua var. ambigua*	Rank 4.2	Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, vernal pools margins. Elevation ranges from 0 to 1425 feet (0 to 435 meters). Blooms Mar-Aug.	**Unlikely.** The Phase 2/Open Space Study Area lacks potentially suitable mesic grassland habitat with coastal influence required for this species.	No further actions are recommended for this species.
pink creamsacs *Castilleja rubicundula var. rubicundula*	Rank 1B.2	Chaparral (openings), cismontane woodland, meadows and seeps, valley and foothill grassland. Elevation ranges from 65 to 2985 feet (20 to 910 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable mesic, open areas on serpentine substrate in chaparral and grassland habitats exist within the Phase 2/Open Space Study Area, and the species is known from nearby occurrences.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Rincon Ridge ceanothus *Ceanothus confusus*	Rank 1B.1	Closed-cone coniferous forest, chaparral, cismontane woodland. Elevation ranges from 245 to 3495 feet (75 to 1065 meters). Blooms Feb-Jun.	**Moderate Potential.** Potentially suitable volcanic and serpentine substrate in Sargent cypress forest and chaparral habitats exist within the Phase 2/Open Space Study Area, and the species is known from nearby occurrences.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Calistoga ceanothus *Ceanothus divergens*	Rank 1B.2	Chaparral (serpentine or volcanic, rocky). Elevation ranges from 555 to 3115 feet (170 to 950 meters). Blooms Feb-Apr.	**Moderate Potential.** Potentially suitable chaparral habitat on rocky volcanic and serpentine substrates exists within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
holly-leaved ceanothus *Ceanothus purpureus*	Rank 1B.2	Chaparral, cismontane woodland. Elevation ranges from 390 to 2100 feet (120 to 640 meters). Blooms Feb-Jun.	**Moderate Potential.** Potentially suitable chaparral and oak woodland edge habitats on rocky volcanic slopes exist within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Sonoma ceanothus *Ceanothus sonomensis*	Rank 1B.2	Chaparral (sandy, serpentine or volcanic). Elevation ranges from 705 to 2625 feet (215 to 800 meters). Blooms Feb-Apr.	**Moderate Potential.** Potentially suitable chaparral habitat on volcanic substrate exists within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
pappose tarplant *Centromadia parryi ssp. parryi*	Rank 1B.2	Chaparral, coastal prairie, meadows and seeps, marshes and swamps (coastal salt), valley and foothill grassland (vernally mesic). Elevation ranges from 0 to 1380 feet (0 to 420 meters). Blooms May-Nov.	**Unlikely.** This species is known from alkaline substrate, which is not present within the Phase 2/Open Space Study Area.	No further actions are recommended for this species.
dwarf soaproot *Chlorogalum pomeridianum var. minus*	Rank 1B.2	Chaparral (serpentine). Elevation ranges from 1000 to 3280 feet (305 to 1000 meters). Blooms May-Aug.	**Moderate Potential.** Potentially suitable chaparral habitat on serpentine substrate exists within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Brewer's clarkia *Clarkia breweri*	Rank 4.2	Chaparral, cismontane woodland, coastal scrub. Elevation ranges from 705 to 3660 feet (215 to 1115 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable chaparral and oak woodland habitats on serpentine substrate exists within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Tracy's clarkia *Clarkia gracilis ssp. tracyi*	Rank 4.2	Chaparral (openings, usually serpentine). Elevation ranges from 210 to 2135 feet (65 to 650 meters). Blooms Apr-Jul.	**Present.** This species was observed in several locations within the Phase 1 Phase 2/Open Space Study Area in chaparral habitat on serpentine substrate.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
serpentine collomia *Collomia diversifolia*	Rank 4.3	Chaparral, cismontane woodland. Elevation ranges from 655 to 1970 feet (200 to 600 meters). Blooms May-Jun.	**Present.** This species was observed in several locations within the Phase 2/Open Space Study Area in chaparral habitat on serpentine substrate.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
serpentine bird's-beak *Cordylanthus tenuis ssp. brunneus*	Rank 4.3	Closed-cone coniferous forest, chaparral, cismontane woodland. Elevation ranges from 1000 to 3000 feet (305 to 915 meters). Blooms Jul-Aug.	**Present.** This species was observed south of Butts Canyon Road within the Phase 1 Phase 2/Open Space Study Area on steep, rocky, serpentine substrate in leather oak chaparral and foothill pine woodland.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
serpentine cryptantha *Cryptantha dissita*	Rank 1B.2	Chaparral (serpentine). Elevation ranges from 1295 to 1905 feet (395 to 580 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable chaparral habitat on serpentine substrate exists within the Phase 2/Open Space Study Area, and the species is known from nearby occurrences.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
deep-scarred cryptantha *Cryptantha excavata*	Rank 1B.1	Cismontane woodland (sandy or gravelly). Elevation ranges from 325 to 1640 feet (100 to 500 meters). Blooms Apr-May.	**Moderate Potential.** Potentially suitable sandy, gravelly, dry streambank habitat is present within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
red-stemmed cryptantha *Cryptantha rostellata*	Rank 4.2	Cismontane woodland, valley and foothill grassland. Elevation ranges from 130 to 2625 feet (40 to 800 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable open, rocky, dry sites in grassland, chaparral, and oak and pine woodland habitats exist within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
mountain lady's-slipper *Cypripedium montanum*	Rank 4.2	Broadleaved upland forest, cismontane woodland, lower montane coniferous forest, north coast coniferous forest. Elevation ranges from 605 to 7300 feet (185 to 2225 meters). Blooms Mar-Aug.	**Unlikely.** The Phase 2/Open Space Study Area lacks potentially suitable habitat for this species which prefers cooler/mesic coniferous forest with partial to closed canopy, often near streams and wetlands.	No further actions are recommended for this species.
swamp larkspur *Delphinium uliginosum*	Rank 4.2	Chaparral, valley and foothill grassland. Elevation ranges from 1115 to 2000 feet (340 to 610 meters). Blooms May-Jun.	**Present.** This species has been observed in numerous locations within the Phase 2/Open Space Study Area in seeps, wet meadows, and along streams on serpentine substrate.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
Cascade downingia *Downingia willamettensis*	Rank 2B.2	Cismontane woodland (lake margins), valley and foothill grassland (lake margins), vernal pools. Elevation ranges from 45 to 3640 feet (15 to 1110 meters). Blooms Jun-Jul(Sep).	**Moderate Potential.** Potentially suitable lake margin habitat is present within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
marsh horsetail *Equisetum palustre*	Rank 3	Marshes and swamps. Elevation ranges from 145 to 3280 feet (45 to 1000 meters). Blooms unk.	**Unlikely.** The nearest known occurrences are in the immediate San Francisco Bay area; occurrences in Lake County are dubious (documented from a second source, not based on voucher specimen or direct observation).	No further actions are recommended for this species.
Brandegee's eriastrum *Eriastrum brandegeeae*	Rank 1B.1	Chaparral, cismontane woodland. Elevation ranges from 1390 to 2755 feet (425 to 840 meters). Blooms Apr-Aug.	**Moderate Potential.** Potentially suitable barren, volcanic substrate is present within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
streamside daisy *Erigeron biolettii*	Rank 3	Broadleaved upland forest, cismontane woodland, north coast coniferous forest. Elevation ranges from 95 to 3610 feet (30 to 1100 meters). Blooms Jun-Oct.	**Moderate Potential.** Potentially suitable rocky volcanic and serpentine substrates exist within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Greene's narrow-leaved daisy *Erigeron greenei*	Rank 1B.2	Chaparral (serpentine or volcanic). Elevation ranges from 260 to 3295 feet (80 to 1005 meters). Blooms May-Sep.	**Present.** This species was observed in numerous locations within the Phase 2/Open Space Study Area in rocky, chaparral habitat, usually on serpentine substrate.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
Snow Mountain buckwheat *Eriogonum nervulosum*	Rank 1B.2	Chaparral (serpentine). Elevation ranges from 980 to 6905 feet (300 to 2105 meters). Blooms Jun-Sep.	**Moderate Potential.** Potentially suitable chaparral habitat on rocky, serpentine substrate exists within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
bay buckwheat *Eriogonum umbellatum var. bahiiforme*	Rank 4.2	Cismontane woodland, lower montane coniferous forest. Elevation ranges from 2295 to 7220 feet (700 to 2200 meters). Blooms Jul-Sep.	**Moderate Potential.** Potentially suitable chaparral and oak and foothill pine woodland habitats on rocky, serpentine and volcanic substrates exists within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Loch Lomond button-celery *Eryngium constancei*	FE, SE, Rank 1B.1	Vernal pools. Elevation ranges from 1505 to 2805 feet (460 to 855 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable vernal wetland habitat exists within the Phase 2/Open Space Study Area at waterbodies such as Wildcat Lake, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Jepson's coyote thistle *Eryngium jepsonii*	Rank 1B.2	Valley and foothill grassland, vernal pools. Elevation ranges from 5 to 985 feet (3 to 300 meters). Blooms Apr-Aug.	**Moderate Potential.** Potentially suitable seasonal wetlands on clay substrate are present within the Phase 2/Open Space Study Area.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
bare monkeyflower *Erythranthe nudata*	Rank 4.3	Chaparral, cismontane woodland. Elevation ranges from 655 to 2295 feet (200 to 700 meters). Blooms May-Jun.	**Present.** This species has been observed in numerous locations within the Phase 2/Open Space Study Area in mesic areas, seeps, and along streams on serpentine substrate.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
St. Helena fawn lily *Erythronium helenae*	Rank 4.2	Chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 1145 to 4005 feet (350 to 1220 meters). Blooms Mar-May.	**Present.** This species has been observed in multiple locations within the Phase 2/Open Space Study Area on north-facing slopes in rocky, chaparral habitat on serpentine substrate.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
San Joaquin spearscale *Extriplex joaquinana*	Rank 1B.2	Chenopod scrub, meadows and seeps, playas, valley and foothill grassland. Elevation ranges from 0 to 2740 feet (1 to 835 meters). Blooms Apr-Oct.	**Unlikely.** The Phase 2/Open Space Study Area lacks potentially suitable alkaline habitat for this species.	No further actions are recommended for this species.
adobe-lily *Fritillaria pluriflora*	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 195 to 2315 feet (60 to 705 meters). Blooms Feb-Apr.	**Moderate Potential.** Potentially suitable heavy soils in chaparral and grassland habitats exists within the Phase 2/Open Space Study Area, and several occurrences of this species have been documented surrounding and within the larger Guenoc Ranch property.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Purdy's fritillary *Fritillaria purdyi*	Rank 4.3	Chaparral, cismontane woodland, lower montane coniferous forest. Elevation ranges from 570 to 7400 feet (175 to 2255 meters). Blooms Mar-Jun.	**Present.** This species has been documented in multiple locations within the Phase 2/Open Space Study Area on rocky, serpentine substrate in chaparral and foothill pine woodland habitats, and similar habitat exists elsewhere within the Phase 2/Open Space Study Area.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
Boggs Lake hedge-hyssop *Gratiola heterosepala*	SE, Rank 1B.2	Marshes and swamps (lake margins), vernal pools. Elevation ranges from 30 to 7790 feet (10 to 2375 meters). Blooms Apr-Aug.	**Moderate Potential.** Potentially suitable habitat exists along and within Wildcat Lake and Blacktail Lake.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Hall's harmonia *Harmonia hallii*	Rank 1B.2	Chaparral (serpentine). Elevation ranges from 1000 to 3200 feet (305 to 975 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable chaparral habitat on rocky, serpentine substrate exists within the Phase 2/Open Space Study Area, and the species is known from nearby occurrences.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
nodding harmonia *Harmonia nutans*	Rank 4.3	Chaparral, cismontane woodland. Elevation ranges from 245 to 3200 feet (75 to 975 meters). Blooms Mar-May.	**Moderate Potential.** Potentially suitable chaparral and foothill pine woodland habitats on rocky, volcanic substrate exists within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
serpentine sunflower *Helianthus exilis*	Rank 4.2	Chaparral, cismontane woodland. Elevation ranges from 490 to 5005 feet (150 to 1525 meters). Blooms Jun-Nov.	**Present.** This species has been observed in numerous locations within the Phase 2/Open Space Study Area on serpentine substrate in seasonally wet areas on such as seeps, meadows, and along streams.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
congested-headed hayfield tarplant *Hemizonia congesta ssp. congesta*	Rank 1B.2	Valley and foothill grassland. Elevation ranges from 65 to 1835 feet (20 to 560 meters). Blooms Apr-Nov.	**Moderate Potential.** Potentially suitable grassland habitat exists within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
glandular western flax *Hesperolinon adenophyllum*	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 490 to 4315 feet (150 to 1315 meters). Blooms May-Aug.	**Moderate Potential.** Potentially suitable chaparral and foothill pine woodland habitat on rocky, serpentine substrate exists within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
two-carpellate western flax *Hesperolinon bicarpellatum*	Rank 1B.2	Chaparral (serpentine). Elevation ranges from 195 to 3295 feet (60 to 1005 meters). Blooms May-Jul.	**Present.** This species has been observed in multiple locations within the Phase 2/Open Space Study Area in chaparral, foothill pine woodland, and Sargent cypress woodland habitats on rocky serpentine and volcanic substrates.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
Lake County western flax *Hesperolinon didymocarpum*	SE, Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 1080 to 1200 feet (330 to 365 meters). Blooms May-Jul.	**Present.** This species has been observed in multiple locations in the central and southern portions of the Phase 2/Open Space Study Area in chaparral habitat on rocky, serpentine substrate.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
drymaria-like western flax *Hesperolinon drymarioides*	Rank 1B.2	Closed-cone coniferous forest, chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 325 to 3705 feet (100 to 1130 meters). Blooms May-Aug.	**Moderate Potential.** Potentially suitable chaparral, foothill pine woodland, and Sargent cypress woodland habitats on rocky, serpentine substrate exist within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Sharsmith's western flax *Hesperolinon sharsmithiae*	Rank 1B.2	Chaparral. Elevation ranges from 885 to 985 feet (270 to 300 meters). Blooms May-Jul.	**Moderate Potential.** Potentially suitable chaparral habitat on serpentine substrate exists within the Phase 2/Open Space Study Area, and the species is known from nearby occurrences.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Bolander's horkelia *Horkelia bolanderi*	Rank 1B.2	Chaparral, lower montane coniferous forest, meadows and seeps, valley and foothill grassland. Elevation ranges from 1475 to 3610 feet (450 to 1100 meters). Blooms (May)Jun-Aug.	**Moderate Potential.** Potentially suitable habitat exists within the Phase 2/Open Space Study Area and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
California satintail *Imperata brevifolia*	Rank 2B.1	Chaparral, coastal scrub, mojavean desert scrub, meadows and seeps (often alkali), riparian scrub. Elevation ranges from 0 to 3985 feet (0 to 1215 meters). Blooms Sep-May.	**Unlikely.** This species is only known in the region from a single, historic (1928) occurrence located approximately 11 miles northwest of the Phase 2/Open Space Study Area. The native status of the single plant observed is also in doubt. In addition, the Phase 2/Open Space Study Area lacks alkaline substrate.	No further actions are recommended for this species.
Northern California black walnut *Juglans hindsii*	Rank 1B.1[3]	Riparian forest, riparian woodland. Elevation ranges from 0 to 1445 feet (0 to 440 meters). Blooms Apr-May.	**Present.** This species was observed in low numbers associated with old home sites, barns, and similar sites across the Phase 2/Open Space Study Area. Occurrences of this species within the Phase 2/Open Space Study Area have been planted or are offspring of planted individuals and should not be considered special-status (Potter et al. 2018).	Although this species was observed within multiple locations across the Phase 1 Study Area, it is associated with old home sites, barns, and similar areas and represents planted specimens that should not be considered special-status and is therefore not addressed in this report. No additional actions are recommended for this species.
Santa Lucia dwarf rush *Juncus luciensis*	Rank 1B.2	Chaparral, great basin scrub, lower montane coniferous forest, meadows and seeps, vernal pools. Elevation ranges from 980 to 6695 feet (300 to 2040 meters). Blooms Apr-Jul.	**Moderate Potential.** Potentially suitable wetland habitat exists within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Burke's goldfields *Lasthenia burkei*	FE, SE, Rank 1B.1	Meadows and seeps (mesic), vernal pools. Elevation ranges from 45 to 1970 feet (15 to 600 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable vernal wetland habitat exists within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Contra Costa goldfields *Lasthenia conjugens*	FE, Rank 1B.1	Cismontane woodland, playas (alkaline), valley and foothill grassland, vernal pools. Elevation ranges from 0 to 1540 feet (0 to 470 meters). Blooms Mar-Jun.	**Unlikely.** The Phase 2/Open Space Study Area lacks potentially suitable alkaline habitat required for this species.	No further actions are recommended for this species.
Colusa layia *Layia septentrionalis*	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 325 to 3595 feet (100 to 1095 meters). Blooms Apr-May.	**Present.** This species was observed within the Phase 2/Open Space Study Area, always in association with blue oak woodland.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
legenere *Legenere limosa*	Rank 1B.1	Vernal pools. Elevation ranges from 0 to 2885 feet (1 to 880 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable vernal wetland habitat exists within the Phase 2/Open Space Study Area in along and within Wildcat Lake and Blacktail Lake, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
bristly leptosiphon *Leptosiphon acicularis*	Rank 4.2	Chaparral, cismontane woodland, coastal prairie, valley and foothill grassland. Elevation ranges from 180 to 4920 feet (55 to 1500 meters). Blooms Apr-Jul.	**Moderate Potential.** Potentially suitable grassland and grassy openings in oak woodland, foothill pine woodland, scrub, and chaparral habitats exist within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Jepson's leptosiphon *Leptosiphon jepsonii*	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 325 to 1640 feet (100 to 500 meters). Blooms Mar-May.	**Moderate Potential.** Potentially suitable grassland and grassy openings in chaparral, oak woodland, and foothill pine woodland on volcanic and serpentine substrates exists within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
broad-lobed leptosiphon *Leptosiphon latisectus*	Rank 4.3	Broadleaved upland forest, cismontane woodland. Elevation ranges from 555 to 4920 feet (170 to 1500 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable grassland and grassy openings in woodland exist within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
woolly-headed lessingia *Lessingia hololeuca*	Rank 3	Broadleaved upland forest, coastal scrub, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 45 to 1000 feet (15 to 305 meters). Blooms Jun-Oct.	**Moderate Potential.** Potentially suitable clay and serpentine substrate exists within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Bolander's lily *Lilium bolanderi*	Rank 4.2	Chaparral, lower montane coniferous forest. Elevation ranges from 95 to 5250 feet (30 to 1600 meters). Blooms Jun-Jul.	**Unlikely.** Although potentially suitable open, clay, serpentine substrate is present, the bulk of known occurrences of this plant are located in Del Norte, Humboldt, and Siskiyou counties.	No further actions are recommended for this species.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
redwood lily *Lilium rubescens*	Rank 4.2	Broadleaved upland forest, chaparral, lower montane coniferous forest, north coast coniferous forest, upper montane coniferous forest. Elevation ranges from 95 to 6265 feet (30 to 1910 meters). Blooms Apr-Aug(Sep).	**Moderate Potential.** Potentially suitable chaparral habitat exists within the Phase 2/Open Space Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
woolly meadowfoam *Limnanthes floccosa ssp. floccosa*	Rank 4.2	Chaparral, cismontane woodland, valley and foothill grassland, vernal pools. Elevation ranges from 195 to 4380 feet (60 to 1335 meters). Blooms Mar-May(Jun).	**Moderate Potential.** Potentially suitable vernally wet areas and pond/lake margins exist within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Sebastopol meadowfoam *Limnanthes vinculans*	FE, SE, Rank 1B.1	Meadows and seeps, valley and foothill grassland, vernal pools. Elevation ranges from 45 to 1000 feet (15 to 305 meters). Blooms Apr-May.	**Moderate Potential.** Potentially suitable vernally wet areas in grassland and oak woodland exist within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Hoover's lomatium *Lomatium hooveri*	Rank 4.3	Chaparral, cismontane woodland. Elevation ranges from 980 to 2905 feet (300 to 885 meters). Blooms Apr-Jul.	**High Potential.** This species was observed in several locations within the Phase 1 Study Area in shady draws in blue oak woodland and in rocky chaparral habitat and has high potential to occur in similar habitats within the Phase 2/Open Space Study Area.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Napa lomatium *Lomatium repostum*	Rank 4.3	Chaparral, cismontane woodland. Elevation ranges from 295 to 2725 feet (90 to 830 meters). Blooms Mar-Jun.	**Moderate Potential.** Potentially suitable rocky, volcanic and serpentine substrate in chaparral, foothill pine woodland and Sargent cypress woodland exist within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Cobb Mountain lupine *Lupinus sericatus*	Rank 1B.2	Broadleaved upland forest, chaparral, cismontane woodland, lower montane coniferous forest. Elevation ranges from 900 to 5005 feet (275 to 1525 meters). Blooms Mar-Jun.	**Moderate Potential.** Potentially suitable gravelly substrate in chaparral, foothill pine woodland, Sargent cypress woodland, and oak woodland habitats exist within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Heller's bush-mallow *Malacothamnus helleri*	Rank 3.3	Chaparral (sandstone), riparian woodland (gravel). Elevation ranges from 1000 to 2085 feet (305 to 635 meters). Blooms May-Jul.	**Moderate Potential.** Potentially suitable chaparral habitat on sandstone substrate and gravelly riparian habitat exists within the Phase 2/Open Space Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Mt. Diablo cottonweed *Micropus amphibolus*	Rank 3.2	Broadleaved upland forest, chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 145 to 2705 feet (45 to 825 meters). Blooms Mar-May.	**Moderate Potential.** Potentially suitable sparsely vegetated oak woodland, foothill pine woodland, chaparral, scrub, and grassland habitats exist within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
marsh microseris *Microseris paludosa*	Rank 1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland. Elevation ranges from 15 to 1165 feet (5 to 355 meters). Blooms Apr-Jun(Jul).	**Moderate Potential.** Potentially suitable grassland and openings in oak woodland, foothill pine woodland, chaparral, and scrub on fine-textured substrate exist within the Phase 2/Open Space Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
sylvan microseris *Microseris sylvatica*	Rank 4.2	Chaparral, cismontane woodland, great basin scrub, pinyon and juniper woodland, valley and foothill grassland (serpentine). Elevation ranges from 145 to 4920 feet (45 to 1500 meters). Blooms Mar-Jun.	**Moderate Potential.** Potentially suitable grassland and grassy openings in oak and foothill pine woodlands exists within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
green monardella *Monardella viridis*	Rank 4.3	Broadleaved upland forest, chaparral, cismontane woodland. Elevation ranges from 325 to 3315 feet (100 to 1010 meters). Blooms Jun-Sep.	**Present.** This species was observed within the Phase 2/Open Space Study Area in rocky, chaparral habitat on serpentine and volcanic substrates.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
little mousetail *Myosurus minimus ssp. apus*	Rank 3.1	Valley and foothill grassland, vernal pools (alkaline). Elevation ranges from 65 to 2100 feet (20 to 640 meters). Blooms Mar-Jun.	**Unlikely.** Alkaline soils are not present within the Phase 2/Open Space Study Area.	No further actions are recommended for this species.
cotula navarretia *Navarretia cotulifolia*	Rank 4.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 10 to 6005 feet (4 to 1830 meters). Blooms May-Jun.	**Present.** This species was observed in abundance in the western portion of the Phase 2/Open Space Study Area on heavy, serpentine soils in mesic grassland.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Jepson's navarretia *Navarretia jepsonii*	Rank 4.3	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 570 to 2805 feet (175 to 855 meters). Blooms Apr-Jun.	**Present.** This species was observed within the Phase 2/Open Space Study Area in grassland or grassy openings in chaparral habitat on clay soils.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
Baker's navarretia *Navarretia leucocephala ssp. bakeri*	Rank 1B.1	Cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, vernal pools. Elevation ranges from 15 to 5710 feet (5 to 1740 meters). Blooms Apr-Jul.	**Moderate Potential.** Potentially suitable vernal wetlands on clay soils are present within the Phase 2/Open Space Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
few-flowered navarretia *Navarretia leucocephala ssp. pauciflora*	FE, ST, Rank 1B.1	Vernal pools (volcanic ash flow). Elevation ranges from 1310 to 2805 feet (400 to 855 meters). Blooms May-Jun.	**Unlikely.** The Phase 2/Open Space Study Area lacks potentially suitable vernal pool habitat with volcanic ash flow substrate required for this species.	No further actions are recommended for this species.
many-flowered navarretia *Navarretia leucocephala ssp. plieantha*	FE, SE, Rank 1B.2	Vernal pools (volcanic ash flow). Elevation ranges from 95 to 3115 feet (30 to 950 meters). Blooms May-Jun.	**Unlikely.** The Phase 2/Open Space Study Area lacks potentially suitable vernal pool habitat with volcanic ash flow substrate required for this species.	No further actions are recommended for this species.
small pincushion navarretia *Navarretia myersii ssp. deminuta*	Rank 1B.1	Vernal pools (clay loam). Elevation ranges from 1160 to 1165 feet (355 to 355 meters). Blooms Apr-May.	**Moderate Potential.** Potentially suitable vernal wetland habitat exists within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
adobe navarretia *Navarretia nigelliformis ssp. nigelliformis*	Rank 4.2	Valley and foothill grassland vernally mesic, vernal pools sometimes. Elevation ranges from 325 to 3280 feet (100 to 1000 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable, vernally mesic clay substrate in grassland habitat exists within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Porter's navarretia *Navarretia paradoxinota*	Rank 1B.3	Meadows and seeps. Elevation ranges from 540 to 2755 feet (165 to 840 meters). Blooms May-Jun(Jul).	**Moderate Potential.** Potentially suitable, vernally mesic openings on serpentine substrate exist within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Marin County navarretia *Navarretia rosulata*	Rank 1B.2	Closed-cone coniferous forest, chaparral. Elevation ranges from 655 to 2085 feet (200 to 635 meters). Blooms May-Jul.	**Moderate Potential.** Potentially suitable, dry, rocky substrate in Sargent cypress woodland, chaparral, and scrub habitats exists within the Phase 2/Open Space Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
slender Orcutt grass *Orcuttia tenuis*	FT, SE, Rank 1B.1	Vernal pools. Elevation ranges from 110 to 5775 feet (35 to 1760 meters). Blooms May-Sep(Oct).	**Moderate Potential.** Potentially suitable vernal wetland habitat exists within the Phase 2/Open Space Study Area in Blacktail Lake, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Howell's broomrape *Orobanche valida ssp. howellii*	Rank 4.3	Chaparral (serpentine or volcanic). Elevation ranges from 590 to 5710 feet (180 to 1740 meters). Blooms Jun-Sep.	**Moderate Potential.** Potentially suitable chaparral habitat in rocky, volcanic and serpentine substrates exists within the Phase 2/Open Space Study Area, and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Geysers panicum *Panicum acuminatum var. thermale*	SE, Rank 1B.2	Closed-cone coniferous forest, riparian forest, valley and foothill grassland. Elevation ranges from 1000 to 8105 feet (305 to 2470 meters). Blooms Jun-Aug.	**Unlikely.** This species is associated with hot springs, and such habitat is not present within the Phase 2/Open Space Study Area. The nearest occurrence of this species is approximately 10 miles west of the Phase 2/Open Space Study Area.	No further actions are recommended for this species.
Sonoma beardtongue *Penstemon newberryi var. sonomensis*	Rank 1B.3	Chaparral (rocky). Elevation ranges from 2295 to 4495 feet (700 to 1370 meters). Blooms Apr-Aug.	**Moderate Potential.** Potentially suitable rock outcrops in chaparral habitat exist within the Phase 2/Open Space Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Michael's rein orchid *Piperia michaelii*	Rank 4.2	Coastal bluff scrub, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest. Elevation ranges from 5 to 3000 feet (3 to 915 meters). Blooms Apr-Aug.	**Unlikely.** This species is typically associated with substrates comprised of mudstone and humus, which are not present within the Phase 2/Open Space Study Area.	No further actions are recommended for this species.
bearded popcornflower *Plagiobothrys hystriculus*	Rank 1B.1	Valley and foothill grassland (mesic), vernal pools margins. Elevation ranges from 0 to 900 feet (0 to 274 meters). Blooms Apr-May.	**Moderate Potential.** Potentially suitable vernally mesic areas in grassland habitat are present within the Phase 2/Open Space Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Calistoga popcornflower *Plagiobothrys strictus*	FE, ST, Rank 1B.1	Meadows and seeps, valley and foothill grassland, vernal pools. Elevation ranges from 295 to 525 feet (90 to 160 meters). Blooms Mar-Jun.	**Unlikely.** The Phase 2/Open Space Study Area lacks alkaline sites suitable for this species.	No further actions are recommended for this species.
Napa blue grass *Poa napensis*	FE, SE, Rank 1B.1	Meadows and seeps, valley and foothill grassland. Elevation ranges from 325 to 655 feet (100 to 200 meters). Blooms May-Aug.	**Unlikely.** The Phase 2/Open Space Study Area lacks alkaline sites suitable for this species.	No further actions are recommended for this species.
eel-grass pondweed *Potamogeton zosteriformis*	Rank 2B.2	Marshes and swamps (assorted freshwater). Elevation ranges from 0 to 6100 feet (0 to 1860 meters). Blooms Jun-Jul.	**Moderate Potential.** Potentially suitable lake and reservoir habitats are present within the Phase 2/Open Space Study Area and the species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
California alkali grass *Puccinellia simplex*	Rank 1B.2	Chenopod scrub, meadows and seeps, valley and foothill grassland, vernal pools. Elevation ranges from 5 to 3050 feet (2 to 930 meters). Blooms Mar-May.	**Unlikely.** The Phase 2/Open Space Study Area lacks alkaline sites suitable for this species.	No further actions are recommended for this species.
Lobb's aquatic buttercup *Ranunculus lobbii*	Rank 4.2	Cismontane woodland, north coast coniferous forest, valley and foothill grassland, vernal pools. Elevation ranges from 45 to 1540 feet (15 to 470 meters). Blooms Feb-May.	**Moderate Potential.** Potentially suitable seasonally ponded sites exist within the Phase 2/Open Space Study Area	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Lake County stonecrop *Sedella leiocarpa*	FE, SE, Rank 1B.1	Cismontane woodland, valley and foothill grassland, vernal pools. Elevation ranges from 1195 to 2590 feet (365 to 790 meters). Blooms Apr-May.	**Moderate Potential.** Potentially suitable vernally wet areas in oak woodland and grassland habitats and volcanic substrate exist within the Phase 2/Open Space Study Area.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Cleveland's ragwort *Senecio clevelandii var. clevelandii*	Rank 4.3	Chaparral (serpentine seeps). Elevation ranges from 1195 to 2955 feet (365 to 900 meters). Blooms Jun-Jul.	**Present.** This species was observed within the Phase 1 Phase 2/Open Space Study Area south of Butts Canyon Road on serpentine substrate in and adjacent to intermittent and perennial streams and in wetland meadows.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
Napa checkerbloom *Sidalcea hickmanii ssp. napensis*	Rank 1B.1	Chaparral. Elevation ranges from 1360 to 2000 feet (415 to 610 meters). Blooms Apr-Jun.	**Moderate Potential.** Potentially suitable chaparral habitat on rhyolitic substrates exists within the Phase 2/Open Space Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Keck's checkerbloom *Sidalcea keckii*	FE, Rank 1B.1	Cismontane woodland, valley and foothill grassland. Elevation ranges from 245 to 2135 feet (75 to 650 meters). Blooms Apr-May(Jun).	**Present.** This species was observed in a single location within the Phase 2/Open Space Study Area on serpentine clay soils.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
marsh checkerbloom *Sidalcea oregana ssp. hydrophila*	Rank 1B.2	Meadows and seeps, riparian forest. Elevation ranges from 3605 to 7545 feet (1100 to 2300 meters). Blooms (Jun)Jul-Aug.	**Moderate Potential.** Potentially suitable streambank and wetland meadow habitat exists within the Phase 2/Open Space Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Kenwood Marsh checkerbloom *Sidalcea oregana ssp. valida*	FE, SE, Rank 1B.1	Marshes and swamps (freshwater). Elevation ranges from 375 to 490 feet (115 to 150 meters). Blooms Jun-Sep.	**Unlikely.** This species is highly restricted to two known locations, the nearest of which is approximately 12 miles southwest of the Phase 2/Open Space Study Area.	No further actions are recommended for this species.
long-styled sand-spurrey *Spergularia macrotheca var. longistyla*	Rank 1B.2	Meadows and seeps, marshes and swamps. Elevation ranges from 0 to 835 feet (0 to 255 meters). Blooms Feb-May.	**Unlikely.** The Phase 2/Open Space Study Area lacks alkaline sites suitable for this species.	No further actions are recommended for this species.
Tamalpais jewelflower *Streptanthus batrachopus*	Rank 1B.3	Closed-cone coniferous forest, chaparral. Elevation ranges from 1000 to 2135 feet (305 to 650 meters). Blooms Apr-Jul.	**Unlikely.** Potentially suitable habitat but the Phase 2/Open Space Study Area is greatly removed from the nearest known occurrence of this species, which is highly restricted to the vicinity of Mt. Tamalpais in Marin County.	No further actions are recommended for this species.
Socrates Mine jewelflower *Streptanthus brachiatus ssp. brachiatus*	Rank 1B.2	Closed-cone coniferous forest, chaparral. Elevation ranges from 1785 to 3280 feet (545 to 1000 meters). Blooms May-Jun.	**Moderate Potential.** Potentially suitable Sargent cypress woodland, foothill pine woodland, and chaparral habitats on serpentine substrate exist within the Phase 2/Open Space Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
Freed's jewelflower *Streptanthus brachiatus ssp. hoffmanii*	Rank 1B.2	Chaparral, cismontane woodland. Elevation ranges from 1605 to 4005 feet (490 to 1220 meters). Blooms May-Jul.	**Moderate Potential.** Potentially suitable Sargent cypress woodland, foothill pine woodland, and chaparral habitats on serpentine substrate exist within the Phase 2/Open Space Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
green jewelflower *Streptanthus hesperidis*	Rank 1B.2	Chaparral (openings), cismontane woodland. Elevation ranges from 425 to 2495 feet (130 to 760 meters). Blooms May-Jul.	**Present.** This species was observed at numerous locations in the Phase 2/Open Space Study Area in chaparral and foothill pine woodland habitats on rocky, serpentine substrates.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
Three Peaks jewelflower *Streptanthus morrisonii ssp. elatus*	Rank 1B.2	Chaparral (serpentine). Elevation ranges from 295 to 2675 feet (90 to 815 meters). Blooms Jun-Sep.	**Present.** This species was observed in one location within the Phase 2/Opens Space Phase 2/Open Space Study Area. The individuals observed were intermediate between ssp. *elatus* and ssp. *hirtiflorus*, and as a result, all were identified to the specific level only; however, both subspecies have a CNPS Rank of 1B.2.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
Kruckeberg's jewelflower *Streptanthus morrisonii ssp. kruckebergii*	Rank 1B.2	Cismontane woodland (serpentine). Elevation ranges from 705 to 3395 feet (215 to 1035 meters). Blooms Apr-Jul.	**Moderate Potential.** Potentially suitable rocky, serpentine outcrops in Sargent cypress woodland, foothill pine woodland, and chaparral habitats exist within the Phase 2/Open Space Study Area, and this species is known from nearby occurrences.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
early jewelflower *Streptanthus vernalis*	Rank 1B.2	Closed-cone coniferous forest, chaparral. Elevation ranges from 2000 to 2000 feet (610 to 610 meters). Blooms Mar-May.	**Moderate Potential.** Potentially suitable Sargent cypress woodland, foothill pine woodland, and chaparral habitats on serpentine substrate exist within the Phase 2/Open Space Study Area, and this species is known from nearby occurrences.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
slender-leaved pondweed *Stuckenia filiformis ssp. alpina*	Rank 2B.2	Marshes and swamps (assorted shallow freshwater). Elevation ranges from 980 to 7055 feet (300 to 2150 meters). Blooms May-Jul.	**Moderate Potential.** Potentially suitable pond and reservoir habitats exist within the Phase 2/Open Space Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
short-podded thelypodium *Thelypodium brachycarpum*	Rank 4.2	Chaparral, lower montane coniferous forest, meadows and seeps. Elevation ranges from 2195 to 8400 feet (670 to 2560 meters). Blooms May-Aug.	**Moderate Potential.** Potentially suitable chaparral, foothill pine woodland, and Sargent cypress woodland on serpentine substrates exist within the Phase 2/Open Space Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
marsh zigadenus *Toxicoscordion fontanum*	Rank 4.2	Chaparral, cismontane woodland, lower montane coniferous forest, meadows and seeps, marshes and swamps. Elevation ranges from 45 to 3280 feet (15 to 1000 meters). Blooms Apr-Jul.	**Present.** This species has been observed in numerous locations within the Phase 2/Open Space Study Area in seeps, wet meadows, and along streams on serpentine substrate.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
Napa bluecurls *Trichostema ruygtii*	Rank 1B.2	Chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland, vernal pools. Elevation ranges from 95 to 2230 feet (30 to 680 meters). Blooms Jun-Oct.	**Moderate Potential.** Potentially suitable mesic areas on volcanic substrate in chaparral, blue oak woodland, foothill pine woodland, and grassland habitats exist within the Phase 2/Open Space Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.
saline clover *Trifolium hydrophilum*	Rank 1B.2	Marshes and swamps, valley and foothill grassland (mesic, alkaline), vernal pools. Elevation ranges from 0 to 985 feet (0 to 300 meters). Blooms Apr-Jun.	**Unlikely.** The Phase 2/Open Space Study Area lacks alkaline sites suitable for this species.	No further actions are recommended for this species.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Dark-mouth triteleia *Triteleia lugens*	Rank 4.3	Broadleaved upland forest, chaparral, coastal scrub, lower montane coniferous forest. Elevation ranges from 328 to 3280 feet (100 to1000 meters). Blooms Apr-Jun	**Present.** This species was observed within the Phase 2/Open Space Study Area in low numbers in a limited number of areas south of Butts Canyon Road, on rocky, volcanic substrate.	This species was observed in one or more locations within the Phase 2/Open Space Study Area. Recommendations for this species can be found in Section 6.3.
oval-leaved viburnum *Viburnum ellipticum*	Rank 2B.3	Chaparral, cismontane woodland, lower montane coniferous forest. Elevation ranges from 705 to 4595 feet (215 to 1400 meters). Blooms May-Jun.	**Moderate Potential.** Potentially suitable chaparral, foothill pine woodland, and oak woodland habitats are present within the Phase 2/Open Space Study Area, and this species is known from the region.	Although this species was not observed, it was determined to have potential to occur within the Phase 2/Open Space Study Area based on the habitats present and nearby occurrences. Recommendations for this species can be found in Section 6.3.

[1]Key to Conservation Status:

FE	Federal Endangered
FT	Federal Threatened
SE	State Endangered
ST	State Threatened
Rank 1B.1	CNPS Rank 1B.1: Rare, threatened, or endangered in California and elsewhere (seriously threatened in California)
Rank 1B.2	CNPS Rank 1B.2: Rare, threatened, or endangered in California and elsewhere (moderately threatened in California)
Rank 1B.3	CNPS Rank 1B.3: Rare, threatened, or endangered in California and elsewhere (not very threatened in California)
Rank 2B.1	CNPS Rank 2B.1: Rare, threatened, or endangered in California, but more common elsewhere (seriously threatened in California)
Rank 2B.2	CNPS Rank 2B.2: Rare, threatened, or endangered in California, but more common elsewhere (moderately threatened in California)
Rank 2B.3	CNPS Rank 2B.3: Rare, threatened, or endangered in California, but more common elsewhere (not very threatened in California)
Rank 3.1	CNPS Rank 3.1: Plants about which more information is needed - A review list (seriously threatened in California)
Rank 3.2	CNPS Rank 3.2: Plants about which more information is needed - A review list (moderately threatened in California)
Rank 3.3	CNPS Rank 3.3: Plants about which more information is needed - A review list (not very threatened in California)
Rank 4.2	CNPS Rank 4.2: Plants of limited distribution - A watch list (moderately threatened in California)
Rank 4.3	CNPS Rank 4.3: Plants of limited distribution - A watch list (not very threatened in California)

[2]Key to Potential for Occurrence:

No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).

Unlikely. Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.

Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.

High Potential. All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

Present. Species was observed on the site or has been recorded (i.e. CNDDB, other reports) on the site recently.

[3]Although this species is listed as Rank 1B.1, recent data suggests that this species should not be considered special-status (Potter et al. 2018)

APPENDIX E

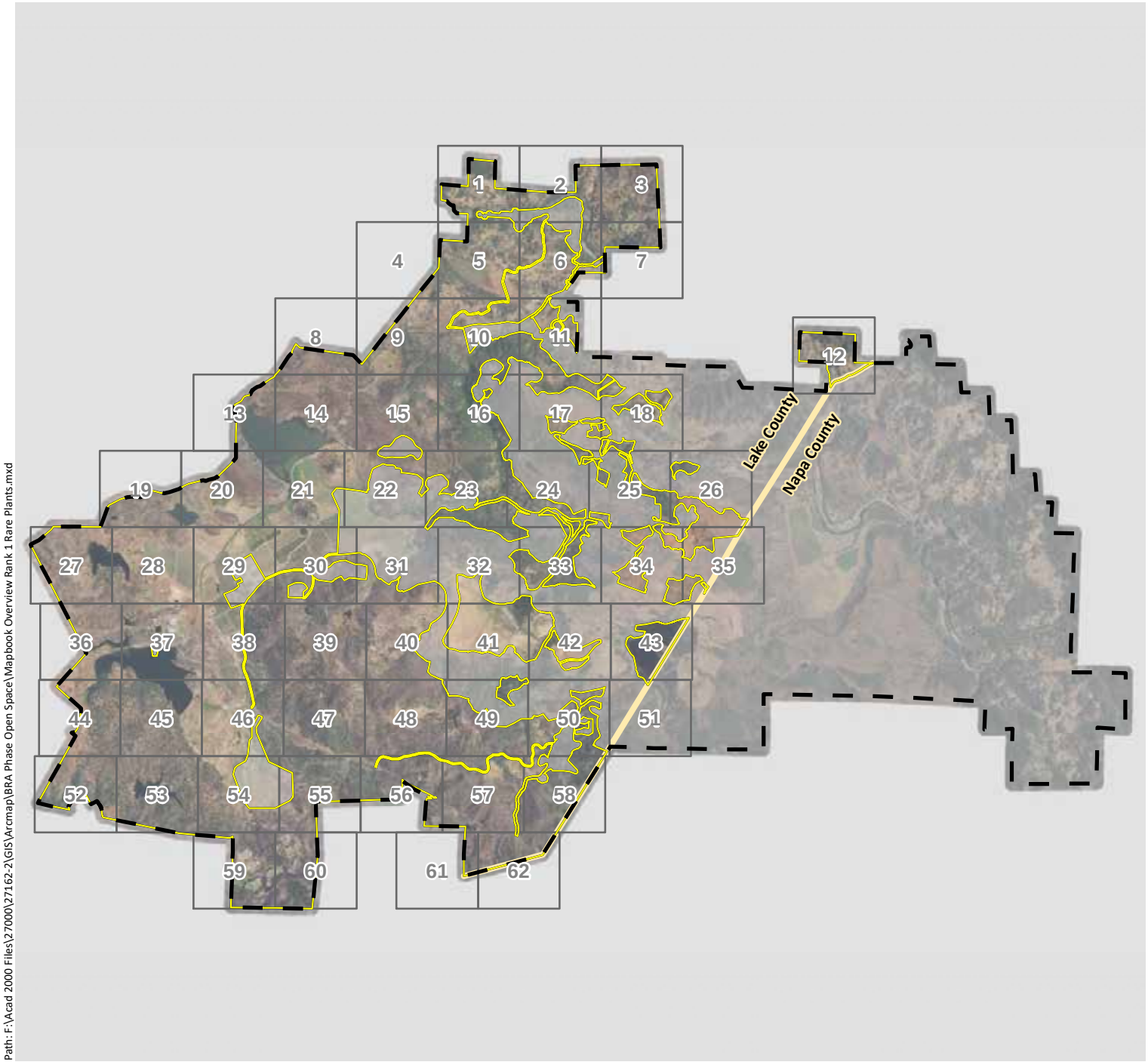
SPECIAL-STATATUS PLANT SPECIES OBSERVED WITHIN THE PHASE 2/OPEN SPACE STUDY AREA

APPENDIX E1

FEDERAL, STATE, AND CNPS RANK 1 SPECIAL-STATUS PLANT SPECIES OBSERVED WITHIN THE PHASE 2/OPEN SPACE STUDY AREA

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Overview)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Property Boundary

Phase 2 and Open Space Study Area

Mapbook Grid

County Boundary

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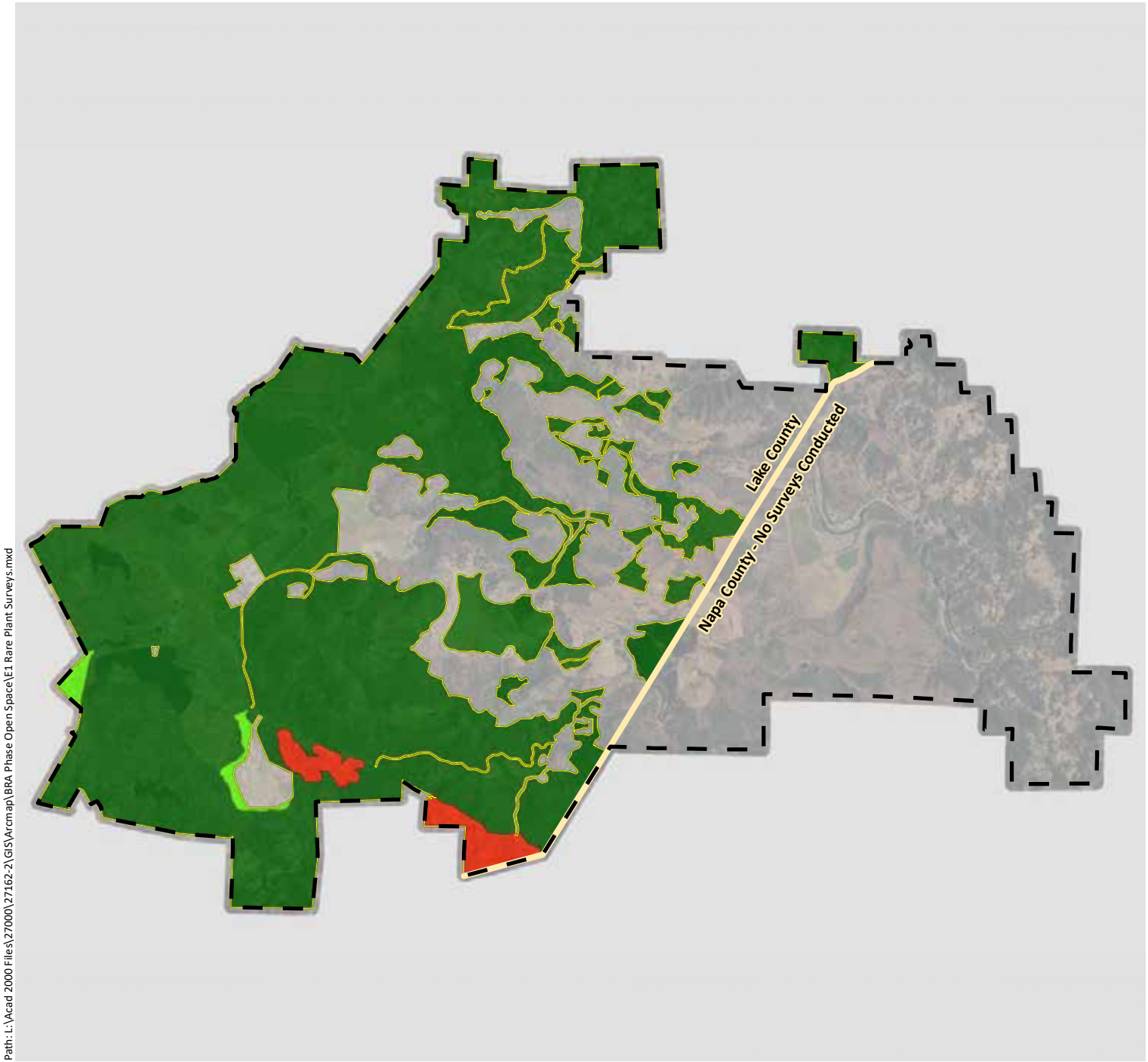
Sources: Hexagon 2016 Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area
(Special-Status Plant Surveys)

Maha Resort and Guenoc Valley Development, Phase 2 & Open Space



- Property Boundary
- County Boundary
- Phase 2 & Open Space Study Area
- Mid-Season Survey Only
- Late-Season Survey Only
- Early, Mid-, and Late-Season Surveys

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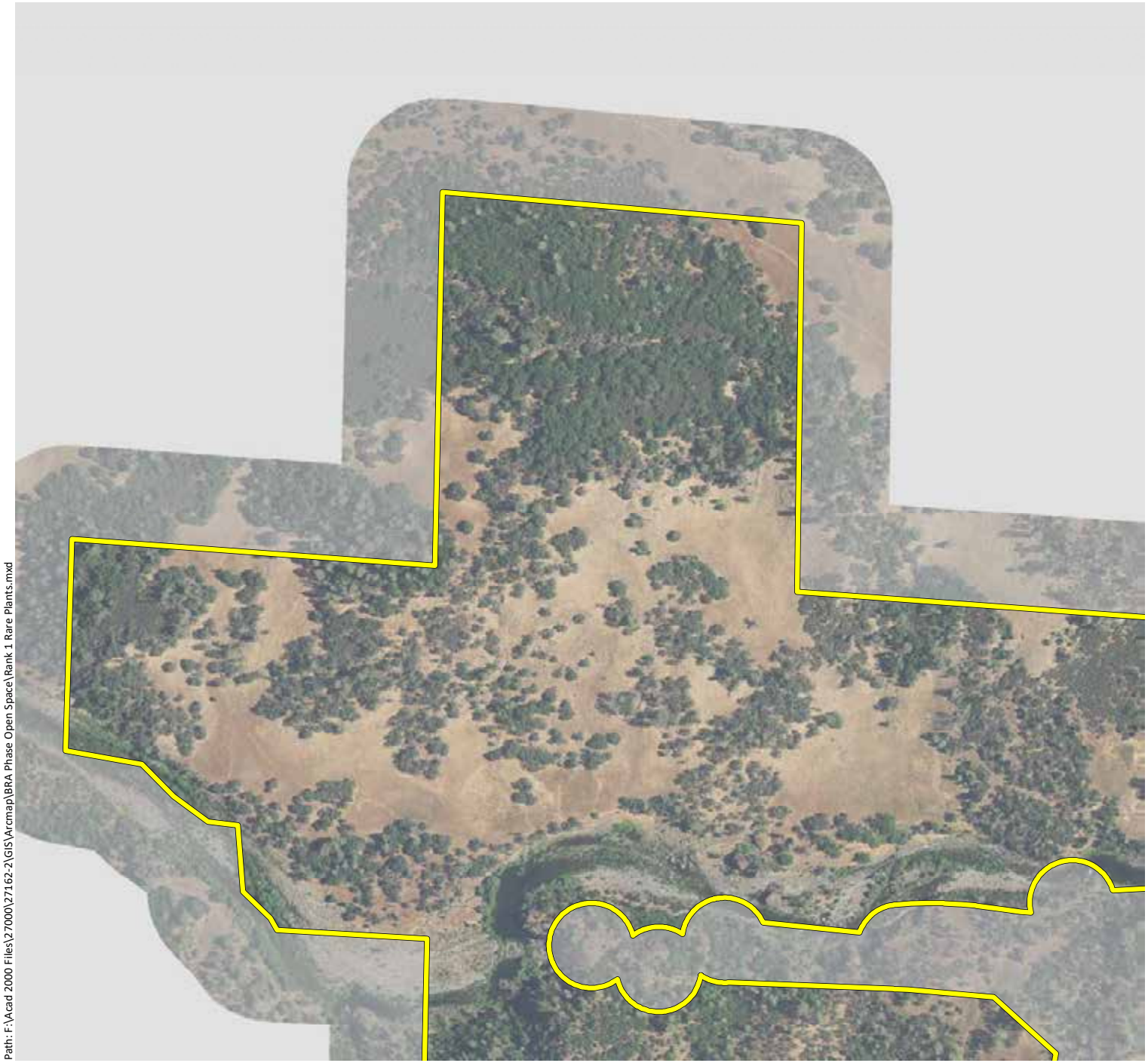
Sources: Hexagon 2016 Aerial, WRA | Prepared By: mrochelle, 7/19/2019



Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 1)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 2)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 3)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 4)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 5)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 6)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 7)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 8)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 9)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

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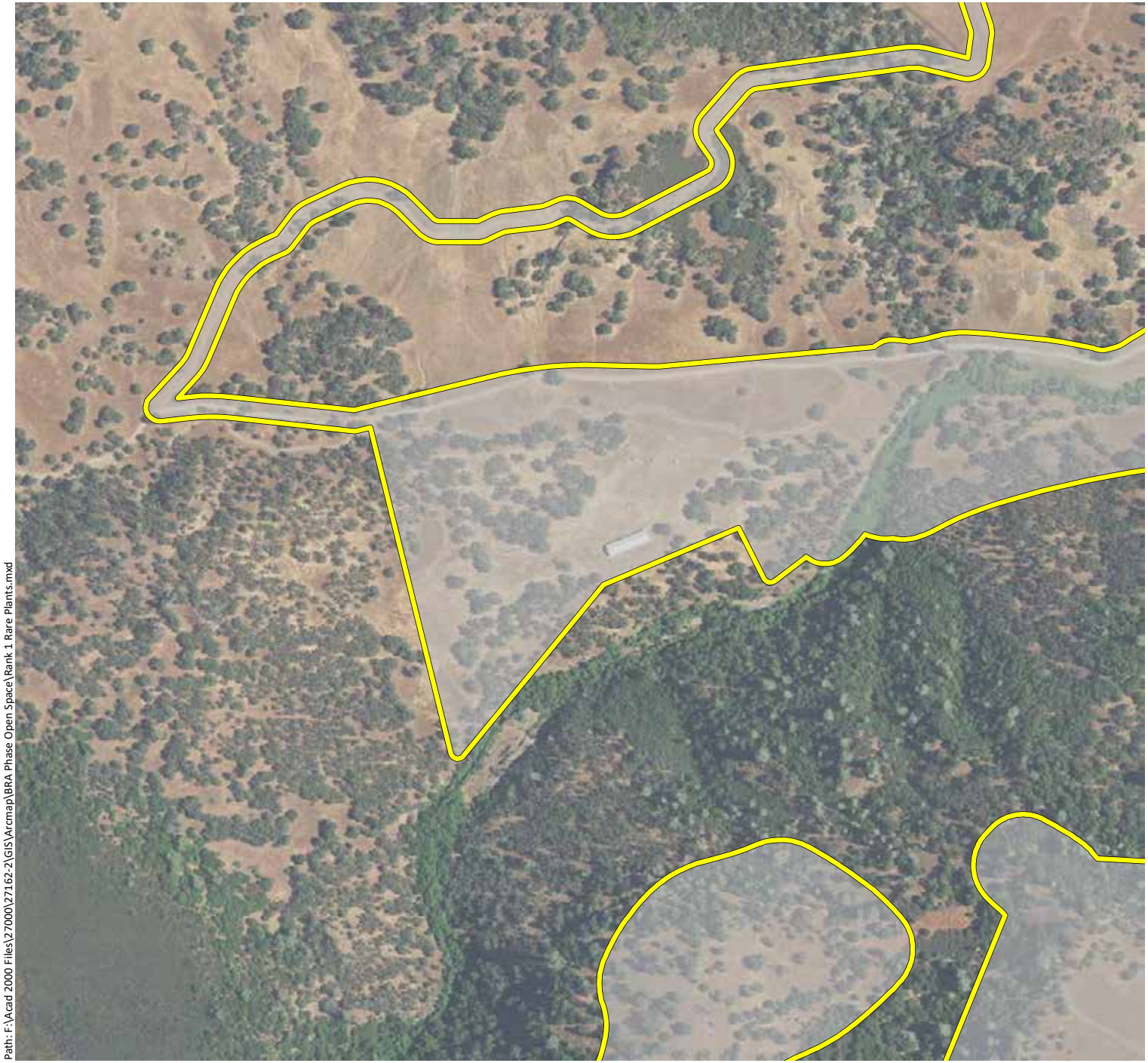
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 10)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 11)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 12)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 13)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 14)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 15)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

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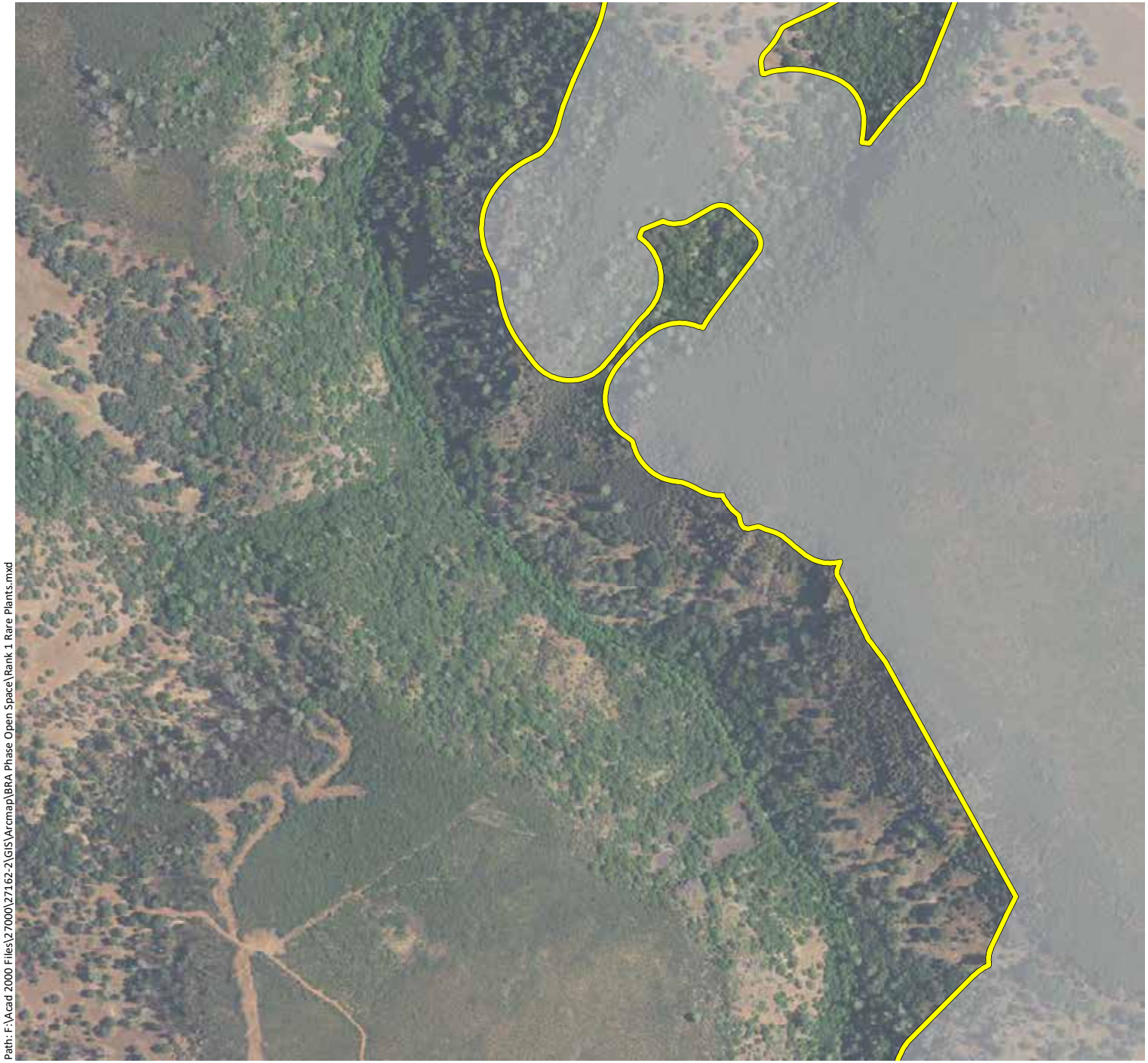
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 16)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

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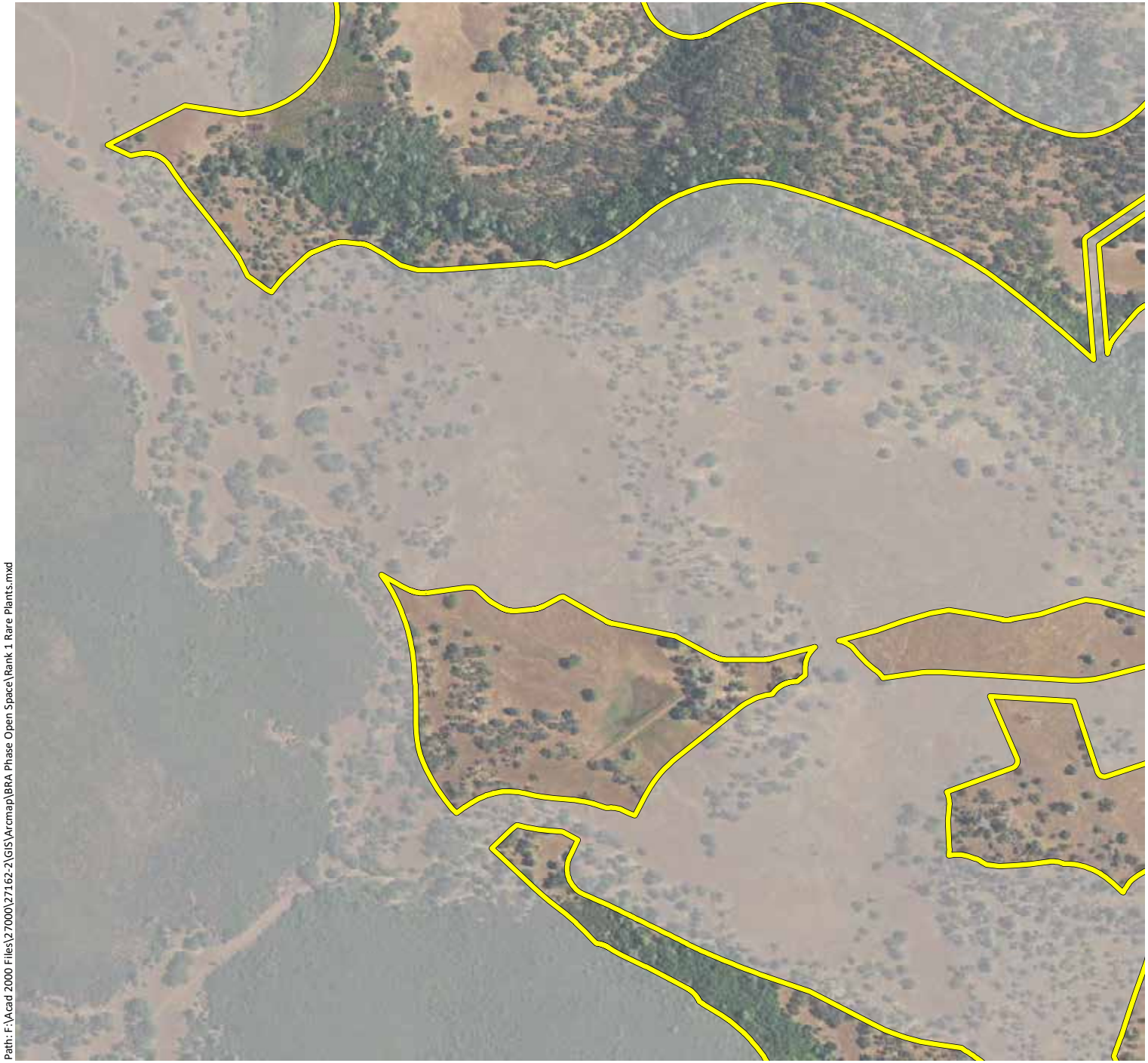
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 17)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

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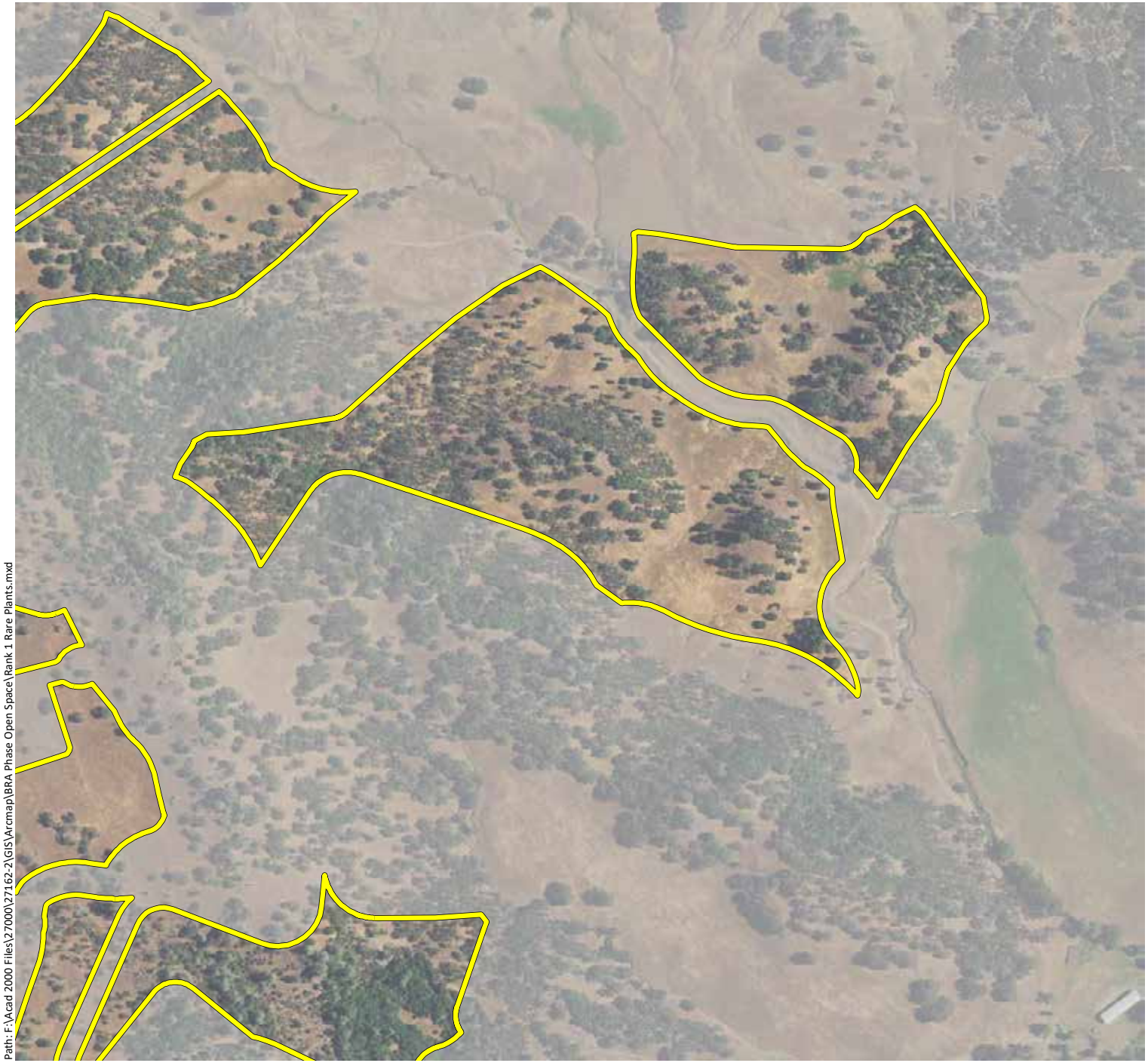
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 18)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 19)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Federally-Endangered Plants

State-Endangered Plants

CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 20)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

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ENVIRONMENTAL CONSULTANTS

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Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 21)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

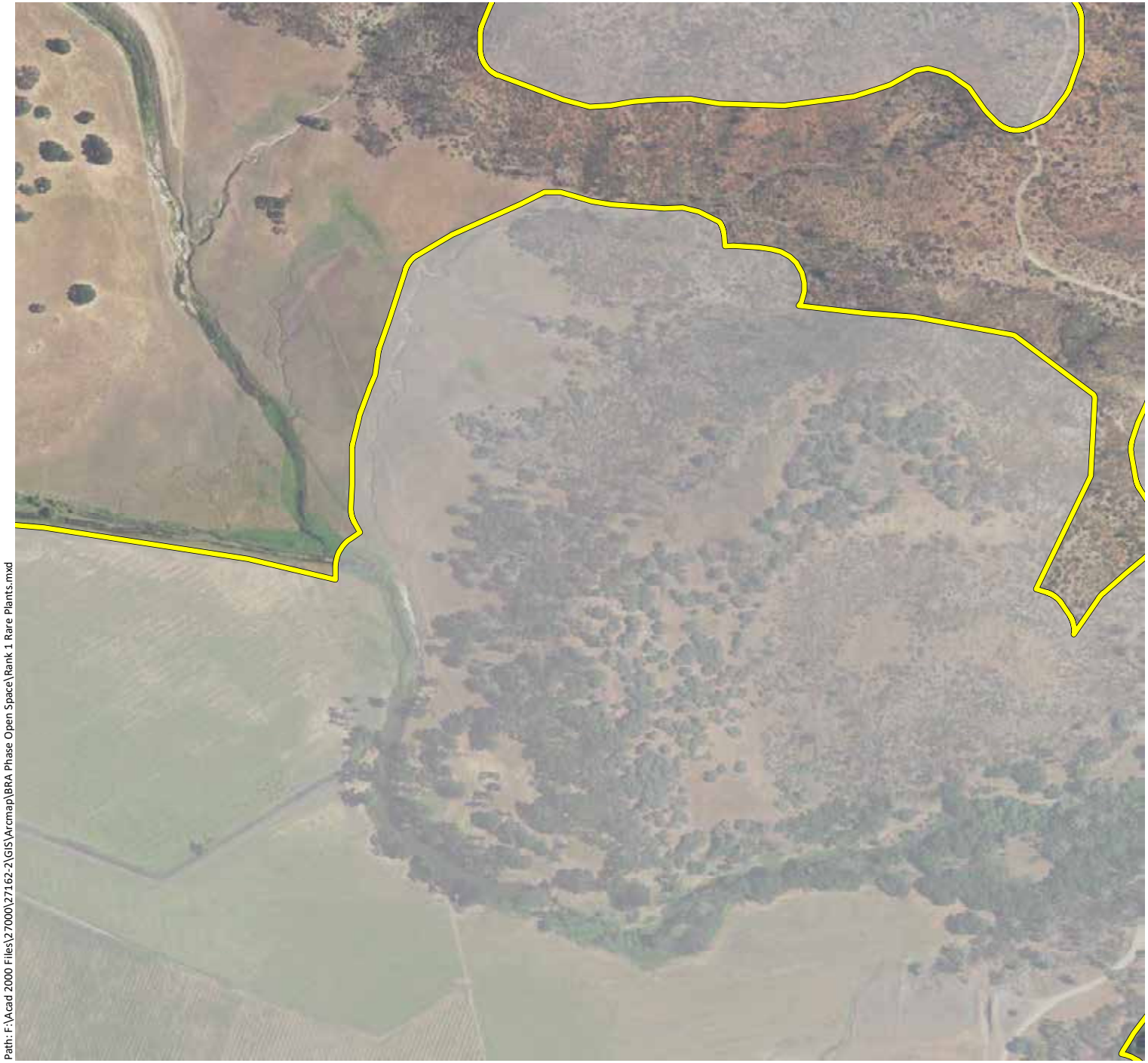
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 22)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Federally-Endangered Plants

State-Endangered Plants

CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

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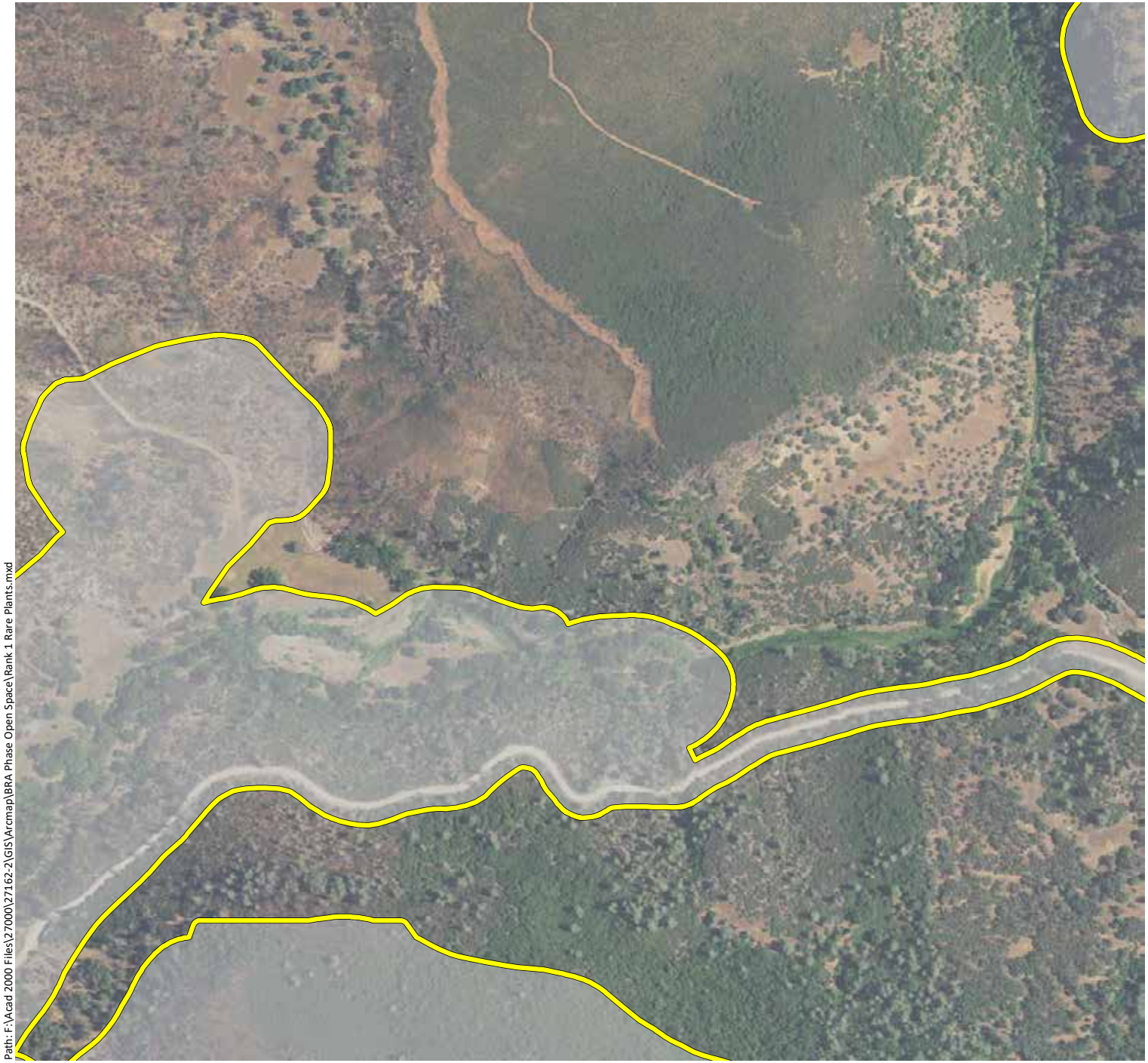
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 23)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 24)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

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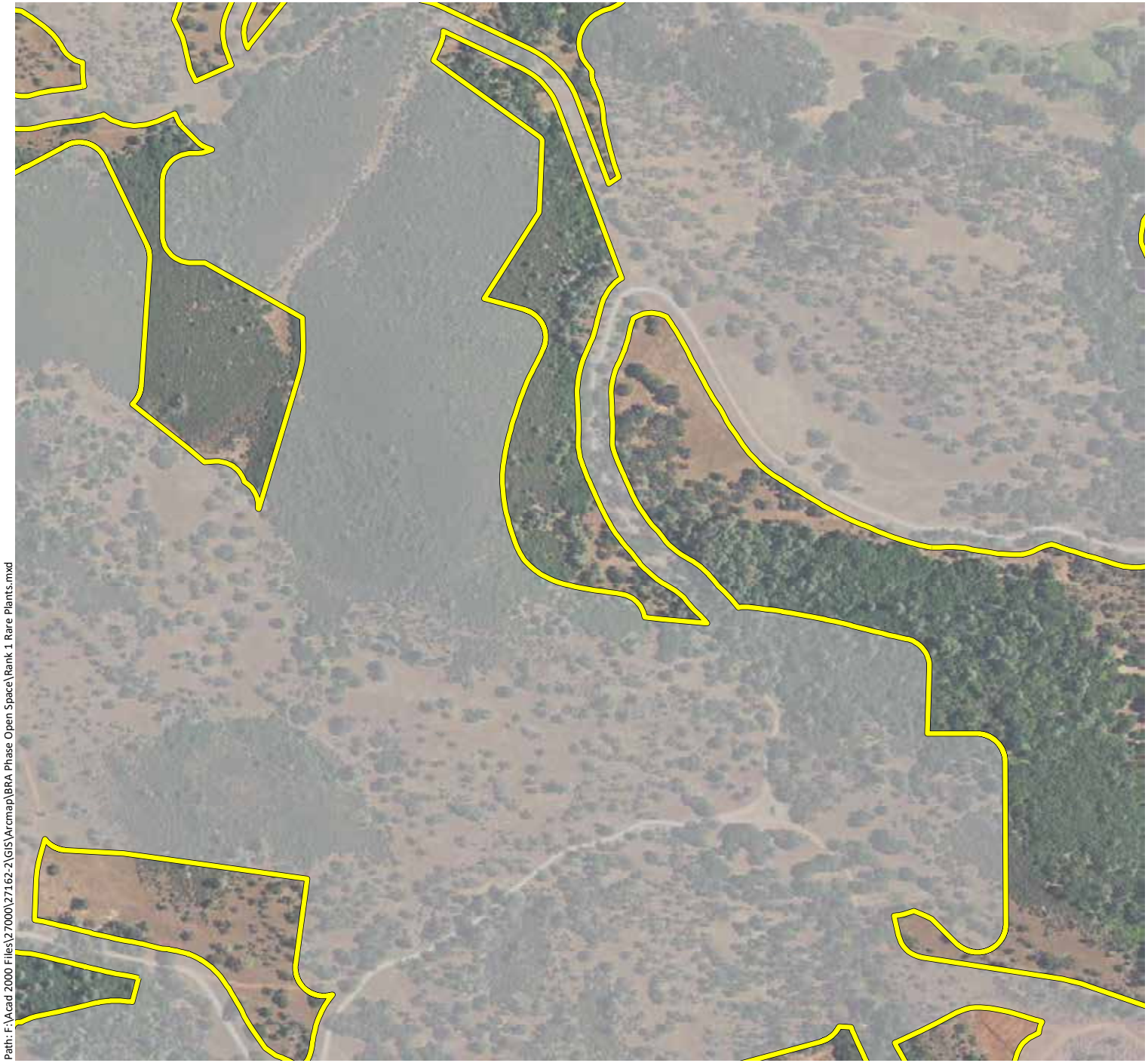
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 25)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

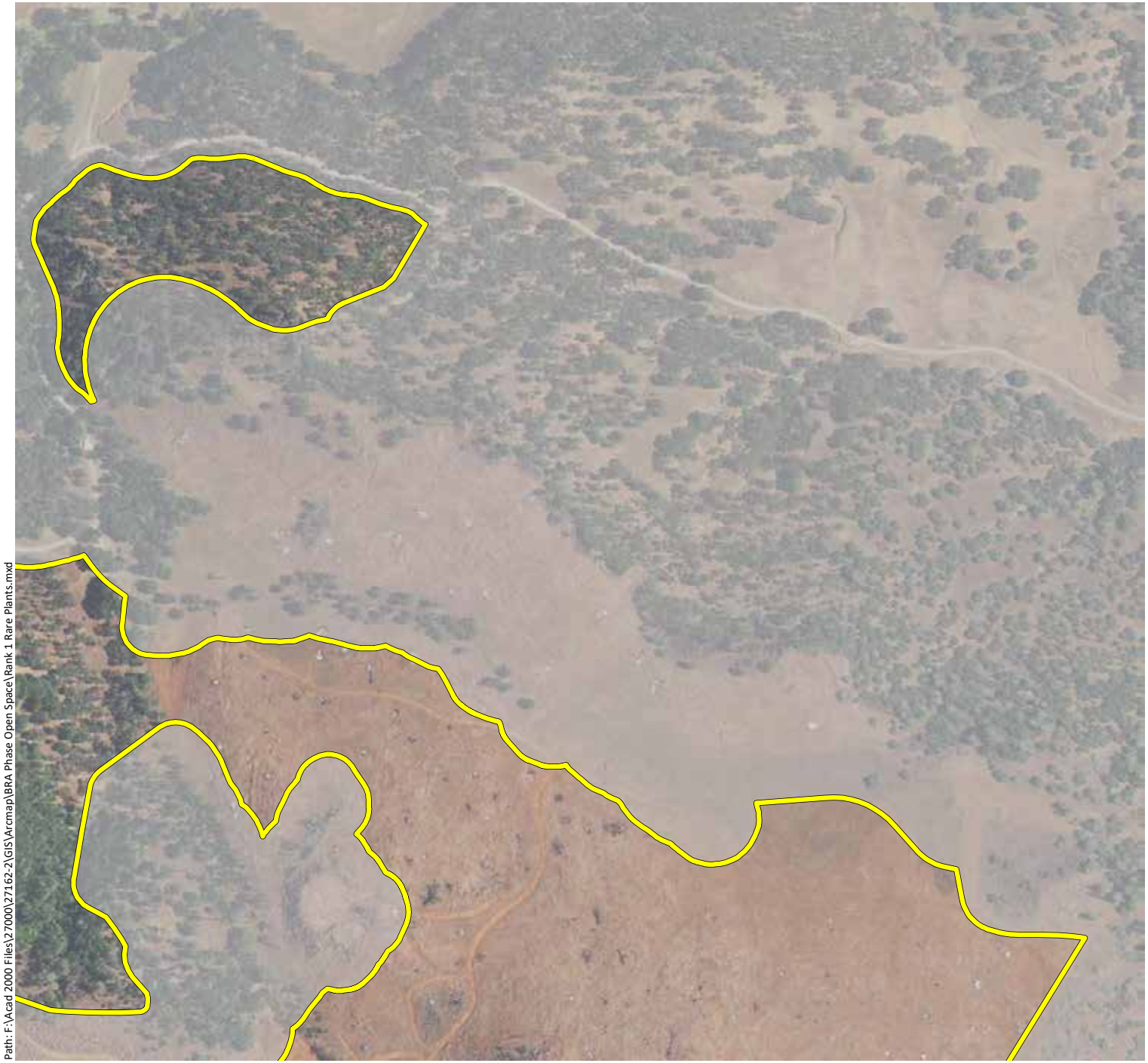
Feet

wra

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 26)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

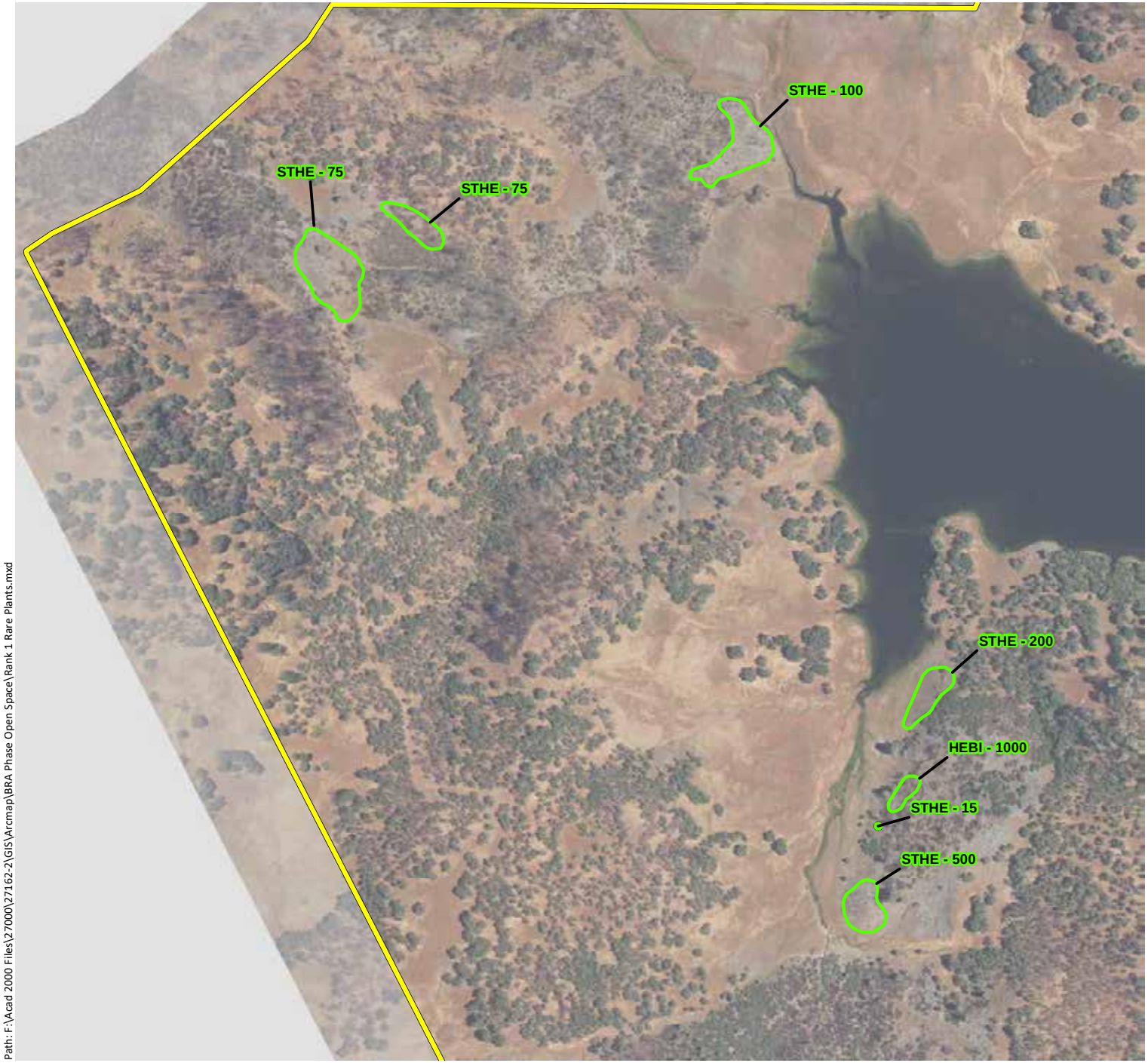
Feet

wra

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 27)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 28)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 29)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

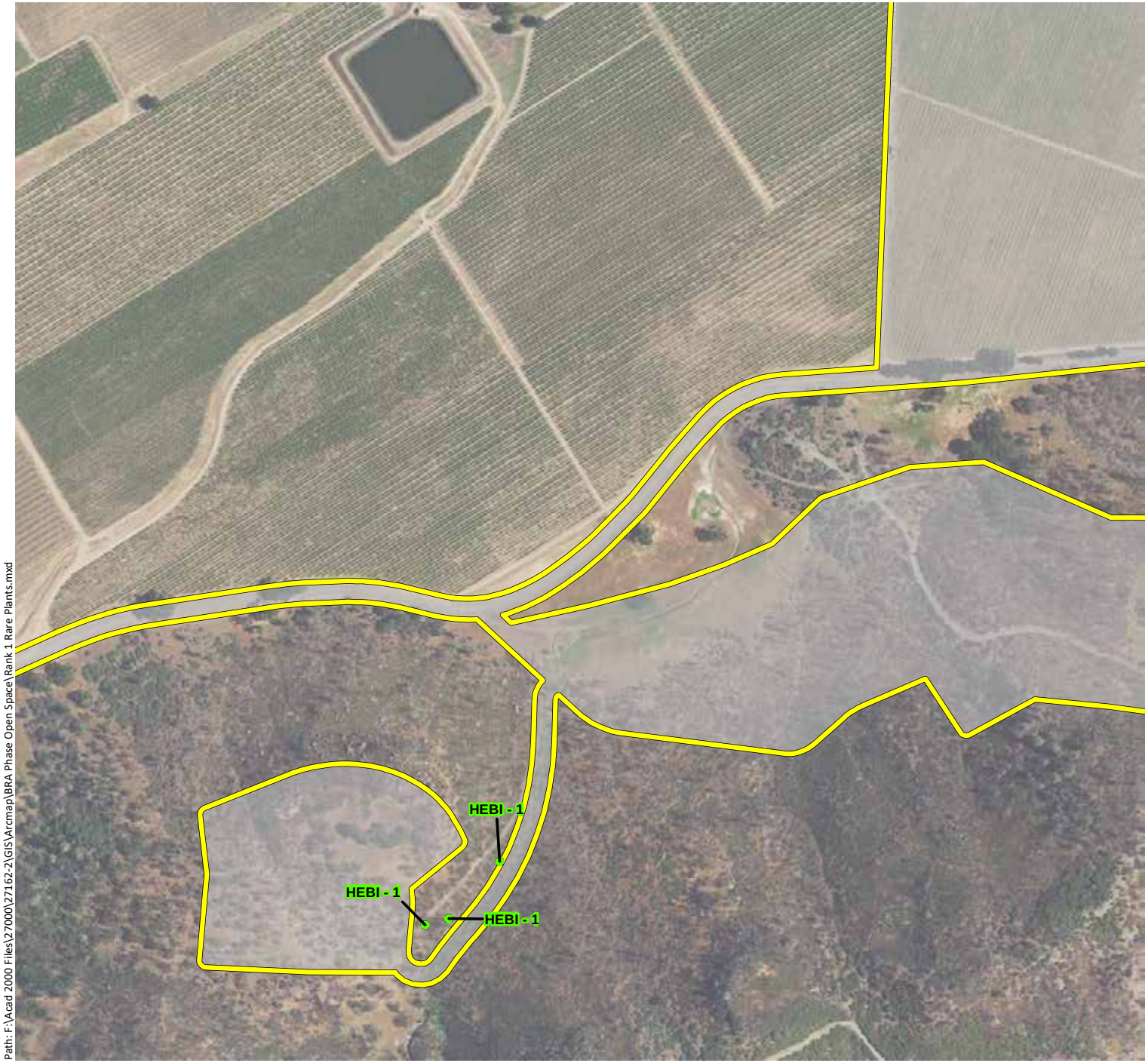
Feet

wra

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 30)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

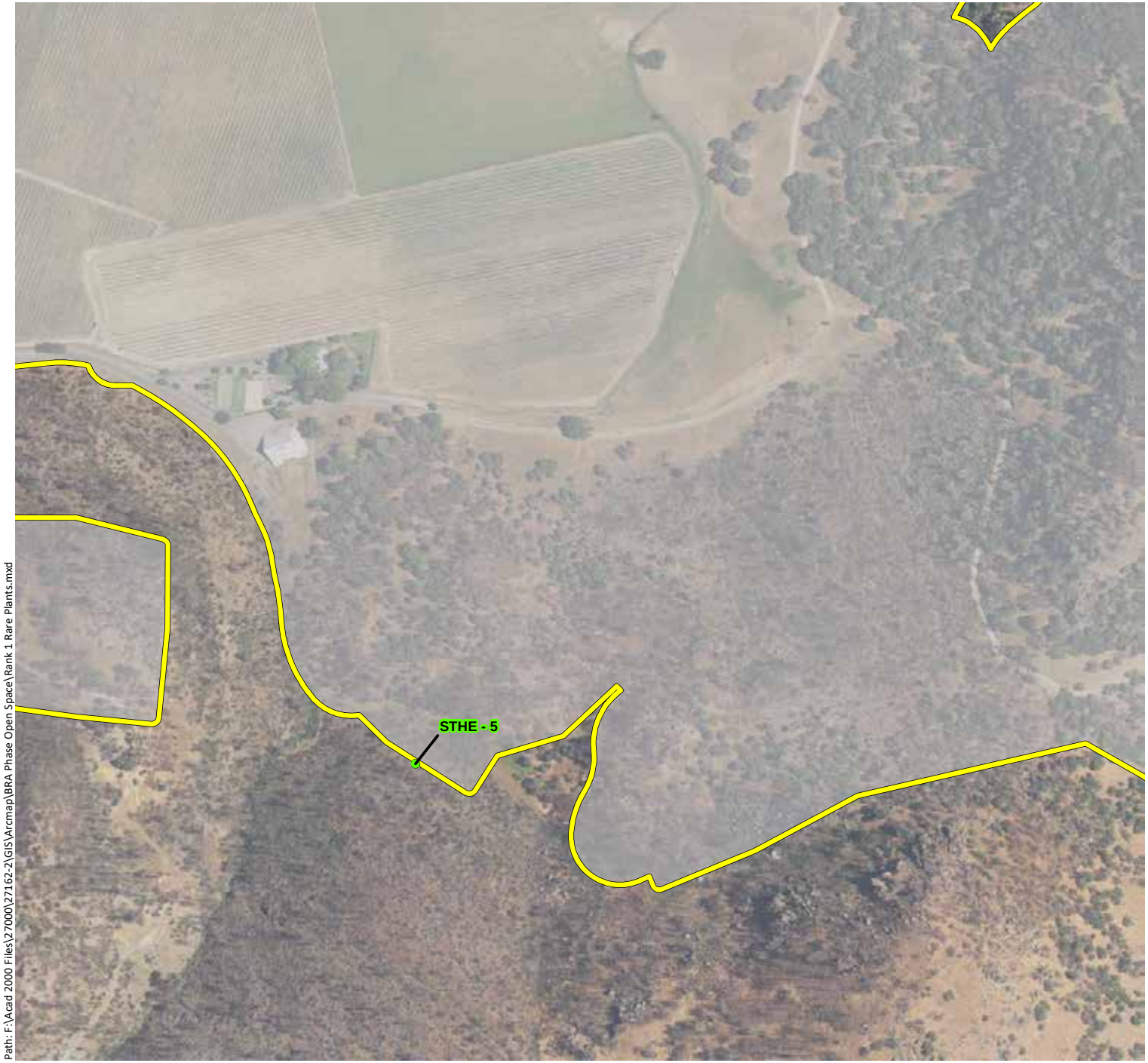
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 31)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

Federally-Endangered Plants

State-Endangered Plants

CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

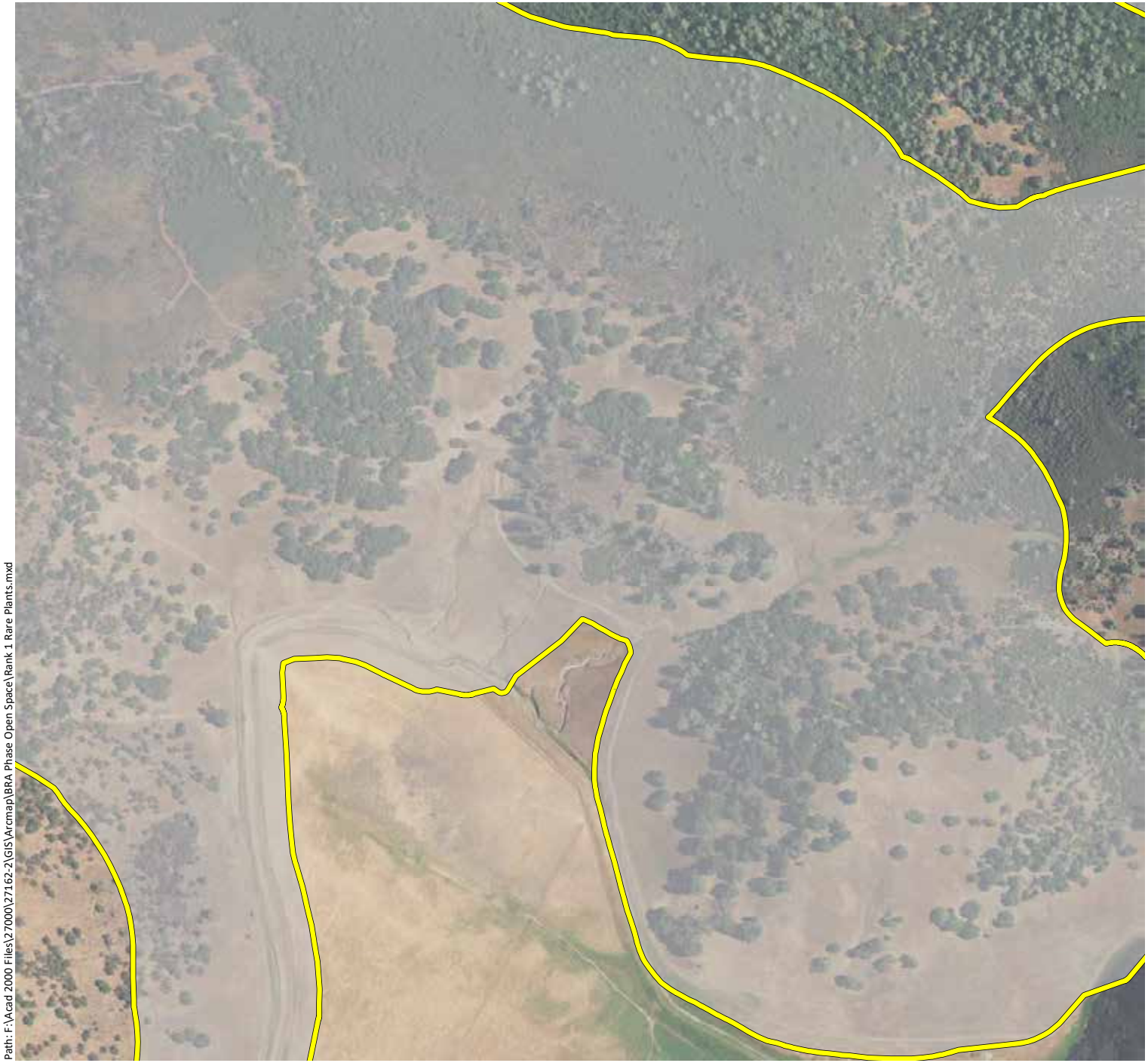
Feet

wra

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 32)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

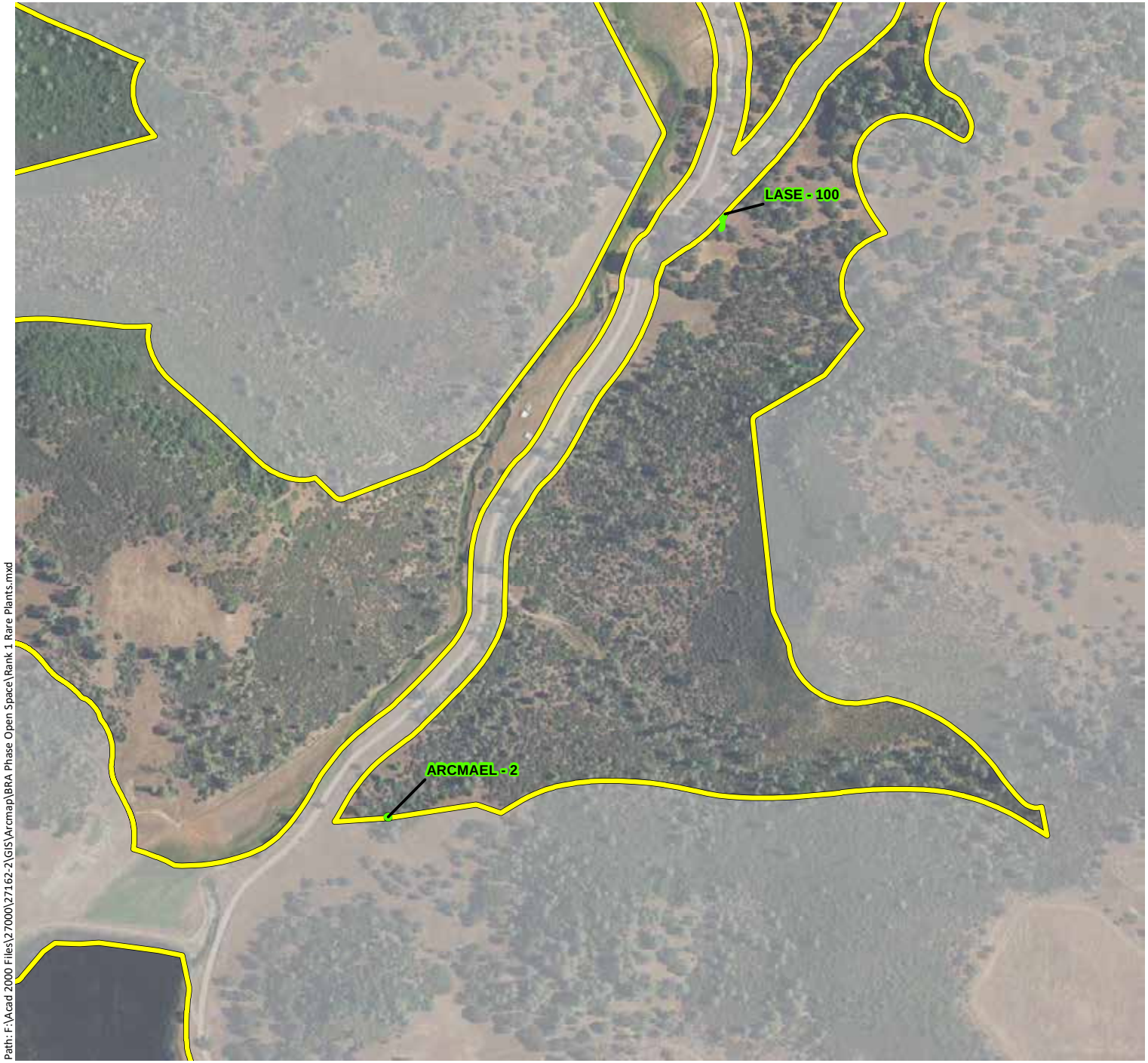
wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 33)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.
Federally-Endangered Plants
State-Endangered Plants
CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch
BAMA: Big-scale balsamroot
BRLE: Narrow-flowered California brodiaea
ERGR: Greene's narrow-leaved fleabane
HEBI: Two carpellate western flax
LASE: Colusa layia
STHE: Green jewelflower
STMO: Morrison's jewelflower

N

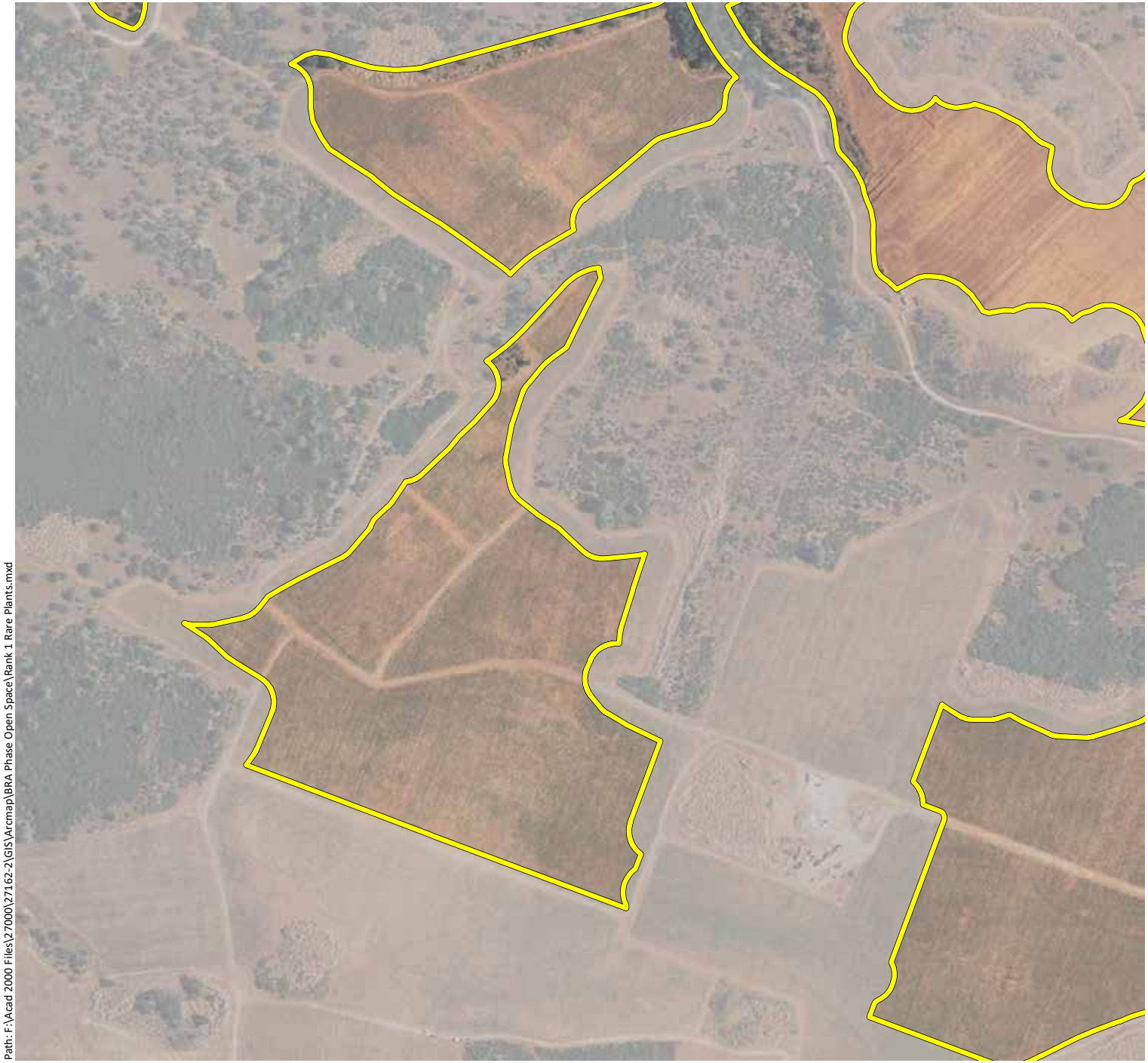
0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 34)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

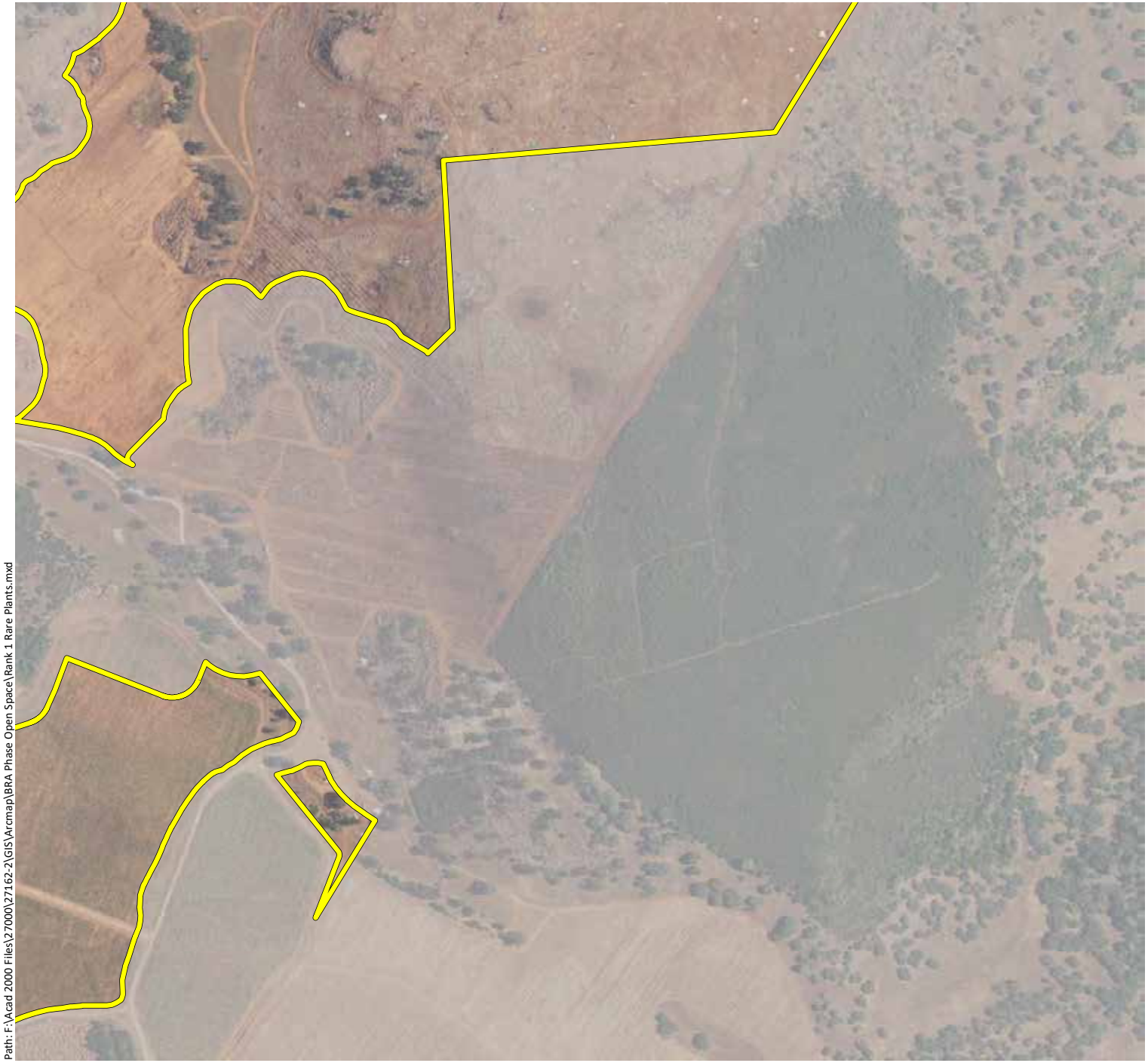
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 35)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 36)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.
Federally-Endangered Plants
State-Endangered Plants
CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch
BAMA: Big-scale balsamroot
BRLE: Narrow-flowered California brodiaea
ERGR: Greene's narrow-leaved fleabane
HEBI: Two carpellate western flax
LASE: Colusa layia
STHE: Green jewelflower
STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 37)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 38)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.
Federally-Endangered Plants
State-Endangered Plants
CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch
BAMA: Big-scale balsamroot
BRLE: Narrow-flowered California brodiaea
ERGR: Greene's narrow-leaved fleabane
HEBI: Two carpellate western flax
LASE: Colusa layia
STHE: Green jewelflower
STMO: Morrison's jewelflower

N

0 500 1,000

Feet

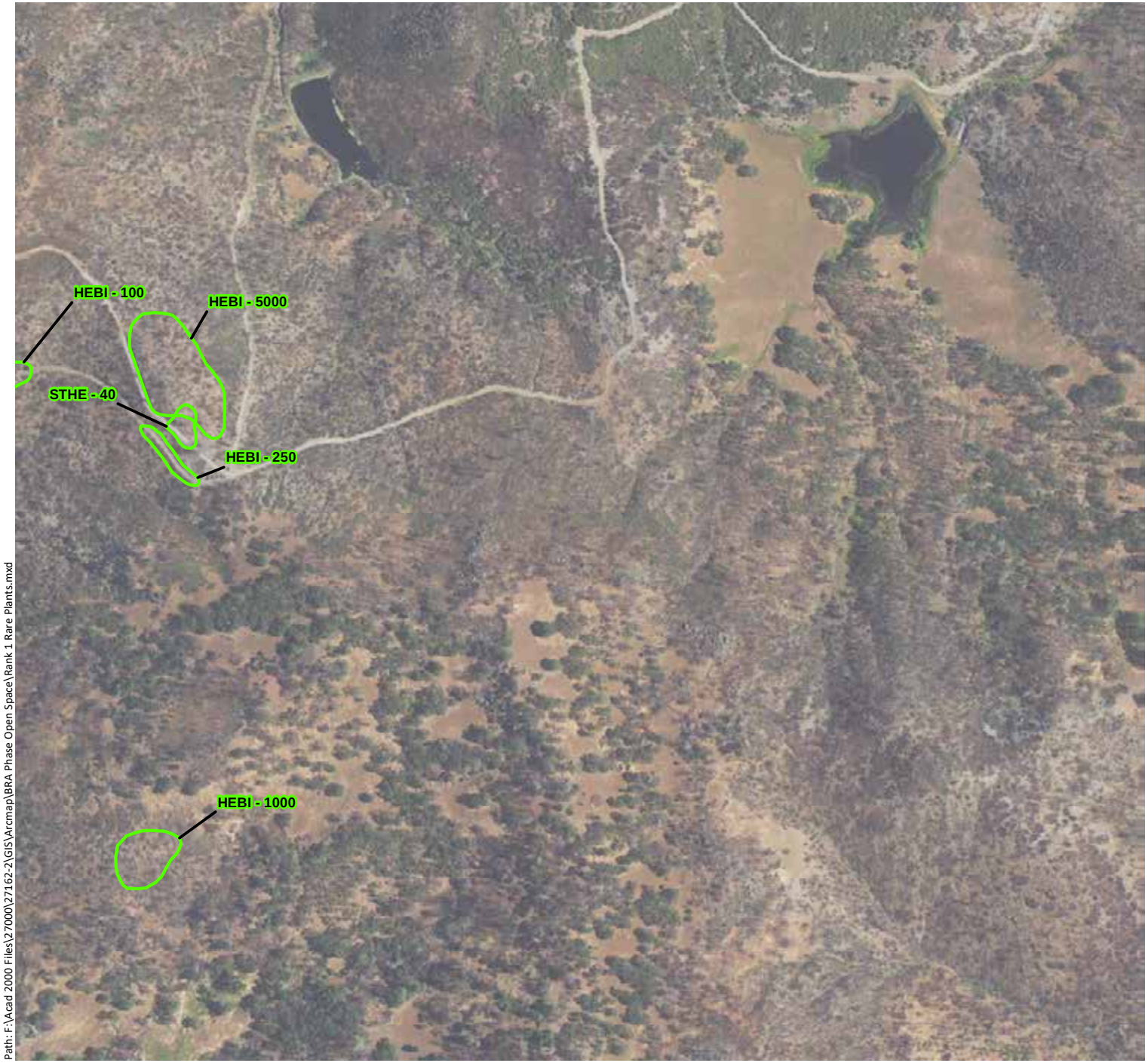
wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 39)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.
Federally-Endangered Plants
State-Endangered Plants
CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch
BAMA: Big-scale balsamroot
BRLE: Narrow-flowered California brodiaea
ERGR: Greene's narrow-leaved fleabane
HEBI: Two carpellate western flax
LASE: Colusa layia
STHE: Green jewelflower
STMO: Morrison's jewelflower

N

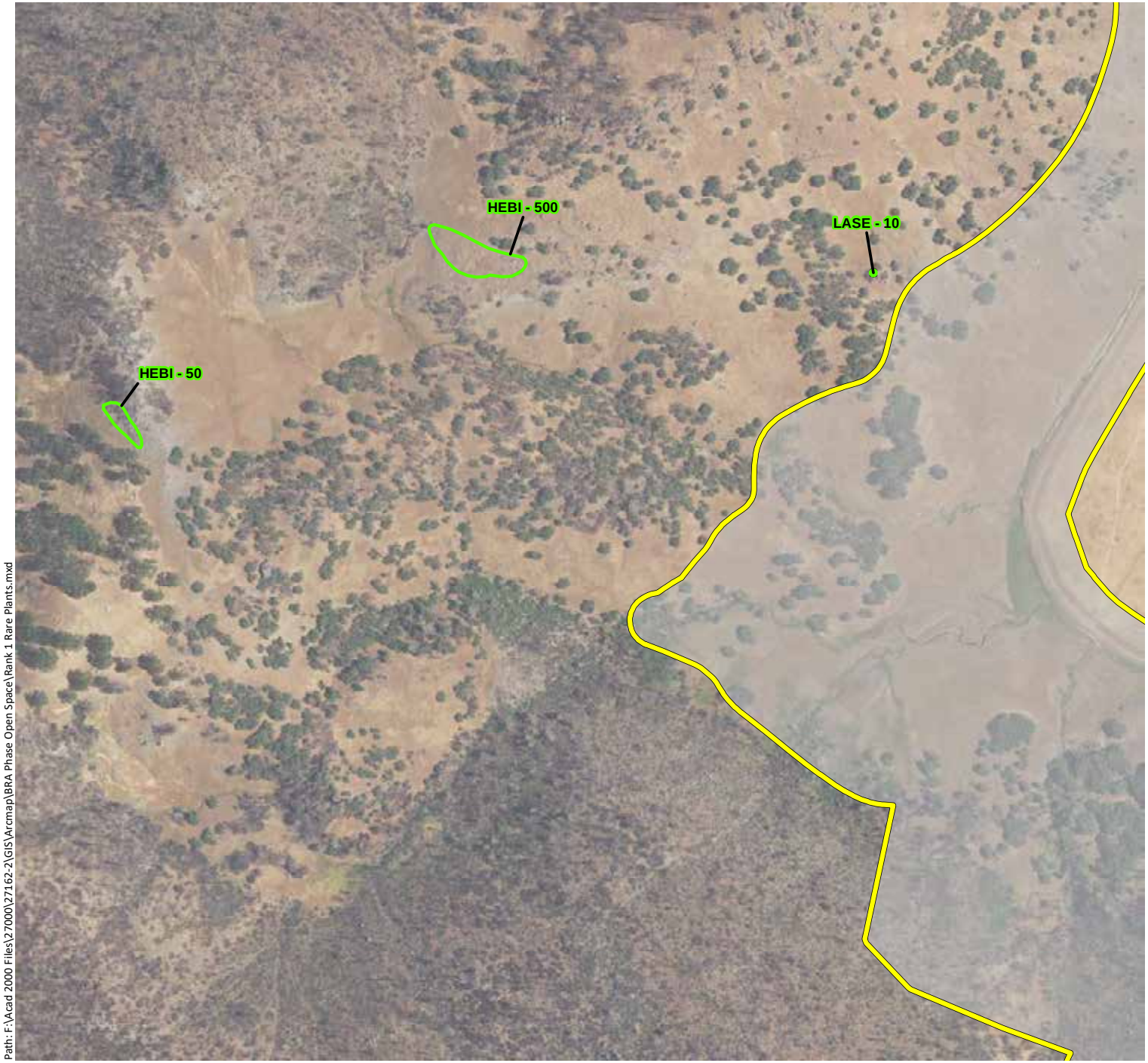
0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 40)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 41)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 42)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 43)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 44)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

Federally-Endangered Plants

State-Endangered Plants

CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 45)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 46)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.
Federally-Endangered Plants
State-Endangered Plants
CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch
BAMA: Big-scale balsamroot
BRLE: Narrow-flowered California brodiaea
ERGR: Greene's narrow-leaved fleabane
HEBI: Two carpellate western flax
LASE: Colusa layia
STHE: Green jewelflower
STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 47)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.
Federally-Endangered Plants
State-Endangered Plants
CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch
BAMA: Big-scale balsamroot
BRLE: Narrow-flowered California brodiaea
ERGR: Greene's narrow-leaved fleabane
HEBI: Two carpellate western flax
LASE: Colusa layia
STHE: Green jewelflower
STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 48)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

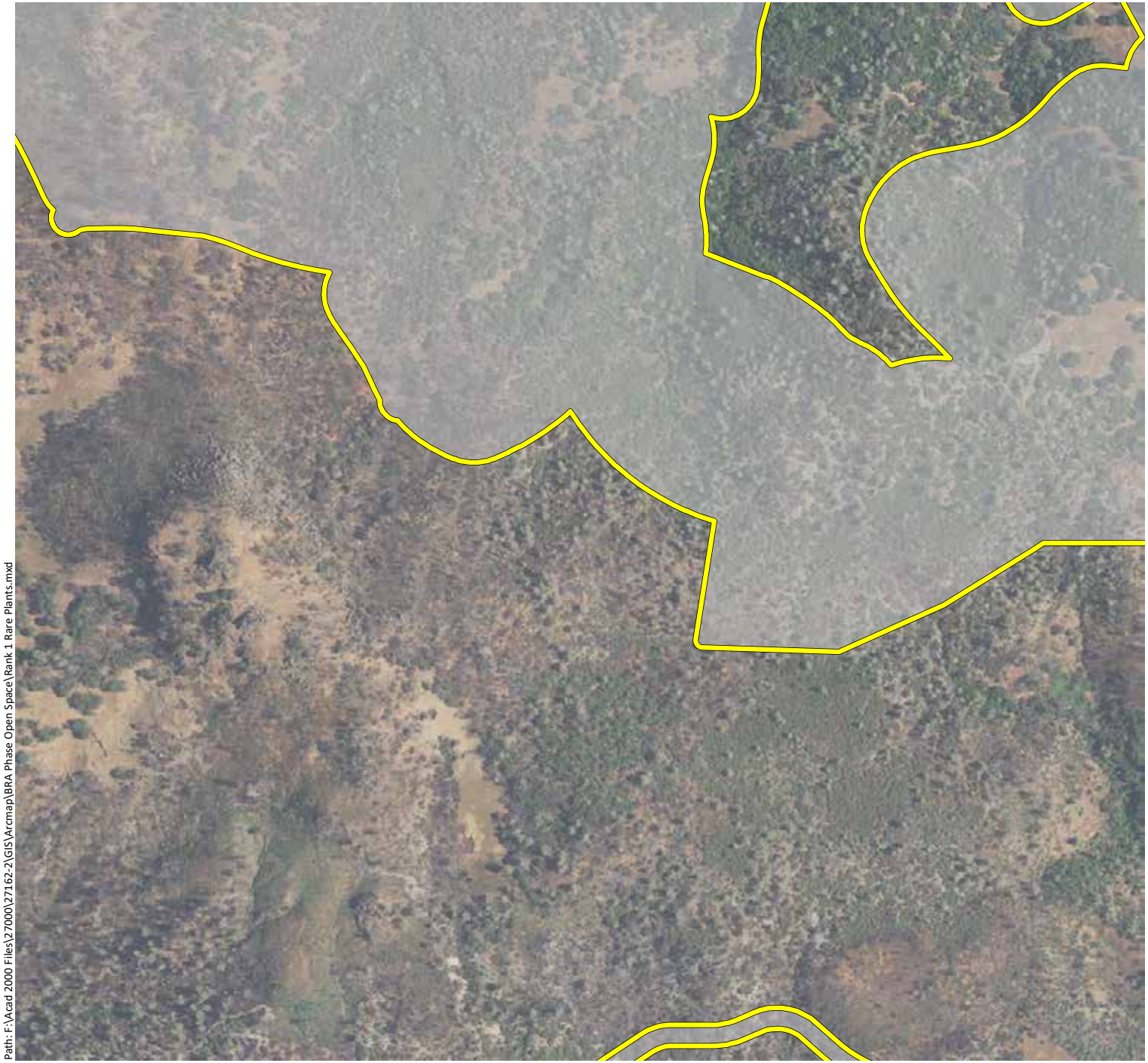
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 49)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

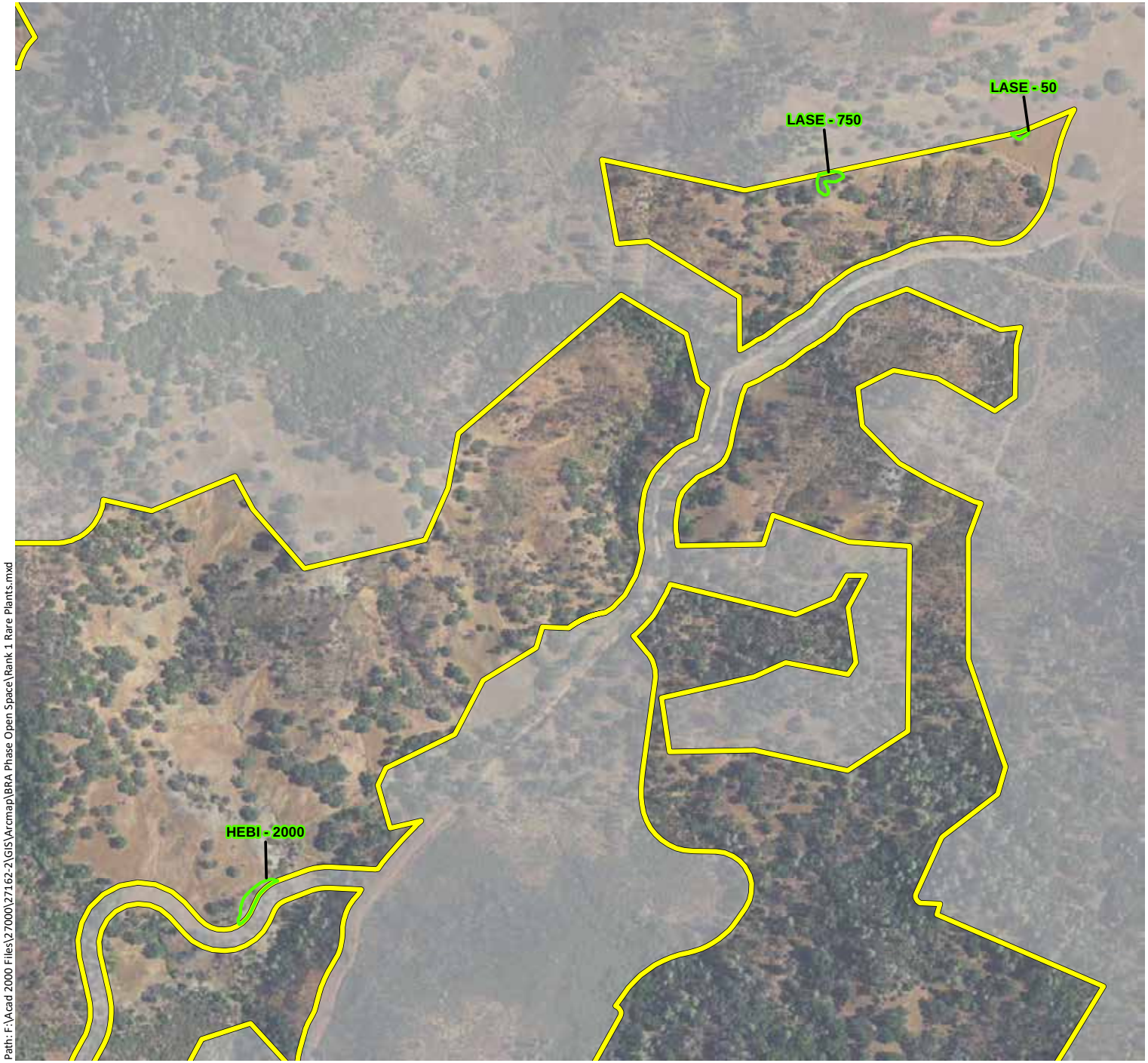
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 50)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 51)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 52)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 53)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 54)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

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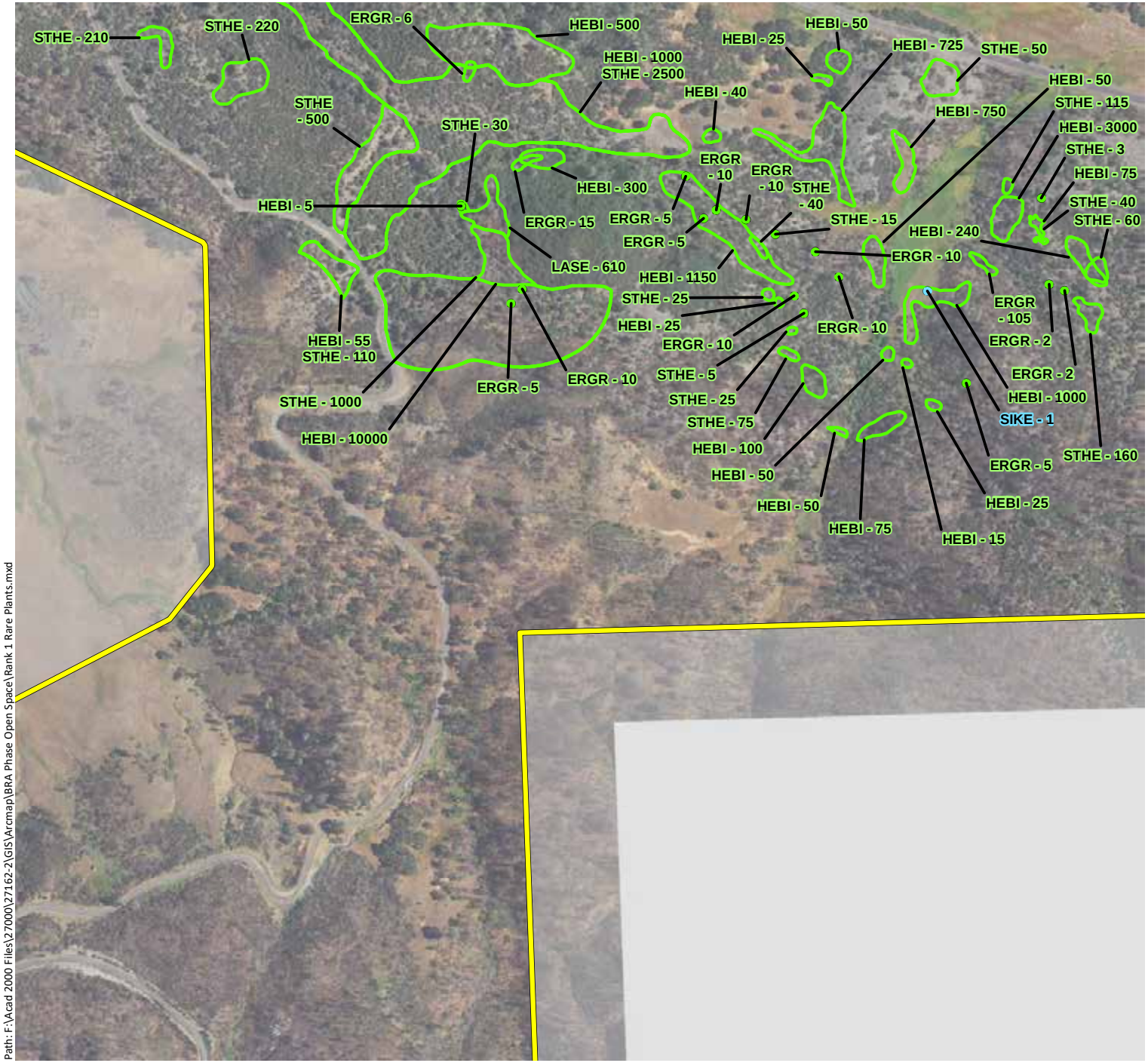
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 55)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

Federally-Endangered Plants

State-Endangered Plants

CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 56)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

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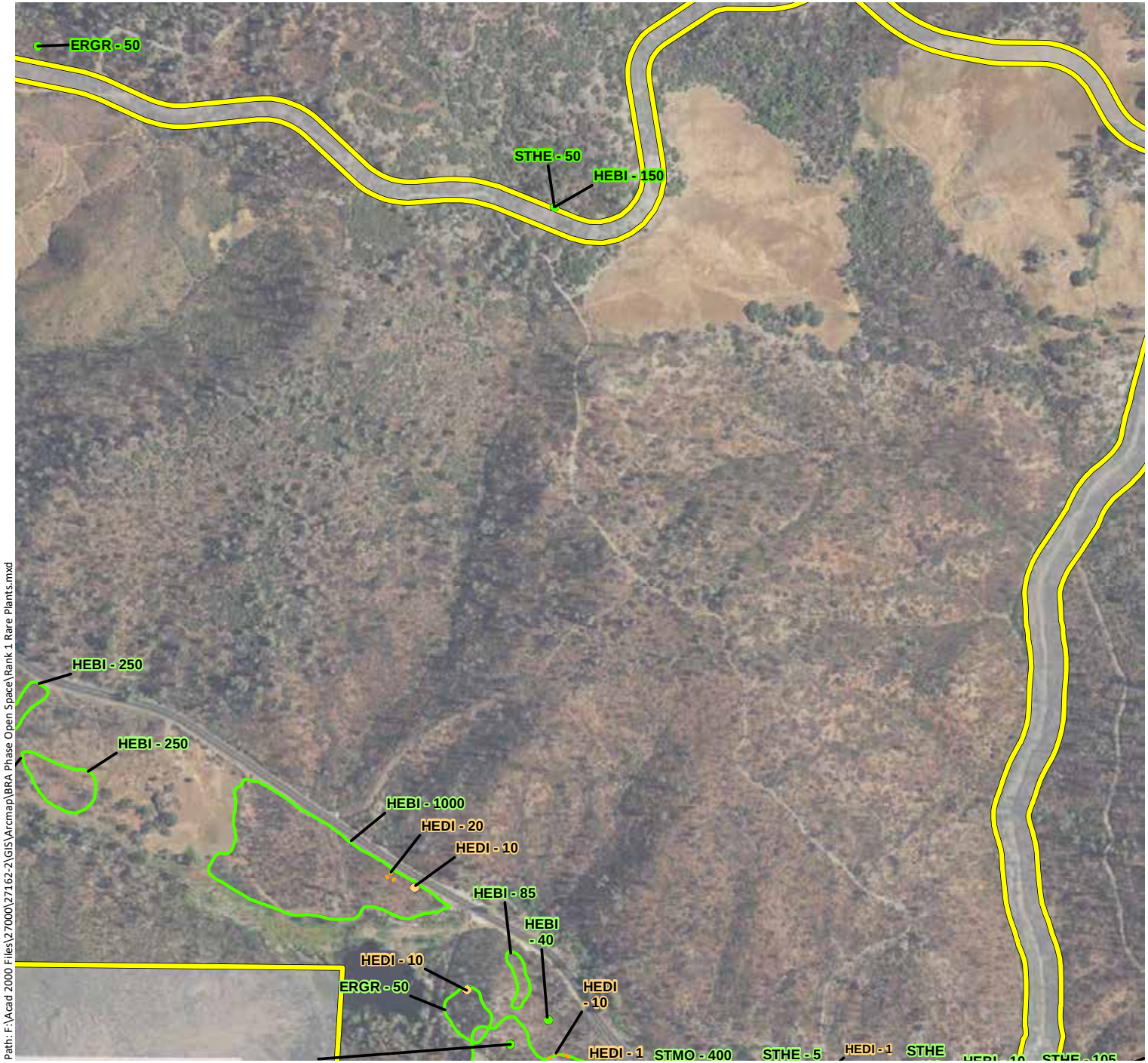
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 57)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

Federally-Endangered Plants

State-Endangered Plants

CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

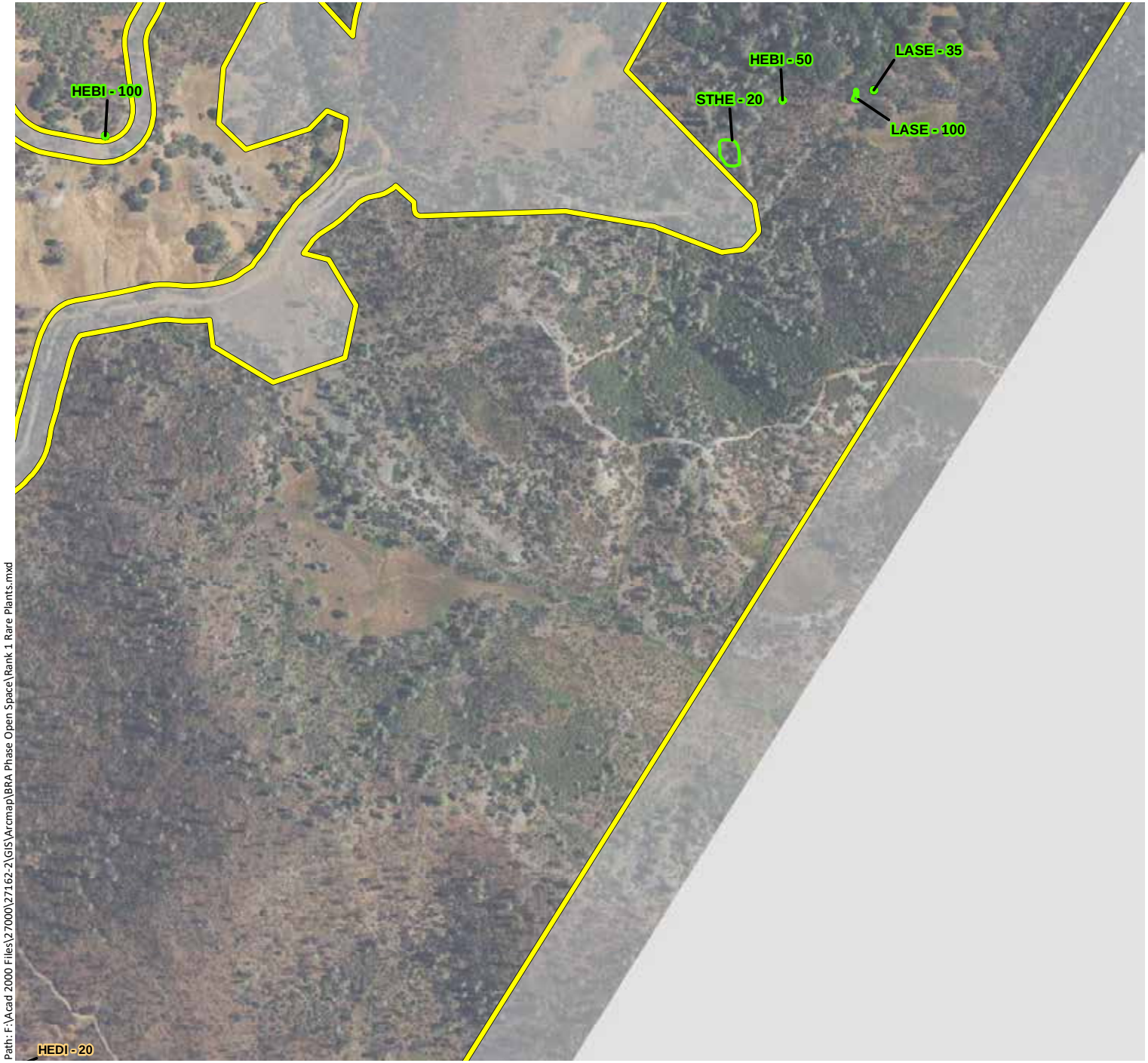
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 58)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1.
Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 59)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 60)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

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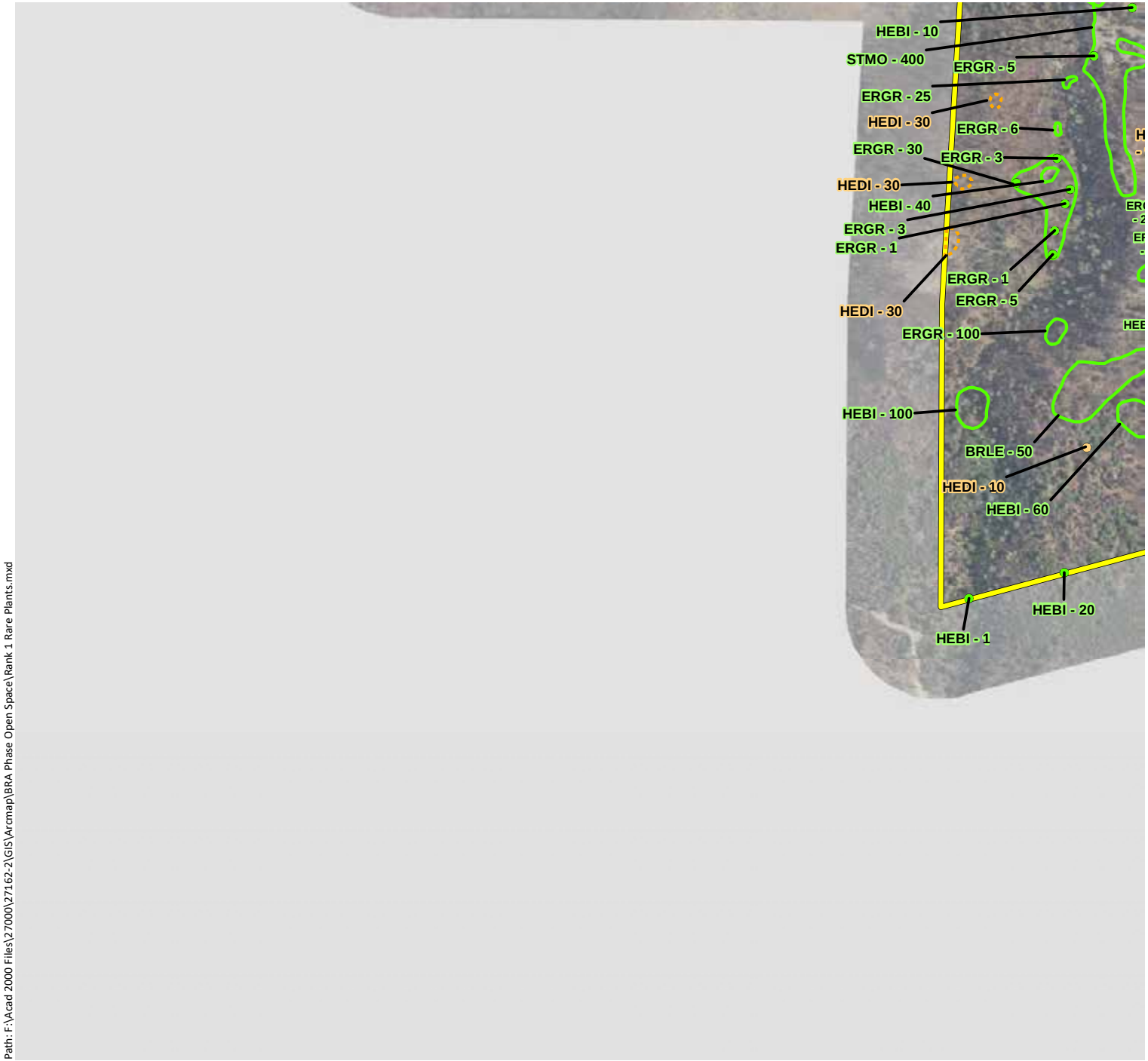

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 61)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E1. Federal, State, and CNPS Rank 1 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 62)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

- Phase 2 & Open Space Study Area - 11,549 ac.
- Federally-Endangered Plants
- State-Endangered Plants
- CNPS Rank 1 Plants

Key to Species Codes

Federally-Endangered Plants:

SIKE: Keck's checkerbloom

State-Endangered Plants:

HEDI: Lake County western flax

CNPS Rank 1 Plants:

ASJE: Jepson's milkvetch

BAMA: Big-scale balsamroot

BRLE: Narrow-flowered California brodiaea

ERGR: Greene's narrow-leaved fleabane

HEBI: Two carpellate western flax

LASE: Colusa layia

STHE: Green jewelflower

STMO: Morrison's jewelflower

N

0 500 1,000

Feet

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 1 Rare Plants.mxd

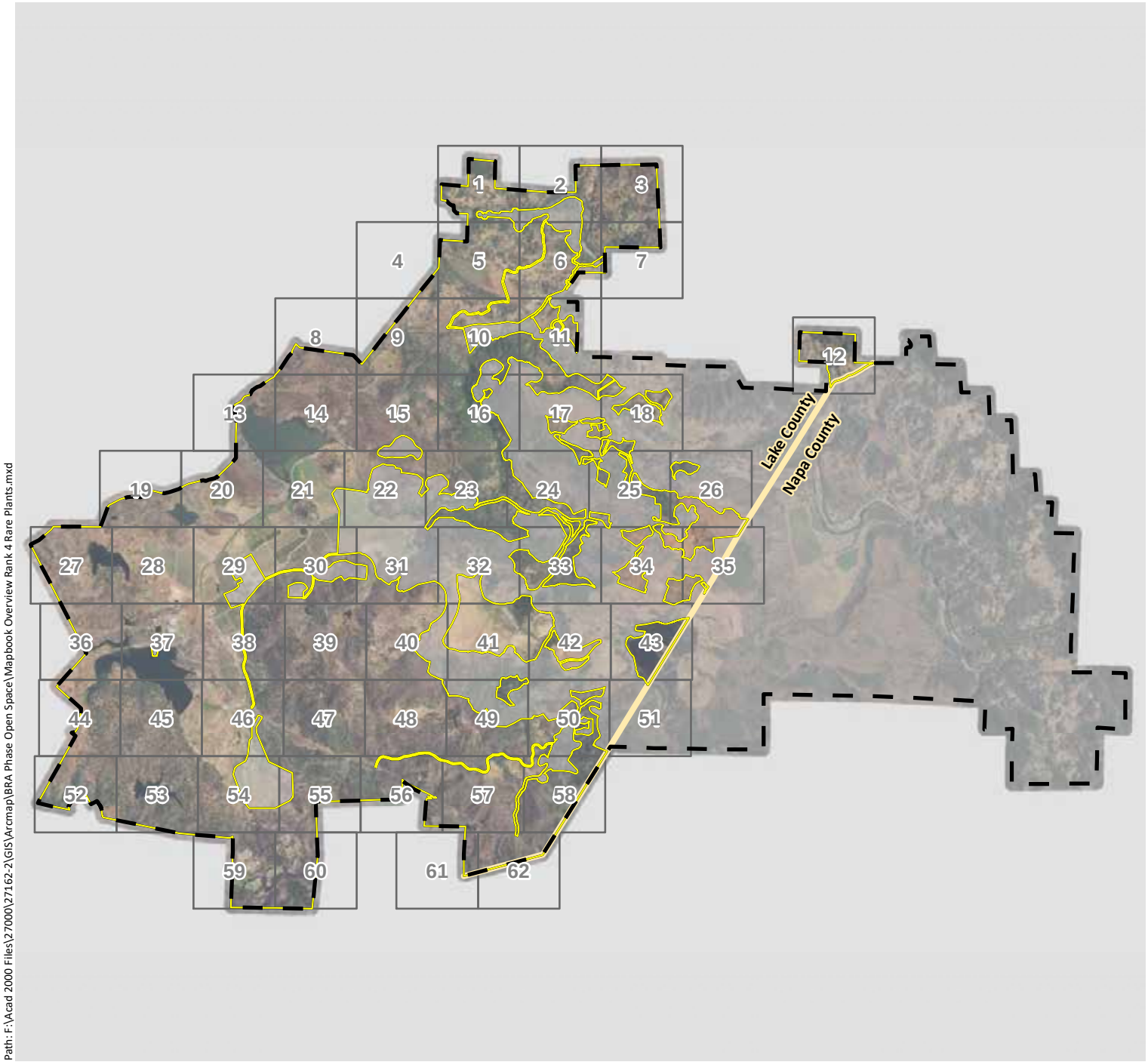
Sources: 2016 Hexagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

APPENDIX E2

CNPS RANK 4 SPECIAL-STATUS PLANT SPECIES OBSERVED WITHIN THE PHASE 2/OPEN SPACE STUDY AREA

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Overview)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Property Boundary

Phase 2 and Open Space Study Area

Mapbook Grid

County Boundary

N

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Miles

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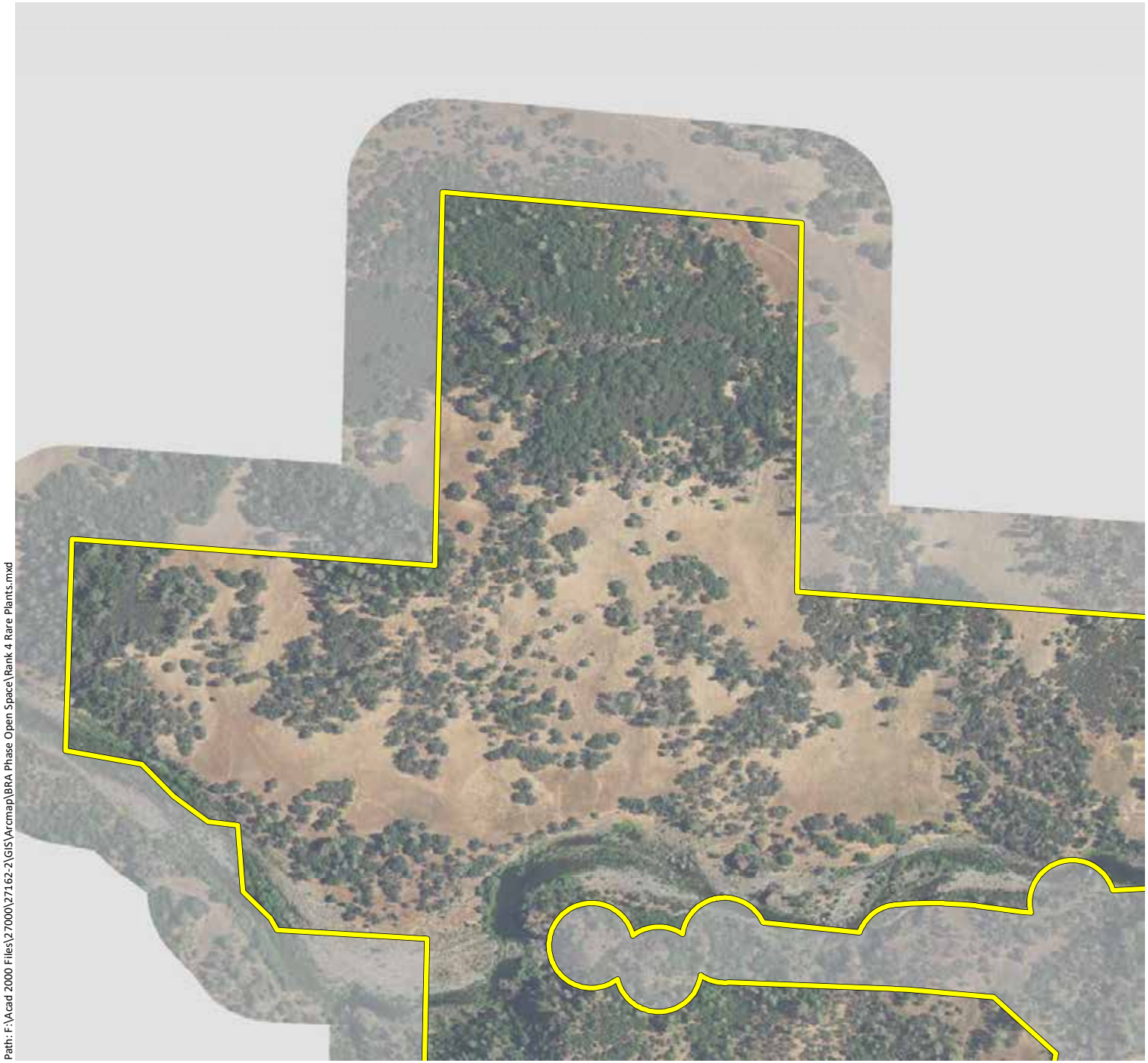
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Mapbook Overview Rank 4 Rare Plants.mxd

Sources: Hexagon 2016 Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area
(Mapbook Sheet 1)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 2)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

- ANVI: Tall snapdragon
- ASCL: Cleveland's milk-vetch
- CACOOX: Mt. Saint Helena morning glory
- CAUN: Pink star-tulip
- CLGRTR: Tracy's clarkia
- CODI: Serpentine collomia
- COTEBR: Serpentine bird's beak
- DEUL: Swamp Larksbur
- EMU/MINU: Bare monkeyflower
- ERHE: Mt. Saint Helena fawn lily
- FRPU: Purdy's fritillary
- HEEX: Serpentine sunflower
- MOVI: Green monardella
- NACO: Cotula navarretia
- NAJE: Jepson's navarretia
- SECLCL: Cleaveland's ragwort
- TOFO: Marsh zigadenus
- TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area
(Mapbook Sheet 3)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area
(Mapbook Sheet 4)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 5)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 6)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area
(Mapbook Sheet 7)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 8)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 9)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

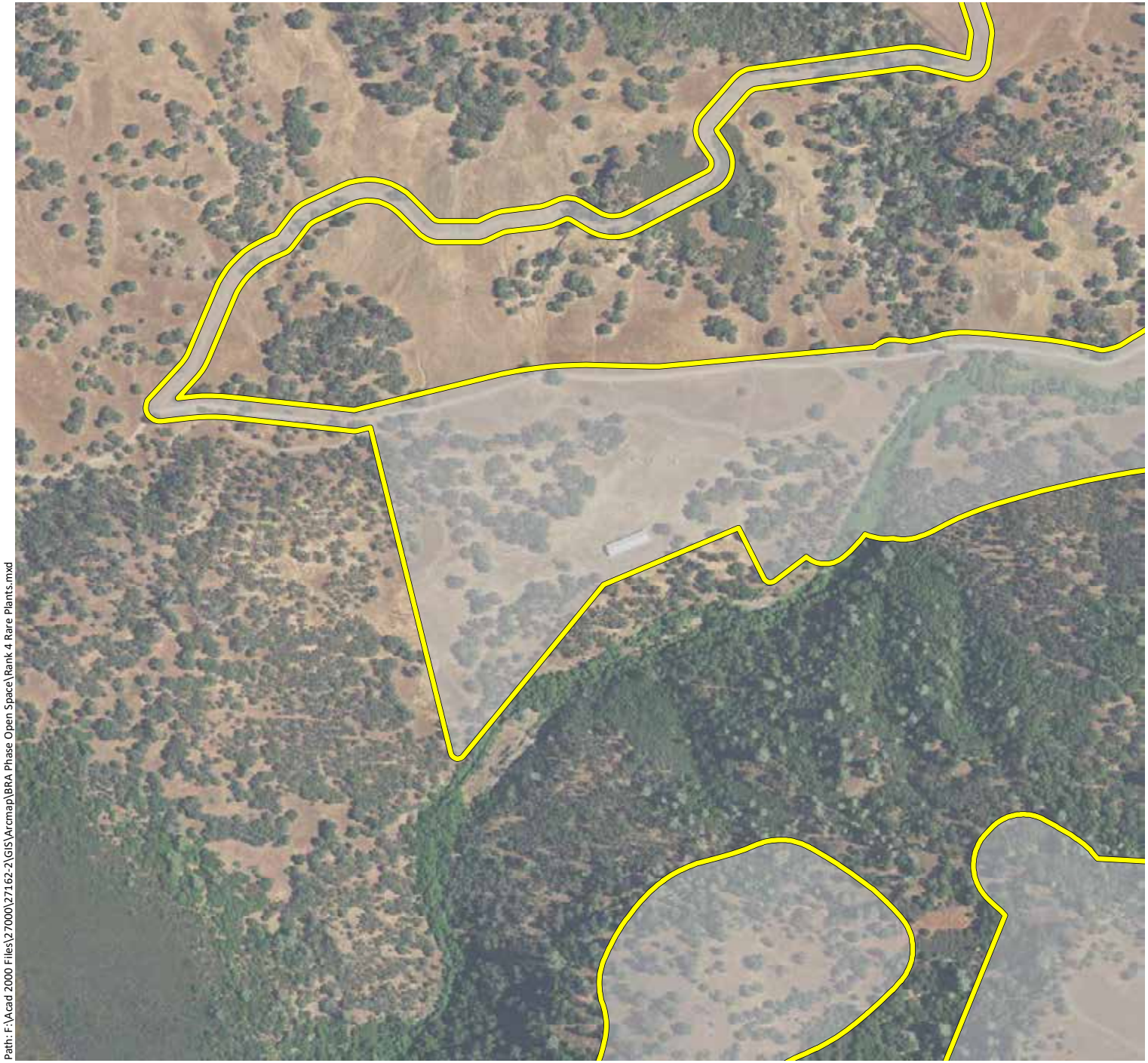
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 10)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 11)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 12)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 13)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area
(Mapbook Sheet 14)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

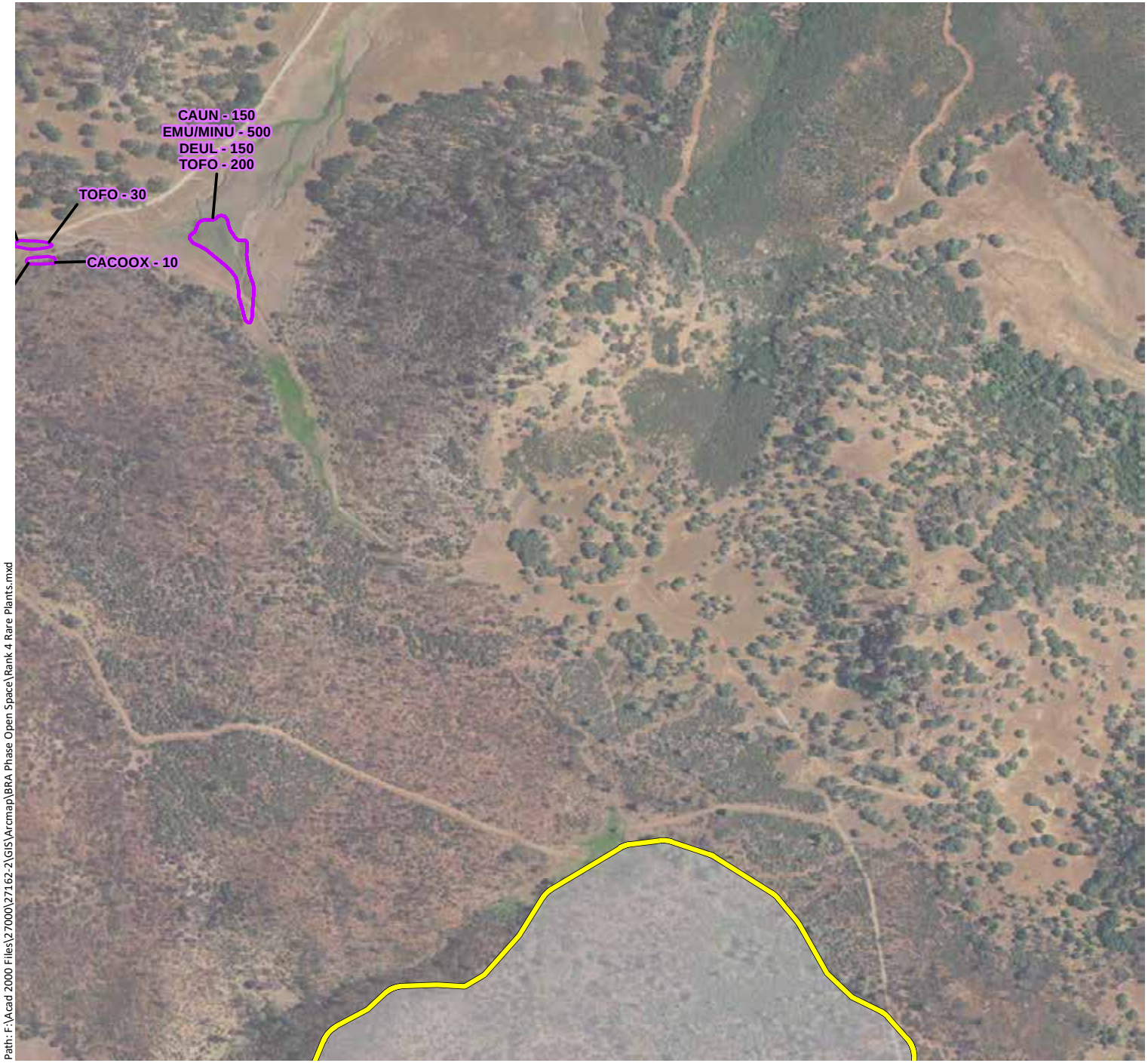
0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 15)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

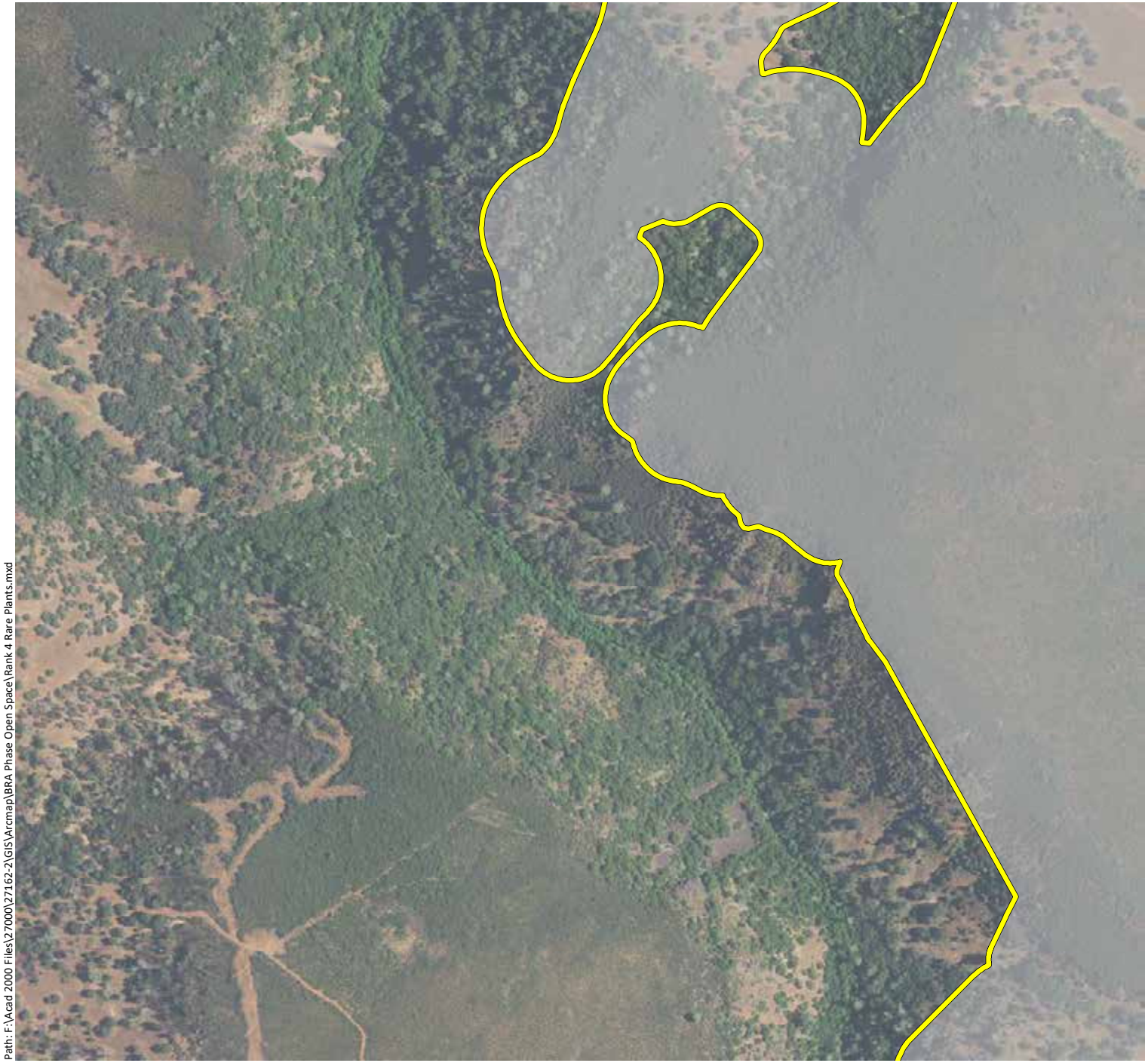
0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 16)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

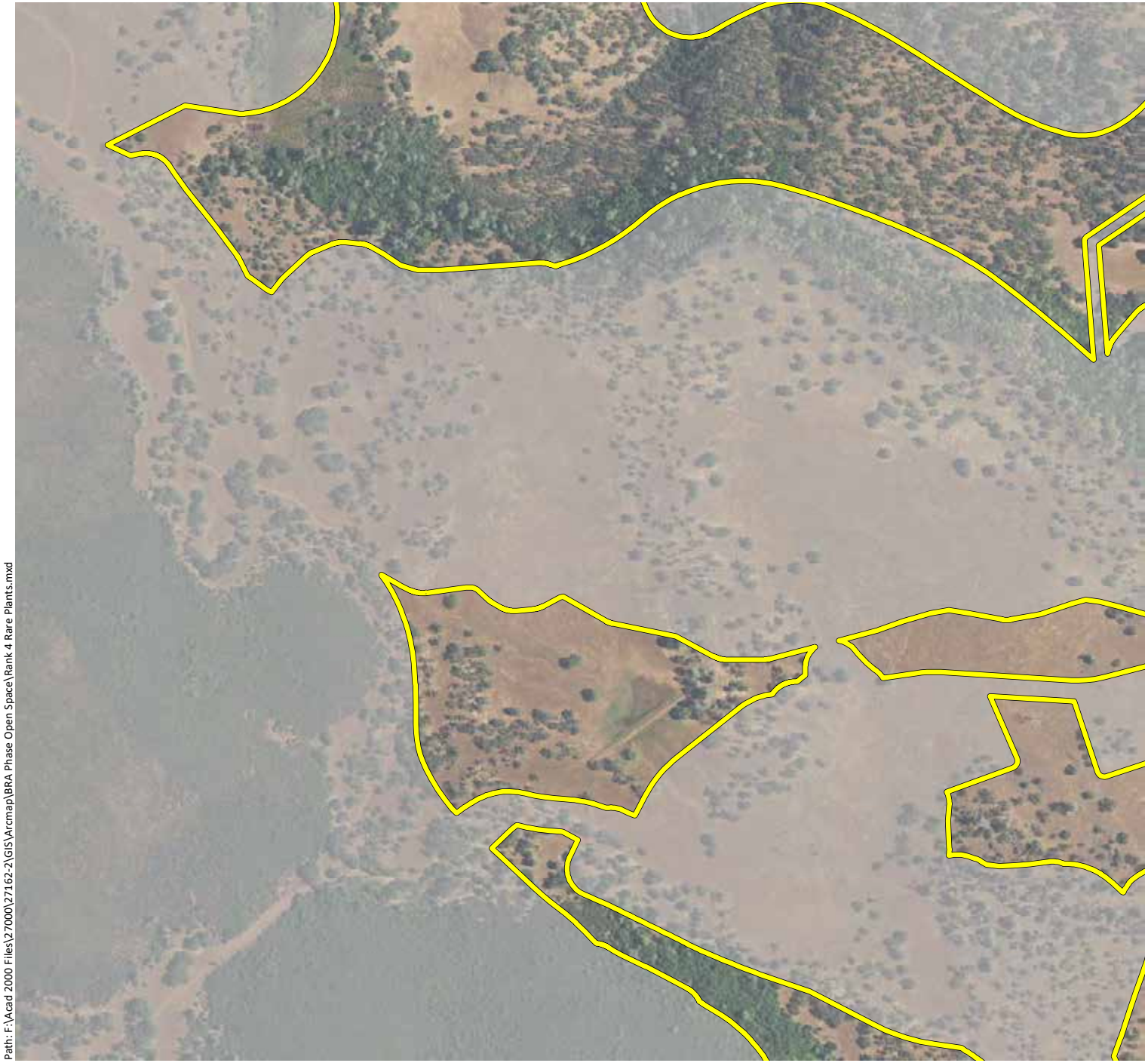
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 17)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

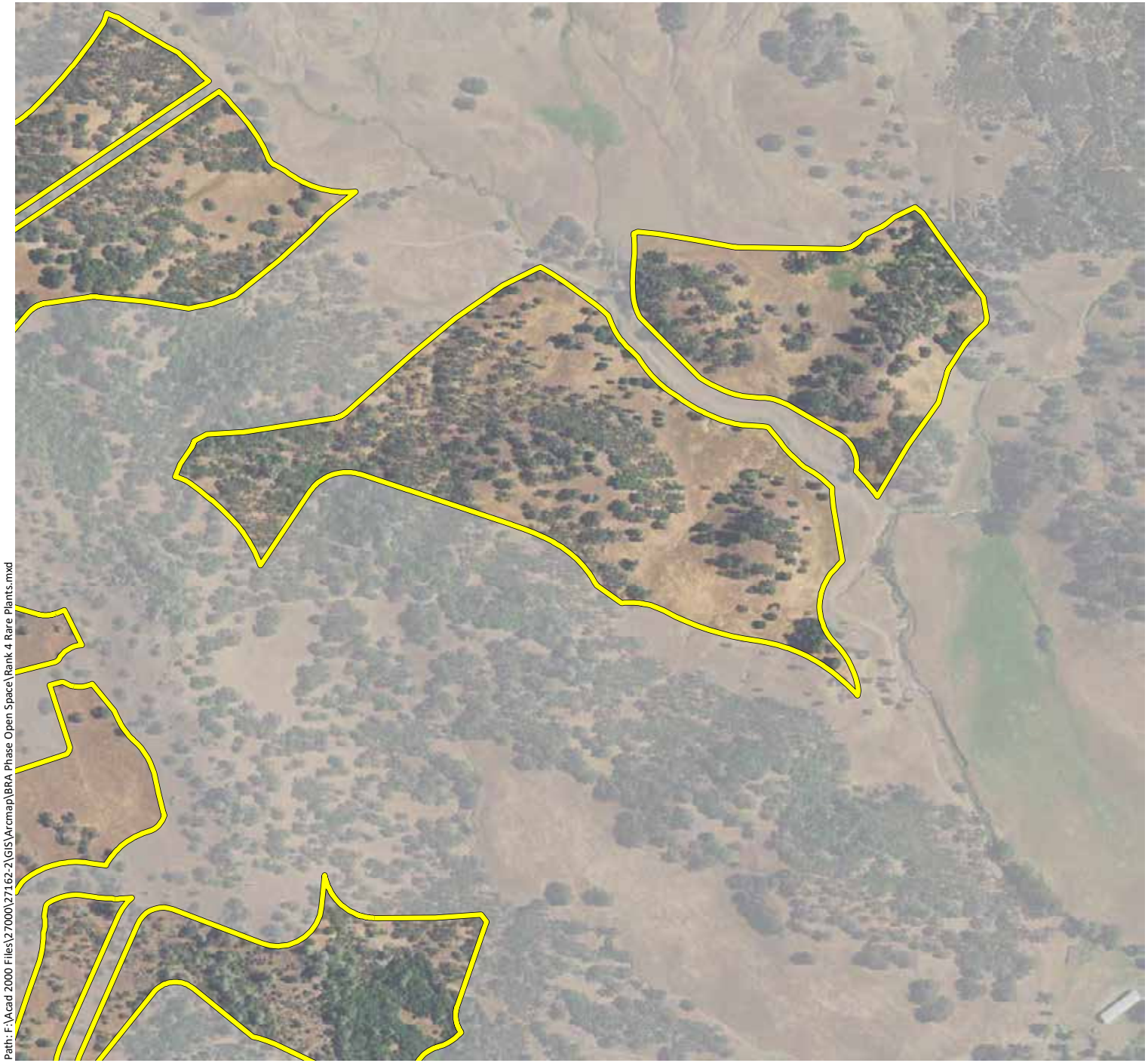
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 18)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area
(Mapbook Sheet 19)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 20)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 21)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

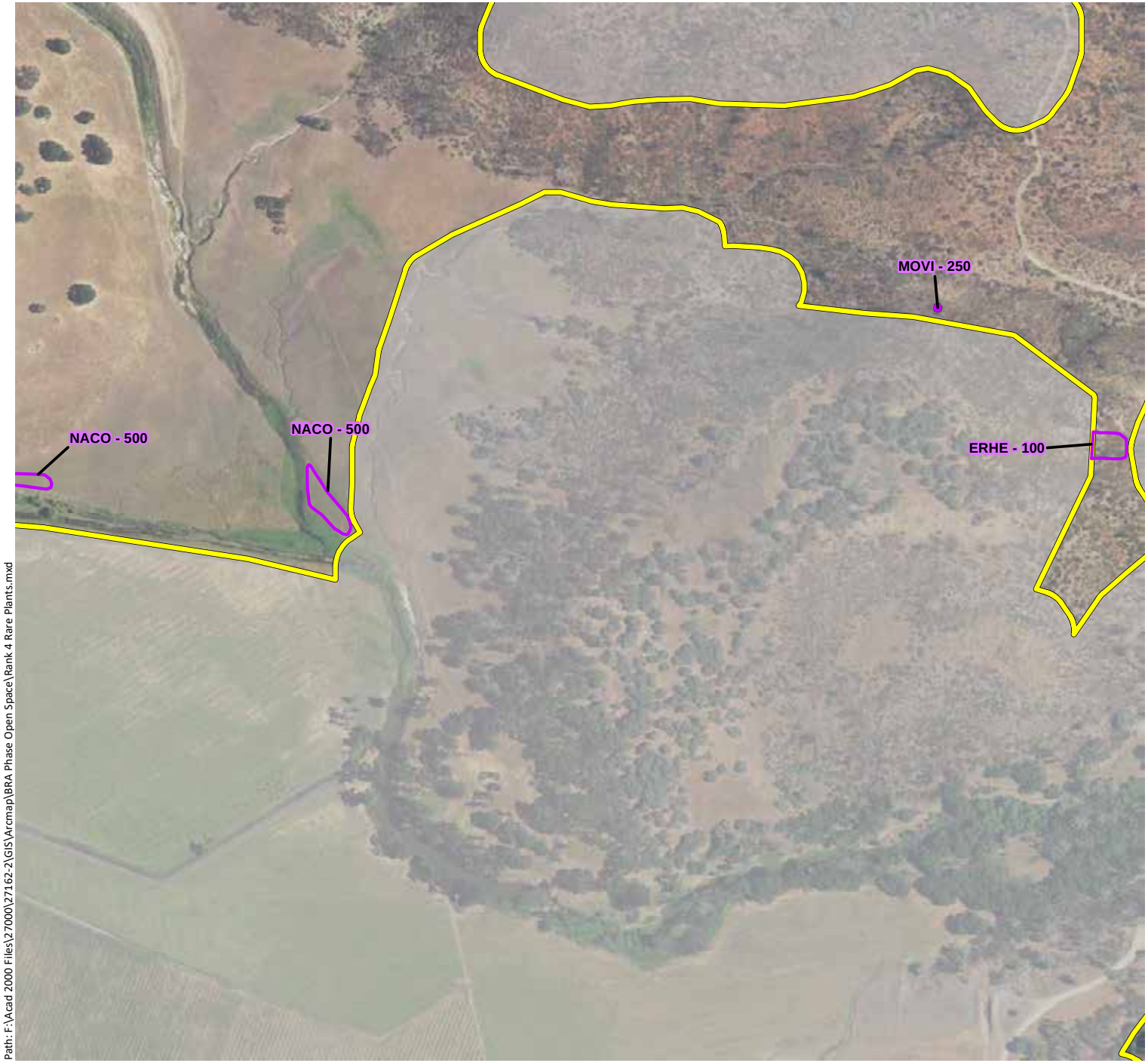
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area
(Mapbook Sheet 22)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

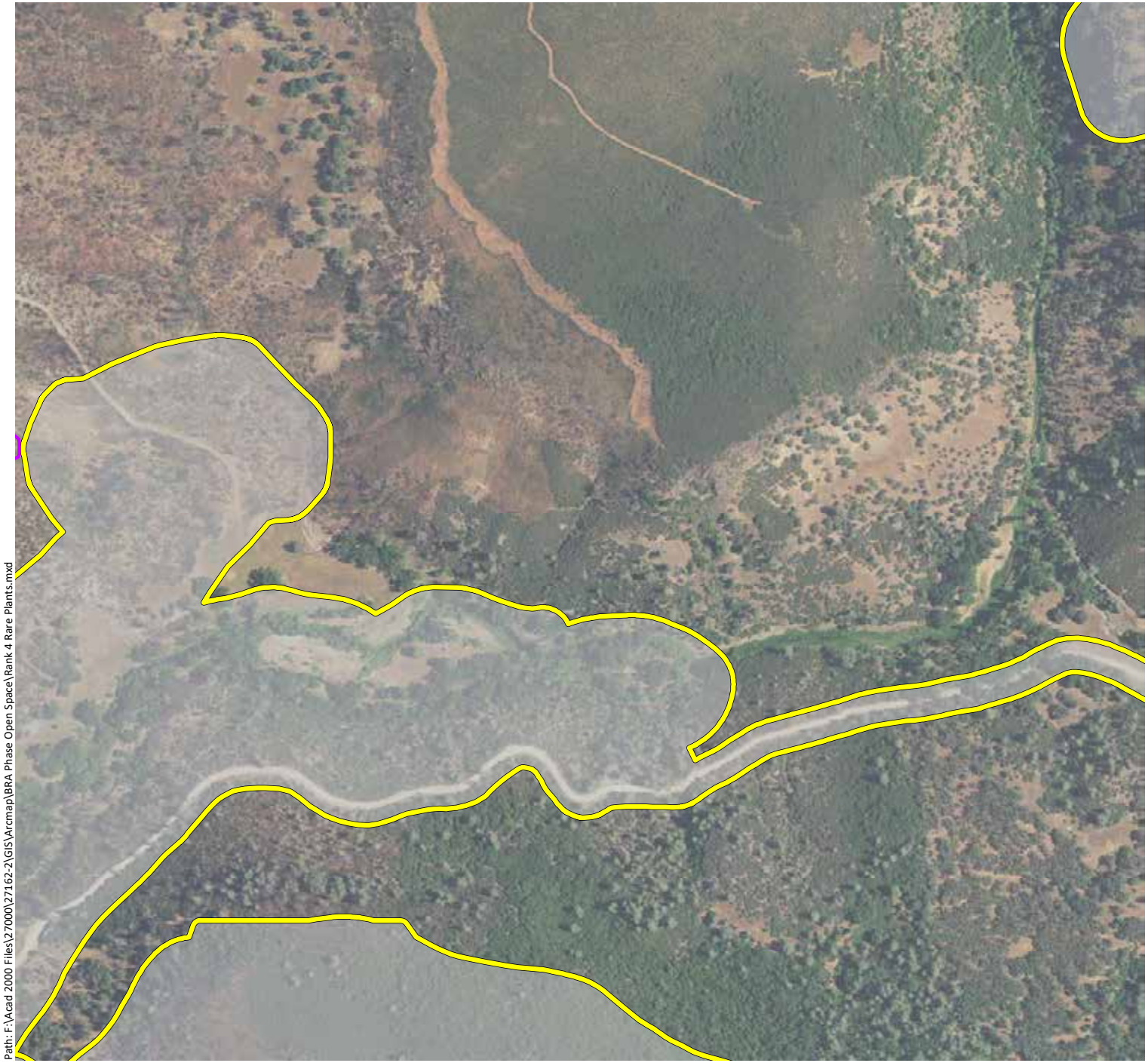
wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 23)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area
(Mapbook Sheet 24)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

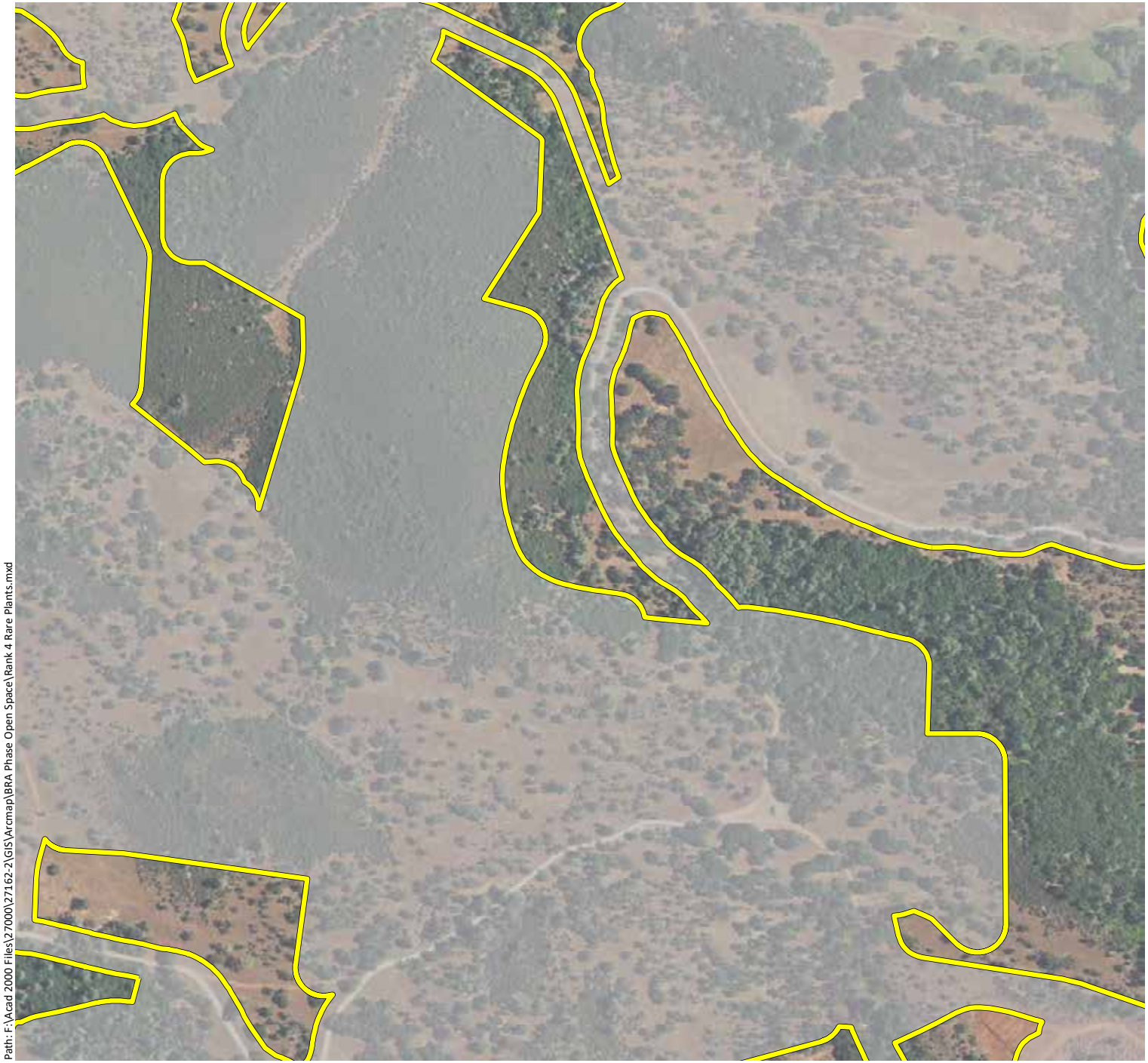
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 25)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

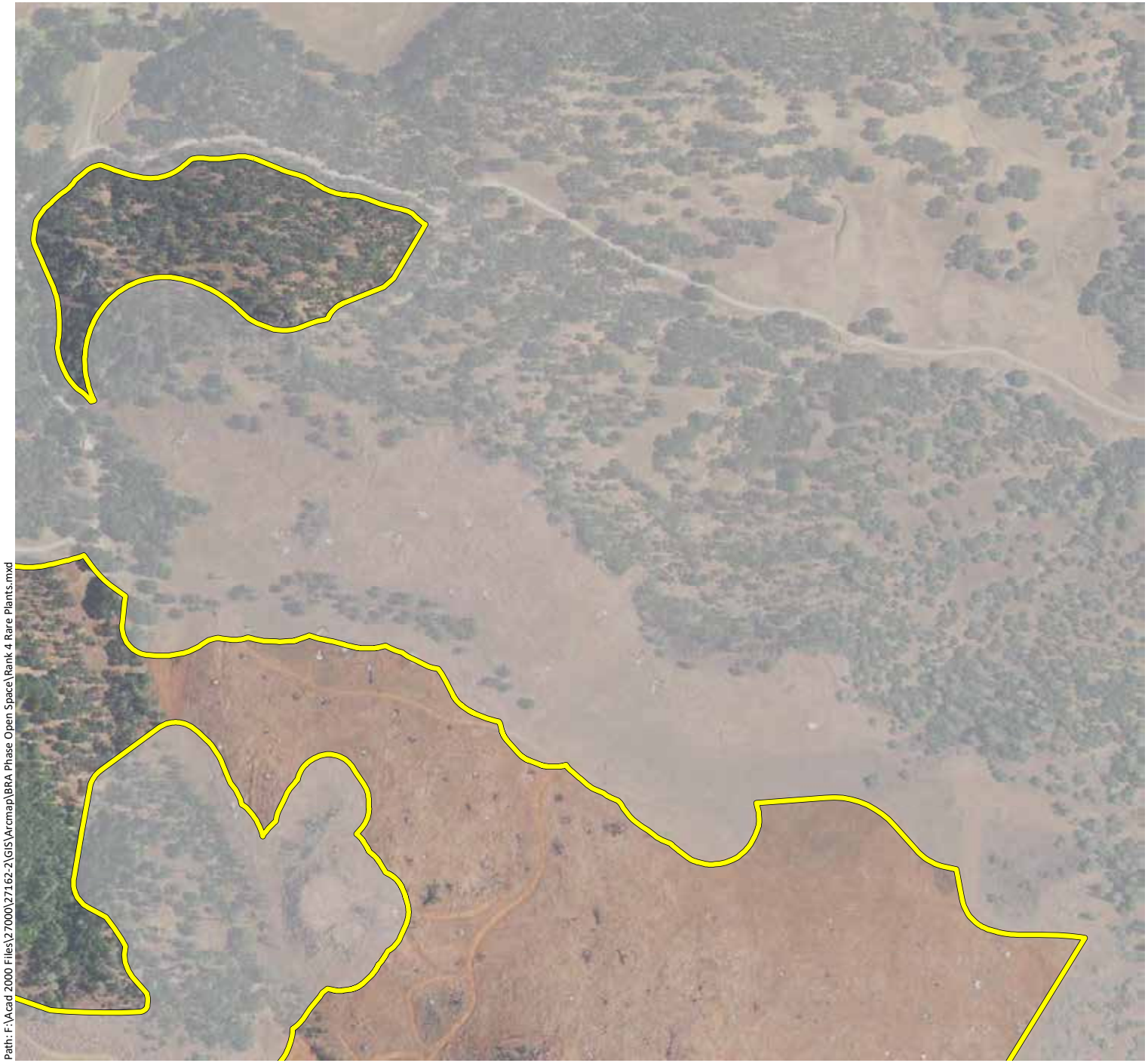
0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 26)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

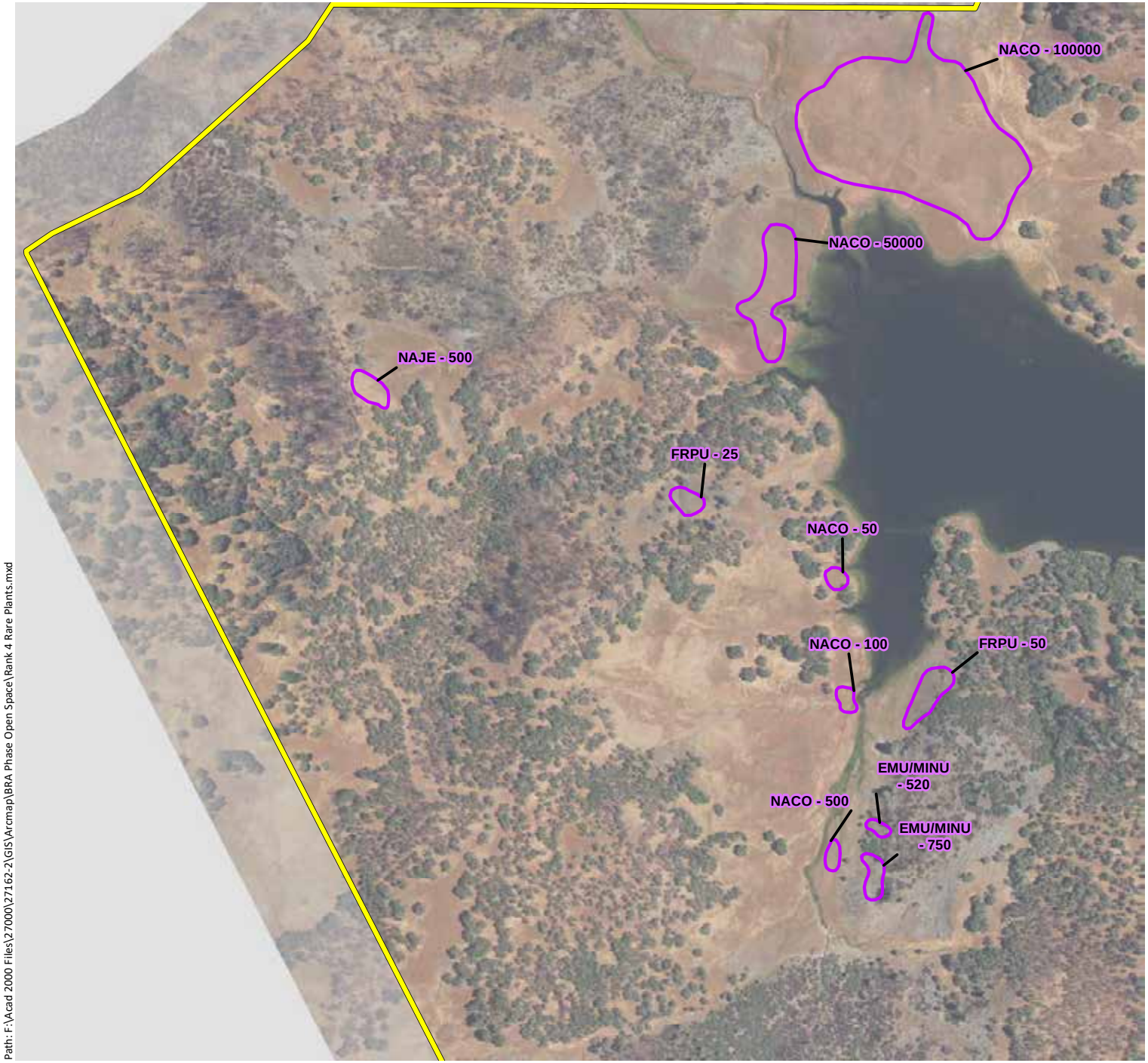
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 27)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 28)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

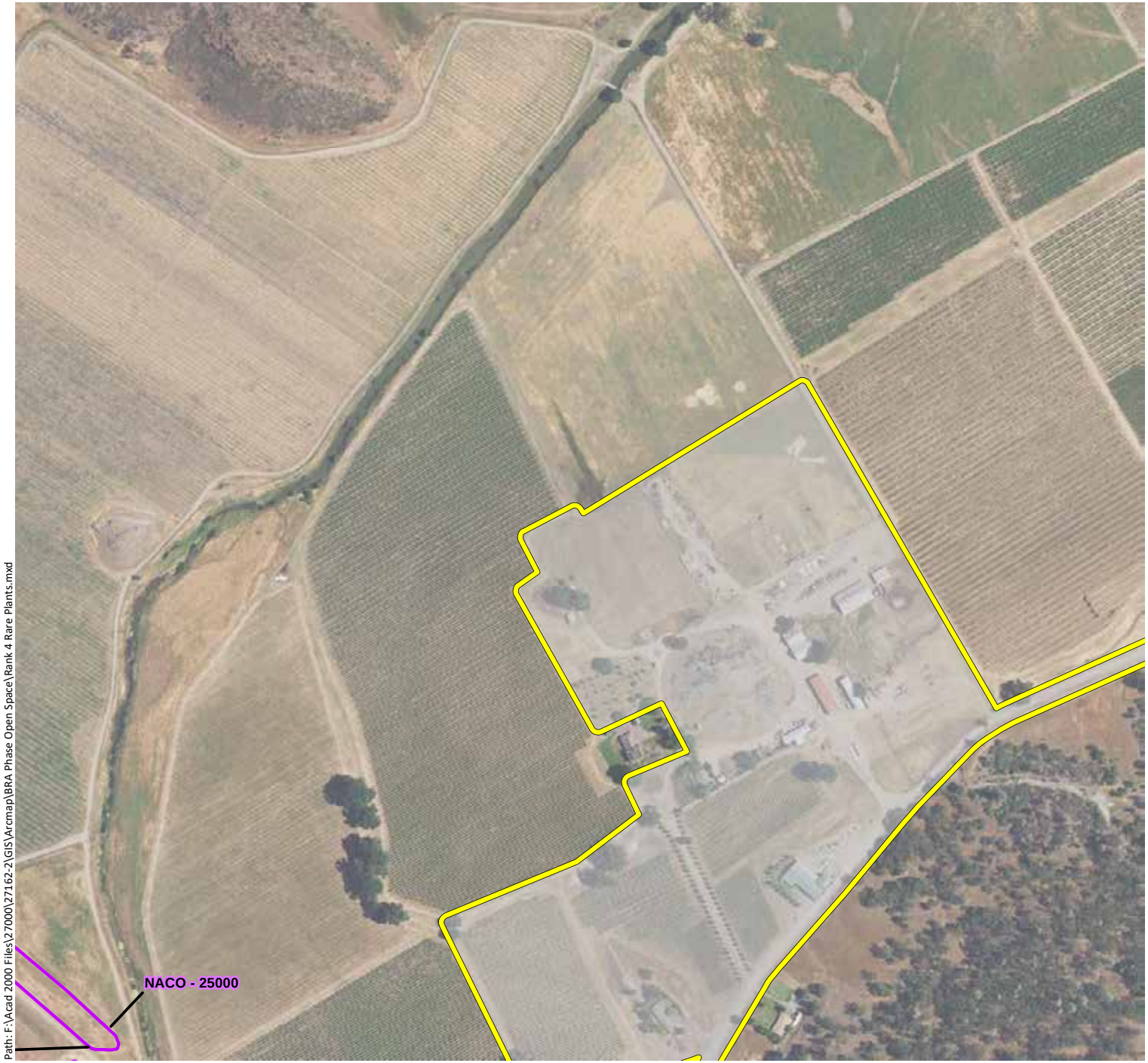
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 29)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

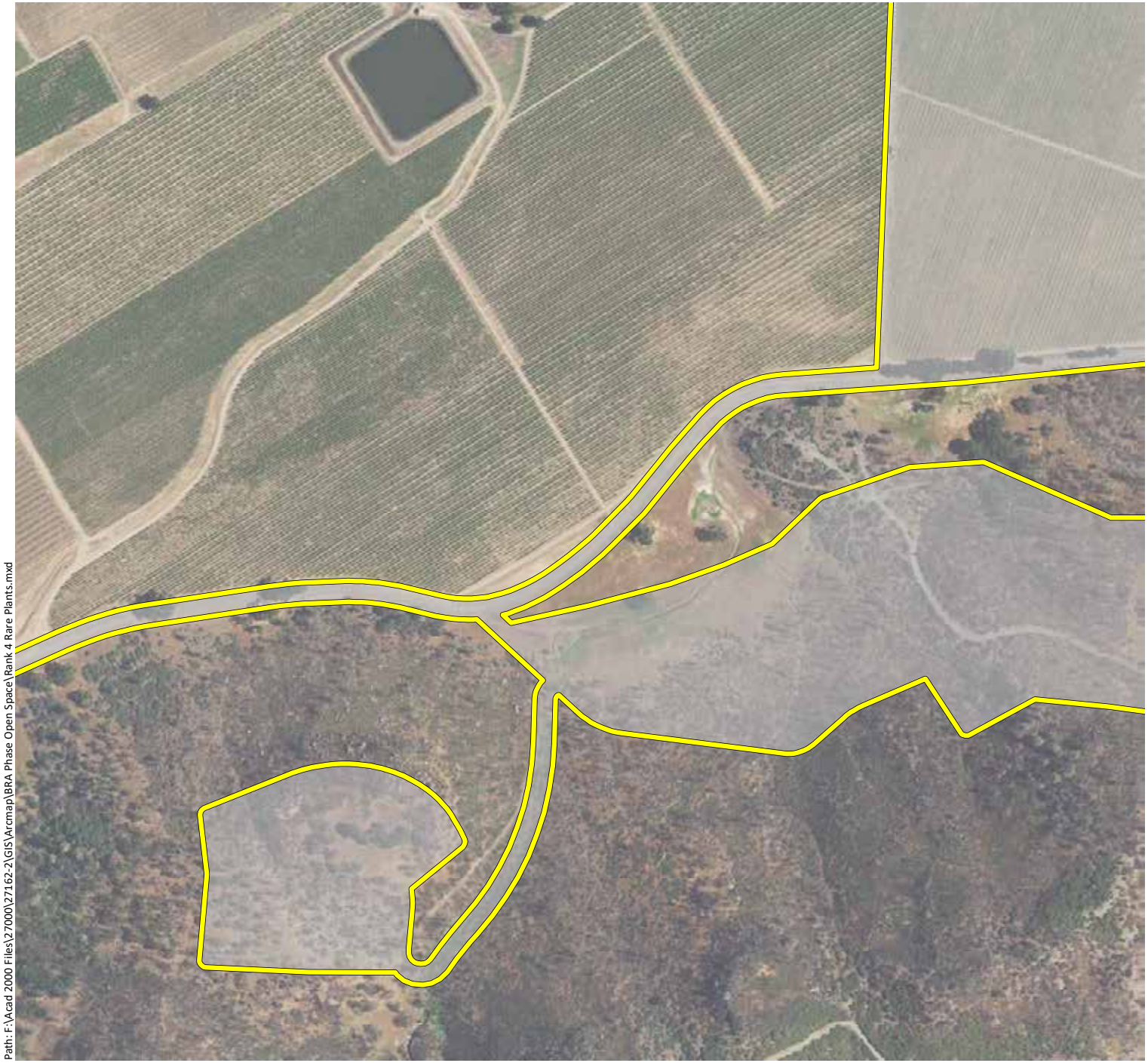
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 30)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

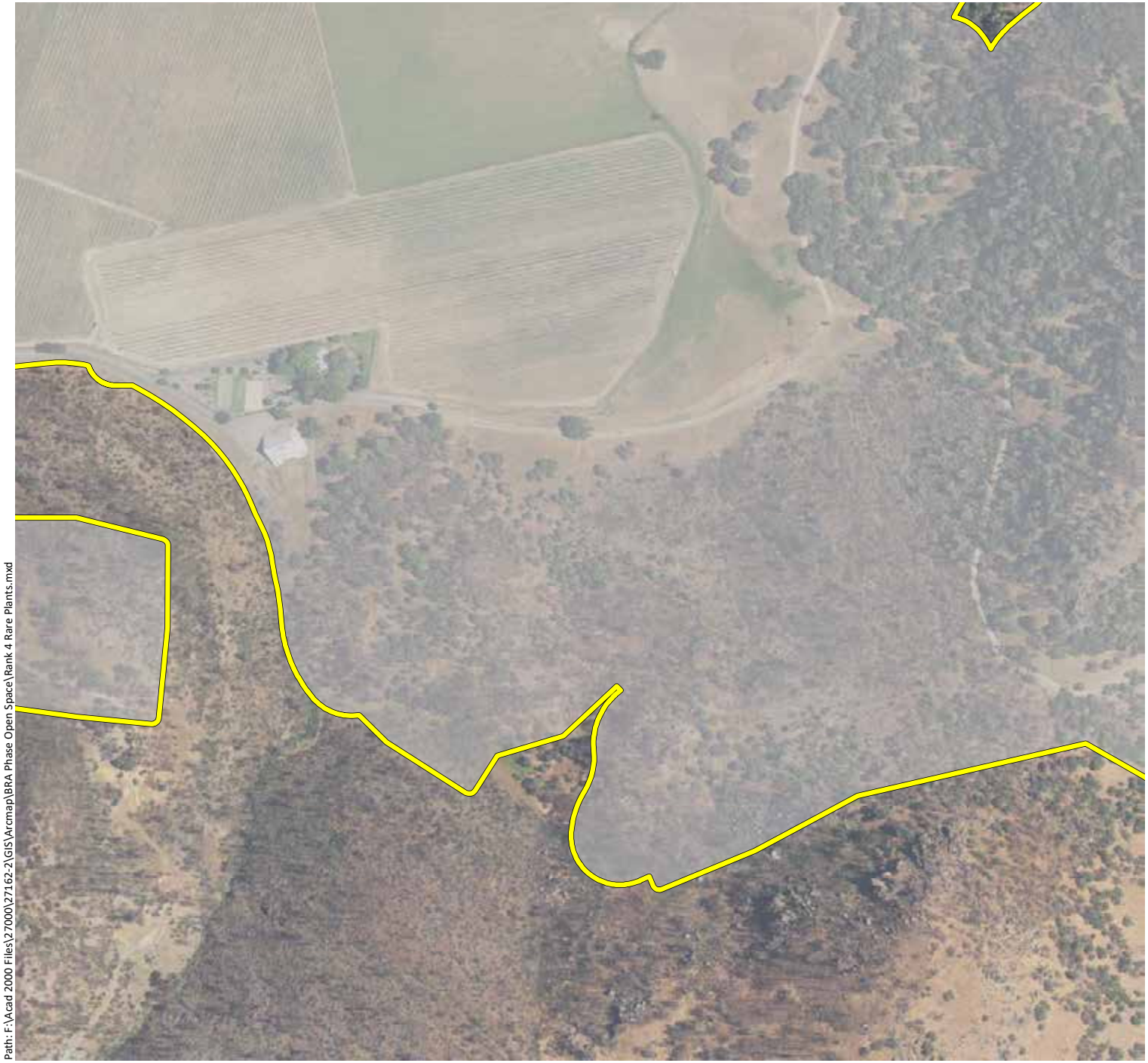
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 31)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

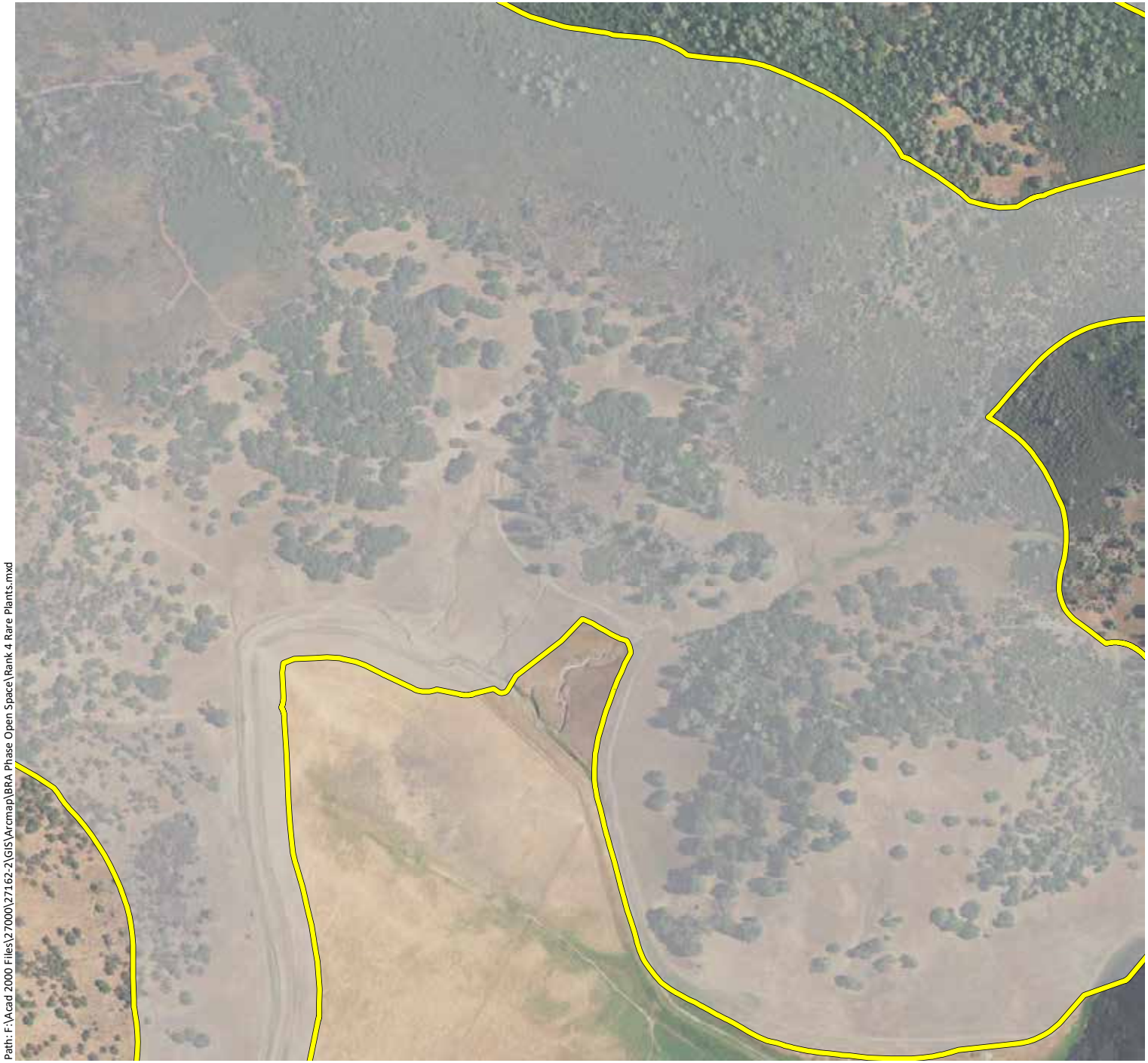
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 32)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

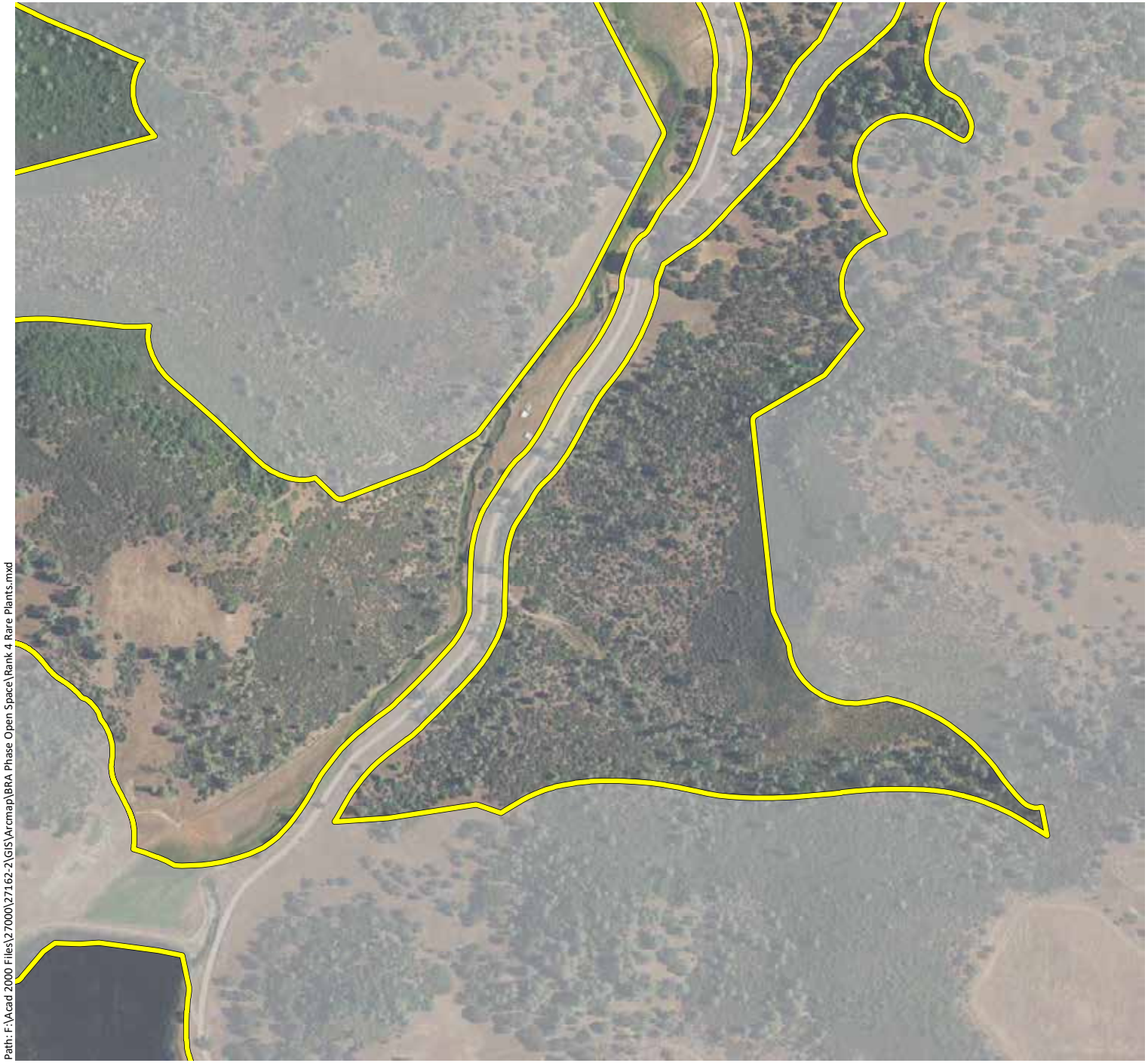
Feet

wra

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 33)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

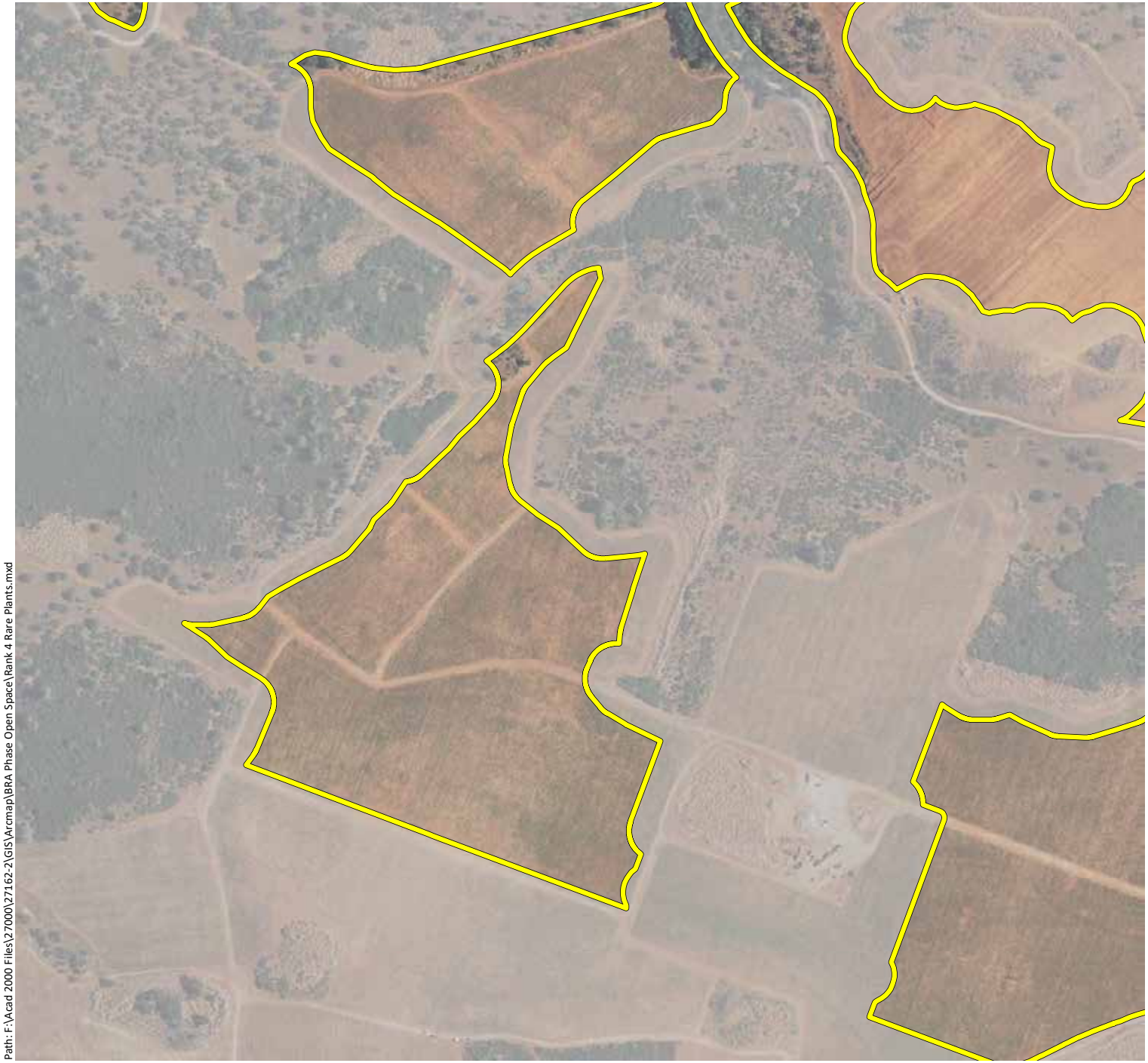
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 34)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

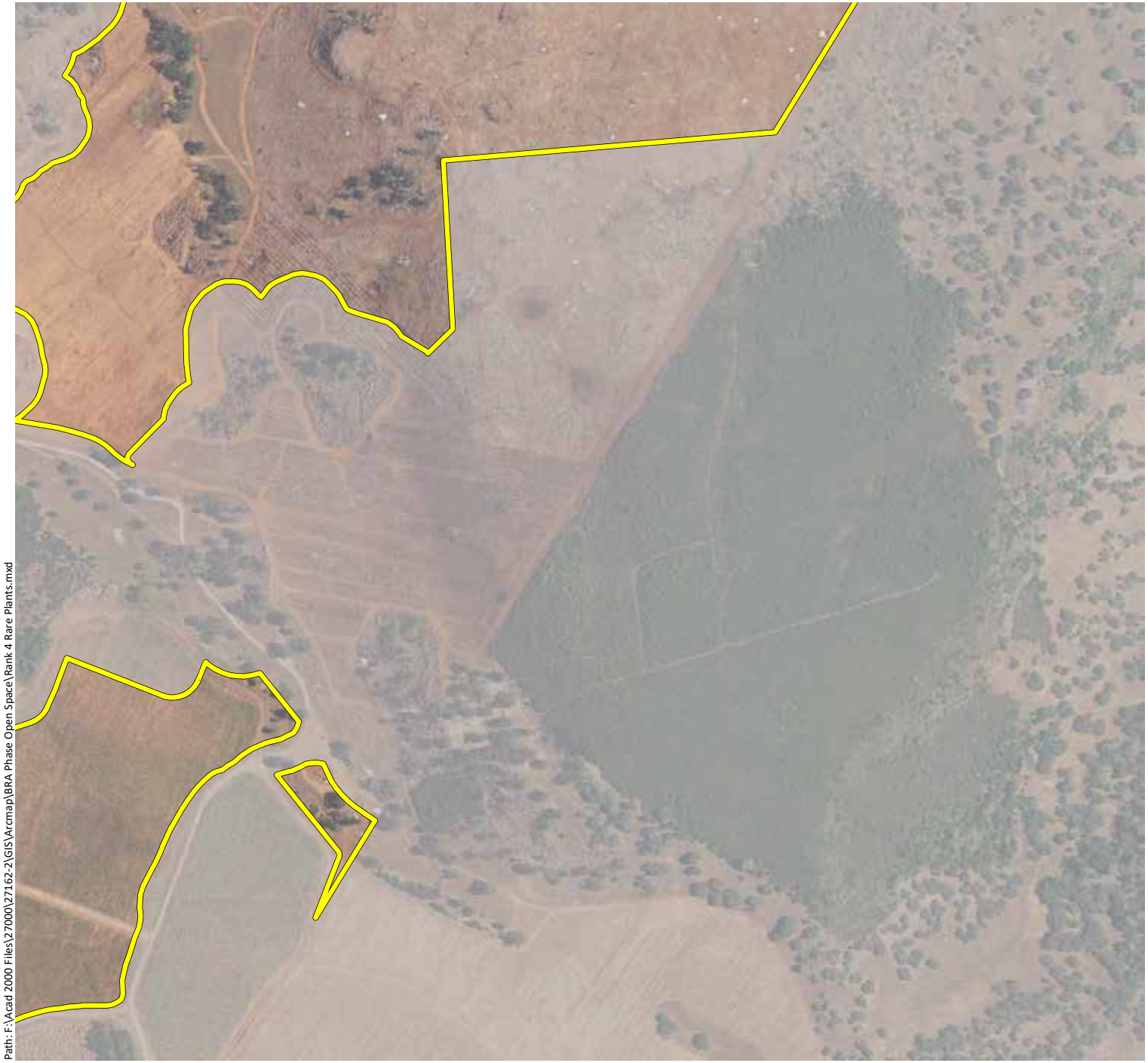
0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 35)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 36)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

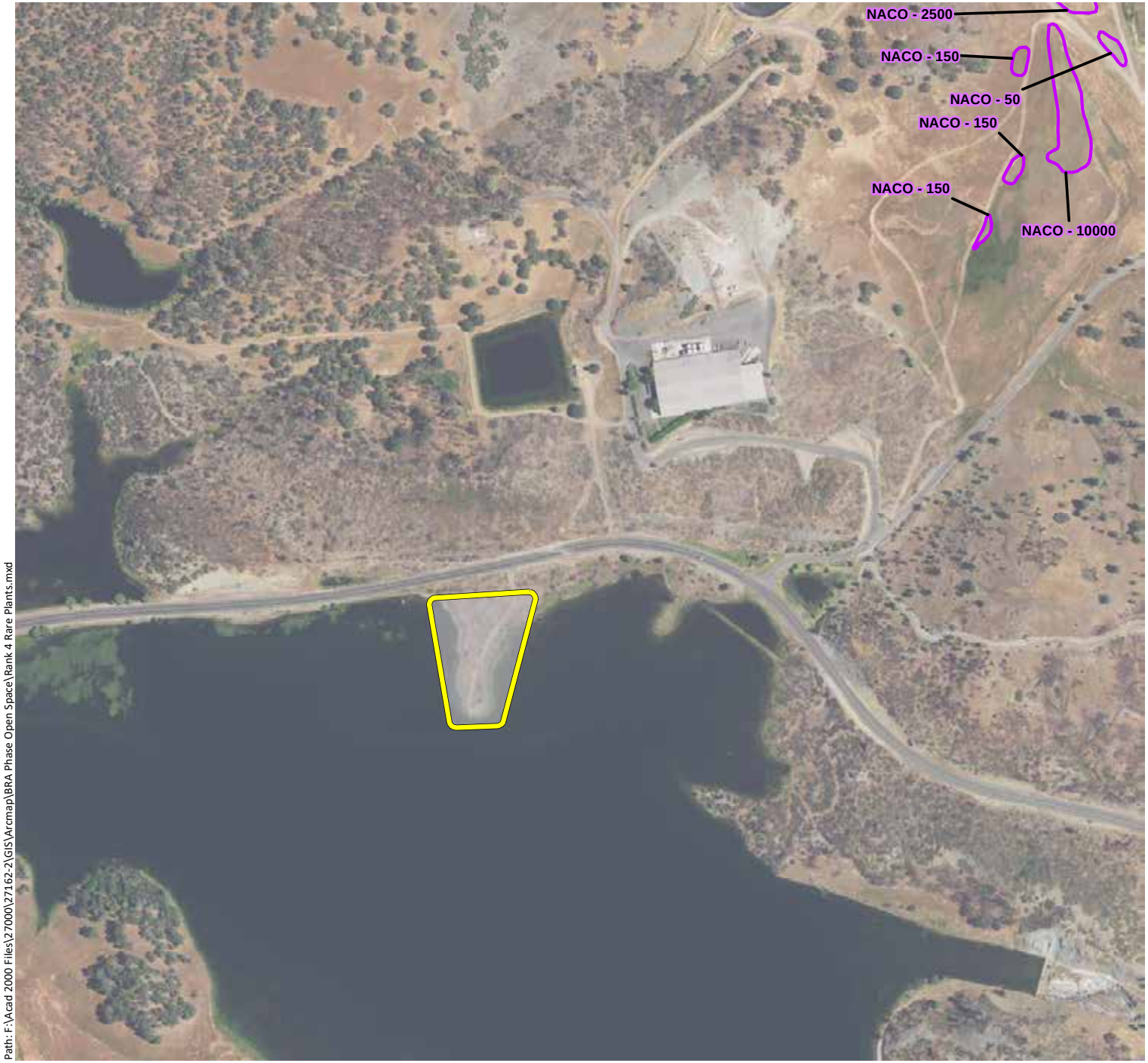
0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 37)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 38)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 39)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

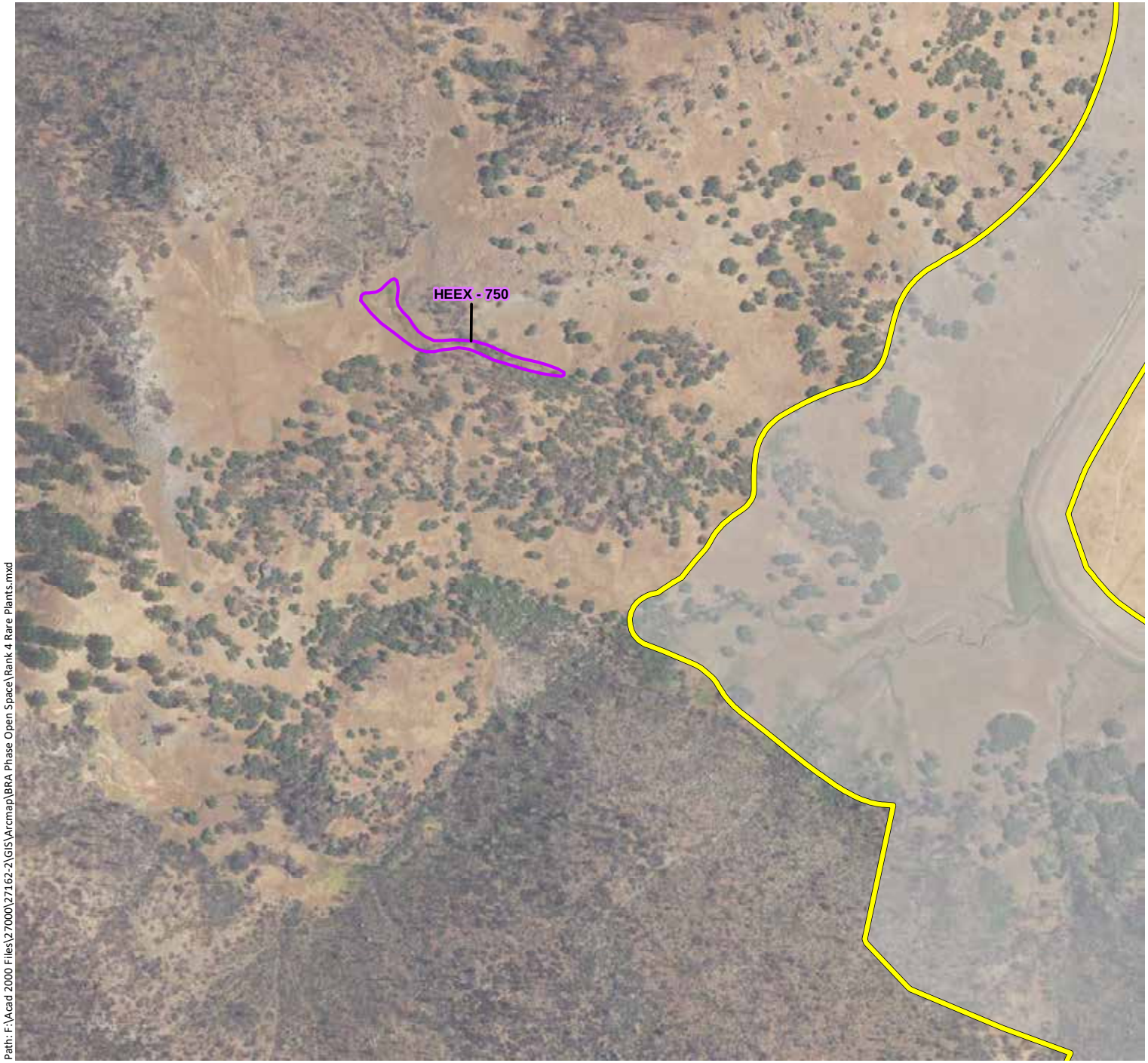
wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 40)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 41)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 42)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 43)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 44)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 45)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra

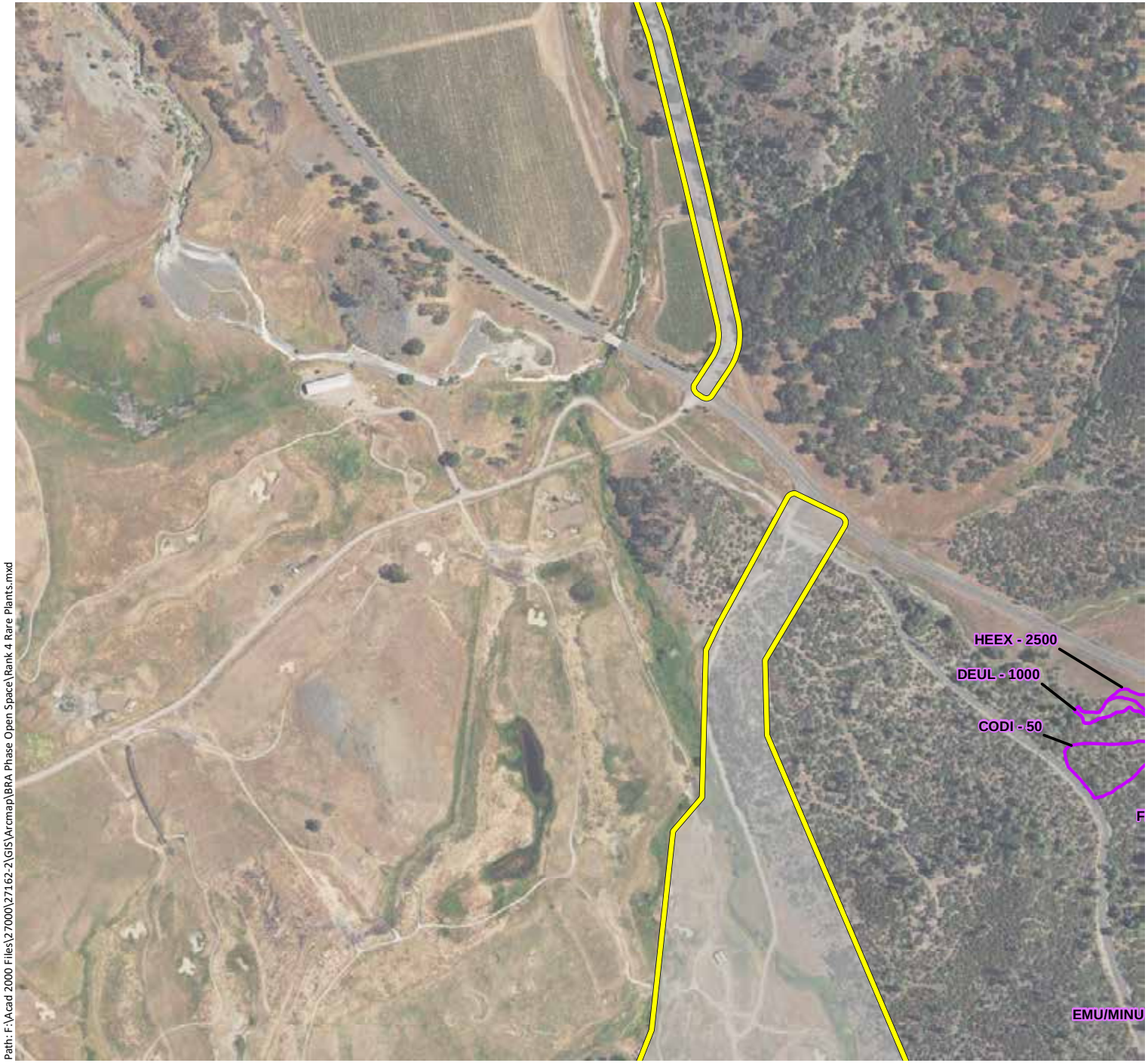
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area
(Mapbook Sheet 46)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

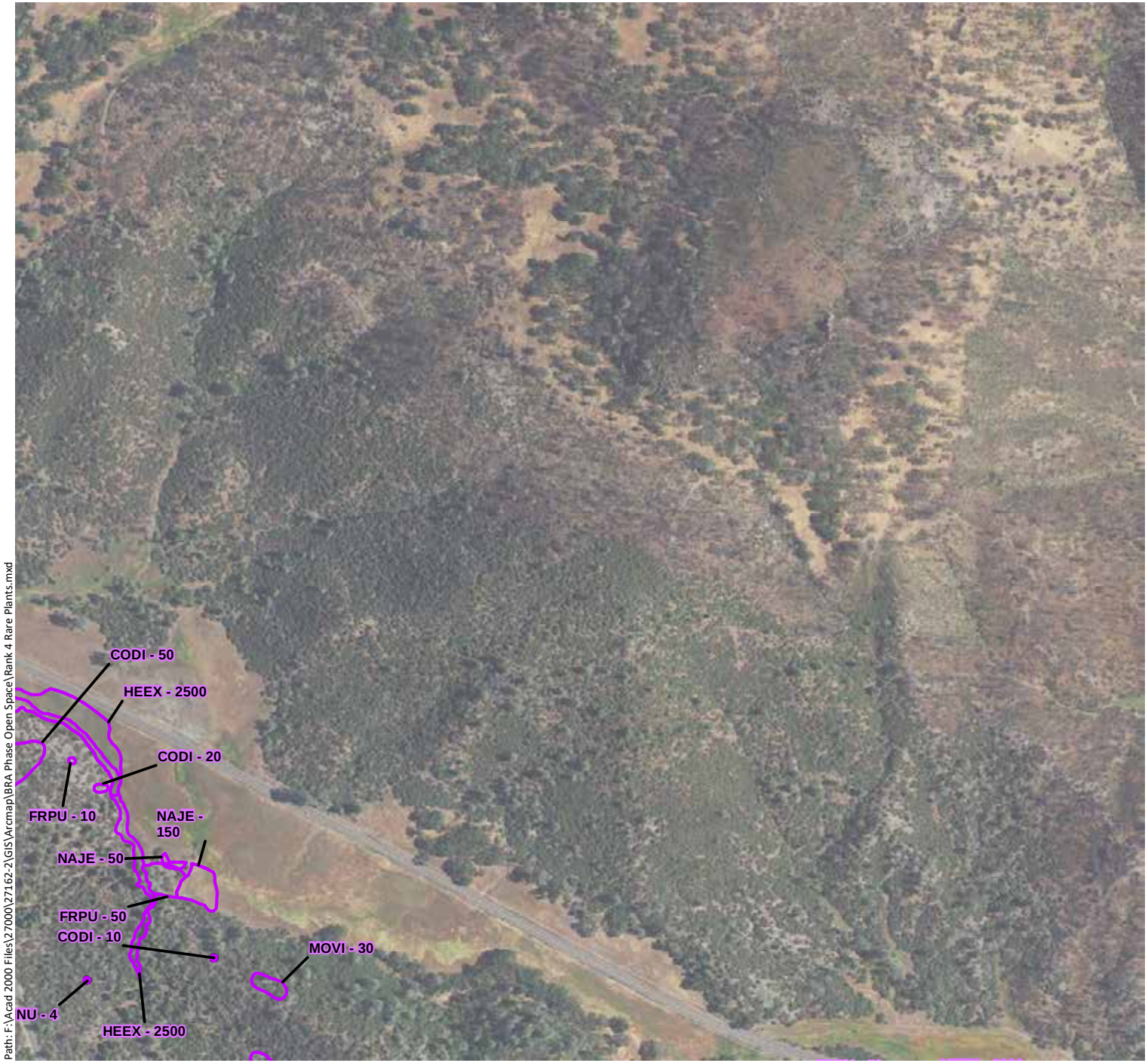
wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 47)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 48)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

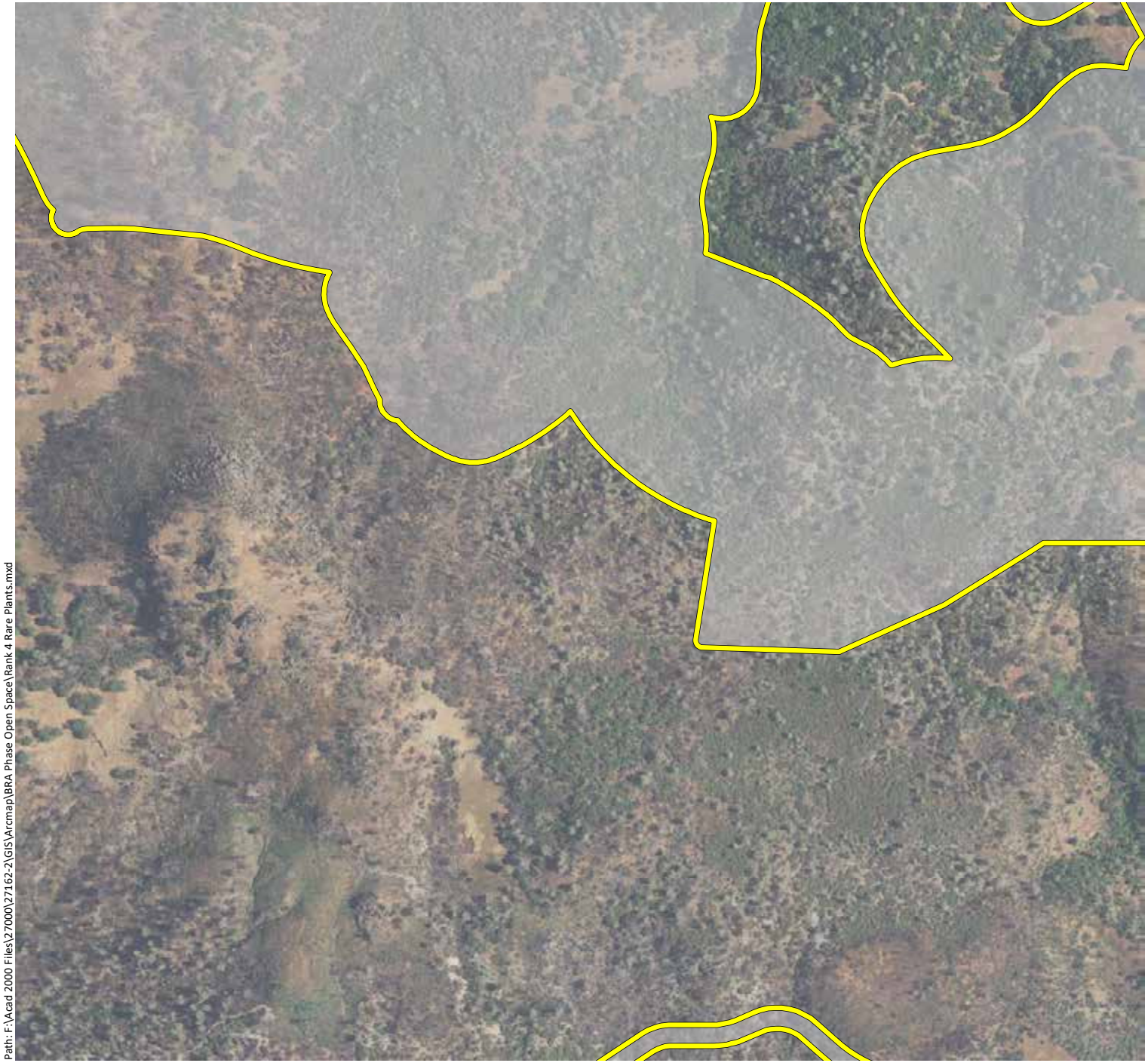
Feet

wra

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019



Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 49)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

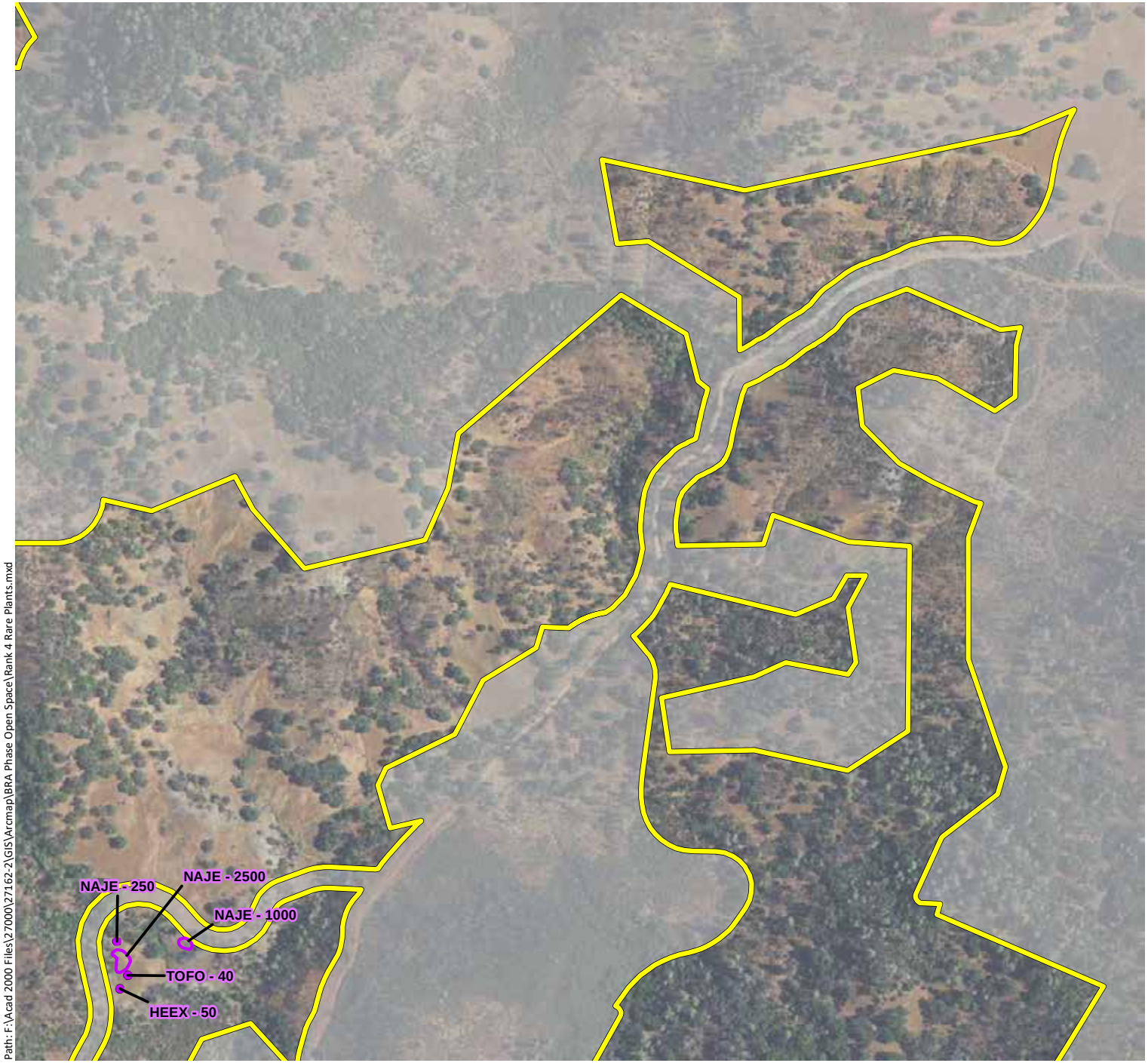
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 50)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 51)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 52)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 53)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 54)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

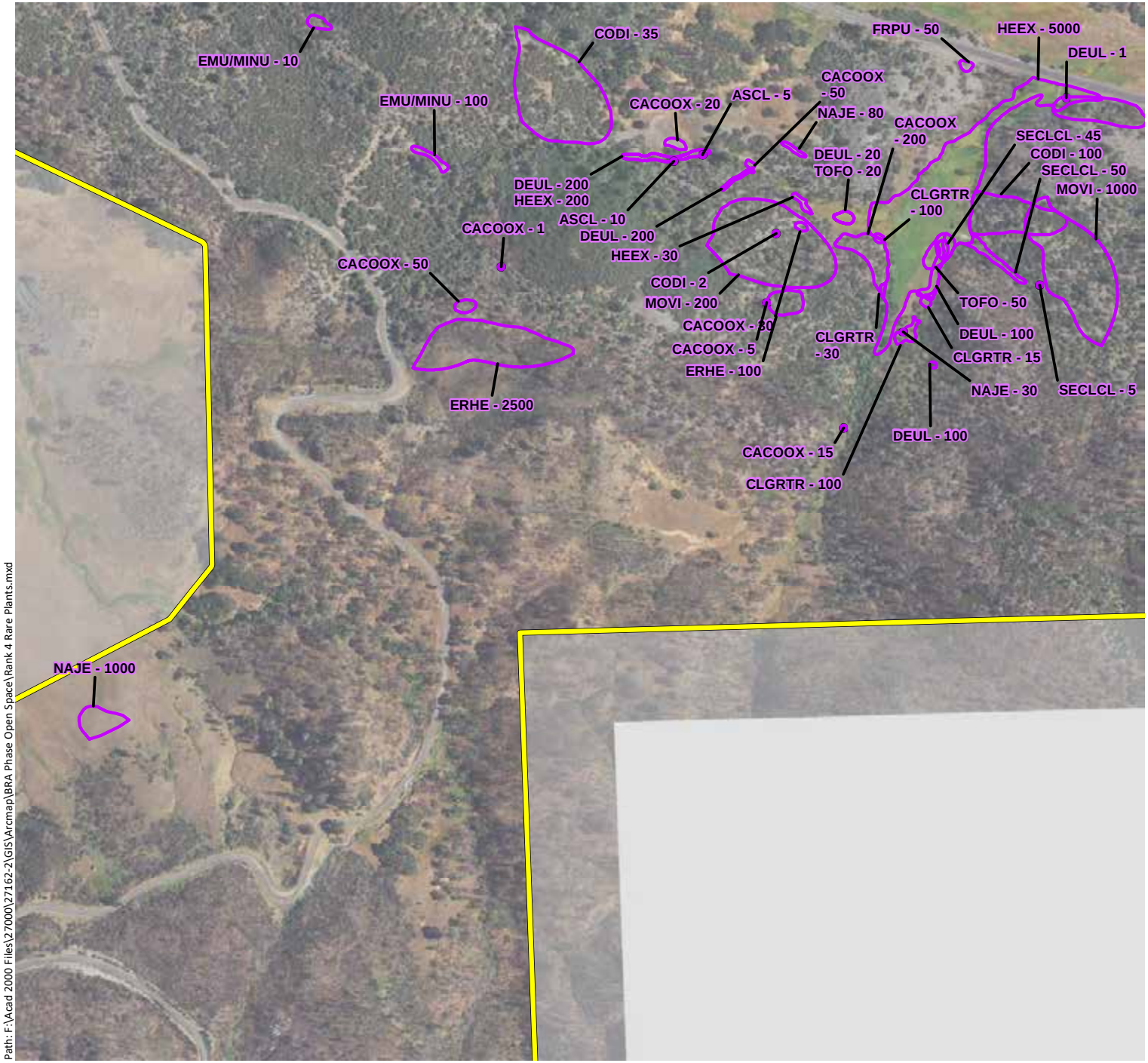
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 55)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

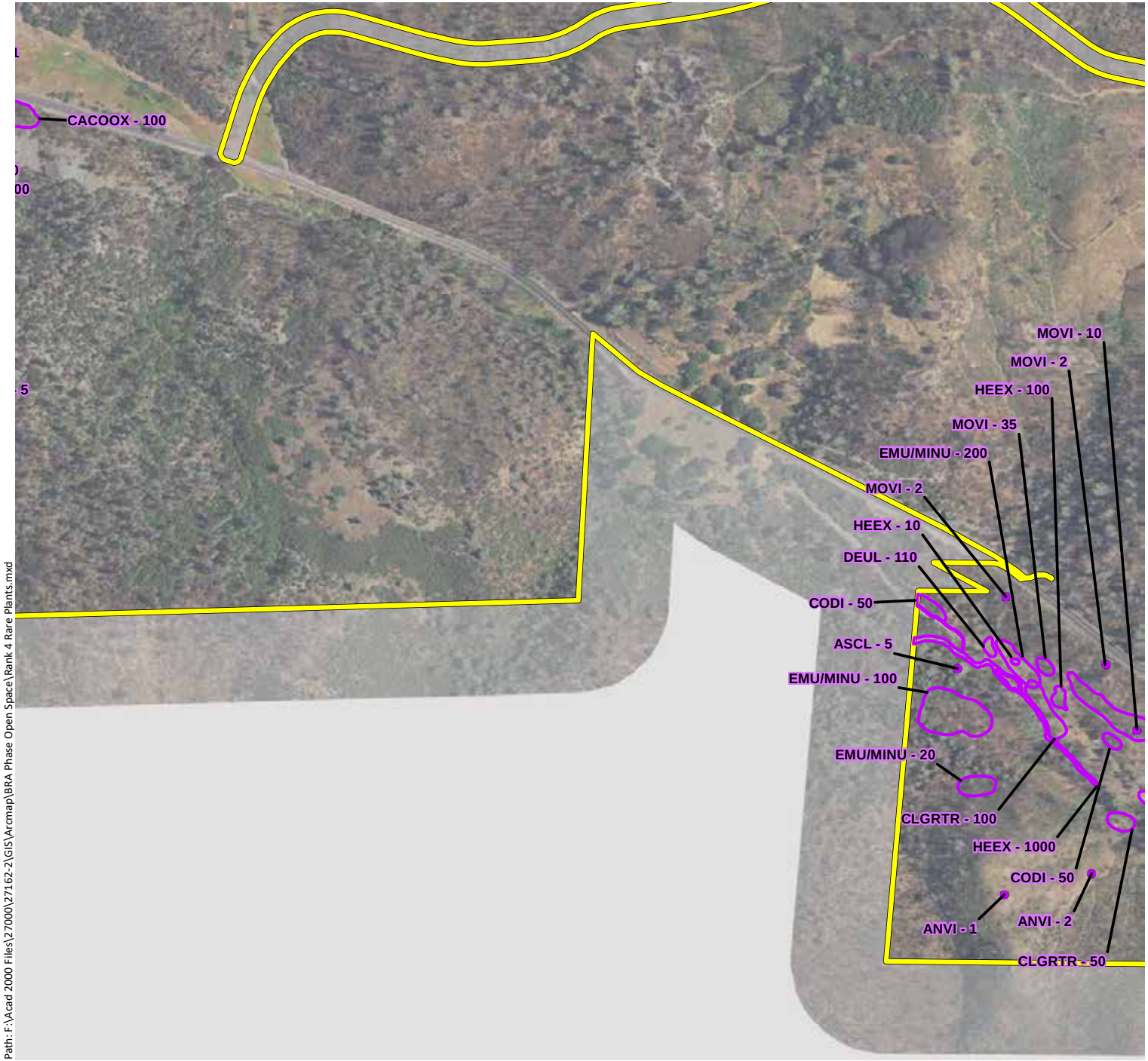
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 56)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon
ASCL: Cleveland's milk-vetch
CACOOX: Mt. Saint Helena morning glory
CAUN: Pink star-tulip
CLGRTR: Tracy's clarkia
CODI: Serpentine collomia
COTEBR: Serpentine bird's beak
DEUL: Swamp Larksbur
EMU/MINU: Bare monkeyflower
ERHE: Mt. Saint Helena fawn lily
FRPU: Purdy's fritillary
HEEX: Serpentine sunflower
MOVI: Green monardella
NACO: Cotula navarretia
NAJE: Jepson's navarretia
SECLCL: Cleaveland's ragwort
TOFO: Marsh zigadenus
TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

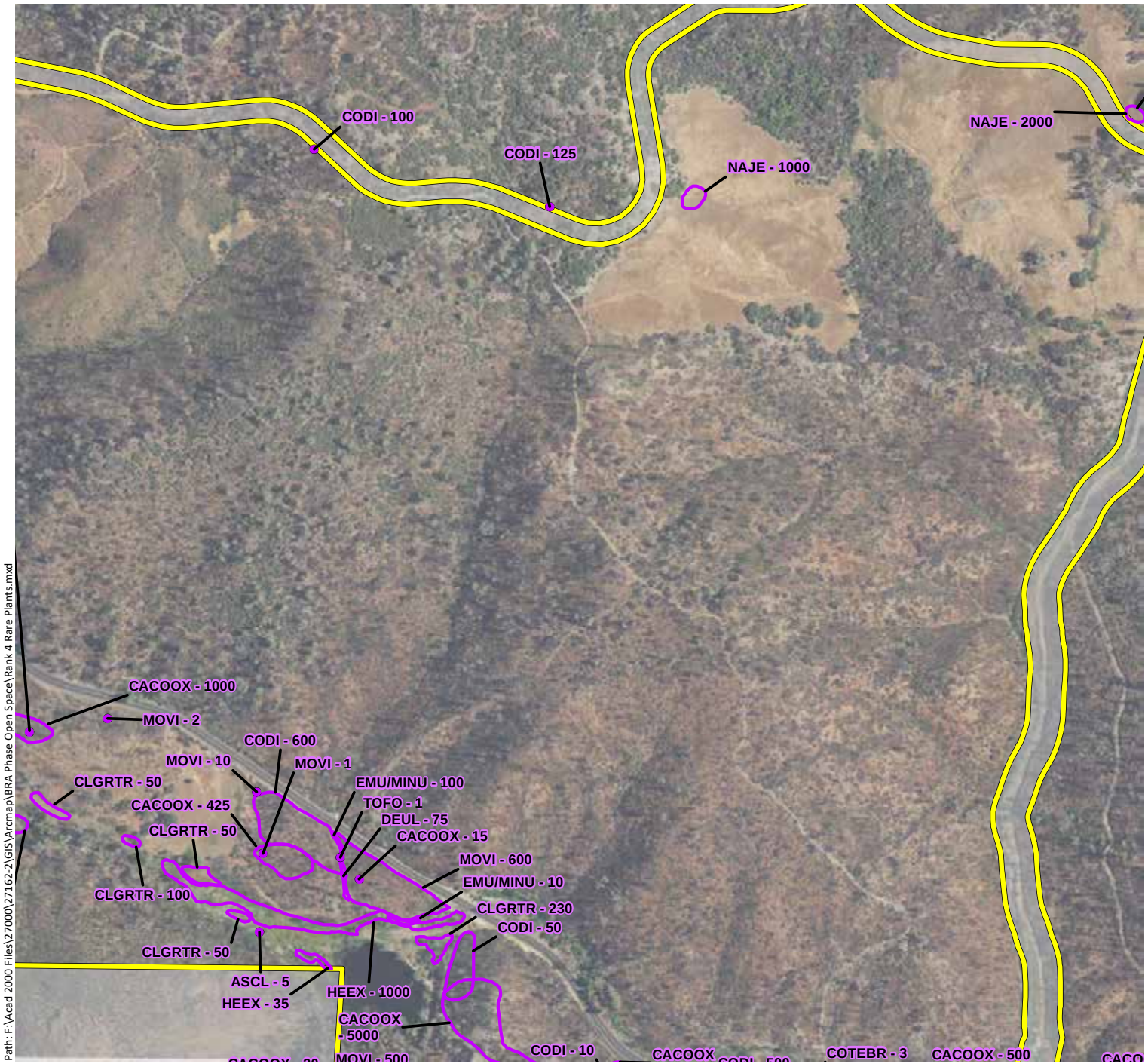
wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 57)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

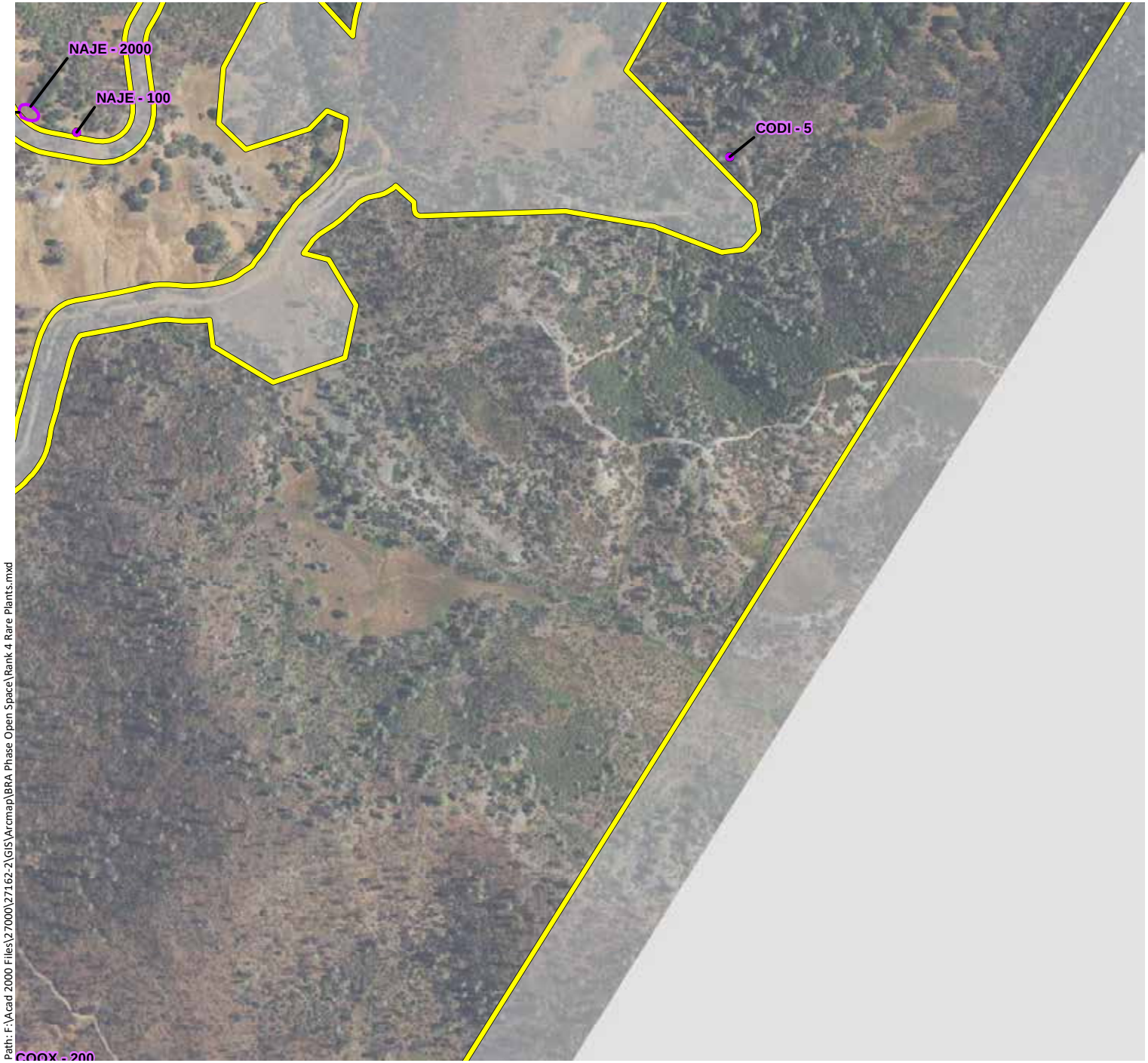
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 58)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space



Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 59)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 60)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\BRA Phase Open Space\Rank 4 Rare Plants.mxd

Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 61)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon

ASCL: Cleveland's milk-vetch

CACOOX: Mt. Saint Helena morning glory

CAUN: Pink star-tulip

CLGRTR: Tracy's clarkia

CODI: Serpentine collomia

COTEBR: Serpentine bird's beak

DEUL: Swamp Larksbur

EMU/MINU: Bare monkeyflower

ERHE: Mt. Saint Helena fawn lily

FRPU: Purdy's fritillary

HEEX: Serpentine sunflower

MOVI: Green monardella

NACO: Cotula navarretia

NAJE: Jepson's navarretia

SECLCL: Cleaveland's ragwort

TOFO: Marsh zigadenus

TRLU: Dark-mouthed triteleia

N

0 500 1,000

Feet

wra
ENVIRONMENTAL CONSULTANTS

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Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

Appendix E2.
CNPS Rank 4 Special-Status Plant Species Observed within the Phase 2 and Open Space Study Area (Mapbook Sheet 62)

Maha Resort and Guenoc Valley Development, Phase 2 and Open Space

Phase 2 & Open Space Study Area - 11,549 ac.

CNPS Rank 4 Plants

Key to Species Codes

ANVI: Tall snapdragon
ASCL: Cleveland's milk-vetch
CACOOX: Mt. Saint Helena morning glory
CAUN: Pink star-tulip
CLGRTR: Tracy's clarkia
CODI: Serpentine collomia
COTEBR: Serpentine bird's beak
DEUL: Swamp Larksbur
EMU/MINU: Bare monkeyflower
ERHE: Mt. Saint Helena fawn lily
FRPU: Purdy's fritillary
HEEX: Serpentine sunflower
MOVI: Green monardella
NACO: Cotula navarretia
NAJE: Jepson's navarretia
SECLCL: Cleaveland's ragwort
TOFO: Marsh zigadenus
TRLU: Dark-mouthed triteleia

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Feet

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Sources: 2016 Heaxagon Aerial, WRA | Prepared By: mrochelle, 6/28/2019

APPENDIX F

LIST OF WILDLIFE SPECIES OBSERVED WITHIN THE PHASE 2/OPEN SPACE STUDY AREA

Appendix F. List of Wildlife Species Observed within Guenoc Ranch

Surveys were conducted by WRA wildlife biologists between 2017 and 2019.

Scientific Name	Common Name	Conservation Status[1]
Mammals		
Antrozous pallidus	Pallid bat	SSC WBWG High
Canis latrans	Coyote	-
Dipodomys californicus	California kangaroo rat	-
Eptesicus fuscus	Big brown bat	-
Geomyidae sp.	Gopher sp.	-
Lasionycteris noctivagans	Silver-haired bat	WBWG Medium
Lepus californicus	Black-tailed jackrabbit	-
Lynx rufus	Bobcat	-
Mephitis mephitis	Skunk	-
Myotis californicus	California myotis	-
Myotis yumanensis	Yuma myotis	-
Odocoileus hemionus californicus	California mule deer	-
Otospermophilus beecheyi	California ground squirrel	-
Parastrellus hesperus	Canyon bat	-
Procyon lotor	Raccoon	-
Sciurus griseus	Western gray squirrel	-
Sciurus niger	Eastern fox squirrel	-
Sus scrofa	Feral pig	-
Tadarida brasiliensis	Mexican free-tailed bat	-
Birds		
Accipiter cooperii	Cooper's hawk	-

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Scientific Name	Common Name	Conservation Status[1]
Aechmophorus clarkii	Clark's grebe	-
Aechmophorus occidentalis	Western grebe	-
Agelaius phoeniceus	Red-winged blackbird	-
Aimophila ruficeps	Rufous-crowned sparrow	-
Aix sponsa	Wood duck	-
Anas platyrhynchos	Mallard	-
Anas strepera	Gadwall	-
Aphelocoma californica	California scrub-jay	-
Apodidae sp.	Swift sp.	-
Aquila chrysaetos	Golden eagle	CFP, BCC
Ardea herodias	Great blue heron	-
Baeolophus inornatus	Oak titmouse	BCC
Branta canadensis	Canada goose	-
Bubo virginianus	Great horned owl	-
Buteo jamaicensis	Red-tailed hawk	-
Buteo lineatus	Red-shouldered hawk	-
Butorides virescens	Green heron	-
Callipepla californica	California quail	-
Calypte anna	Anna's hummingbird	-
Cathartes aura	Turkey vulture	-
Charadrius vociferus	Killdeer	-
Chondestes grammacus	Lark sparrow	-
Circus cyaneus	Northern harrier	SSC
Cistothorus palustris	Marsh wren	-
Colaptes auratus	Northern flicker	-

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Scientific Name	Common Name	Conservation Status[1]
Columba livia	Rock pigeon	-
Corvus brachyrhynchos	American crow	-
Corvus corax	Common raven	-
Elanus leucurus	White-tailed kite	CFP
Eremophila alpestris	Horned lark	-
Euphagus cyanocephalus	Brewer's blackbird	-
Falco peregrinus	Peregrine falcon	CFP, BCC
Falco sparverius	American kestrel	-
Falco spp.	Falcon	-
Geothlypis trichas	Common yellowthroat	-
Haemorhous mexicanus	House finch	-
Haliaeetus leucocephalus	Bald eagle	SE, CFP, BCC
Hirundo rustica	Barn swallow	-
Junco hyemalis	Dark-eyed junco	-
Megaceryle alcyon	Belted kingfisher	-
Megascops kennicottii	Western screech owl	-
Melanerpes formicivorus	Acorn woodpecker	-
Meleagris gallopavo	Wild turkey	-
Melospiza melodia	Song sparrow	-
Melozone crissalis	California towhee	-
Mimus polyglottos	Northern mockingbird	-
Myiarchus cinerascens	Ash-throated flycatcher	-
Nycticorax nycticorax	Black-crowned night heron	-
Pandion haliaetus	Osprey	-
Petrochelidon pyrrhonota	Cliff swallow	-

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Scientific Name	Common Name	Conservation Status[1]
Phalacrocorax auritus	Double-crested cormorant	-
Phalaenoptilus nuttallii	Common poorwill	-
Picoides nuttallii	Nuttall's woodpecker	BCC
Podilymbus podiceps	Pied-billed grebe	-
Poecile rufescens	Chestnut-backed chickadee	-
Psaltriparus minimus	Bushtit	-
Quiscalus mexicanus	Great-tailed grackle	-
Sayornis nigricans	Black phoebe	-
Selasphorus sasin	Allen's hummingbird	BCC
Setophaga petechia	Yellow warbler	SSC, BCC
Setophaga townsendi	Townsend's warbler	-
Sialia mexicana	Western bluebird	-
Sitta carolinensis	White-breasted nuthatch	-
Sphyrapicus ruber	Red-breasted sapsucker	-
Spinus psaltria	Lesser goldfinch	-
Spinus tristis	American goldfinch	-
Stelgidopteryx serripennis	Northern rough-winged swallow	-
Streptopelia decaocto	Eurasian collared-dove	-
Sturnella sp.	Meadow lark	-
Sturnella neglecta	Western meadowlark	-
Sturnus vulgaris	European starling	-
Tachycineta bicolor	Tree swallow	-
Tachycineta thalassina	Violet green swallow	-
Thryomanes bewickii	Bewick's wren	-
Troglodytes aedon	House wren	-

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Scientific Name	Common Name	Conservation Status[1]
Turdus migratorius	American robin	-
Tringa melanoleuca	greater yellowlegs	-
Tyrannus verticalis	Western kingbird	-
Tyto alba	Barn owl	-
Xanthocephalus xanthocephalus	Yellow-headed blackbird	SSC
Zenaida macroura	Mourning dove	-
Reptiles and Amphibians		
Actinemys marmorata	Western pond turtle	SSC
Anaxyrus boreas	Western toad	-
Lampropeltis getula californiae	California kingsnake	-
Lithobates catesbeianus	American bullfrog	-
Pituophis catenifer	Gopher snake	-
Plestiodon skiltonianus	Western skink	-
Pseudacris regilla	Pacific tree frog	-
Pseudacris sierra	Sierran treefrog	-
Rana boylii	Foothill yellow-legged frog	SC, SSC
Sceloporus occidentalis	Western fence lizard	-
Taricha granulosa	Rough-skinned newt	-
Thamnophis sirtalis	Common garter snake	-
Fishes		
Catostomus occidentalis	Sacramento sucker	-
Cyprinus carpio	Common carp	-
Gambusia affinis	Western mosquitofish	-
Lavinia symmetricus symmetricus	Central California roach	-
Lepomis cyanellus	Green sunfish	-

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Scientific Name	Common Name	Conservation Status[1]
Lepomis macrochirus	Bluegill	-
Micropterus dolomieu	Smallmouth bass	-
Micropterus salmoides	Largemouth bass	-
Oncorhynchus mykiss	Rainbow trout	-
Ptychocheilus grandis	Sacramento pikeminnow	-
Invertebrates		
Euphydryas chalcedona	Variable checkerspot butterfly	-
Junonia coenia	Buckeye butterfly	-
Lethocerus americanus	Giant water bug	-
Pacifastacus leniusculus	Signal crayfish	-
Papilio zelicaon	Anise swallowtail butterfly	-
Pieris rapae	Cabbage white butterfly	-
Vanessa cardui	Painted lady butterfly	-

[1]Key to Conservation Status:

SC	State Candidate
SE	State Endangered
CFP	CDFW Fully Protected Animal
SSC	CDFW Species of Special Concern
BCC	USFWS Birds of Conservation Concern
WBWG	Western Bat Working Group

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APPENDIX G

POTENTIAL SPECIAL-STATUS WILDLIFE SPECIES TO OCCUR WITHIN THE PHASE 2/OPEN SPACE STUDY AREA

Appendix G. Potential for Special-Status Wildlife Species to occur within the Phase 2 and Open Space Study Area

List compiled from database searches focused on the following 7.5-minute USGS quadrangles: Aetna Springs, Calistoga, Chiles Valley, Clearlake Highlands, Detert Reservoir, Glascock Mountain, Jericho Valley, Knoxville, Lower Lake, Mark West Springs, Middletown, Mount St. Helena, St. Helena, Walter Springs, Whispering Pines, and Wilson Valley USGS 7.5' quadrangles (CDFW 2019a; USFWS 2019). List also compiled by a review of other CDFW and USFWS lists and publications (Tomson et al. 2016, Shuford and Gardali 2008, Moyle et al. 2015, USFWS 2008, Bolster 1998, WBWG 2019) focused on the region.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Mammals				
Pallid bat *Antrozous pallidus*	SSC, WBWG	Found in deserts, grasslands, shrublands, woodlands, and forests. Most common in open, forages along river channels. Roost sites include crevices in rocky outcrops and cliffs, caves, mines, trees and various human structures such as bridges, barns, and buildings (including occupied buildings). Roosts must protect bats from high temperatures. Sensitive to disturbance of roosting sites.	**Present.** This species was documented on the property in 2018. The Phase 2 and Open Space Study Area contains shrubland, forested habitats, rocky outcroppings, chaparral, and agricultural areas that may support this species. Stream, riparian, and grassland boarding open water provide foraging for this species.	Recommendations for this species can be found in Section 6.4.
Ring-tailed cat (Ringtail) *Bassariscus astutus*	CFP	Widely distributed throughout most of California, absent from some portions of the Central Valley and northeastern California. Found in a variety of habitats throughout the western US including riparian areas, semi-arid country, deserts, chaparral, oak woodlands, pinyon pine woodlands, juniper woodlands and montane conifer forests usually under 1400m in elevation. Typically uses cliffs or large trees for shelter.	**Moderate Potential.** Oak woodland, riparian, scrub and chaparral within the Phase 2 and Open Space Study Area provide potentially suitable habitat for this species. Additionally, the property is within a greater area that is largely undeveloped and densely vegetated that may provide suitable habitat for this species.	Recommendations for this species can be found in Section 6.4.

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Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Townsend's big-eared bat *Corynorhinus townsendii*	SSC, WBWG	This species is associated with a wide variety of habitats from deserts to mid-elevation mixed coniferous-deciduous forest. Females form maternity colonies in buildings, caves and mines and males roost singly or in small groups. Foraging occurs in open forest habitats where they glean moths from vegetation.	**High Potential.** The Phase 2 and Open Space Study Area contains mixed forest and many water features which provide foraging habitat. There are also many occurrences of this species within five miles of the Phase 2 and Open Space Study Area (CDFW 2019a).	Recommendations for this species can be found in Section 6.4.
Silver-haired bat *Lasionycteris noctivagans*	WBWG	Primarily a forest dweller, feeding over streams, ponds, and open brushy areas. Summer habitats include a variety of forest and woodland types, both coastal and montane. Roosts in hollow trees, snags, buildings, rock crevices, caves, and under bark.	**Present.** This species was detected on the property during surveys in 2018. The Phase 2 and Open Space Phase 2 and Open Space Study Area contains woodland, forest, riparian and open habitat suitable for this species. The Phase 2 and Open Space Phase 2 and Open Space Study Area could support roosting in hollow trees, snags, and rock crevices.Phase 2 and Open Space Study Area	Recommendations for this species can be found in Section 6.4.
Western red bat *Lasiurus blossevillii*	SSC, WBWG	This species is highly migratory and is typically solitary, roosting primarily in the foliage of trees or shrubs. It is associated with broad-leaved tree species including cottonwoods, sycamores, alders, and maples. Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas.	**Moderate Potential.** This species has not been documented within 10 miles of the property (CDFW 2019a). However, the Phase 2 and Open Space Study Area contains broad-leaved tree species typically associated with this species. Stream channel, riparian, open water and edge habitats provide suitable foraging habitat for this species.	Recommendations for this species can be found in Section 6.4.
Hoary bat *Lasiurus cinereus*	WBWG	Prefers open forested habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.	**High Potential.** The Phase 2 and Open Space Study Area contains forested habitats and habitat mosaics, with large pine and oak trees throughout. Grassland boarding open water and edge habitats along forested areas provide foraging for this species.	Recommendations for this species can be found in Section 6.4.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Fisher, west coast DPS *Martes pennanti* [*M. pennant pacifica*]	SSC	Intermediate to large-tree stages of coniferous forests and deciduous-riparian areas with high percent canopy closure. Use cavities, snags, logs and rocky areas for cover and denning. Need large areas of mature, dense forest.	**No Potential.** The project does not contain suitable coniferous forest and is located outside of the species range.	No further actions are recommended for this species.
Long-eared myotis *Myotis evotis*	WBWG	Occurs in semiarid shrublands, sage, chaparral, and agricultural areas, but is usually associated with coniferous forests from sea level to 9000 feet. Individuals roost under exfoliating tree bark, and in hollow trees, caves, mines, cliff crevices, and rocky outcrops on the ground. They also sometimes roost in buildings and under bridges.	**High Potential.** The Phase 2 and Open Space Study Area contains shrubland, forested habitats, rocky outcroppings, chaparral, and agricultural areas that are typically associated with the species. Grassland boarding open water and edge habitats along forested areas provide foraging for this species.	Recommendations for this species can be found in Section 6.4.
Fringed myotis *Myotis thysanodes*	WBWG	Associated with a wide variety of habitats including dry woodlands, desert scrub, mesic coniferous forest, grassland, and sage-grass steppes. Buildings, mines and large trees and snags are important day and night roosts.	**Moderate Potential.** The Phase 2 and Open Space Study Area contains dry woodland and grassland habitat that could provide suitable foraging for this species. Buildings and trees within the Phase 2 and Open Space Study Area could also provide suitable roosting habitat for this species.	Recommendations for this species can be found in Section 6.4.
Long-legged myotis *Myotis volans*	WBWG	Primarily found in coniferous forests, but also occurs seasonally in riparian and desert habitats. Large hollow trees, rock crevices and buildings are important day roosts. Other roosts include caves, mines and buildings.	**Moderate Potential.** The Phase 2 and Open Space Study Area contains dry woodland and grassland habitat that could provide suitable foraging for this species. Buildings, rock crevices, and trees within the Phase 2 and Open Space Study Area could also provide suitable roosting habitat for this species.	Recommendations for this species can be found in Section 6.4.

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Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
American badger *Taxidea taxus*	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Requires friable soils and open, uncultivated ground. Preys on burrowing rodents.	**Moderate Potential.** The Phase 2 and Open Space Study Area contains, and is surrounded by, large expanses of uncultivated open ground with shrub, grassland, and forest habitat. Burrowing rodents were observed within the Phase 2 and Open Space Study Area, which may support a prey base for the species.	Recommendations for this species can be found in Section 6.4.
Birds				
Tricolored blackbird *Agelaius tricolor*	BCC, SSC, ST	Nearly endemic to California, where it is most numerous in the Central Valley and vicinity. Highly colonial, nesting in dense aggregations over or near freshwater in emergent growth or riparian thickets. Also uses flooded agricultural fields. Abundant insect prey near breeding areas essential.	**High Potential.** The Phase 2 and Open Space Study Area contains several reservoirs with sufficient emergent vegetation to support nesting by this species. This species has been documented nesting within 1 mile of the property (CDFW 2019a).	Recommendations for this species can be found in Section 6.4.
Grasshopper sparrow *Ammodramus savannarum*	SSC	Summer resident. Breeds in open grasslands, generally with low- to moderate-height grasses and scattered shrubs. Well-hidden nests are placed on the ground.	**High Potential.** The Phase 2 and Open Space Study Area is within this species' breeding range, and contains large areas of grasslands to support foraging and nesting (CDFW 2019a, eBird 2019). This species has been documented within 0.5 mile of the property (eBird 2019).	Recommendations for this species can be found in Section 6.4.
Golden eagle *Aquila chrysaetos*	BCC, CFP	Occurs year-round in rolling foothills, mountain areas, sage-juniper flats, and deserts. Cliff-walled canyons provide nesting habitat in most parts of range; also nests in large trees, usually within otherwise open areas.	**Present.** This species was observed nesting just south of the property in 2018. Adult and juvenile golden eagles were observed in oak woodland communities within the property. The Phase 2 and Open Space Study Area contains suitable open areas with large trees to support nesting and foraging.	Recommendations for this species can be found in Section 6.4.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Short-eared owl *Asio flammeus*	SSC	Occurs year-round, but primarily as a winter visitor; breeding very restricted in most of California. Found in open, treeless areas (e.g., marshes, grasslands) with elevated sites for foraging perches and dense herbaceous vegetation for roosting and nesting. Preys mostly on small mammals, particularly voles.	**Unlikely.** The Phase 2 and Open Space Study Area contains suitable grassland foraging habitat for this species, which may winter there. However, this species is a rare breeder in interior California (CDFW 2019a, eBird 2019).	No further actions are recommended for this species.
Long-eared owl *Asio otus*	SSC	Occurs year-round in California. Nests in trees in a variety of woodland habitats, including oak and riparian, as well as tree groves. Requires adjacent open land with rodents for foraging, and the presence of old nests of larger birds (hawks, crows, magpies) for breeding.	**Moderate Potential.** The Phase 2 and Open Space Study Area contains oak and riparian habitats adjacent to open lands that could support foraging and nesting.	Recommendations for this species can be found in Section 6.4.
Burrowing owl *Athene cunicularia*	SSC, BCC	Year-round resident and winter visitor. Occurs in open, dry grasslands and scrub habitats with low-growing vegetation, perches and abundant mammal burrows. Preys upon insects and small vertebrates. Nests and roosts in old mammal burrows, most commonly those of ground squirrels.	**Moderate Potential.** This species has not been documented breeding in Lake County (CDFW 2019a, eBird 2019). This species may occasionally winter within uncanopied grassland areas within the Phase 2 and Open Space Study Area with suitable burrows. This species has been documented wintering within 2 miles of the property (eBird 2019). Burrows suitable for burrowing owl occupation were observed in open grassland within the Phase 2 and Open Space Study Area. In addition, ground squirrels were observed throughout the Phase 2 and Open Space Study Area and additional suitable burrow habitat for owls may arise in the future.	Recommendations for this species can be found in Section 6.4.

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Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Oak titmouse *Baeolophus inornatus*	BCC	Occurs year-round in woodland and savannah habitats where oaks are present, as well as riparian areas. Nests in tree cavities.	**Present.** This species was observed within the woodland communities on the property in 2018 and 2019. The Phase 2 and Open Space Study Area contains woodland and tree cavities suitable for nesting by this species.	Recommendations for this species can be found in Section 6.4.
Vaux's swift *Chaetura vauxi*	SSC	Summer resident, breeding primarily in forested areas. Nests in tree cavities, favoring those with a large vertical extent; also uses chimneys and other man-made substrates. Forages aerially for insects.	**Unlikely.** The Phase 2 and Open Space Study Area does not contain the dense coniferous forest this species prefers, and is outside of the known breeding range of the species (CDFW 2019a).	No further actions are recommended for this species.
Northern harrier *Circus cyaneus*	SSC	Year-round resident and winter visitor. Found in open habitats including grasslands, prairies, marshes and agricultural areas. Nests on the ground in dense vegetation, typically near water or otherwise moist areas. Preys on small vertebrates.	**Present.** This species was observed foraging within the Phase 2 and Open Space Study Area in 2018. The Phase 2 and Open Space Study Area contains open grassland which may support nesting and foraging by this species.	No further actions are recommended for this species.
Olive-sided flycatcher *Contopus cooperi*	SSC, BCC	Summer resident. Typical breeding habitat is montane coniferous forests. At lower elevations, also occurs in wooded canyons and mixed forests and woodlands. Often associated with forest edges. Arboreal nest sites located well off the ground.	**Moderate Potential.** The Phase 2 and Open Space Study Area contains woodland and riparian habitats that may support nesting.	Recommendations for this species can be found in Section 6.4.
White-tailed kite *Elanus leucurus*	CFP	Year-round resident in coastal and valley lowlands with scattered trees and large shrubs, including grasslands, marshes and agricultural areas. Nests in trees, of which the type and setting are highly variable. Preys on small mammals and other vertebrates.	**Present.** This species was observed within the Phase 2 and Open Space Study Area in 2018. The Phase 2 and Open Space Study Area provides open foraging habitat for this species and large trees and shrubs suitable for nesting.	Recommendations for this species can be found in Section 6.4.

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Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Prairie falcon *Falco mexicanus*	BCC	Year-round resident and winter visitor. Inhabits dry, open terrains, including foothills and valleys. Breeding sites located on steep cliffs. Forages widely.	**Moderate Potential.** The Phase 2 and Open Space Study Area contains open areas and rocky cliffs that provide potential foraging and nesting habitat for this species.	Recommendations for this species can be found in Section 6.4.
American peregrine falcon *Falco peregrinus anatum*	CFP, BCC	Year-round resident and winter visitor. Occurs in a wide variety of habitats, though often associated with coasts, bays, marshes and other bodies of water. Nests on protected cliffs and also on man-made structures including buildings and bridges. Preys on birds, especially waterbirds. Forages widely.	**Present.** This species was observed nesting on exposed cliffs within the Phase 2 and Open Space Study Area in 2018. The Phase 2 and Open Space Study Area contains several reservoirs and rocky cliffs that provide potential foraging and nesting habitat for this species.	Recommendations for this species can be found in Section 6.4.
Bald eagle *Haliaeetus leucocephalus*	SE, CFP, BCC	Occurs year-round in California, but primarily a winter visitor. Nests in large trees in the vicinity of larger lakes, reservoirs and rivers. Wintering habitat somewhat more variable but usually features large concentrations of waterfowl or fish.	**Present.** Adult and juvenile bald eagles were observed flying and roosting adjacent to multiple reservoirs within the Phase 2 and Open Space Study Area in 2018 and 2019. This species has been previously documented to nest within the Phase 2 and Open Space Study Area around McCreary Reservoir (CDFW 2019a).	Recommendations for this species can be found in Section 6.4.
Yellow-breasted chat *Icteria virens*	SSC	Summer resident, occurring in riparian areas with an open canopy, very dense understory, and trees for song perches. Nests in thickets of willow, blackberry, and wild grape.	**Moderate Potential.** The Phase 2 and Open Space Study Area contains riparian areas with dense vegetation to support nesting, and this species has been documented approximately 3 miles south of the Phase 2 and Open Space Study Area (eBird 2019).	Recommendations for this species can be found in Section 6.4.
Least bittern *Ixobrychus exilis*	SSC, BCC	Summer resident primarily in portions of the Central Valley and southern California. Typically breeds in deeper freshwater marshes with dense emergent and woody vegetation.	**Moderate Potential.** The Phase 2 and Open Space Study Area contains several deep reservoirs with emergent vegetation.	Recommendations for this species can be found in Section 6.4.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Loggerhead shrike *Lanius ludovicianus*	BCC, SSC	Year-round resident in open woodland, grassland, savannah and scrub. Prefers areas with sparse shrubs, trees, posts, and other suitable perches for foraging. Preys upon large insects and small vertebrates. Nests are well-concealed in densely-foliaged shrubs or trees.	**High Potential.** The Phase 2 and Open Space Study Area provides open areas for foraging as well as suitably dense vegetation in scrub and woodland communities to support nesting. This species has been documented within 1.5 miles of the property (eBird 2019).	Recommendations for this species can be found in Section 6.4.
Lewis's woodpecker *Melanerpes lewis*	BCC	Uncommon resident in California occurring on open oak savannahs, broken deciduous and coniferous habitats. Breeds primarily in ponderosa pine forests, riparian woodlands and disturbed pine forests but is also known to nest in orchards and oak woodlands.	**High Potential.** The Phase 2 and Open Space Study Area contains oak savannah and woodland habitat to support this species, and the Phase 2 and Open Space Study Area is within the known breeding range of this species. This species has been documented within the Phase 2 and Open Space Study Area (eBird 2019).	Recommendations for this species can be found in Section 6.4.
Flammulated owl *Otus flammeolus*	BCC	Nesting habitat includes multi-age class stands with multiple canopy layers, including a veteran tree component for nesting and roosting. Secondary cavity nester, utilizing natural cavities or those excavated by woodpeckers.	**Unlikely.** The Phase 2 and Open Space Study Area does not contain dense canopied-coniferous forest habitat that this species prefers, and this species is not known to inhabit eastern Lake County.	No further actions are recommended for this species.
Nuttall's woodpecker *Picoides nuttallii*	BCC	Year-round resident in lowland woodlands throughout much of California west of the Sierra Nevada. Typical habitat is dominated by oaks; also occurs in riparian woodland. Nests in tree cavities.	**Present.** This species was observed within the woodland communities in the Phase 2 and Open Space Study Area in 2018. The Phase 2 and Open Space Study Area contains woodland and tree cavities suitable for nesting.	Recommendations for this species can be found in Section 6.4.
Purple martin *Progne subis*	SSC	Inhabits woodlands and low elevation coniferous forests. Nests in old woodpecker cavities and human-made structures. Nest is often located in tall, isolated tree or snag.	**High Potential.** The Phase 2 and Open Space Study Area contains woodlands with snags and cavities to support nesting, and this species has been documented to nest within the Phase 2 and Open Space Study Area (CDFW 2019a).	Recommendations for this species can be found in Section 6.4.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Bank swallow *Riparia riparia*	ST	Summer resident in riparian and other lowland habitats near rivers, lakes and the ocean in northern California. Nests colonially in excavated burrows on vertical cliffs and bank cuts (natural and manmade) with fine-textured soils. Historical nesting range in southern and central areas of California has been eliminated by habitat loss. Currently known to breed in Siskiyou, Shasta, and Lassen Cos., portions of the north coast, and along Sacramento River from Shasta Co. south to Yolo Co.	**Unlikely.** The Phase 2 and Open Space Study Area is outside of the breeding range for this species. There are no documented sightings of this species within 12 miles of the Phase 2 and Open Space Study Area (CDFW 2019a).	No further actions are recommended for this species.
Allen's hummingbird *Selasphorus sasin*	BCC	Summer resident along the California coast, breeding in a variety of woodland and forest habitats, including parks and gardens with abundant nectar sources. Nest in shrubs and trees with dense vegetation.	**Present.** This species was observed within the property during site assessments in 2018. The Phase 2 and Open Space Study Area contains woodland and riparian habitats with nectar sources that may support nesting.	Recommendations for this species can be found in Section 6.4.
Yellow warbler *Setophaga* [*Dendroica*] *petechia brewsteri*	SSC, BCC	Summer resident throughout much of California. Breeds in riparian vegetation close to water, including streams and wet meadows. Microhabitat used for nesting variable, but dense willow growth is typical. Occurs widely on migration.	**Present.** This species was observed in the property in 2018. The Phase 2 and Open Space Study Area contains riparian areas with dense vegetation to support nesting.	Recommendations for this species can be found in Section 6.4.
Lawrence's goldfinch *Spinus* [*Carduelis*] *lawrencei*	BCC	Summer resident; generally uncommon and local. Typically found in arid open woodlands, including oak savannah. Breeding distribution is erratic from year to year.	**Moderate Potential.** The Phase 2 and Open Space Study Area contains undisturbed oak savannah, which provides breeding habitat for this species.	Recommendations for this species can be found in Section 6.4.
Black-chinned sparrow *Spizella atrogularis*	BCC	Prefers sloping ground in mixed chaparral, chamise-redshank chaparral, sagebrush, and similar brushy habitats. Often on arid, south-facing slopes with ceanothus, manzanita, sagebrush, and chamise.	**High Potential.** The property is within this species' breeding range, and the Phase 2 and Open Space Study Area contains dense shrub and chaparral habitats this species requires for nesting (eBird 2019).	Recommendations for this species can be found in Section 6.4.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Northern spotted owl *Strix occidentalis caurina*	FT, ST, SSC	Year-round resident in dense, structurally complex forests, primarily those with old-growth conifers. . Nests on platform-like substrates in the forest canopy, including in tree cavities. Preys on mammals.	**No Potential.** The Phase 2 and Open Space Study Area does not contain the dense, old growth coniferous forest this species prefers. The nearest documented occurrence of this species is near Robert Louis Stevenson State Park, 5 miles southwest of the property (CDFW 2019a).	No further actions are recommended for this species.
Yellow-headed blackbird *Xanthocephalus xanthocephalus*	SSC	Summer resident. Breeds colonially in freshwater emergent wetlands with dense vegetation and deep water, often along borders of lakes or ponds. Requires abundant large insects such as dragonflies; nesting is timed for maximum emergence of insect prey.	**Present.** This species was observed nesting in emergent vegetation within the Phase 2 and Open Space Study Area in 2018 and 2019.	Recommendations for this species can be found in Section 6.4.
Reptiles and Amphibians				
Western pond turtle *Actinemys marmorata*	SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches with aquatic vegetation. Require basking sites such as partially submerged logs, vegetation mats, or open mud banks, and suitable upland habitat (sandy banks or grassy open fields) for egg-laying.	**Present.** The species was observed within portions of Bucksnort Creek in 2018. The various streams and large open-water reservoirs within the property provide suitable aquatic habitat, and the open grasslands adjacent to these features may support nesting. This species has also been documented in CNDDB within the Phase 2 and Open Space Study Area (CDFW 2019a).	Recommendations for this species can be found in Section 6.4.
California giant salamander *Dicamptodon ensatus*	SSC	Occurs in the north-central Coast Ranges. Moist coniferous and mixed forests are typical habitat; also uses woodland and chaparral. Adults are terrestrial and fossorial, breeding in cold, permanent or semi-permanent streams. Larvae usually remain aquatic for over a year.	**Unlikely.** The Phase 2 and Open Space Study Area does not contain suitable coniferous forest typical of the species habitat requirements. Streams in the Phase 2 and Open Space Study Area are suboptimal to unsuitable for this species with warm summer water temperatures and non-native predatory fish and bullfrogs. The property is also located outside of the species known range.	No further actions are recommended for this species.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Foothill yellow-legged frog *Rana boylii*	SSC, SC	Found in or near rocky streams in a variety of habitats. Prefers partly-shaded, shallow streams and riffles with a rocky substrate; requires at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis. Feeds on both aquatic and terrestrial invertebrates.	**Present.** The species was observed within the property in 2018 in association with Butts Creek. Other potentially suitable streams were observed throughout the Phase 2 and Open Space Study Area. Perennial streams with rocky substrate provide suitable habitat for the species, including both Butts Creek and Putah Creek. This species has also been documented in CNDDB within the property (CDFW 2019a).	Recommendations for this species can be found in Section 6.4.
California red-legged frog *Rana draytonii*	FT, SSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11 to 20 weeks of permanent water for larval development. Associated with quiet perennial to intermittent ponds, stream pools and wetlands. Prefers shorelines with extensive vegetation. Disperses through upland habitats after rains.	**Unlikely.** Focused surveys for the species were conducted within the property in 2018 and 2019 and found no individuals. Aquatic habitat features within the Phase 2 and Open Space Study Area are dominated by several non-native predators including bass, sunfish, American bullfrog, and crayfish. There are no CNDDB occurrences of the species within 10-miles of the site. Due to the lack of detections during focused nighttime surveys, non-native predator dominated aquatic habitat, and absence of nearby documented occurrences, it is unlikely that the species would occur within the Phase 2 and Open Space Study Area.	No further actions are recommended for this species.
Red-bellied newt *Taricha rivularis*	SSC	Inhabits coastal forests from southern Sonoma County northward, with an isolated population in Santa Clara County. Redwood forest provides typical habitat, though other forest types (e.g., hardwood) are also occupied. Adults are terrestrial and fossorial. Breeding occurs in streams, usually with relatively strong flow.	**Unlikely.** The Phase 2 and Open Space Study Area does not contain suitable coastal redwood or hardwood forest typical of the species habitat requirements. The property is also located outside of the species known range.	No further actions are recommended for this species.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Fishes				
Pacific lamprey *Entosphenus* [*Lampetra*] *tridentatus*	SSC	Spawns between March and July in gravel bottomed streams in riffle habitat. Larvae drift downstream to areas of low velocity and fine substrates and are relatively immobile in the stream substrates.	**No Potential.** The property does not contain anadromous aquatic habitat necessary to support this species. The property is within the upper Putah Creek Watershed that drains into Lake Berryessa, which forms a complete fish passage barrier for fish returning from the ocean and blocks this species from the Phase 2 and Open Space Study Area.	No further actions are recommended for this species.
Clear Lake tule perch *Hysterocarpus traski lagunae*	SSC	Occurs in low elevation streams of the Russian River system. Requires clear, flowing water with abundant cover and deep (> 1 m) pools.	**Unlikely.** The property is within the upper Putah Creek Watershed that drains into Lake Berryessa. This species is only known for Clear Lake and associated tributaries; which is outside of the Phase 2 and Open Space Study Area. Tule perch is not known for the upper Putah Creek Watershed.	No further actions are recommended for this species.
Russian River tule perch *Hysterocarpus traski pomo*	SSC	Occurs in low elevation streams of the Russian River system. Requires clear, flowing water with abundant cover and deep (> 1 m) pools.	**Unlikely.** The property is within the upper Putah Creek Watershed that drains into Lake Berryessa. This species is only known for the Russian River and its tributaries; which is outside of the Phase 2 and Open Space Study Area.	No further actions are recommended for this species.
River lamprey *Lampetra ayresi*	SSC	Lower Sacramento River, San Joaquin River and Russian River. May occur in coastal streams north of San Francisco Bay. Adults need clean, gravelly riffles, Ammocoetes need sandy backwaters or stream edges, good water quality and temps < 25 degrees C.	**No Potential.** The Phase 2 and Open Space Study Area does not contain anadromous aquatic habitat necessary to support this species. The property is within the upper Putah Creek Watershed that drains into Lake Berryessa, which forms a complete fish passage barrier for fish returning from the ocean and blocks this species from the Phase 2 and Open Space Study Area.	No further actions are recommended for this species.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Clear Lake hitch *Lavinia exilicauda chi*	ST, SSC	Found only in Clear Lake, Lake County, and associated ponds. Spawns in streams flowing into Clear Lake. Adults found in the limnetic zone. Juveniles found in the nearshore shallow-water habitat hiding in the vegetation.	**Unlikely.** The property is within the upper Putah Creek Watershed that drains into Lake Berryessa. This species is only known for Clear Lake and associated tributaries; which is outside of the property.	No further actions are recommended for this species.
Clear Lake – Russian River roach *Lavinia symmetricus ssp. 4*	SSC	Habitat generalists. Found in warm intermittent streams as well as cold, well-aerated streams.	**Unlikely.** The Phase 2 and Open Space Study Area is within the upper Putah Creek Watershed that drains into Lake Berryessa. This species is only known for Clear Lake and associated tributaries; which is outside of the Phase 2 and Open Space Study Area. Roach in the Phase 2 and Open Space Study Area are within the range and distribution of Central California roach, which are not a special-status species.	No further actions are recommended for this species.
Navarro roach *Lavinia symmetricus navarroensis*	SSC	Occurs only in the Navarro River and its tributaries. Adaptable; found in warm, intermittent streams as well as cold, well-aerated streams.	**Unlikely.** The property is within the upper Putah Creek Watershed that drains into Lake Berryessa. This species is only known for the Navarro River and its tributaries; which is outside of the property.	No further actions are recommended for this species.
Coho salmon - central CA coast ESU *Oncorhynchus kisutch*	FE, SE	Federal listing includes populations between Punta Gorda and San Lorenzo River. State listing includes populations south of San Francisco Bay only. Occurs inland and in coastal marine waters. Requires beds of loose, silt-free, coarse gravel for spawning. Also needs cover, cool water and sufficient dissolved oxygen.	**No Potential.** This species is considered extirpated from San Francisco Bay and associated tributaries, including the greater Sacramento River Watershed. The Phase 2 and Open Space Study Area does not contain anadromous aquatic habitat necessary to support this species. The property is within the upper Putah Creek Watershed that drains into Lake Berryessa, which forms a complete fish passage barrier for fish returning from the ocean and blocks this species from the Phase 2 and Open Space Study Area.	No further actions are recommended for this species.

Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Steelhead - Central Valley DPS *Oncorhynchus mykiss*	FT	Occurs from the Russian River south to Soquel Creek and Pajaro River. Also in San Francisco and San Pablo Bay Basins. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for 1 or more years before migrating downstream to the ocean.	**Unlikely.** The Phase 2 and Open Space Study Area does not contain anadromous aquatic habitat necessary to support this species. The property is within the upper Putah Creek Watershed that drains into Lake Berryessa, which forms a complete fish passage barrier for fish returning from the ocean and blocks this species from the Phase 2 and Open Space Study Area. The resident form, rainbow trout, is known to occur in Lake Berryessa and may utilize portions of upper Putah Creek and associated tributaries that are within the Phase 2 and Open Space Study Area. Rainbow trout was observed within Butts Creek in 2018. However, the resident form of the species is not protected as a steelhead in areas where anadromy is blocked, such as the waters within the Phase 2 and Open Space Study Area.	No further actions are recommended for this species.
Chinook salmon - California coastal ESU *Oncorhynchus tshawytscha*	FT	California Coastal Chinook Salmon ESU includes all naturally spawned populations of Chinook salmon from rivers and streams south of the Klamath River (exclusive) to the Russian River (inclusive). Adult numbers depend on pool depth and volume, amount of cover, and proximity to gravel. Water temps >27 degrees C lethal to adults.	**No Potential.** The Phase 2 and Open Space Study Area does not contain anadromous aquatic habitat necessary to support this species. The property is within the upper Putah Creek Watershed that drains into Lake Berryessa, which forms a complete fish passage barrier for fish returning from the ocean and blocks this species from the Phase 2 and Open Space Study Area.	No further actions are recommended for this species.

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Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Invertebrates				
Crotch bumble bee *Bombus crotchii*	SC	Crotch bumble bee occurs primarily in the Mediterranean region, pacific coast, western desert, and great valley of southwestern California. Populations used to extend through the southern two-thirds of California, but is now absent through much of its historic range.	**Unlikely.** The property is north of this species current range.	No further actions are recommended for this species.
Western bumblebee *Bombus occidentalis*	SC	Once widespread in the western United States and Canada, populations of this insect have drastically declined in recent decades. Pollinates a variety of wild flowering plants and crops.	**Unlikely.** Although this species historically occurred throughout California, recent studies have shown that the property is outside of this species current extent of occurrence.	No further actions are recommended for this species.
Conservancy fairy shrimp *Branchinecta conservation*	FE	Endemic to the grasslands of the northern two-thirds of the Central Valley, found in large, turbid pools. Inhabits astatic pools located in swales formed by old, braided alluvium, filled by winter/spring rains, lasting until June.	**Unlikely.** Although there are vernal pools that are a part of the Lake-Napa Vernal Pool complex about 2 miles north west of the property, this species has not been documented in Lake County (CDFW 2019a, Erikson and Belk, 1999). Additionally, no vernal pools with soil and/or hydrological characteristics that could support this species were observed within the Phase 2 and Open Space Study Area.	No further actions are recommended for this species.

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Species	Conservation Status[1]	Habitat	Potential for Occurrence[2]	Recommendations
Vernal pool fairy shrimp *Branchinecta lynchi*	FT	Endemic to the grasslands of the Central Valley, central coast mountains, and south coast mountains, in astatic rain-filled pools. Inhabits small, clear-water sandstone-depression pools, and grassy swales, earth slumps, or basalt-flow depression pools.	**Unlikely.** Although there are vernal pools that are a part of the Lake-Napa Vernal Pool complex about 2 miles north west of the property, this species has not been documented in Lake County (CDFW 2019a, Erikson and Belk, 1999). Additionally, no vernal pools with soil and/or hydrological characteristics that could support this species were observed within the Phase 2 and Open Space Study Area.	No further actions are recommended for this species.
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT	Occurs only in the central valley of California, in association with blue elderberry (*Sambucus mexicana*). Prefers to lay eggs in elderberry 2 to 8 inches in diameter; some preference shown for "stressed" elderberry.	**Unlikely.** The property is located west of this species' documented range in the Central Valley. A non-listed subspecies, *Desmocerus californicus californicus*, is known to occur in the coast range hills. The closest documented occurrence of valley elderberry longhorn beetle is 12 miles northeast of the property in the Cache Creek watershed (CDFW 2019a.) Given the low dispersal ability of this species, it is unlikely to occur within the property (Collinge et al. 2001)	No further actions are recommended for this species.
California freshwater shrimp *Syncaris pacifica*	FE, SE	Endemic to Marin, Napa, and Sonoma counties. Found in low elevation, low gradient streams where riparian cover is moderate to heavy. Shallow pools away from main stream flow. Winter: undercut banks with exposed roots. Summer: leafy branches touching water.	**Unlikely.** Although the Phase 2 and Open Space Study Area contains perennial streams, this species has not been documented in Lake County and the nearest documented occurrence is over 10 miles southwest of the property near Calistoga, in a different watershed from the Phase 2 and Open Space Study Area (CDFW 2019a).	No further actions are recommended for this species.

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[1]Key to Conservation Status:

FE	Federal Endangered
FT	Federal Threatened
FC	Federal Candidate
BCC	USFWS Birds of Conservation Concern
SE	State Endangered
ST	State Threatened
SC	State Candidate
SSC	CDFW Species of Special Concern
CFP	California Fully Protected Species
WBWG	Western Bat Working Group High or Medium Priority Species

[2]Potential for Occurrence:

No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements (cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).

Unlikely. Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.

Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.

High Potential. All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

Present. Species was observed on the site or has been recorded (i.e. CNDDB, other reports) on the site recently.

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APPENDIX H

SITE PHOTOGRAPHS

Photograph 1. Example of white alder groves along Bucksnort Creek (taken June 7, 2017).

Photograph 2. Example of white alder groves along Bucksnort Creek (taken June 7, 2018).

Photograph 3. Example of Sargent cypress woodland (taken April 18, 2018).

Photograph 4. Example of Sargent cypress woodland in the southern portion of the Study Area (taken April 18, 2018).

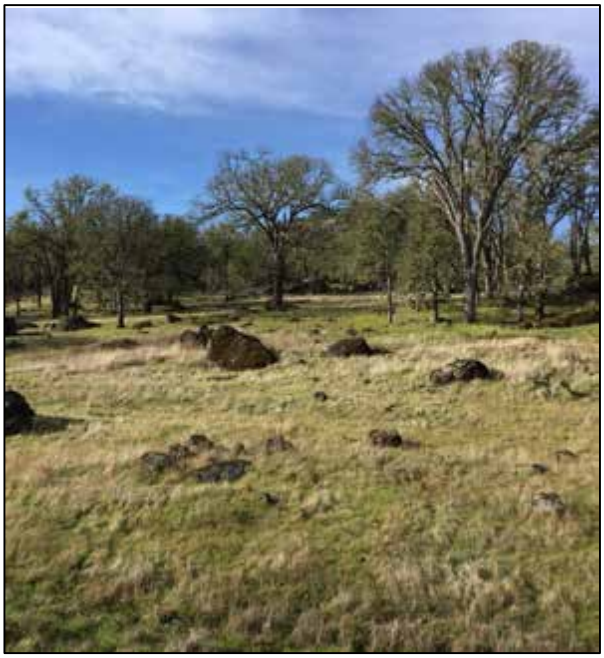
Photograph 5. Example of foothill pine woodland (taken April 2, 2018).

Photograph 6. Example of foothill pine woodland (taken March 30, 2018).

Photograph 7. Example of Douglas fir forest (in background) (taken May 25, 2019).

Photograph 8. Example of mixed oak woodland (in background, on right) (taken May 25, 2019).

Photograph 9. Example of blue oak woodland (taken April 18, 2018).



Photograph 10. Example of blue oak woodland (taken March 30, 2018).

Photograph 11. Example of blue oak savanna (taken June 6, 2017).

Photograph 12. Example of valley oak woodland along Bucksnort Creek (taken June 8, 2017).

Photograph 13. Example of valley oak woodland along Bucksnort Creek (taken June 8, 2017).

Photograph 14. Example of interior live oak woodland (taken June 6, 2017).

Photograph 15. Example of interior live oak woodland (taken June 6, 2017).

Photograph 16. Example of chamise chaparral (taken April 18, 2018).

Photograph 17. Example of chamise chaparral (burned) (taken April 20, 2018).

Photograph 18. Example of chamise chaparral (taken May 1, 2018).

Photograph 19. Example of whiteleaf manzanita chaparral (taken April 18, 2018).

Photograph 20. Example of whiteleaf manzanita chaparral (taken August 21, 2018).

Photograph 21. Example of musk brush chaparral (taken March 29, 2018).

Photograph 22. Example of musk brush chaparral (taken June 7, 2018).

Photograph 23. Example of California yerba santa scrub (taken March 14, 2018).

Photograph 24. Example of California yerba santa scrub (taken March 14, 2018).

Photograph 25. Example of scrub oak chaparral (taken April 20, 2018).

Photograph 26. Example of leather oak chaparral (burned) (taken May 15, 2018).

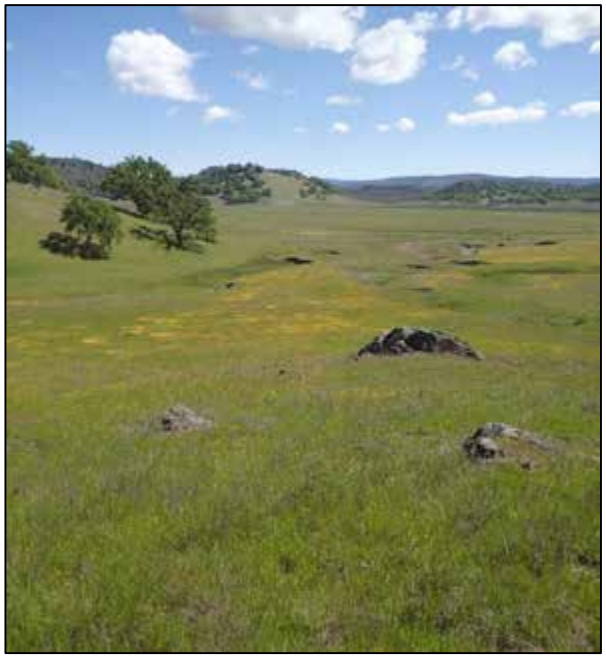
Photograph 27. Example of leather oak chaparral (burned) (taken April 20, 2018).

Photograph 28. Example of leather oak chaparral (taken May 15, 2018).

Photograph 29. Example of Brewer willow thickets along McCain Creek (taken June 8, 2017).

Photograph 30. Example of Brewer willow thickets along McCain Creek (taken May 18, 2018).

Photograph 31. Example of non-native grasslands, in spring (taken March 30, 2018).



Photograph 32. Example of non-native grasslands, with native wildflowers (taken March 19, 2018).

Photograph 33. Example of non-native grasslands, with native wildflowers (taken April 20, 2018).

Photograph 34. Example of non-native grasslands, in late summer (taken June 8, 2017).

Photograph 35. Example of non-native grasslands, with native wildflowers (taken September 6, 2018).

Photograph 36. Example of non-native grasslands, with native wildflowers (taken June 8, 2017).

Photograph 37. Example of purple needlegrass grassland (taken April 19, 2018).

Photograph 38. Example of emergent wetland (taken June 5, 2017).

Photograph 39. Example of emergent wetland (taken June 7, 2017).

Photograph 40. Example of emergent wetland (taken June 5, 2017).

Photograph 41. Example of emergent wetland (taken June 5, 2017).

Photograph 42. Example of in-line reservoir on an unnamed stream near Lower Bohn Lake (taken June 4, 2018).

Photograph 43. Example of off-line reservoir on a tributary to Butts Creek (taken April 18, 2018).

Photograph 44. Blacktail Lake (in-line reservoir) (taken April 18, 2018).

Photograph 45. Example of ephemeral stream (taken April 20, 2018).

Photograph 46. Example of ephemeral stream (taken April 19, 2018).

Photograph 47. Example of ephemeral stream (taken April 19, 2018).

Photograph 48. Example of intermittent stream (unnamed) (taken April 18, 2018).

Photograph 49. Example of intermittent stream (unnamed) (taken April 19, 2018).

Photograph 50. Example of intermittent stream (Butcherknife Creek) (taken June 7, 2017).

Photograph 51. Example of perennial stream (Putah Creek) (taken April 20, 2018).

Photograph 52. Example of perennial stream (Bucksnort Creek) (taken June 7, 2017).

Photograph 53. Example of perennial stream (Bucksnort Creek) (taken May 30, 2018).

Photograph 54. Example of agricultural (vineyard) areas (taken April 19, 2018).

Photograph 55. Example of agricultural (vineyard) areas (taken August 22, 2018).

Photograph 56. Example of rock outcrops (taken June 7, 2018).

Photograph 57. Example of rock outcrops (taken June 7, 2018).

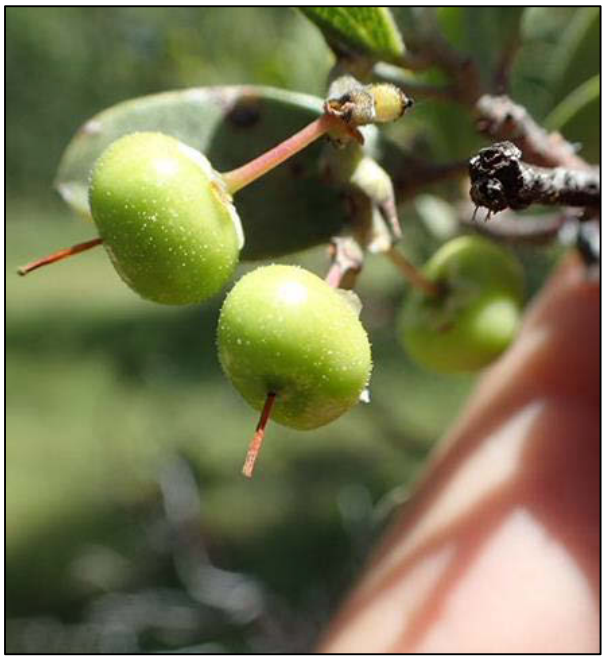
Photograph 58. Keck's checkerbloom (*Sidalcea keckii*; FE, CNPS Rank 1B.1) (taken May 17, 2018).

Photograph 59. Keck's checkerbloom (taken May 17, 2018).

Photograph 60. Lake County western flax (*Hesperolinon didymocarpum*; SE, CNPS Rank 1B.2) (taken May 17, 2018).

Photograph 61. Lake County western flax (taken May 15, 2018).

Photograph 62. Knocti manzanita (*Arctostaphylos manzanita* ssp. *elegans*; CNPS Rank 1B.3) (taken May 26, 2019).



Photograph 63. Knocti manzanita (taken May 26, 2019).

Photograph 64. Narrow-anthered brodiaea (*Brodiaea leptandra*; CNPS Rank 1B.2) (taken June 14, 2018).

Photorgraph 65. Greene's narrow-leaved fleabane (*Erigeron greenei*; CNPS Rank 1B.2) (taken June 14, 2018).

Photograph 66. Two-carpellate western flax (*Hesperolinon bicarpellatum*; CNPS Rank 1B.2) (taken May 15, 2018).

Photograph 67. Two-carpellate western flax (taken June 14, 2018).

Photograph 68. Colusa layia (*Layia septentrionalis*; CNPS Rank 1B.2) (taken April 19, 2018).

Photograph 69. Colusa layia (taken April 20, 2018).

Photograph 70. Green jewelflower (*Streptanthus hesperidis*; CNPS Rank 1B.2) (taken June 8, 2018).

Photograph 71. Green jewelflower (taken June 13, 2018).

Photograph 72. Morrison's jewelflower (*Streptanthus morrisonii*; CNPS Rank 1B.2) (taken June 14, 2018).

Photograph 73. Morrison's jewelflower (taken June 14, 2018).

Photograph 74. Tall snapdragon (*Antirrhinum virga*; CNPS Rank 4.3) (taken June 8, 2017).

Photograph 75. Cleveland's milkvetch (*Astragalus clevelandii*; CNPS Rank 4.3) (taken June 15, 2018).

Photograph 76. Pink star tulip (*Calochortus uniflorus*; CNPS Rank 4.2) (taken May 8, 2019).

Photograph 77. Mt. Saint Helena morning glory (*Calystegia collina* ssp. *oxyphylla*; CNPS Rank 4.2) (taken May 16, 2018).

Photograph 78. Tracy's clarkia (*Clarkia gracilis* ssp. *tracyi*; Rank 4.2) (taken June 8, 2018).

Photograph 79. Serpentine collomia (*Collomia diversifolia*; CNPS Rank 4.3) (taken April 18, 2018).

Photograph 80. Serpentine bird's beak (*Cordylanthus tenuis* ssp. *brunneus*; CNPS Rank 4.3) (taken on June 8, 2018).

Photograph 81. Swamp larkspur (*Delphinium uliginosum*; CNPS Rank 4.2) (taken on May 15, 2018).

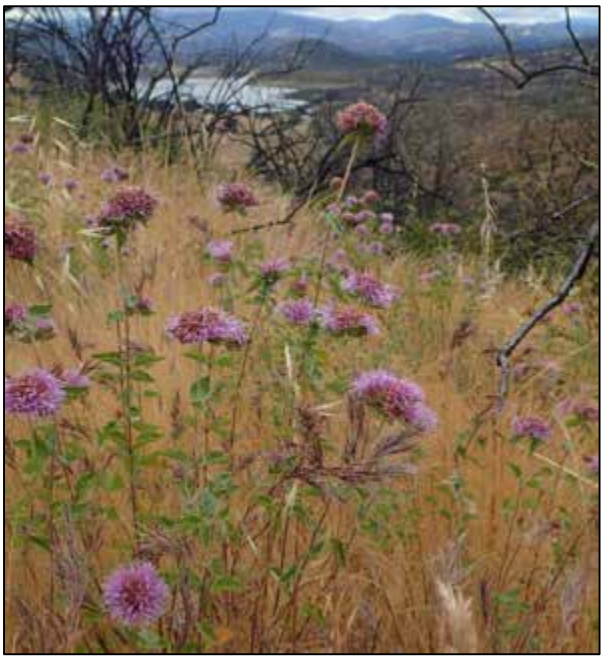
Photograph 82. Bare monkeyflower (*Erythranthe nudata*; CNPS Rank 4.3) (taken April 18, 2018).

Photograph 83. St. Helena fawn lily (*Erythronium helenae*; CNPS Rank 4.2) (taken March 14, 2018).

Photograph 84. Purdy's fritillary (*Fritillaria purdyi*; CNPS Rank 4.3) (taken March 14, 2018).

Photograph 85. Serpentine sunflower (*Helianthus exilis*; CNPS Rank 4.2) (taken September 6, 2018).

Photograph 86. Serpentine sunflower (taken September 6, 2018).



Photograph 87. Green monardella (*Monardella viridis*; CNPS Rank 4.3) (taken June 8, 2017).

Photograph 88. Cotula navarretia (*Navarretia cotulifolia*; CNPS Rank 4.2) (taken May 3, 2018).

Photograph 89. Jepson's navarretia (*Navarretia jepsonii*; CNPS Rank 4.3) (taken June 7, 2017).

Photograph 90. Cleveland's ragwort (*Senecio clevelandii* var. *clevelandii*; CNPS Rank 4.3) (taken June 15, 2018).

Photograph 91. Marsh zigadenus (*Toxicoscordion fontanum*; CNPS Rank 4.2) (taken May 18, 2018).

Photograph 92. Dark-mouth triteleia (*Triteleia lugens*; CNPS Rank 4.3) (taken May 18, 2018).

Photograph 93. Golden eagle (*Aquila chrysaetos*; BGEA, CFP, BCC) (taken April 2, 2018).

Photograph 94. Bald eagle (*Haliaeetus leucocephalus*; BGEA, SE, CFP BCC) (taken April 25, 2018).

Photograph 95. Peregrine falcon (*Falco peregrinus*; CFP, BCC) nest located outside of the Study Area (taken April 3, 2018).

Photograph 96. Western pond turtle (*Actinemys marmorata*; SSC) (taken April 3, 2018).

Photograph 97. Western pond turtle (taken April 3, 2018).

Photograph 98. Foothill yellow-legged frog (*Rana boylii*; SC, SCC) egg masses within Butts Creek in the southern portion of the Study Area (taken April 4, 2018).

Photograph 99. Foothill yellow-legged frog egg masses within Butts Creek in the southern portion of the Study Area (taken April 4, 2018).

APPENDIX BRA2

FUTURE PHASES BIOLOGICAL RESOURCES ASSESSMENT

Biological Resources Assessment

21000 Santa Clara Road
Middletown, Lake County, California

Prepared For:

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EXECUTIVE SUMMARY

This report details the regulatory background, methods, results, and recommendations of a biological resources assessment conducted at 21000 Santa Clara Road, Lake County, California. WRA, Inc. performed field surveys on October 22, 2018, March 14, April 28, and May 20, 2019.

The 13.33-acre Study Area is primarily composed of a mix of native and non-native grasslands. An intermittent stream and associated riparian scrub are located along the western edge of the Study Area.

Eight special-status plants and 20 special-status wildlife species were determined to have the potential to occur within the Study Area. No special-status plants were observed during seasonally timed surveys, therefore no impacts to special-status plants are expected. Recommendations are provided to avoid impacts to special-status wildlife.

Four potentially sensitive biological communities were observed within the Study Area. Recommendations have been developed and are provided herein to avoid or mitigate for impacts to these resources.

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LIST OF ACRONYMS

BGEPA	Bald and Golden Eagle Protection Act
BIOS	Biogeographic Information and Observation System
BRRS	Biological Resources Reconnaissance Survey
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CFGC	California Fish and Game Code
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
County	County of Lake
Corps	U.S. Army Corps of Engineers
CSRL	California Soils Resources Lab
CWA	Clean Water Act
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Federal Endangered Species Act
MBTA	Migratory Bird Treaty Act
NOAA	National Oceanic and Atmospheric Administration
NMFS	National Marine Fisheries Service
NRCS	Natural Resource Conservation Service
NWI	National Wetland Inventory
NWPL	National Wetland Plant List
OHWM	Ordinary High Water Mark
CRPR	California Rare Plant Ranks
RWQCB	Regional Water Quality Control Board
SFP	State Fully Protected Species
SSC	Species of Special Concern
SWRCB	State Water Resource Control Board
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WBWG	Western Bat Working Group

1.0 INTRODUCTION

1.1 Purpose of Assessment

In October 2018, and March, April, and May 2019, WRA, Inc. (WRA) performed an assessment of biological resources at 21000 Santa Clara Road (Study Area) in Middletown, Lake County, California (Figure 1, Appendix A). The purpose of the assessment is to gather the information necessary to complete a review of biological resources under the California Environmental Quality Act (CEQA).

A biological resources assessment (BRA) provides general information on the presence, or potential presence, of sensitive species and habitats. These assessments included focused surveys for special-status plant species determined to have potential to occur in the Study Area; however, focused or protocol-level surveys for wildlife were not included as part of the assessment. A stream and wetland assessment is also included as part of the survey; however, WRA conducted a formal wetland delineation in October 2018, the results of which are presented in a separate report. This biological assessment is based on information available at the time of the study and on-site conditions that were observed on the date(s) the site was visited.

This report describes the results of the site visit, which assessed the Study Area for (1) the presence of sensitive biological communities, (2) the potential for biological communities on the site to support special-status plant and wildlife species, and (3) the presence of any other sensitive natural resources protected by local, state, or federal laws and regulations. Special-status species observed during the site assessment were documented and their presence is discussed herein. Specific findings on the habitat suitability or presence of special-status species or sensitive habitats may require that protocol-level surveys or other studies be conducted; recommendations for additional studies are provided, if necessary.

Figures are included in Appendix A. A list of plants and wildlife observed during the site visits is included as Appendix B. An assessment of all of the special-status species documented from the general vicinity and their potential to occur in the Study Areas is included as Appendix C. Representative photographs of the Study Area are included as Appendix D.

2.0 REGULATORY BACKGROUND

This report is intended to facilitate conformance of future development with the standards outlined in the Lake County Code and General Plan. In addition to the requirements of Lake County, the future development may also be subject to several federal and state regulations designed to protect sensitive natural resources. As no project is proposed at this time, general requirements in the context of future development are addressed herein.

2.1 Federal and State Regulatory Setting

2.1.1 Sensitive Biological Communities

Herein, biological communities are understood to be those areas of a particular vegetation type, soil or bedrock formation, aquatic features, and/or other distinct phenomenon. Typically, biological communities have distinct boundaries that can be delineated based on changes in plant assemblages, soil types, and/or changes in surface/near-surface hydroperiod. The several regulations defining and protecting sensitive biological communities are discussed below.

Waters of the United States: The United States Army Corps of Engineers (Corps) regulates "Waters of the United States" under Section 404 of the Clean Water Act (CWA). Waters of the United States are defined in the Code of Federal Regulations (CFR) as waters susceptible to use in commerce, including interstate waters and wetlands, all other waters (intrastate waterbodies, including wetlands), and their tributaries (33 CFR 328.3). Potential wetland areas, according to the three criteria used to delineate wetlands as defined in the Corps Wetlands Delineation Manual (Environmental Laboratory 1987), are identified by the presence of (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. Areas that are inundated at a sufficient depth and for a sufficient duration to exclude growth of hydrophytic vegetation are subject to Section 404 jurisdiction as "other waters" and are often characterized by an ordinary high water mark (OHWM). Other waters, for example, generally include lakes, rivers, and streams. The placement of fill material into Waters of the United States generally requires an individual or nationwide permit from the Corps under Section 404 of the CWA.

Waters of the State: The term "Waters of the State" is defined by the Porter-Cologne Act as "any surface water or groundwater, including saline waters, within the boundaries of the state." The Regional Water Quality Control Board (RWQCB) protects all waters in its regulatory scope and has special responsibility for wetlands, riparian areas, and headwaters. These waterbodies have high resource value, are vulnerable to filling, and are not systematically protected by other programs. RWQCB jurisdiction includes "isolated" wetlands and waters that may not be regulated by the Corps under Section 404. Waters of the State are regulated by the RWQCB under the State Water Quality Certification Program which regulates discharges of fill and dredged material under Section 401 of the CWA and the Porter-Cologne Water Quality Control Act. Projects that require a Corps permit, or fall under other federal jurisdiction, and have the potential to impact Waters of the State, are required to comply with the terms of the Water Quality Certification determination. If a project does not require a federal permit, but does involve dredge or fill activities that may result in a discharge to Waters of the State, the RWQCB has the option to regulate the dredge and fill activities under its state authority in the form of Waste Discharge Requirements.

Streams, Lakes, and Riparian Habitat: Streams and lakes, as habitat for fish and wildlife species, are subject to jurisdiction by CDFW under Sections 1600-1616 of California Fish and Game Code (CFGC). Alterations to or work within or adjacent to streambeds or lakes generally require a 1602 Lake and Streambed Alteration Agreement. The term "stream", which includes creeks and rivers, is defined in the California Code of Regulations (CCR) as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life [including] watercourses having a surface or subsurface flow that supports or has supported riparian vegetation" (14 CCR 1.72). In addition, the term "stream" can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife (CDFG 1994). "Riparian" is defined as "on, or pertaining to, the banks of a stream." Riparian vegetation is defined as "vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself" (CDFG 1994). Removal of riparian vegetation also requires a Section 1602 Lake and Streambed Alteration Agreement from CDFW.

The County of Lake has developed a "Waterway Combining District" zoning designation that applies to all perennial and intermittent streams, including adjacent wetlands and riparian vegetation (Section 37 of the Zoning Ordinance). The County defines a protected riparian zone as an area extending:

- 30 feet from the top of bank any perennial stream,
- 20 feet from the top of bank of any intermittent stream,
- 20 feet from the edge of any adjacent wetlands or the ordinary high water mark of other bodies of water, or
- To the outer extent of vegetation dominated by common riparian species such as Fremont cottonwood (*Populus fremontii*), white alder (*Alnus rhombifolia*), box elder (*Acer negundo*), dogwood (*Cornus* spp.), willow (*Salix* spp.), and big leaf maple (*Acer macrophyllum*) (this latter zone may extend beyond 30 feet).

The County restricts development and other activities within the riparian zone defined above, with a number of exemptions for agriculture, management, and other resource-dependent activities as outlined in Sections 37.5 and 37.6 of the zoning ordinance.[1]

Sensitive Natural Communities: Sensitive natural communities not discussed above include habitats that fulfill special functions or have special values. Natural communities considered sensitive are those identified in local or regional plans, policies, regulations, or by the CDFW. CDFW ranks sensitive communities as "threatened" or "very threatened" (CDFG 2010, CDFW 2018b) and keeps records of their occurrences in its California Natural Diversity Database (CNDDB; CDFW 2018). CNDDB vegetation alliances are ranked 1 through 5 based on NatureServe's (2018) methodology, with those alliances ranked globally (G) or statewide (S) as 1 through 3 or associations ranked “Y” considered sensitive. Impacts to sensitive natural communities identified in local or regional plans, policies, or regulations or those identified by the CDFW or U.S. Fish and Wildlife Service (USFWS) must be considered and evaluated under CEQA (CCR Title 14, Div. 6, Chap. 3, Appendix G).

2.1.2 Special-Status Species

Plants: Special-status plants include species/taxa that have been listed as endangered or threatened, or are formal candidates for such listing, under the federal Endangered Species Act (ESA) and/or California Endangered Species Act (CESA). Plant species on the California Native Plant Society (CNPS) Rare and Endangered Plant Inventory (Inventory) with California Rare Plant Ranks (Rank) of 1, 2, and 3 are also considered special-status plant species and must be considered under CEQA. Rank 4 species are typically only afforded protection under CEQA when such species are particularly unique to the locale (e.g., range limit, low abundance/low frequency, limited habitat) or are otherwise considered locally rare. A description of the CNPS Ranks is provided below in Table 1. No specific plant species are listed as sensitive within the Lake County General Plan.

Table 1. CNPS Ranks and Threat Codes

[1] Section 30-9 of the County Municipal Code provides different watercourse setbacks based on stream class and erosion hazard ratings. Based on conversations with the Lake County Planning Department, WRA believes that the watercourse setbacks provided in Article 37 of the Zoning Ordinance take precedence.

California Rare Plant Ranks (formerly known as CNPS Lists)	
Rank 1A	Presumed extirpated in California and either rare or extinct elsewhere
Rank 1B	Rare, threatened, or endangered in California and elsewhere
Rank 2A	Presumed extirpated in California, but more common elsewhere
Rank 2B	Rare, threatened, or endangered in California, but more common elsewhere
Rank 3	Plants about which more information is needed - A review list
Rank 4	Plants of limited distribution - A watch list
Threat Ranks	
0.1	Seriously threatened in California
0.2	Moderately threatened in California
0.3	Not very threatened in California

Wildlife: As with plants, special-status wildlife include species/taxa that have been listed or are formal candidates for such under ESA and/or CESA. The federal Bald and Golden Eagle Protection Act provides relatively broad protections to both of North America's eagle species (bald [*Haliaeetus leucocephalus*] and golden eagle [*Aquila chrysaetos*)] that in some regards are similar to those provided by ESA. The CFGC designates some species as Fully Protected (SFP), which indicates that take of that species cannot be authorized through a state permit. Additionally, CDFW Species of Special Concern (species that face extirpation in California if current population and habitat trends continue) are given special consideration under CEQA, and are therefore considered special-status species. In addition to regulations for special-status species, most native birds in the United States, including non-status species, have baseline legal protections under the Migratory Bird Treaty Act of 1918 and CFGC, i.e., sections 3503, 3503.5 and 3513. Under these laws/codes, the intentional harm or collection of adult birds as well as the intentional collection or destruction of active nests, eggs, and young is illegal. For bat species, the Western Bat Working Group (WBWG) designates conservation status for species of bats, and those with a high or medium-high priority are typically given special consideration under CEQA. The Lake County General Plan does not list specific wildlife species as sensitive.

Critical Habitat, Essential Fish Habitat, and Wildlife Corridors: Critical habitat is a term defined in the ESA as a specific and formally-designated geographic area that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. The ESA requires federal agencies to consult with the USFWS to conserve listed species on their lands and to ensure that any activities or projects they fund, authorize, or carry out will not jeopardize the survival of a threatened or endangered species. In consultation for those species with critical habitat, federal agencies must also ensure that their activities or projects do not adversely modify critical habitat to the point that it will no longer aid in the species' recovery. Note that designated critical habitat areas that are currently unoccupied by the species but which are deemed necessary for the species' recovery are also protected by the prohibition against adverse modification.

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) provides for conservation and management of fishery resources in the U.S. This Act establishes a national program intended to prevent overfishing, rebuild overfished stocks, ensure conservation, and facilitate long-term protection through the establishment of Essential Fish Habitat (EFH). EFH consists of aquatic areas that contain habitat essential to the long-term

survival and health of fisheries, which may include the water column, certain bottom types, vegetation (e.g. eelgrass (*Zostera* spp.)), or complex structures such as oyster beds. Any federal agency that authorizes, funds, or undertakes action that may adversely affect EFH is required to consult with NMFS.

3.0 ENVIRONMENTAL SETTING

The Study Area is set in a single parcel of approximately 13 acres, located in southeast Lake County, approximately 0.29 mile northwest of the downtown Middletown. It is situated in the Collayomi Valley along Dry Creek (USGS 2018). Detailed descriptions of the local setting are below.

3.1 Topography and Soils

The overall topography of the Study Area is flat. The elevation is approximately 1,100 feet above sea level. According to the *Soil Survey of Lake County* (USDA 1989), the Study Area is underlain by three soil mapping units: Kelsey Fine Sandy Loam, Talmage Very Gravelly Sandy Loam, and Xerofluvents, Very Gravelly. The parent soil series of these mapping units are summarized below.

Kelsey series: This series consists of very deep fine sandy loam that formed in alluvium from mixed rock sources situated on floodplains ranging from 900 to 1,600 feet. Soil pH is neutral (7.0) to slightly alkaline (7.4). These soils are listed as hydric in Lake County, but are well drained with very slow runoff and moderately rapid permeability and did not display any field indicators of hydric soils. Native vegetation includes annual grasses and forbs with scattered valley oaks (*Quercus lobata*) (USDA 1989, CSRL 2019).

Talmage Series: This series consist of very deep gravelly sandy loam formed in alluvium from mixed rock alluvial fans and plains at elevations ranging from 350 to 1,800 feet. Soil pH is slightly acidic (6.5) to neutral (7.0). These soils listed as hydric in Lake County, but are somewhat excessively drained with slow to medium runoff and moderately rapid permeability and did not display any field indicators of hydric soils. Native vegetation typically includes annual grasses and forbs with scattered oaks (*Quercus* spp.) (USDA 1989, CSRL 2019).

Xerofluvents Very Gravelly: This map unit consist of very deep, excessively drained soils formed from gravelly alluvium from mixed rock on narrow floodplains adjacent to stream channels. These soils are listed as hydric in Lake County, but have very slow runoff with rapid permeability and did not display any field indicators of hydric soils. Native vegetation typically includes vinegar weed (*Trichostema* spp.), foxtail fescue (*Festuca myuros*), and filaree (*Geranium* spp.) (USDA 1989).

3.2 Climate and Hydrology

The Study Area is located outside of the coastal fog belt of the San Francisco Bay Area, but annual rainfall is substantial in winter through early spring. The average monthly maximum temperature in Lakeport, approximately 25 miles to the northwest of Middletown, is 72.7 degrees Fahrenheit, while the average monthly minimum temperature is 41.4 degrees Fahrenheit. Precipitation predominantly falls as rainfall with an annual average of 44.1 inches in Middletown. Precipitation-bearing weather systems are predominantly from the west and south with the majority of rain falls between November and March, with a combined average of 36.95 inches (Western Regional Climate Center 2019).

The local watershed is Dry Creek-Putah Creek (HUC 12: 180201620303) and the regional watershed is Putah Creek (HUC 8: 18020162). One mapped blue-line stream, Dry Creek, is located within the Study Area (USGS 2018); this feature is also mapped as an intermittent stream in the National Wetlands Inventory (NWI 2019). No other wetland or stream features are mapped within the Study Area. The primary hydrologic sources are direct precipitation and consequent sheetflow, as well as channelized stream flow and occasional overbank flooding from Dry Creek.

3.3 Biota and Land Use

A majority of the Study Area was burned in the Valley Fire of September 2015; the fire intensity was at a level which charred trees and large shrubs, and cleared the herbaceous layer. However, the property was not developed and has not been developed in recent history (Historical Aerials 2019); evidence of discing for fire breaks was observed during the site visits. The Study Area is composed of grassland and oak woodland with riparian scrub associated with Dry Creek. Detailed plant community descriptions are included in Section 5.1 and all observed plant species are listed in Appendix B.

Currently the Study Area is undeveloped. Regional land-uses are primarily residential and commercial. Historically, the region was likely open rangeland consisting of numerous small ranches. There does not appear to be a history of intensive agriculture, quarrying, mining, or timbering (Historic Aerials 2019).

4.0 ASSESSMENT METHODS

Prior to the site visit, WRA biologists reviewed the following literature and performed database searches to assess the potential for sensitive natural communities (e.g., wetlands) and special-status species (e.g., endangered plants):

- *Soil Survey of Lake County, California* (USDA 1989)
- Middletown 7.5-minute quadrangle (USGS 2018)
- Aerial photographs (Google Earth 2019)
- Historical Aerial photographs (Historical Aerials 2019)
- National Wetlands Inventory (USFWS 2019a)
- California Natural Diversity Database (CNDDB, CDFW 2019a)
- California Native Plant Society Electronic Inventory (CNPS 2019a)
- Consortium of California Herbaria (CCH 2019)
- USFWS Information for Planning and Conservation Species Lists (USFWS 2018)
- CDFG publication *California Bird Species of Special Concern* (Shuford and Gardali 2008)
- CDFW publication *Fish Species of Special Concern in California* (Moyle et. al. 2015)
- USFWS publication *Birds of Conservation Concern* (2008)
- Western Bat Working Group Online Species Accounts (2018)
- CDFW and University of California Press publication *California Amphibian and Reptile Species of Special Concern* (Thomson et al. 2016)
- *A Manual of California Vegetation Online* (CNPS 2019b)
- *California Natural Community List* (CDFW 2018b)

Database searches (i.e., CNDDB, CNPS) focused on the Middletown, Clearlake Highlands, Lower Lake, Wilson Valley, Whispering Pines, Jericho Valley, Mount St. Helena, Detert Reservoir, and

Aetna Springs USGS 7.5-minute quadrangles for special-status plants. The special-status wildlife evaluation was based on database searches for the entirety of Lake County. Figures 3 and 4 in Appendix A contain observations of special-status species documented within a five-mile radius of the Study Area.

Following the remote assessment, a botanist with 40-hour Corps wetland delineation training and a wildlife biologist traversed the entire Study Area on foot to document: (1) biological communities (e.g., terrestrial communities, aquatic resources), (2) existing conditions and to determine if such provide suitable habitat for any special-status plant or wildlife species, (3) if and what type of aquatic resources (e.g., wetlands) are present, and (4) if special-status species are present.

4.1 Biological Communities

4.1.1 Terrestrial Natural Communities

The Study Area's terrestrial natural communities were evaluated to determine if such areas have the potential to support special-status plants or wildlife. In most instances, communities are delineated based on distinct shifts in plant assemblage (vegetation), and follow the *California Natural Community List* (CDFW 2018b), *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986), and *A Manual of California Vegetation, Online Edition* (CNPS 2019b). In some cases it may be necessary to identify variants of community types or to describe non-vegetated areas that are not described in the literature; should an undescribed variant be used, it will be noted in the description.

Vegetation alliances (natural communities) with a CDFW Rank of critically imperiled (S1/G1), imperiled (S2/G2), or vulnerable (S3/G3) as well as associations ranked with a "Y", were evaluated as sensitive as part of this evaluation.[2]

4.1.2 Aquatic Natural Resources

Aquatic natural resources include Waters of the U.S., Waters of the State, and Streams Lakes, and Riparian Habitat as defined in the CWA, Porter-Cologne Act, and CFGC, respectively. Lake County mandates setbacks from these aquatic resources, and therefore requires mapping of the outward extent of such features.

A formal wetland delineation was conducted during the site assessment. Results of the delineation are included in a separate report. In areas expressing superficial indicators of wetlands such as hydrophytic vegetation (i.e., plant communities dominated by wetland species), evidence of inundation or flowing water, saturated soils and seepage, and topographic depressions/swales, WRA biologists performed sample points following the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Corps 2008).

Streams potentially jurisdictional under the CWA and/or the CFGC were delineated using a mix of surveyed topography data, high resolution aerial photographs, and a sub-meter GPS unit. The ordinary high water mark was used to determine the extent of potential Section 404 jurisdiction, while the top-of-bank was used to determine the extent of CFGC Section 1602. Streams with associated woody vegetation were assessed to determine if these areas would be considered

[2] Ranking of CDFW List of Vegetation Alliances is based on NatureServe Rankings (NatureServe 2018)

riparian habitat by the CDFW following *A Field Guide to Lake and Streambed Alteration Agreements, Section 1600-1607, California Fish and Game Code* (CDFG 1994).

4.2 Special-Status Species

4.2.1 General Assessment

Potential occurrence of special-status species in the Study Area was evaluated by first determining which special-status species occur in the vicinity of the Study Area through a literature and database review. Database searches for known occurrences of special-status species focused on the 7.5-minute USGS quadrangles mentioned above for special-status plants and the entirety of Lake County for special-status wildlife.

An initial site visit was made on October 22, 2018 to evaluate the presence of suitable habitat for special-status species. Suitable habitat conditions are based on physical and biological conditions of the site, as well as the professional expertise of the investigating biologists. The potential for each special-status species to occur in the Study Area was then determined according to the following criteria:

- **No Potential.** Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).
- **Unlikely**. Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.
- **Moderate Potential**. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.
- **High Potential**. All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.
- **Present**. Species is observed on the site or has been recorded (i.e. CNDDB, other reports) on the site in the recent past.

If a more thorough assessment was deemed necessary, a focused or protocol-level assessment or survey was conducted or recommended as a future study. Methods for the assessments are described below. If a special-status species was observed during the site visit, its presence was recorded and discussed below in Section 5.2.

4.2.2 Special-Status Plants

WRA biologists conducted initial habitat assessments and floristic survey within the Study Area on October 22, 2018. The initial site assessment is intended to identify the presence or absence of suitable habitat for each special-status species known to occur in the vicinity in order to determine its potential to occur in the Study Area. Based on the October site assessment and database search results, additional site visits were conducted on March 14, April 28, and May 20, 2019 to conduct focused surveys for special-status plants. If a special-status species was observed during the site visits, its presence was recorded and discussed. Plants were identified to the taxonomic level necessary to determine whether or not they were sensitive using *The Jepson Manual, 2nd Edition* (Baldwin et. al. 2012) and Jepson Flora Project (eFlora 2019). Plant names follow those of Jepson Flora Project (eFlora 2019), unless otherwise noted.

4.2.3 Special-Status Wildlife

WRA biologists conducted wildlife habitat assessments and general wildlife visual encounter surveys within the Study Area during the October 22 site visit. Targeted assessments (e.g., in-depth evaluation of ponds for aquatic organisms) and protocol-level surveys were deemed inapplicable at the time of the site visit, due to inappropriate timing between such a survey and any future development on the site.

4.3 Critical Habitat, Essential Fish Habitat, and Wildlife Corridors

Prior to the site visit the USFWS Critical Habitat Mapper (USFWS 2018b) and the NMFS Essential Fish Habitat Mapper (NMFS 2018) were queried to determine if critical habitat for any species or EFH, respectively, occurs within the Study Area.

To account for potential impacts to wildlife movement/migratory corridors, biologists reviewed maps from the California Essential Connectivity Project (CalTrans 2010), habitat connectivity data available through the CDFW Biogeographic Information and Observation System (BIOS) (CDFW 2019a). Additionally, aerial imagery (Google 2019) for the local area was referenced to assess if local core habitat areas were present within, or connected to the Study Area. This assessment was refined based on observations of on-site physical and/or biological conditions.

5.0 ASSESSMENT RESULTS

5.1 Biological Communities

WRA observed six terrestrial biological communities and one aquatic biological community within the Study Area: developed, non-native grassland, popcorn flower fields, native grassland, blue oak woodland, mixed riparian woodland and perennial stream. Biological communities within the Study Area are illustrated in Figure 2 (Appendix A). The non-sensitive biological communities in the Study Area include non-native grasslands and developed areas. Sensitive biological communities within the Study Area are the valley oak woodland, mixed riparian woodland, popcorn flower patches, perennial stream and native grassland. Table 3 summarizes the acreage and sensitivity of the biological communities present within the Study Area.

Table 3. Biological Communities Present within the Study Area

Vegetation Alliance (CNPS 2019b)	Acres within Study Area
Non-Sensitive	
Developed (no vegetation alliance)	0.37
Non-native Annual Grassland – Wild Oat-Brome Grassland (*Avena* spp.-*Bromus* spp. Semi-Natural Herbaceous Stands)	11.18
Sensitive	
Valley Oak Woodland (*Quercus lobata* Woodland Alliance)	0.29

Native Grassland – Squirreltail Patches (*Elymus multisetus* Provisional Herbaceous Alliance)	0.83
Riparian Scrub – Arroyo Willow Thicket (*Salix lasiolepis* Shrubland Alliance)	0.25
Intermittent Stream (no vegetation alliance)	0.41 (227 linear feet)

5.1.1 Terrestrial Biological Communities

Non-Sensitive

Developed (no vegetation alliance). Rank: None. Developed portions of the Study Area are limited to a gravel access road leading from the terminus of Santa Clara Road along the eastern side of the site to a utility station located on the property to the north. The Study Area contains 0.37-acre of developed.

Non-native Annual Grassland – Wild Oat-Brome Grassland (*Avena* spp.-*Bromus* spp. Semi-Natural Herbaceous Stands). CDFW Rank: None: The Study Area contains 11.18 acres of non-native grassland. These grasslands are dominated by non-native grasses including wild oat (*Avena barbata*), soft chess (*Bromus hordeaceus*), medusa head (*Elymus caput-medusae*), and rye (*Secale* sp.). Non-native forbs including vetch (*Vicia* spp.), rose clover (*Trifolium hirtum*), western filaree (*Erodium moschatum*), big heron bill (*Erodium botrys*), and yellow star thistle (*Centaurea solstitialis*) are characteristically present within the non-native grassland. This community is not considered sensitive by Lake County, CDFW, or any other regulatory entity.

Sensitive

Valley Oak Woodland (*Quercus lobata* Woodland Alliance). CDFW Rank: G3 S3: Valley oak woodlands typically occur in the outer and inner Coast Ranges, Transverse Ranges, Sierra Nevada foothills, and coast from southern Humboldt County south to San Diego County, situated on valley bottoms, lower slopes, and summit valleys underlain by alluvial or residual well-drained substrates with high organic content (CNPS 2019b). The Study Area contains 0.29 acre of valley oak woodland situated in the southwestern corner. The dominant tree is valley oak (*Quercus lobata*) with intermittent cover. The understory is similar in composition to the non-native grasslands. These woodlands are considered sensitive to CDFW as indicated by the S3 ranking. Additionally, oak woodland retention is required in the Lake County General Plan Open Space, Conservation, and Recreation Policy OSC-1.13. See Section 6.0 below for further discussion of recommendations.

Native Grassland – Squirreltail Patches (*Elymus multisetus* Provisional Herbaceous Alliance). CDFW Rank: G4 S4?: Squirreltail patches are typically located throughout the state under a wide range of ecological and topographical positions (CNPS 2019b). The Study Area contains 0.83 acre of native grassland dominated by squirreltail grass (*Elymus multisetus*). Within the Study Area, the native grassland patches contained 10 to 40 percent absolute cover of squirreltail grass mixed with California poppy (*Eschscholzia californica*), California plantago, tarweed (*Hemizonia congesta* ssp. *luzulifolia*.), q-tips, soft chess, and dense flower owl's clover (*Castilleja exserta*) as associated species. While the alliance is ranked "S4?" by CDFW, the association which best fits the squirreltail patch alliance *(Elymus multisetus-Eschscholzia californica-Plantago erecta*) is ranked "Y," therefore this native grassland type may be considered sensitive. See Section 6.0 below for further discussion of recommendations.

Riparian Scrub – Arroyo Willow Thicket (*Salix lasiolepis* Shrubland Alliance). CDFW Rank: G4 S4 and Section 1602 of CFGC: The Study Area contains 0.25 acres of riparian scrub, located along the banks of Dry Creek. The riparian scrub best fits the arroyo willow thicket (*Salix lasiolepis* Shrubland Alliance) (CNPS 2019b). Arroyo willow thickets typically occur on stream banks and slopes, slope seeps, and stringers along drainages throughout California (CNPS 2019b). The riparian scrub was burned during the Valley Fire and is growing in, forming woody thickets mixed with open herbaceous areas. The shrub canopy is dominated by arroyo willow, with sandbar willow (*Salix exigua*) and Oregon ash (*Fraxinus latifolia*) as co-dominants. The herbaceous areas are dominated by wetland species including tall cyperus (*Cyperus eragrostis*), iris-leaved rush (*Juncus xiphioides*), fiddleleaf dock (*Rumex pulcher*), annual beard grass (*Polypogon monspeliensis*), and western goldenrod (*Euthamia occidentalis*). This community is associated with Dry Creek and therefore considered to be riparian vegetation. Riparian vegetation is within CDFW jurisdiction under Section 1600 of the CFGC. Additionally, Lake County requires riparian setbacks as outlined in Policy OSC-1.4 of the County General Plan; see Section 6.0 below for further discussion of recommendations.

5.1.2 Aquatic Natural Resources

Sensitive

Intermittent Stream. Section 404/401 of CWA and Section 1602 of CFGC. A 227-linear foot (0.41 acre) portion of Dry Creek is located along the western boundary of the Study Area. Dry Creek is a tributary of Putah Creek, located approximately 0.39 mile northeast of the Study Area. Dry Creek is an intermittent stream with water going subsurface during the driest portions of the year. The stream was dry during the October site visit; however, water was flowing during the spring site visits. The stream bottom is unvegetated, consisting of mixed gravel and fine sediment. The slopes of the bank are somewhat gradual, with evidence of scour to the top of the ordinary high water mark (OHWM). The banks are vegetated with herbaceous species and arroyo willow (*Salix lasiolepis*), sandbar willow (*Salix exigua*) and Oregon ash (*Fraxinus latifolia*) in the shrub canopy. This stream is sensitive as it is within the jurisdiction of the Corps and RWQCB under Section 404/401 of the CWA and within CDFW jurisdiction under Section 1602 of the CFGC. Additionally, Lake County requires stream setbacks as outlined in Sec 30-9 of the County Code and Article 37; see Section 6.0 below for further discussion of recommendations.

5.2 Special-Status Species

A total of 116 plant species and 22 wildlife species were identified within the Study Area during the site visits. A list of all observed species can be found in Appendix B. Figures 3 and 4 in Appendix A includes figures depicting known occurrences of special-status plants and wildlife within a 5-mile radius of the Study Area. A table summarizing the potential for special-status species to occur within the Study Area is included in Appendix C.

5.2.1 Special-Status Plant Species

Based upon a review of the resource databases listed in Section 4.0, 110 special-status plant species have been documented in the vicinity of the Study Area. Figure 3 in Appendix A shows the subset of those species documented within 5 miles of the Study Area. Eight of these species were originally considered to have the potential to occur in the Study Area based on habitat conditions observed during the October 2018 site visit. The remaining species documented from

the greater vicinity of the Study Area were determined to be unlikely or have no potential to occur for one or more of the following:

- Hydrologic conditions (e.g., tidal, seeps; vernal pools) necessary to support the special-status plant species are not present in the Study Area;
- Edaphic (soil) conditions (e.g., volcanics, serpentine, rocky barrens) necessary to support the special-status plant species are not present in the Study Area;
- Topographic conditions (e.g., slopes, montane conditions) necessary to support the special-status plant species are not present in the Study Area;
- Unique pH conditions (e.g., alkali scalds, acidic bogs) necessary to support the special-status plant species are not present in the Study Area;
- Associated natural communities (e.g., interior chaparral, coniferous forest) necessary to support the special-status plant species are not present in the Study Area;
- The Study Area is geographically isolated (e.g. below elevation, coastal environ) from the documented range of the special-status plant species.

Based on the type and quality of natural communities present within the Study Area, eight special-status plants were determined to have potential to occur. Each species is discussed below and summarized in Appendix C. Focused special-status plant surveys were conducted during the March, April, and May site visits; however, no special-status plants were observed and none are anticipated to occur.

Special-Status Plants with Potential to Occur within the Study Area

Bent-flowered fiddleneck (*Amsinckia lunaris*); CRPR 1B. Moderate Potential. Not Observed. Bent-flowered fiddleneck is an annual forb in the forget-me-not family (Boraginaceae) that blooms from March to June. It typically occurs in open areas within cismontane woodland, valley and foothill grassland, and coastal bluff scrub habitat often underlain by clay substrate at elevations ranging from 10 to 1625 feet (CDFW 2019a, CNPS 2019a). Known associated species include coast live oak, blue oak (*Quercus douglasii*), California juniper (*Juniperus californicus*), buck brush (*Ceanothus cuneatus*), poison oak, miniature lupine (*Lupinus bicolor*), foothill lotus (*Acmispon brachycarpus*), calf lotus (*A. wrangelianus*), fringe pod (*Thysanocarpus curvipes*), q-tips (*Micropus californicus*), cream cups (*Platystemon californicus*), slender tarweed (*Madia gracilis*), common yarrow (*Achillea millefolium*), goldenback fern (*Pentagramma triangularis*), one-sided bluegrass (*Poa secunda*), woolly sunflower (*Eriophyllum lanatum*), and slender wild oat (*Avena barbata*) (CDFW 2019a).

There are eight CNDDB (CDFW 2019a) records of this species in the greater vicinity of the Study Area. The nearest documented occurrence is from May 1953, on Highway 29 approximately two miles northeast of the Study Area (CDFW 2019a). Bent-flowered fiddleneck was originally determined to have a moderate potential to occur in the grassland and open woodland habitat within the Study Area due to the presence of suitable substrates and associated species in woodland and grassland habitat. However, this species was not observed during the focused surveys in March and April and is considered absent.

Congested-headed hayfield tarplant (*Hemizonia congesta* ssp. *congesta*); CRPR 1B. Moderate Potential. Not Observed. Congested-headed hayfield tarplant is an annual herb in the sunflower family (Asteraceae) that blooms from April to November. It typically occurs in grassy areas and fallow fields in coastal scrub, and valley and foothill grassland at elevations ranging from 65 to 1,840 feet (CDFW 2019a, CNPS 2019a). Known associated species include coast live oak, white hyacinth (*Triteleia hyacinthina*), Italian rye grass (*Festuca perennis*), little rattlesnake

grass (*Briza minor*), pennyroyal (*Mentha pulegium*), and spiny-fruited buttercup (*Ranunculus muricatus*) (CDFW 2019a).

There is one CNDDB (CDFW 2019a) record of this species in the greater vicinity of the Study Area. This documented occurrence is from 1980 along Highway 29, approximately two miles northeast of the Study Area (CDFW 2019a). Congested-headed hayfield tarplant was originally determined to have a moderate potential to occur in the grassland areas of the Study Area due to the presence of associated species, suitable substrate and the observation of hayfield tarplant (*Hemizonia* sp.) during the October site visit. However, this species was not observed during the focused survey in May and is considered absent.

Colusa layia (*Layia septentrionalis*); CRPR 1B. Moderate Potential. Not Observed. Colusa layia is an annual forb in the sunflower family (Asteraceae) that blooms from April through May. It typically occurs in openings and herbaceous areas underlain by serpentine substrates within chaparral, cismontane woodland, and valley and foothill grassland habitats at elevations ranging from 330 to 3,595 feet (CNPS 2019a, CDFW 2019a). Known associated species include blue oak (*Quercus douglasii*), white-leaf manzanita (*Arctostaphylos manzanita*), wooly sunflower (*Eriophyllum lanatum*), one-sided blue grass (*Poa secunda*), few flowered Collinsia (*Collinsia sparsiflora*), soft chess (*Bromus hordeaceus*), miners lettuce (*Claytonia perfoliata*), cream cups (*Platystemon californicus*), bluehead gilia (*Gilia capitata*), and purple Chinese houses (*Collinsia heterophylla*).

There are 16 CNDDB (CDFW 2019) records of this species in the greater vicinity of the Study Area. The nearest documented occurrence in the vicinity of the Study Area is from 1932 in Cobb Valley, approximately 8 miles northwest of the Study Area (CDFW 2019a). Colusa layia was originally determined to have a moderate potential to occur in the grassland and woodland areas. However, this species was not observed during the focused survey in April and May and is considered absent.

Bristly leptosiphon (*Leptosiphon acicularis*); CRPR 4. Moderate Potential. Not Observed. Bristly leptosiphon is an annual forb in the phlox family (Polemoniaceae) that blooms from April to July. It typically occurs in chaparral, cismontane woodland, coastal prairie, and valley and foothill grassland habitat at elevations ranging from 175 to 4875 feet (CNPS 2019a). Known associated species include bird's-eyes (*Gilia tricolor*), true babystars (*Leptosiphon bicolor*), redstem filaree (*Erodium cicutarium*), purple needlegrass (*Stipa pulchra*), European hair grass (*Aira caryophyllea*), short pod lotus (*Acmispon brachycarpus*), Spanish lotus (*Acmispon americanus*), and miniature lupine (*Lupinus bicolor*) (CCH 2019).

Bristly leptosiphon is known from the Clearlake Highlands, Middletown, and Kelseyville USGS quads (CNPS 2019a). There are seven CCH (2019) records within the vicinity of the Study Area. The nearest documented occurrence is from April 1933 in Middletown. Bristly leptosiphon was originally determined to have a moderate potential to occur in the Study Area due to the presence of suitable habitat, and the relative location of the nearest documented occurrence. However, this species was not observed during the focused survey in April and May and is considered absent.

Jepson's Leptosiphon (*Leptosiphon jepsonii*); CRPR 1B. Moderate Potential. Not Observed. Jepson's Leptosiphon is an annual herb in the phlox family (Polemoniaceae) that blooms from March to May. It typically occurs in open to partially shaded areas on volcanic or serpentine substrate in chaparral and cismontane woodland habitat at elevations ranging from 325 to 1640 feet (CDFW 2019a, CNPS 2019a). Known associated species include California bay laurel (*Umbellularia californica*), coast live oak (*Quercus agrifolia*), toyon (*Heteromeles*

arbutifolia), purple needlegrass (*Stipa pulchra*), California oat grass (*Danthonia californica*), and non-native annual grasses (CDFW 2019a).

There are nine CNDDB (CDFW 2019a) records of this species in the greater vicinity of the Study Area. The nearest documented occurrence is from 1936 in Collayomi Valley (CDFW 2019a). Jepson's leptosiphon was originally determined to have a moderate potential to occur in the oak woodland habitat within the Study Area. However, this species was not observed during the focused survey in March, April or May and is considered absent.

Cobb Mountain lupine (*Lupinus sericatus*). CRPR 1B. High Potential. Not Observed. Cobb Mountain lupine is a perennial forb in the pea family (Fabaceae) that blooms from March to June. It typically occurs in openings in wooded slopes underlain by gravelly, often serpentine, substrate in stands of knobcone pine in chaparral, cismontane woodland, and lower montane coniferous forest at elevations ranging from 890 to 4960 feet (CDFW 2019a, CNPS 2019a). Known associated species include knobcone pine (*Pinus attenuata*), ponderosa pine (*Pinus ponderosa*), California black oak (*Quercus kelloggii*), leather oak (*Q. durata*), Pacific madrone (*Arbutus menziesii*), chamise (*Adenostoma fasciculatum*), coyote brush (*Baccharis pilularis*), manzanita (*Arctostaphylos* spp.), poison oak (*Toxicodendron diversilobum*), woodland tarweed (*Anisocarpus madioides*), forest sedge (*Carex multicaulis*), Sonoma sage (*Salvia sonomensis*), and woolly sunflower (*Eriophyllum lanatum*) (CDFW 2019a).

There are 24 CNDDB (CDFW 2019a) records of this species within the greater vicinity of the Study Area. The nearest documented occurrence is from 1976 located near Putah Creek, approximately 4 miles northwest of the Study Area (CDFW 2019a). Cobb Mountain lupine was originally determined to have a high potential to occur in the Study Area due to the presence of associated species and suitable habitat, suitable substrate, and the relative location of documented occurrences. However, this species was not observed during the focused survey in March, April, and May and is considered absent.

Jepson's navarretia (*Navarretia jepsonii*); CRPR 4. Moderate Potential. Not Observed. Jepson's navarretia is an annual herb in the phlox (Polemoniaceae) family that blooms from April through June. The species typically occurs in transitional zones between cismontane woodland, chaparral, and valley and foothill annual grassland habitats on clay soils (often serpentine) at elevations ranging from 550 to 2,800 feet (CNPS 2019a). Known associated species are not provided in the databases.

The nearest previously documented occurrence of this species in the vicinity of the Study Area is from 1937 in Middletown, with several others along Highway 29 northeast of the Study Area (CCH 2019). Jepson's navarretia was originally determined to have a moderate potential to occur in the grasslands or edge of woodlands. However, this species was not observed during the focused survey in April and May and is considered absent.

Keck's checkerbloom (*Sidalcea keckii*); FE, Rank 1B. Moderate Potential. Not Observed. Keck's checkerbloom is an annual herb in the mallow (Malvaceae) family that blooms from April through June. It typically occurs on exposed serpentine clays in cismontane woodland or non-native valley and foothill grassland habitats at elevations ranging from 250 to 2,200 feet (CNPS 2019a). Known associated species includes grey pine (*Pinus sabiniana*), blue oak (*Quercus douglasii*), tarplant (*Holocarpha* spp.) Italian ryegrass (*Festuca perennis*), soft chess *(Bromus hordeaceus*), and blowives (*Achyrachaena mollis*).

There is one CNDDB (CDFW 2019a) record of this species within the greater vicinity of the Study Area. The nearest documented occurrence in the vicinity of the Study Area is from May 2002 near

Pocock Creek, approximately 12 miles east of the Study Area (CDFW 2019a). This species was originally determined to have moderate potential to occur in the grasslands due to presence of associated species. However, this species was not observed during the focused survey in April or May and is considered absent.

5.2.2 Special-Status Wildlife Species

Based upon a review of the resources databases listed in Section 4.0, it was determined that more than 50 special-status wildlife species have been documented in one or more of the 7.5-minute quadrangles in the vicinity of the Study Area. Figure 4 in Appendix A shows the subset of those species that occur within 5 miles of the Property. Appendix C summarizes the potential for each of these species to occur within the Study Area. During the site visit, no special-status wildlife species were observed within the Study Area; however, 20 special-status wildlife species were determined to have a moderate or high potential to occur within the Study Area based on the type and conditions of habitats observed there. The Study Area does not contain designated critical habitat for any species. The remaining species were determined to be unlikely or have no potential to occur in the Study Area for one or more of the following reasons:

- The Study Area is outside of the known or historical range of the species;
- The Study Area lacks specific habitat requirements (i.e. marsh, old growth conifers, cliffs, mines etc.),
- There are barriers to dispersal that make it unlikely for the species to occur on-site.

Special-status wildlife species determined to be potentially present based on the type and condition of habitats present within the Study Area are listed below; the preferred habitat(s) of each species is summarized in Appendix C. Table 4 lists the special-status wildlife species determined to have potential to occur within the Study Area. A list of all wildlife species observed during the site assessments is included as Appendix B.

Table 4. Special-Status Wildlife Species with the Potential to Occur within the Study Area

Scientific Name	Common Name	Conservation Status*
Species with High Potential to Occur		
Birds		
Selasphorus sasin	Allen's hummingbird	BCC
Baeolophus inornatus	oak titmouse	BCC
Elanus leucurus	white-tailed kite	CFP
Species with Moderate Potential to Occur		
Mammals		
Lasiurus blossevillii	western red bat	SSC, WBWG High
Myotis evotis	long-eared myotis	WBWG Medium

Scientific Name	Common Name	Conservation Status*
Lasiurus cinereus	hoary bat	WBWG Medium
Myotis thysanodes	fringed myotis	WBWG High
Antrozous pallidus	pallid bat	SSC, WBWG
Birds		
Progne subis	purple martin	SSC
Setophaga (Dendroica) petechia brewsteri	yellow warbler	SSC, BCC
Lanius ludovicianus	loggerhead shrike	SSC, BCC
Melanerpes lewis	Lewis' woodpecker	BCC
Picoides nuttallii	Nuttall's woodpecker	BCC
Chamaea fasciata	wrentit	BCC
Asio otus	long-eared owl	SSC
Spinus (= Carduelis) lawrencei	Lawrence's goldfinch	BCC
Contopus cooperi	olive-sided flycatcher	SSC, BCC
Icteria virens	yellow-breasted chat	SSC
Reptiles		
Emmys marmorata	western pond turtle	SSC
Amphibians		
Rana boylii	foothill yellow-legged frog	SSC, SC

*Key to Conservation Status:

BCC USFWS Bird of Conservation Concern
CFP California Fully Protected Species
SC State Candidate
SE State Endangered
SSC CDFW Species of Special Concern
WBWG Western Bat Working Group

Mammals

During the site visit on October 22, 2018, no special-status mammals were observed. The only special-status mammals with moderate potential to occur in the Study Area are bats, and no special-status mammals have a high potential to occur. Habitat for bats is marginal, with only a few suitable trees being present that could support roosting. Measures to reduce impacts to special-status bats to a less than significant level are described in Section 6 of this report.

Birds

During the site visit on October 22, 2018, no special-status birds were observed. However, the site does contain habitat that could support nesting for several special-status species, as well as species that receive protections under the California Fish and Game Code and Migratory Bird Treaty Act. Additionally, one California Fully Protected Species, white-tailed kite, could also nest in the Study Area or near enough to the Study Area that nest avoidance buffers for that species could impact future development on the site. Measures to reduce impacts to nesting birds are discussed further in Section 6 of this report.

Amphibians and Reptiles

During the site visit on October 22, 2018, no amphibians were observed. Habitat for special-status amphibians in the Study Area is limited to Dry Creek, which is immediately adjacent to the property, to the west. During the site visit, Dry Creek was entirely dry where it runs along the property boundary and for at least several hundred feet upstream and downstream. No lentic habitats that would support any special-status amphibians were identified during the site visit.

Despite Dry Creek being intermittent, it does have potential to support metamorphosed foothill yellow-legged frog (*Rana boylii*; FYLF), a candidate for listing under the CESA, for most of the year based on aerial imagery. In addition, the stream may be able to support reproduction for the species in most or some years because it contains water beyond August (when tadpoles typically metamorphose). However, the majority of the habitat in the Study Area is a long pool with steep sides at the time of year when breeding occurs, so most of it would not be suitable for FYLF egg laying. Other areas could not be assessed in terms of their capacity to support breeding. That said, this species has been documented up- and downstream of the Study Area (CDFW 2019), so it is possible that metamorphosed FYLF would pass through the Study Area, even if only briefly in transit to or from breeding sites.

Given their protected status under the CESA and potential for presence in or near the Study Area, any impacts to FYLF would need to be addressed in the CEQA process. Impacts to FYLF are reduced significantly if no impacts to the riparian zone occur, because FYLF is a semi-aquatic species and is unlikely to be found far from water. Due to its potential for presence within the Study Area, the CEQA lead agency may request that surveys and/or avoidance measures be implemented to ensure that no take of FYLF occur as a result of the project. Surveys typically consist of a minimum of two discrete surveys during suitable conditions within the Study Area and areas 500 feet up- and downstream. If no FYLF are found during these surveys it is likely that minimal avoidance measures would be recommended. Measures to avoid FYLF are described in Section 6 of this document.

During the site visit on October 22, 2018, no special-status reptiles were observed. The only special-status reptile assessed as having a moderate potential to occur is western pond turtle, and no reptiles were determined to have a high potential to occur. Pond turtles have been documented near the Study Area (CDFW 2019a) and the section of Dry Creek adjacent to the Study Area is suitable for the species for most of the year. Some areas in the riparian zone may be suitable for nesting by the species. Western pond turtle would be unlikely to nest above the stream terraces associated with Dry Creek and is unlikely to traverse areas greater than 300 feet from Dry Creek. If work is to occur within 300 feet of the stream, measures to reduce impacts to western pond turtle to less than significant levels may be required by the CEQA lead agency. These measures are discussed in Section 6.

5.3 Wildlife Corridors

In addition to the special-status wildlife that may occur, non-special-status wildlife species occur and may use portions of the Study Area as a migration corridor. Uncultivated land can be used by a variety of native species to move to various territories seasonally and throughout their life cycle. Within the Study Area, some habitats including, but not limited to the stream corridor associated with Dry Creek may facilitate wildlife movement. Additionally, reservoirs and ponds within close proximity to the Study Area are anticipated to attract native wildlife species. Therefore, portions of the Study Area may occur within one or more wildlife migration corridors.

6.0 RECOMMENDATIONS

6.1 Sensitive Biological Communities

6.1.1 Valley Oak Woodland

The Study Area contains 0.29 acre of valley oak woodland. Valley oak woodlands are considered sensitive by CDFW, and the Lake County General Plan Policy OSC 1.13 requires that oak woodland be maintained and/or improved to the extent feasible to provide for oak woodland and wildlife habitat; however no specific requirements are provided. The oak woodlands should be preserved to the maximum extent practical. If preservation is not practical, mitigation plantings may be necessary if impacts are determined to be significant.

6.1.2 Stream

A portion of Dry Creek is present along the western boundary of the Study Area. Any development should avoid the stream to the extent practical and apply the appropriate stream setback as outlined in the Lake County Code Section 30-9 (Watercourses and Drainage) and/or Article 37 (Regulations for the Waterway or "WW" Combining District). For intermittent streams, a minimum 20 foot setback from the stream TOB is required. If work is to be conducted within the top of bank or ordinary high water mark of Dry Creek, then 404/401 permits from the Corps, RWQCB, and/or a Lake and Streambed Alteration Agreement (LSAA) from CDFW should be acquired.

6.1.3 Riparian Scrub

The Study Area contains 0.25 acre of riparian vegetation. Any development should avoid the riparian vegetation to the extent practical. No specific setbacks are required by Lake County regulations. However, if work is to be conducted within the riparian habitat, then a 401 permit from RWQCB and an LSAA from CDFW should be acquired.

6.1.4 Native Grassland

The Study Area contains 0.83 acre of native grassland. The native grassland is considered sensitive by the CDFW, therefore impacts require consideration under CEQA. Native grassland should be avoided to the extent practical. If avoidance is not practical, mitigation for impacts may be necessary if impacts are determined to be significant.

6.2 Special-Status Species

6.2.1 Special-Status Plants

The Study Area was determined to have the potential to support eight special-status plants. However, no special-status plants were observed during focused surveys conducted in March, April and May 2019. Therefore, it was determined that no special-status plants are likely to occur and no avoidance measures are recommended.

6.2.2 Special-Status Wildlife

Several special-status species were determined to have moderate to high potential to occur, or were observed within the Study Area. One frog, FYLF, a state listed species, and one bird, white-tailed kite, is a California Fully Protected Species. The Study Area is not located within Critical Habitat as designated by USFWS or NMFS. Lake Berryessa forms a total barrier to anadromous fish including steelhead and Chinook salmon, and as such no listed fish species would occur within the reach of Dry Creek that runs along the Study Area. The following recommendations and potential constraints are provided based on the potential for special-status species and their habitat to occur within the Study Area. Where applicable, species with similar requirements and guidance are grouped together.

Mammals

Bats

No bats were observed within the Study Area during the site visit. There is moderate potential for some bat species to occur within the oak trees and riparian woodland within the Study Area. Direct impacts to roosting special-status bat species could occur due to the removal or modification of large living trees (DBH >12 inches) and snags. The destruction or injury of special-status bats or loss of a maternity roost would constitute a potentially significant impact under CEQA and is a violation of the CFGC. Indirect impacts to maternity roosting and/or roosting bat species may include roost abandonment due to noise, increased nighttime lighting, and/or other human disturbances during construction and would also constitute a potentially significant impact under CEQA. The following programmatic-level measures are recommended to avoid impacts to roosting bats during future development of the site:

- Pre-construction survey(s) for bat roosts should be conducted by a qualified biologist in large tees (DBH >12 inches), broadleaf trees in riparian forest habitat, buildings, bridges, and cliffs/rocky outcroppings within 100 feet of a planned work areas. Surveys should occur at least 14 days prior to the start of work, and one or more surveys may be needed for the biologist to evaluate if potential roost habitat occurs and then to determine the type (i.e. maternity or non-maternity) and status (i.e. active or inactive) of the roost. If an active maternity or special-status bat roost is found, and is proposed to be removed or directly impacted as a result of project activities, then consultation with the CDFW will be required.

- Large trees (DBH >12 inches) to be removed should be allowed to lay on the ground for one night to allow any undetected roosting bats to leave the tree before it is chipped or taken offsite.

Birds

Raptors

Raptor nests, including white-tailed kite nests, are protected by the MBTA and CFGC. Protective exclusion buffers around active raptor nests can vary greatly and may extend up to 0.5 mile for some listed species. While project-specific impacts may require additional measures, the following programmatic-level measures are recommended to avoid impacts to raptors:

- Prior to starting construction activities during the nesting season, generally defined as February 1 through August 31, targeted surveys for active raptor nests should be conducted by a qualified biologist. An active nest contains eggs or young.

- For construction activities planned within 0.25 mile of a documented white-tailed kite nest, pre-construction surveys should be conducted in accordance with the most current guidance available from the USFWS and CDFW.

- If a raptor nest containing eggs or young is determined to be present within or adjacent to the work area, then a protective buffer should be established and no project work should occur within the buffered area until the chicks have fledged and no longer require parental support for survival or the nest has been determined to be inactive. Buffer size should be determined by the biologist based on species, nest location, planned disturbance footprint, and presence of any visual or auditory buffers.

Nesting Birds

In addition to white-tailed kite, the site assessment determined that special-status passerine bird species (e.g., Allen's hummingbird, Nuttall's woodpecker, oak titmouse) have a high potential to occur in the Study Area. Several other special-status bird species were determined to have a moderate potential to occur within the Study Area. A variety of native bird species protected under the MBTA as well as the CFCG may also use the Study Area for nesting.

Avoidance of nesting birds is considered a general biological resources "best practice" in California and avoids potential enforcement action by CDFW. Nesting bird pre-construction survey obligations are a common component of various permits and authorizations, including CEQA documents and even local grading permits, and may be deemed applicable to project activities within the Study Area.

Initial vegetation removal, clearing, grubbing activities, along with tree removal and demolition of structures, have the potential to affect nesting migratory birds. Adverse effects to nesting birds covered by the MBTA and the CFGC—including active nests, eggs, and young—would constitute a potential impact that may occur as a result of these activities. While project-specific impacts may require additional measures, the following programmatic-level measures are recommended to avoid impacts to nesting birds:

- If vegetation removal, demolition of buildings or work on bridges, or initial ground disturbance activity occur during the nesting season, defined as February 1 through August 31, then a pre-construction nesting bird survey within the work area should be completed by a qualified biologist no more than 14 days prior to the start of work.

- If active nests (nests with eggs and/or chicks) are observed during the pre-construction survey, project activities should cease within a protective buffer established around the nest by the biologist and work should only resume within the protective buffer after the young have fledged the nest or the nest otherwise becomes inactive. Buffer size should be determined by the biologist based on species, nest location, planned disturbance footprint, and presence of any visual or auditory buffers.

Reptiles and Amphibians

This assessment determined that western pond turtle (WPT) and foothill yellow-legged frog (FYLF) have a moderate potential to occur in the Study Area. Direct impacts to stream features, floodplains, wetlands, ponds, and reservoirs could result in the loss of suitable habitat or potential take of amphibian and reptile species. WRA recommends the development of project-specific avoidance and minimization measures. Work taking place within any river, stream, or lake in the Study Area would require a CDFW-issued Lake or Streambed Alteration Agreement (LSAA). Measures pertaining to aquatic species would be dictated by the LSAA. Measures that may be included in an LSAA are discussed below.

FYLF

Work within streams, riparian areas, and along streamside corridors could impact FYLF by disrupting migratory movements, rearing, or breeding and could result in injury or mortality to individuals. Additional impacts may occur from the removal or altering of habitat, such as those associated with the loss of cover or altering localized water flow. Actions that increase the use of riverine habitats, especially during the breeding and larval rearing stages for FYLF could impact the species. Although there is no time of year when complete avoidance of FYLF is possible, if working in an area where the species is known to occur, there are periods when encountering the species is less likely (CDFW 2018d). Conducting work outside the typical FYLF breeding season and after the onset of autumnal rains, away from wetted features allows for the greatest opportunity for avoidance (CDFW 2018d). While project-specific impacts may require additional measures, the following measures are recommended to avoid impacts to FYLF:

- Activities within 100 feet of the top of bank where FYLF has been documented within the Study Area, or its associated riparian areas, should avoid the FYLF breeding season (March 1 to June 30), and to the extent possible, should be limited to the dry season (July 1 to October 31). No work should occur within 72 hours of rains occurring in October or November when FYLF are likely to be making overland movements.

- Pre-construction surveys should be conducted by a qualified biologist within 5 days of the start of initial project work planned within 100 feet of wetted streams in the Study Area. These surveys should cover at least 500 feet upstream and 500 feet downstream of the work area and should investigate for the presence of all life stages (adults, subadults, tadpoles, or egg masses). If FYLF are observed, the biologist should provide measures to avoid directly impacting the species based on the planned work; such measures may include a protective no-work buffer, exclusion fencing, monitoring, and/or coordination with the CDFW.

FYLF is currently a candidate species for listing under CESA and as such is afforded the protections conveyed by CESA, including protection from "take" without a permit. The clade that occurs in the Project Area has been evaluated as not warranting listing under CESA at this time by the CDFW Staff Review and the CDFG commission has voted to adopt this finding. While the species is technically still a candidate for listing, the ending of candidacy for this clade is imminent and is not likely to result in listing under CESA. However, this clade will remain a species of special concern and will continue to be considered during CEQA processes and permitting processes administered by CDFW. While the implementation of the above described measures should minimize impacts to the species, there is a potential for incidental take of FYLF to occur during work activities in and adjacent to FYLF habitat and this take would still require an ITP, if it occurs during the candidacy period.

WPT

This assessment determined that western pond turtle (WPT) could be present in the Study Area during most parts of the year. Direct impacts to stream features and floodplains could result in the loss of suitable habitat or potential take of pond turtles. Direct mortality, loss of aquatic habitat, or loss of nesting habitat may be considered potentially significant impacts under CEQA. While project-specific impacts may require additional measures, the following measures are recommended to avoid impacts to WPT:

- To the extent possible, initial ground disturbance, vegetation clearing, and associated project activities within 300 feet of Dry Creek are recommended to occur during the dry season (July 1 – October 31).

- Within 14 days prior to the start of work, pre-construction surveys for WPT should occur within 300 feet of Dry Creek. If WPT is observed, the biologist should provide measures to avoid directly impacting the species based on the planned work; such measures may include a protective no-work buffer, exclusion fencing, monitoring, or coordination with the CDFW.

6.3 Wildlife Corridors

This assessment determined that portions of the Study Area may facilitate wildlife movement and may be considered a wildlife corridor. Changes in land use, such as the conversion of raw land to agriculture or installation of buildings and fencing, and increased presence of human disturbance, can diminish or eliminate qualities that make an area a corridor for native species. Under CEQA, project impacts to wildlife corridors are assessed and evaluated.

The Study Area is positioned in an agricultural and urban setting. Development nearby consists of low-density housing with increasingly dense residential and commercial areas to the east. The remaining areas are in current or historic agriculture. None of the areas immediately near the Study Area are entirely natural. The Study Area is likely to serve as a corridor and habitat for a number of species commonly associated with edge habitats such as deer, raccoons, etc. Large mammalian predators would likely avoid the Study Area due to the relatively high density of development. Dry Creek and its riparian zone, along the western edge of the Study Area, is the most likely corridor for transiting wildlife such as frogs and turtles. Some mammals such as otters may use it for movement while it is inundated, and terrestrial animals such as coyotes may use its adjacent riparian edge year round or use the channel itself when it is dry. Provided that a riparian buffer is maintained around the stream, it is unlikely that project activities would alter the Dry Creek's capacity to serve as a corridor from its current condition.

7.0 REFERENCES

Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken (eds.). 2012. The Jepson Manual: Vascular Plants of California, 2nd Edition. University of California Press, Berkeley, CA. 1568 pp.

Calflora website (Calflora). 2019. Website: Information on wild California plants for conservation, education, and appreciation. Available at: http://www.calflora.org/. Accessed: February 2019

California Department of Fish and Game (CDFG). 1994. A Field Guide to Lake and Streambed Alteration Agreements, Sections 1600-1607. Environmental Service Division, California Department of Fish and Game, Sacramento, CA.

(CDFG). 2010. List of Vegetation Alliances and Associations. Vegetation Classification and Mapping Program, California Department of Fish and Game, Sacramento, CA. September 2010.

California Department of Fish and Wildlife (CDFW). 2019a. California Natural Diversity Database (CNDDB), Wildlife and Habitat Data Analysis Branch. Sacramento, CA. Accessed: October 2018 and February 2019.

(CDFW). 2018b. California Natural Community List. Vegetation Classification and Mapping Program, California Department of Fish and Game, Sacramento, CA. October 15, 2018.

(CDFW). 2018d. California Fish Passage Assessment Database. Available at: https://map.dfg.ca.gov/metadata/ds0069.html. Accessed: October 2018.

(CDFW) and California Department of Transportation (CalTrans). 2010. California Essential Habitat Connectivity Project. Available at: https://nrm.dfg.ca.gov/. Accessed: October 2018.

(CNPS). 2019a. Online Inventory of Rare, Threatened, and Endangered Plants of California. Available at: http://www.rareplants.cnps.org/. Accessed: October 2018 and February 2019.

(CNPS). 2019b. A Manual of California Vegetation Online. Available at: http://vegetation.cnps.org/. Accessed: February 2019.

California Soil Resources Lab (CSRL). 2019. Online Soil Survey. Available at: http://casoilresource.lawr.ucdavis.edu/drupal/ Accessed: February 2019.

Consortium of California Herbaria (CCH). 2019. Data provided by the participants of the Consortium of California Herbaria. Available at: http://ucjeps.berkeley.edu/consortium. Accessed: February 2019.

Jepson Herbarium. Jepson Flora Project (eFlora). 2019. Jepson eFlora Online at: http://ucjeps.berkeley.edu/IJM.html. Accessed: October 2019.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Department of the Army, Waterways Experiment Station, Vicksburg, Mississippi 39180-0631.

Google Earth. 2018. Middletown, CA area; Image dates: 1993-2018. Accessed: February 2019.

Historical Aerials. 2019. Available at: http://historicalaerials.com. Accessed: February 2019.

Holland, R. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. California Department of Fish and Game, Sacramento, CA. 156 pp.

National Marine Fisheries Service (NMFS). 2018. Essential Fish Habitat Mapper. Available at: https://www.habitat.noaa.gov/protection/efh/efhmapper/. Accessed: October 2018.

Shuford, W.D. and Gardali, T., eds. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

Thomson, R.C., A.N. Wright, and H.B. Shaffer. 2016. California Amphibian and Reptile Species of Special Concern. Co-published by the California Department of Fish and Wildlife and University of California Press. Oakland, California.

U.S. Army Corps of Engineers (Corps). 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). U.S. Army Corps of Engineers, Engineer Research and Development Center, Vicksburg, MS. September 28, 2008.

U.S. Department of Agriculture (USDA), Soil Conservation Service (SCS). 1989. Soil Survey of Lake County, California. In cooperation with the University of California Agricultural Experiment Station.

U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). 2019. Climate Information for Lake County in the State of California. Available at: http://www.wcc.nrcs.usda.gov/. Accessed: March 2019

U.S. Fish and Wildlife Service (USFWS). 2019a. National Wetlands Inventory. Available at: http://www.fws.gov/wetlands/index.html. Accessed: September 2018 and February 2019.

U.S. Fish and Wildlife Service (USFWS). 2018. List of Federal Endangered and Threatened Species that Occur in Napa County, California. Available at: https://ecos.fws.gov/ipac/. Accessed: October 2018.

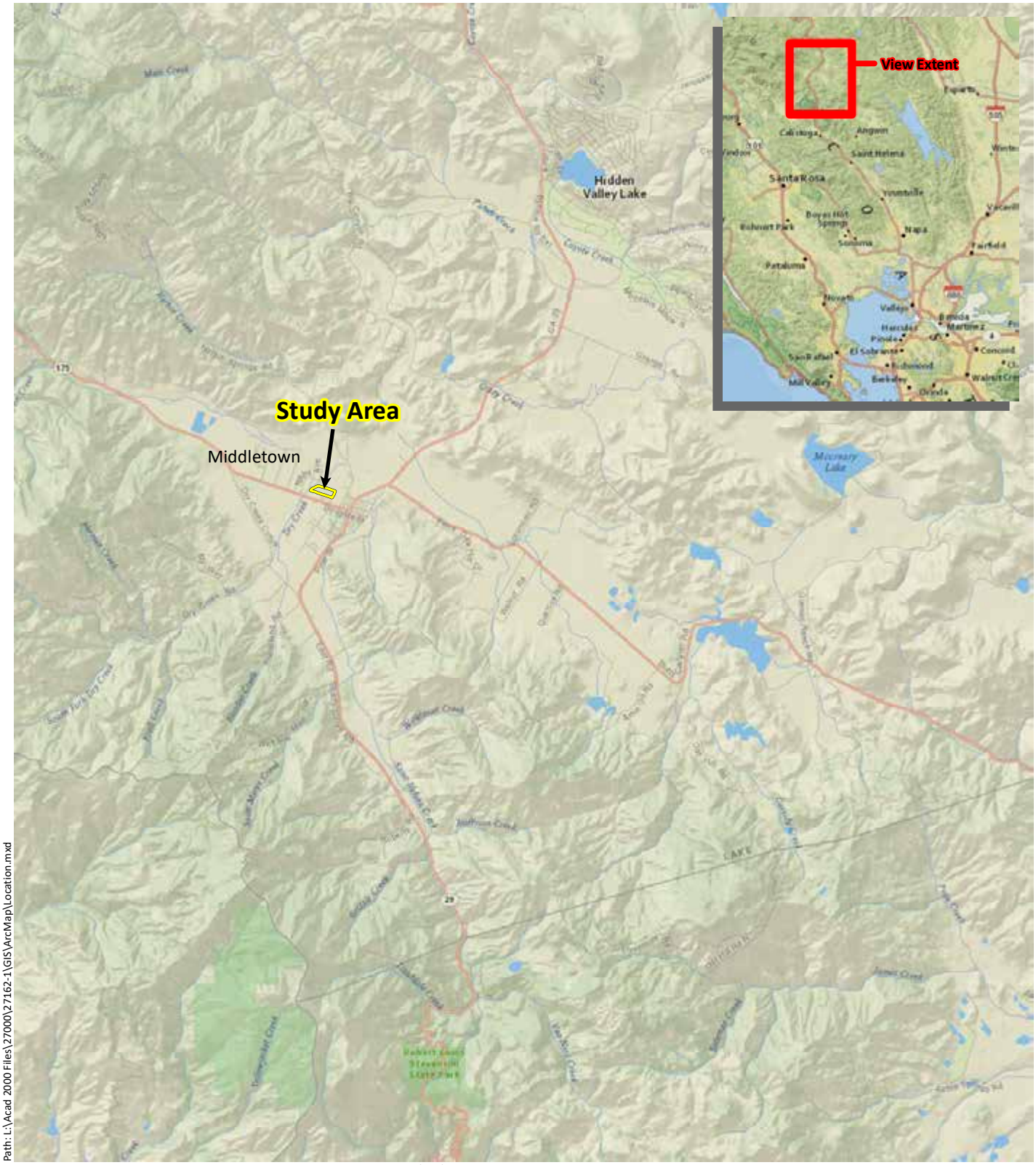
U.S. Geological Survey (USGS). 2018. Middletown, California 7.5-minute quadrangle topographic map.

Western Bat Working Group (WBWG). 2018. Species Accounts. Available at: http://www.wbwg.org/speciesinfo/species_accounts/species_accounts.html. Accessed: October 2018.

Western Regional Climate Center (WRCC). 2019. Western U.S. Climate Summaries-NOAA COOP Stations. Available online at: https://wrcc.dri.edu/Climate/west_coop_summaries.php

APPENDIX A

FIGURES



Sources: National Geographic, WRA | Prepared By: mrochelle, 2/22/2019

Figure 1. Study Area Location

21000 Santa Clara Road
Middletown, Lake County, California

0 1 2 Miles

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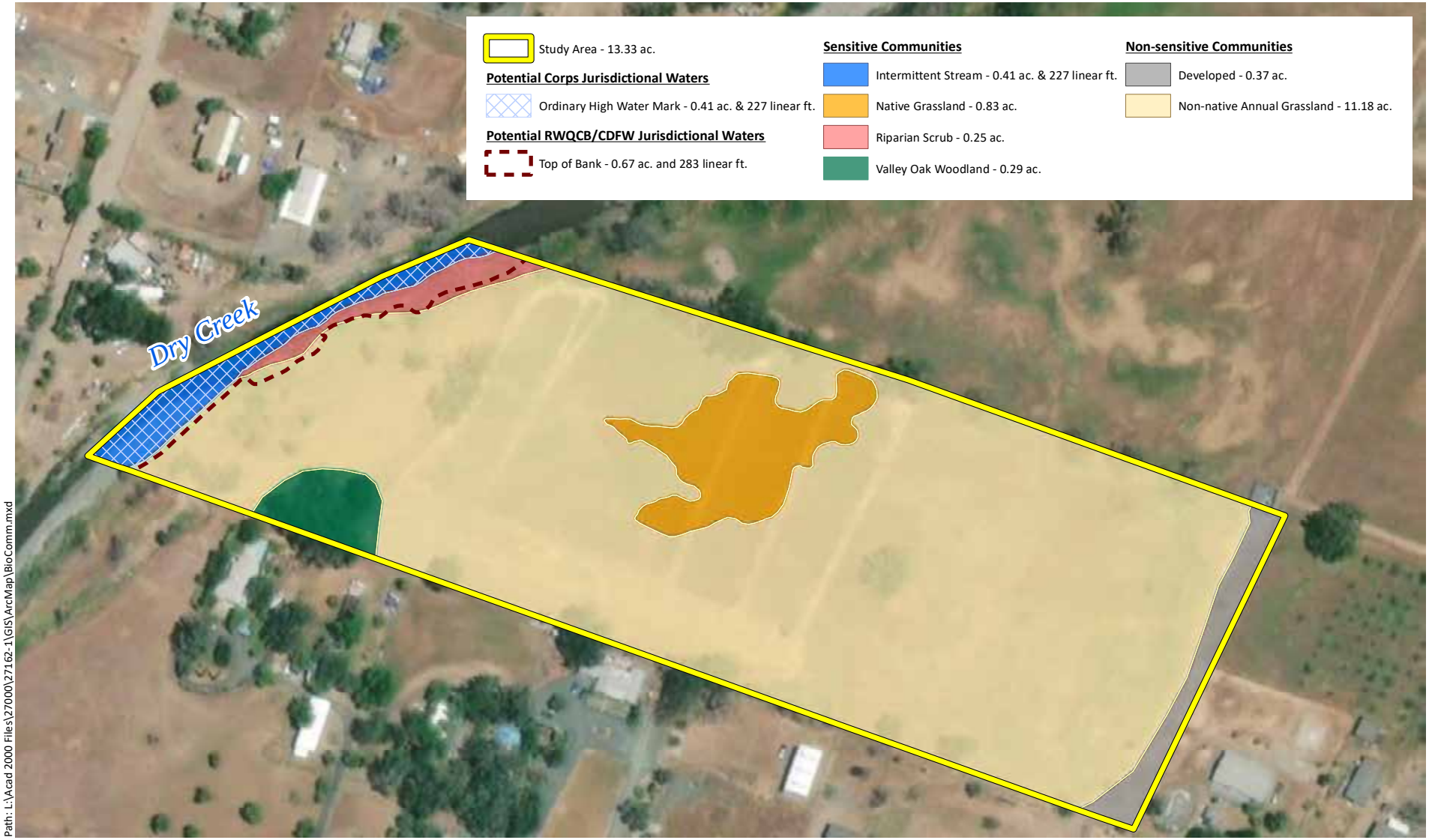

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Sources: Esri Streaming - NAIP 2016, WRA | Prepared By: mrochelle, 6/4/2019

Figure 2. Jurisdictional Features and Biological Communities within the Study Area

21000 Santa Clara Road
Middletown, Lake County, California

0 200 400 Feet

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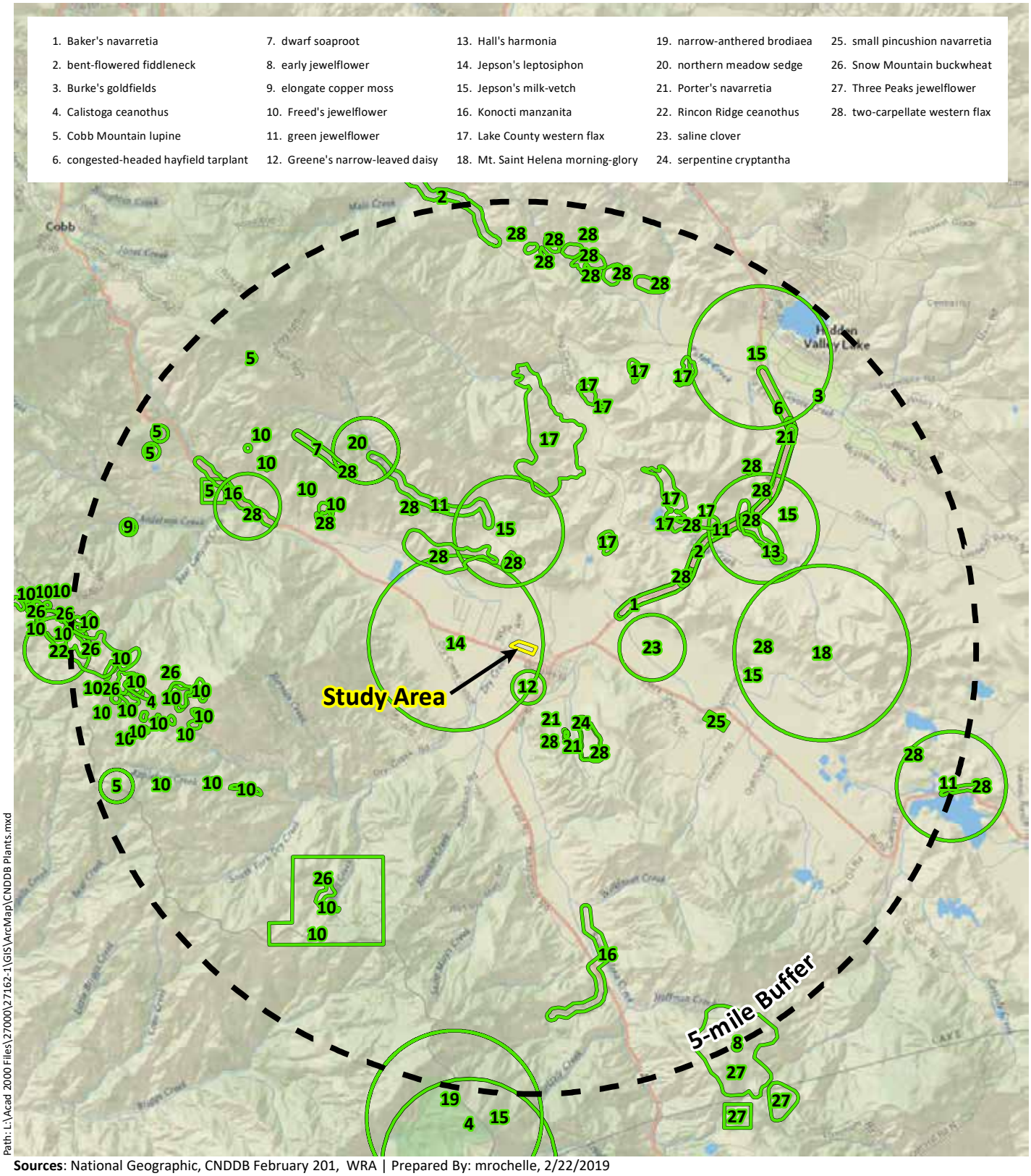

Sources: National Geographic, CNDDB February 201, WRA | Prepared By: mrochelle, 2/22/2019

Figure 3. Special-Status Plant Species Documented within 5-miles of the Study Area

21000 Santa Clara Road
Middletown, Lake County, California

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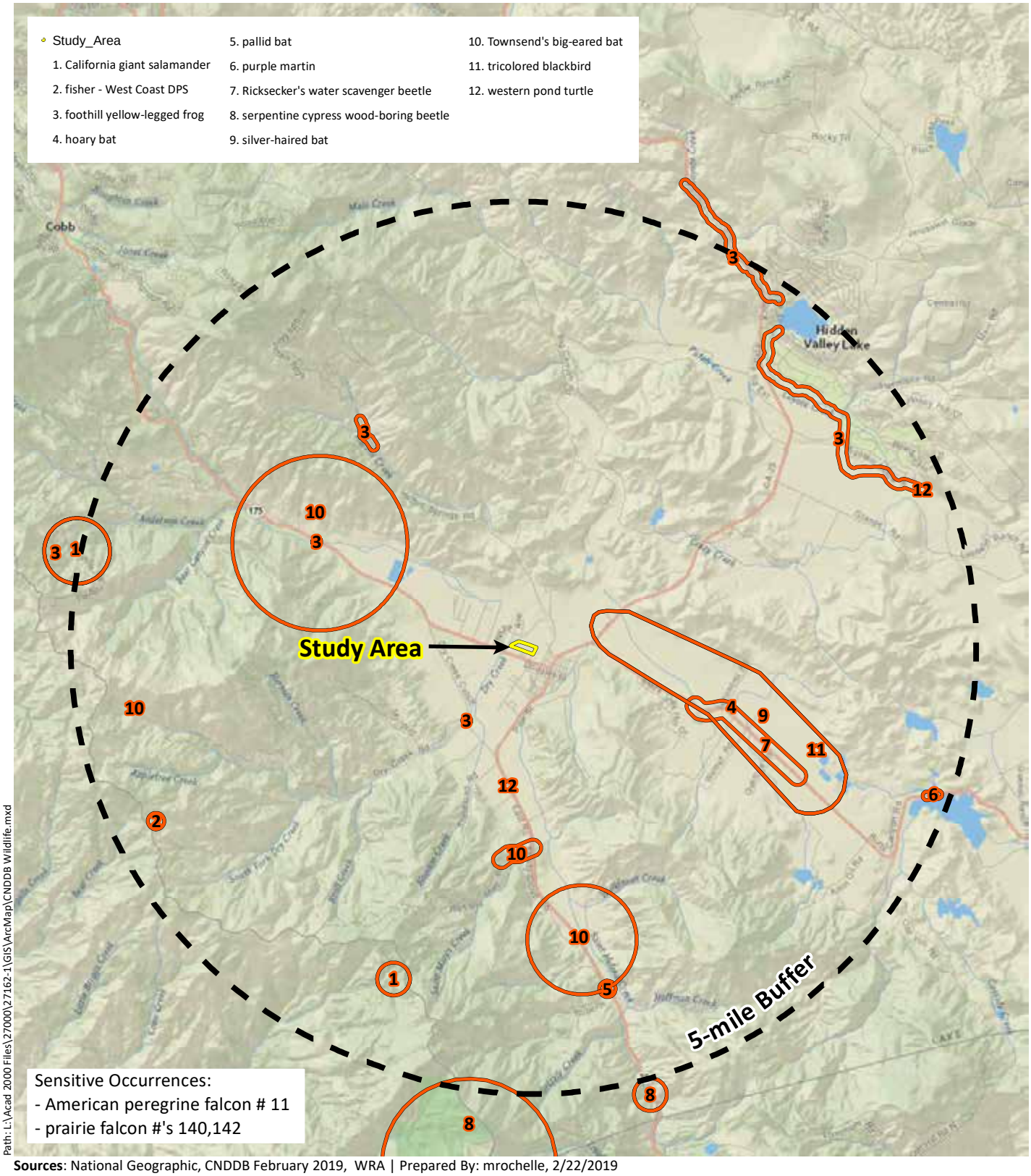
ENVIRONMENTAL CONSULTANTS



Sources: National Geographic, CNDDB February 2019, WRA | Prepared By: mrochelle, 2/22/2019

Figure 4. Special-Status Wildlife Species Documented within 5-miles of the Study Area

21000 Santa Clara Road
Middletown, Lake County, California

0 1 2 Miles

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APPENDIX B

PLANT AND WILDLIFE SPECIES OBSERVED WITHIN THE STUDY AREA

Appendix B: Plant and Wildlife Species Observed within the Study Area.

Table B-1. Plant Species

Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Acmispon americanus var. *americanus*	Spanish lotus	native	annual herb	-	-	UPL
Acmispon brachycarpus	Short podded lotus	native	annual herb	-	-	-
Acmispon wrangelianus	Chilean trefoil	native	annual herb	-	-	-
Aegilops cylindrica	Jointed goatgrass	non-native	annual grass	-	Watch	-
Agoseris heterophylla	Mountain dandelion	native	annual herb	-	-	-
Ailanthus altissima	Tree of heaven	non-native (invasive)	tree	-	Moderate	FACU
Aira caryophyllea	Silvery hairgrass	non-native	annual grass	-	-	FACU
Ancistrocarphus filagineus	Woolly fishhooks	native	annual herb	-	-	-
Aphanes occidentalis	Ladie's mantle	native	annual, perennial herb	-	-	-
Artemisia douglasiana	California mugwort	native	perennial herb	-	-	FAC
Avena barbata	Slim oat	non-native (invasive)	annual, perennial grass	-	Moderate	-
Baccharis pilularis	Coyote brush	native	shrub	-	-	-
Brassica nigra	Black mustard	non-native (invasive)	annual herb	-	Moderate	-
Brickellia californica	California brickellia	native	perennial herb	-	-	FACU

Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Briza minor	Little rattlesnake grass	non-native	annual grass	-	-	FAC
Brodiaea elegans ssp. *elegans*	Harvest brodiaea	native	perennial herb	-	-	FACU
Bromus diandrus	Ripgut brome	non-native (invasive)	annual grass	-	Moderate	-
Bromus hordeaceus	Soft chess	non-native (invasive)	annual grass	-	Limited	FACU
Bromus madritensis	Foxtail chess, foxtail brome	non-native	annual grass	-	-	UPL
Calandrinia menziesii	Red maids	native	annual herb	-	-	FACU
Capsella bursa-pastoris	Shepherd's purse	non-native	annual herb	-	-	FACU
Cardamine hirsuta	Hairy bitter cress	non-native	annual herb	-	-	FACU
Castilleja exserta ssp. *exserta*	Purple owl's clover	native	annual herb	-	-	-
Centaurea solstitialis	Yellow starthistle	non-native (invasive)	annual herb	-	High	-
Clarkia purpurea ssp. *quadrivulnera*	Purple clarkia	native	annual herb	-	-	-
Claytonia parviflora ssp. *parviflora*	Miner'slettuce	native	annual herb	-	-	FACU
Claytonia perfoliata	Miner's lettuce	native	annual herb	-	-	FAC
Croton setiger	Turkey-mullein	native	perennial herb	-	-	-
Cynosurus echinatus	Dogtail grass	non-native (invasive)	annual grass	-	Moderate	-
Cyperus eragrostis	Tall cyperus	native	perennial grasslike herb	-	-	FACW

Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Daucus pusillus	Wild carrot	native	annual herb	-	-	-
Elymus caput-medusae	Medusa head	non-native (invasive)	annual grass	-	High	-
Elymus multisetus	Big squirreltail grass	native	perennial grass	-	-	-
Epilobium canum	California fuchsia	native	perennial herb	-	-	-
Epilobium ciliatum	Slender willow herb	native	perennial herb	-	-	FACW
Epilobium minutum	Minute willowherb	native	annual herb	-	-	FACU
Erigeron canadensis	Canada horseweed	native	annual herb	-	-	FACU
Eriodictyon californicum	Yerba santa	native	shrub	-	-	-
Eriogonum sp.	buckwheat	native	perennial herb	-	-	-
Erodium botrys	Big heron bill	non-native	annual herb	-	-	FACU
Erodium cicutarium	Red stemmed filaree	non-native (invasive)	annual herb	-	Limited	-
Erodium moschatum	White-stem filaree	non-native	annual herb	-	-	-
Eschscholzia californica	California poppy	native	annual, perennial herb	-	-	-
Euthamia occidentalis	Western goldenrod	native	perennial herb	-	-	FACW
Festuca arundinacea	Reed fescue	non-native (invasive)	perennial grass	-	Moderate	FACU
Festuca microstachys	Small fescue	native	annual grass	-	-	-

Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Festuca myuros	Rattail sixweeks grass	non-native (invasive)	annual grass	-	Moderate	FACU
Fraxinus latifolia	Oregon ash	native	tree	-	-	FACW
Galium aparine	Cleavers	native	annual herb	-	-	FACU
Gastridium phleoides	Nit grass	non-native	annual grass	-	-	FACU
Githopsis diffusa ssp. *diffusa*	Southern blue cup	native	annual herb	-	-	FAC
Hemizonia congesta ssp. *clevelandii*	Cleveland's tarweed	native	annual herb	-	-	-
Hirschfeldia incana	Short-podded mustard	non-native (invasive)	perennial herb	-	Moderate	-
Hypericum perforatum ssp. *perforatum*	Klamath weed	non-native	perennial herb	-	Moderate	FACU
Hypochaeris radicata	Hairy cats ear	non-native (invasive)	perennial herb	-	Moderate	FACU
Juglans hindsii	Northern California black walnut	native	tree	Rank 1B.1[1]	-	FAC
Juncus xiphioides	Iris leaved rush	native	perennial grasslike herb	-	-	OBL
Lactuca serriola	Prickly lettuce	non-native	annual herb	-	-	FACU
Lagophylla ramosissima	Common hareleaf	native	annual herb	-	-	-
Lamium amplexicaule	Henbit	non-native	annual herb	-	-	-

[1] While Northern California black walnut is considered rare, that designation is only for individuals occurring within the native range of the species, in the vicinity of the Sacramento Delta. Therefore, it is not considered rare within the Study Area.

Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Leontodon saxatilis	Hawkbit	non-native	annual herb	-	-	FACU
Lepidium latifolium	Perennial pepperweed	non-native (invasive)	perennial herb	-	High	FAC
Lepidium nitidum	Shining pepper grass	native	annual herb	-	-	FAC
Logfia gallica	Narrowleaf cottonrose	non-native	annual herb	-	-	-
Lupinus affinis	Fleshy lupine	native	annual herb	-	-	-
Lupinus bicolor	Lupine	native	annual, perennial herb	-	-	-
Lupinus nanus	Valley sky lupine	native	annual herb	-	-	-
Lythrum hyssopifolia	Hyssop loosestrife	non-native (invasive)	annual, perennial herb	-	Limited	OBL
Marah fabacea	California man-root	native	perennial herb, vine	-	-	-
Marrubium vulgare	White horehound	non-native (invasive)	perennial herb	-	Limited	FACU
Medicago polymorpha	California burclover	non-native (invasive)	annual herb	-	Limited	FACU
Melilotus indicus	Annual yellow sweetclover	non-native	annual herb	-	-	FACU
Micropus californicus	Q tips	native	annual herb	-	-	FACU
Microsteris gracilis	Slender phlox	native	annual herb	-	-	FACU
Navarretia pubescens	Purple navarretia	native	annual herb	-	-	-
Nemophila menziesii var. *menziesii*	Baby blue eyes	native	annual herb	-	-	-

Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Nemophila parviflora	Small flowered nemophila	native	annual herb	-	-	-
Nemophila pedunculata	Meadow nemophila	native	annual herb	-	-	FAC
Plagiobothrys nothofulvus	Rusty haired popcorn flower	native	annual herb	-	-	FAC
Plantago erecta	California plantain	native	annual herb	-	-	-
Plectritis sp.	Plectritis	native	annual herb	-	-	-
Poa bulbosa	Bulbous blue grass	non-native	perennial grass	-	-	FACU
Polypogon monspeliensis	Annual beard grass	non-native (invasive)	annual grass	-	Limited	FACW
Quercus lobata	Valley oak	native	tree	-	-	FACU
Rumex crispus	Curly dock	non-native (invasive)	perennial herb	-	Limited	FAC
Rumex pulcher	Fiddleleaf dock	non-native	perennial herb	-	-	FAC
Rumex salicifolius	Willow leaved dock	native	perennial herb	-	-	FACW
Salix exigua	Narrowleaf willow	native	tree, shrub	-	-	FACW
Salix lasiolepis	Arroyo willow	native	tree, shrub	-	-	FACW
Sambucus nigra ssp. *caerulea*	Blue elderberry	native	shrub	-	-	FAC
Scleranthus annuus ssp. annuus	German knotgrass	non-native	annual herb	-	-	FACU
Secale cereale	Rye	non-native	annual grass	-	-	-

Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Senecio vulgaris	Common groundsel	non-native	annual herb	-	-	FACU
Sidalcea diploscypha	Fringed checker mallow	native	annual herb	-	-	-
Silene gallica	Common catchfly	non-native	annual herb	-	-	-
Stellaria nitens	Shining chickweed	native	annual herb	-	-	-
Thysanocarpus curvipes	Common fringe pod	native	annual herb	-	-	-
Toxicodendron diversilobum	Poison oak	native	vine, shrub	-	-	FACU
Trichostema laxum	Turpentine weed	native	annual herb	-	-	-
Trifolium ciliolatum	Tree clover	native	annual herb	-	-	-
Trifolium dubium	Shamrock	non-native	annual herb	-	-	UPL
Trifolium hirtum	Rose clover	non-native (invasive)	annual herb	-	Limited	-
Trifolium microcephalum	Small head clover	native	annual herb	-	-	FAC
Trifolium microdon	Valparaiso clover	native	annual herb	-	-	-
Trifolium willdenovii	Tomcat clover	native	annual herb	-	-	FACW
Triphysaria pusilla	Little owl's clover	native	annual herb	-	-	-
Umbellularia californica	California bay	native	tree	-	-	FAC
Verbascum blattaria	Moth mullein	non-native	perennial herb	-	-	UPL

Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Verbascum thapsus	Woolly mullein	non-native (invasive)	perennial herb	-	Limited	FACU
Veronica anagallis-aquatica	Water speedwell	non-native	perennial herb	-	-	OBL
Vicia benghalensis	Purple vetch	non-native	annual herb, vine	-	-	-
Vicia sativa	Spring vetch	non-native	annual herb, vine	-	-	FACU
Vitis californica	California wild grape	native	vine, shrub	-	-	FACU
Xanthium strumarium	Cocklebur	native	annual herb	-	-	FAC

[1]Rare Status: The CNPS Inventory of Rare and Endangered Plants (CNPS 2019a)

FE: Federal Endangered
FT: Federal Threatened
SE: State Endangered
ST: State Threatened
SR: State Rare
Rank 1A: Plants presumed extirpated in California and either rare or extinct elsewhere
Rank 1B: Plants rare, threatened, or endangered in California and elsewhere
Rank 2A: Plants presumed extirpated in California, but more common elsewhere
Rank 2B: Plants rare, threatened, or endangered in California, but more common elsewhere
Rank 3: Plants about which we need more information – a review list
Rank 4: Plants of limited distribution – a watch list

[2]Invasive Status: California Invasive Plant Inventory (Cal-IPC 2019)

High: Severe ecological impacts; high rates of dispersal and establishment; most are widely distributed ecologically.
Moderate: Substantial and apparent ecological impacts; moderate-high rates of dispersal, establishment dependent on disturbance; limited-moderate distribution ecologically
Limited: Minor or not well documented ecological impacts; low-moderate rate of invasiveness; limited distribution ecologically
Assessed: Assessed by Cal-IPC and determined to not be an existing current threat

[3]Wetland Status: National List of Plant Species that Occur in Wetlands, Arid West Region (Lichvar et al. 2016)

OBL: Almost always a hydrophyte, rarely in uplands

FACW: Usually a hydrophyte, but occasionally found in uplands
FAC: Commonly either a hydrophyte or non-hydrophyte
FACU: Occasionally a hydrophyte, but usually found in uplands
UPL: Rarely a hydrophyte, almost always in uplands

Table B-2. Observed Wildlife

Common Name	Scientific Name
Mammals	
California mule deer	*Odocoileus hemionus californicus*
coyote	*Canis latrans*
pocket gopher	*Thomomys bottae*
Birds	
acorn woodpecker	*Melanerpes formicivorus*
American crow	*Corvus brachyrhynchos*
Brewer's blackbird	*Euphagus cyanocephalus*
California scrub-jay	*Aphelocoma californica*
California towhee	*Melozone crissalis*
common raven	*Corvus corax*
Eurasian collared-dove	*Streptopelia decaocto*
European starling	*Sturnus vulgaris*
great blue heron	*Ardea herodias*
mourning dove	*Zenaida macroura*
northern flicker	*Colaptes auratus*
northern mockingbird	*Mimus polyglottos*

Common Name	Scientific Name
red-tailed hawk	*Buteo jamaicensis*
turkey vulture	*Cathartes aura*
Reptiles	
western fence lizard	*Sceloporus occidentalis*

APPENDIX C

POTENTIAL FOR SPECIAL-STATUS PLANT AND WILDLIFE SPECIES TO OCCUR WITHIN THE STUDY AREA

Appendix C. Potential for Special-Status Plant and Wildlife Species to Occur within the Study Area. List compiled from database searches focused on the following 7.5-minute USGS quadrangles: Aetna Springs, Detert Reservoir, Jericho Valley, Clearlake Highlands, Lower Lake, Middletown, Mount St. Helena, Whispering Pines and Wilson Valley USGS 7.5' quadrangles (CNPS 2018a, CDFW 2018a; USFWS 2018). List also compiled by a review of other CDFW and USFWS lists and publications (Tomson et al. 2016, Shuford and Gardali 2008, Moyle et al. 2015, USFWS 2008, Bolster 1998, WBWG 2018) focused on the region.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Plants				
Napa false indigo *Amorpha californica var. napensis*	Rank 1B.2	Broadleaved upland forest (openings), chaparral, cismontane woodland. Elevation ranges from 390 to 6560 feet (120 to 2000 meters). Blooms Apr-Jul.	**No Potential.** While the Study Area contains woodland habitat, it is limited in extent and does not have a shrubby understory.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
bent-flowered fiddleneck *Amsinckia lunaris*	Rank 1B.2	Coastal bluff scrub, cismontane woodland, valley and foothill grassland. Elevation ranges from 5 to 1640 feet (3 to 500 meters). Blooms Mar-Jun.	**Moderate Potential.** The Study Area contains grassland habitat which may support this species.	**Not Observed.** This species was not observed during the March or April site visits. No further recommendations.
dimorphic snapdragon *Antirrhinum subcordatum*	Rank 4.3	Chaparral, lower montane coniferous forest. Elevation ranges from 605 to 2625 feet (185 to 800 meters). Blooms Apr-Jul.	**No Potential.** The Study Area does not contain serpentine soils, slopes, nor suitable habitat types.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
twig-like snapdragon *Antirrhinum virga*	Rank 4.3	Chaparral, lower montane coniferous forest. Elevation ranges from 325 to 6610 feet (100 to 2015 meters). Blooms Jun-Jul.	**No Potential.** The Study Area does not contain serpentine soils nor rocky openings. Also suitable habitat types are not present	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
coast rockcress *Arabis blepharophylla*	Rank 4.3	Broadleaved upland forest, coastal bluff scrub, coastal prairie, coastal scrub. Elevation ranges from 5 to 3610 feet (3 to 1100 meters). Blooms Feb-May.	**No Potential.** The Study Area does not contain forest or scrub habitat and is not located very near the coast.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
modest rockcress *Arabis modesta*	Rank 4.3	Chaparral, lower montane coniferous forest. Elevation ranges from 390 to 2625 feet (120 to 800 meters). Blooms Mar-Jul.	**No Potential.** The Study Area does not contain chaparral or coniferous forest habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Oregon rockcress *Arabis oregana*	Rank 4.3	Chaparral, lower montane coniferous forest. Elevation ranges from 1965 to 6005 feet (600 to 1830 meters). Blooms May.	**No Potential.** The Study Area does not contain serpentine soils, chaparral, or coniferous forest.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Konocti manzanita *Arctostaphylos manzanita ssp. elegans*	Rank 1B.3	Chaparral, cismontane woodland, lower montane coniferous forest. Elevation ranges from 1295 to 5300 feet (395 to 1615 meters). Blooms (Jan)Mar-May(Jul).	**No Potential.** The Study Area does not contain volcanic soils, chaparral or forest habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Raiche's manzanita *Arctostaphylos stanfordiana ssp. raichei*	Rank 1B.1	Chaparral, lower montane coniferous forest (openings). Elevation ranges from 1475 to 3395 feet (450 to 1035 meters). Blooms Feb-Apr.	**No Potential.** The Study Area does not contain serpentine soils, chaparral or forest habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
serpentine milkweed *Asclepias solanoana*	Rank 4.2	Chaparral, cismontane woodland, lower montane coniferous forest. Elevation ranges from 750 to 6100 feet (230 to 1860 meters). Blooms May-Jul(Aug).	**No Potential.** The Study Area does not contain serpentine soils, chaparral or forest habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Brewer's milk-vetch *Astragalus breweri*	Rank 4.2	Chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland (open, often gravelly). Elevation ranges from 295 to 2395 feet (90 to 730 meters). Blooms Apr-Jun.	**Unlikely.** While the Study Area contains grassy flats with gravelly soils, this species typically occurs on or near volcanic or serpentine soils which are absent.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Cleveland's milk-vetch *Astragalus clevelandii*	Rank 4.3	Chaparral, cismontane woodland, riparian forest. Elevation ranges from 655 to 4920 feet (200 to 1500 meters). Blooms Jun-Sep.	**Unlikely.** While the Study Area contains sandy stream bank and gravel bars, this species typically occurs on serpentine soils, which are absent.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Jepson's milk-vetch *Astragalus rattanii var. jepsonianus*	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 965 to 2295 feet (295 to 700 meters). Blooms Mar-Jun.	**Unlikely**. While the Study Area contains grassland habitat, this species typically occurs on serpentine soils, which are absent.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
big-scale balsamroot *Balsamorhiza macrolepis*	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 145 to 5100 feet (45 to 1555 meters). Blooms Mar-Jun.	**Unlikely.** While the Study Area contains grassland habitat, this species is typically not found in alluvial valleys and generally found on serpentine soils, which are absent.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
narrow-anthered brodiaea *Brodiaea leptandra*	Rank 1B.2	Broadleaved upland forest, chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 360 to 3000 feet (110 to 915 meters). Blooms May-Jul.	**Unlikely.** While the Study Area contains grassland habitat, this species is typically found on volcanic soils, which are absent.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Indian Valley brodiaea *Brodiaea rosea*	SE, Rank 1B.1	Closed-cone coniferous forest, chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 1095 to 4755 feet (335 to 1450 meters). Blooms May-Jun.	**No Potential.** While the Study Area contains grassland habitat, this species typically occurs on serpentine soils which are absent.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
serpentine reed grass *Calamagrostis ophitidis*	Rank 4.3	Chaparral (open, often north-facing slopes), lower montane coniferous forest, meadows and seeps, valley and foothill grassland. Elevation ranges from 295 to 3495 feet (90 to 1065 meters). Blooms Apr-Jul.	**No Potential.** The Study Area does not contain serpentine soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
pink star-tulip *Calochortus uniflorus*	Rank 4.2	Coastal prairie, coastal scrub, meadows and seeps, north coast coniferous forest. Elevation ranges from 30 to 3510 feet (10 to 1070 meters). Blooms Apr-Jun.	**Unlikely.** While the Study Area contains grassland habitat, no seasonally moist meadows are present.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
four-petaled pussypaws *Calyptridium quadripetalum*	Rank 4.3	Chaparral, lower montane coniferous forest. Elevation ranges from 1030 to 6695 feet (315 to 2040 meters). Blooms Apr-Jun.	**No Potential.** The Study Area does not contain chaparral or coniferous forest habitat, nor serpentine soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Mt. Saint Helena morning-glory *Calystegia collina ssp. oxyphylla*	Rank 4.2	Chaparral, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 915 to 3315 feet (279 to 1010 meters). Blooms Apr-Jun.	**No Potential.** While the Study Area contains grassland habitat, this species typically occurs on serpentine soils which are absent.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
South Coast Range morning-glory *Calystegia collina ssp. venusta*	Rank 4.3	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 1390 to 4890 feet (425 to 1490 meters). Blooms Apr-Jun.	**No Potential.** While the Study Area contains grassland habitat, this species typically occurs on serpentine soils which are absent.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
northern meadow sedge *Carex praticola*	Rank 2B.2	Meadows and seeps (mesic). Elevation ranges from 0 to 10500 feet (0 to 3200 meters). Blooms May-Jul.	**No Potential.** The Study Area does not contain wet meadow habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
pink creamsacs *Castilleja rubicundula var. rubicundula*	Rank 1B.2	Chaparral (openings), cismontane woodland, meadows and seeps, valley and foothill grassland. Elevation ranges from 65 to 2985 feet (20 to 910 meters). Blooms Apr-Jun.	**Unlikely.** While the Study Area contains grassland habitat, this species typically occurs on serpentine soils, which are absent.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Rincon Ridge ceanothus *Ceanothus confusus*	Rank 1B.1	Closed-cone coniferous forest, chaparral, cismontane woodland. Elevation ranges from 245 to 3495 feet (75 to 1065 meters). Blooms Feb-Jun.	**No Potential.** The Study Area does not contain forest or chaparral habitat nor volcanic or serpentine soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Calistoga ceanothus *Ceanothus divergens*	Rank 1B.2	Chaparral (serpentine or volcanic, rocky). Elevation ranges from 555 to 3115 feet (170 to 950 meters). Blooms Feb-Apr.	**No Potential.** The Study Area does not contain chaparral habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
holly-leaved ceanothus *Ceanothus purpureus*	Rank 1B.2	Chaparral, cismontane woodland. Elevation ranges from 390 to 2100 feet (120 to 640 meters). Blooms Feb-Jun.	**No Potential.** The Study Area does not contain chaparral habitat nor volcanic soils and only limited woodland habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Sonoma ceanothus *Ceanothus sonomensis*	Rank 1B.2	Chaparral (sandy, serpentine or volcanic). Elevation ranges from 705 to 2625 feet (215 to 800 meters). Blooms Feb-Apr.	**No Potential.** The Study Area does not contain chaparral habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
pappose tarplant *Centromadia parryi ssp. parryi*	Rank 1B.2	Chaparral, coastal prairie, meadows and seeps, marshes and swamps (coastal salt), valley and foothill grassland (vernally mesic). Elevation ranges from 0 to 1380 feet (0 to 420 meters). Blooms May-Nov.	**Unlikely.** While the Study Area contains grassland habitat, this species typically occurs in alkaline, vernally mesic areas which are absent. Additionally, no *Centromadia* spp. were observed during the October site visit.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
dwarf soaproot *Chlorogalum pomeridianum var. minus*	Rank 1B.2	Chaparral (serpentine). Elevation ranges from 1000 to 3280 feet (305 to 1000 meters). Blooms May-Aug.	**No Potential.** The Study Area does not contain chaparral habitat or serpentine soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Tracy's clarkia *Clarkia gracilis ssp. tracyi*	Rank 4.2	Chaparral (openings, usually serpentine). Elevation ranges from 210 to 2135 feet (65 to 650 meters). Blooms Apr-Jul.	**No Potential.** The Study Area does not contain chaparral habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
serpentine collomia *Collomia diversifolia*	Rank 4.3	Chaparral, cismontane woodland. Elevation ranges from 655 to 1970 feet (200 to 600 meters). Blooms May-Jun.	**No Potential.** The Study Area does not contain serpentine soils nor chaparral habitat and limited woodland habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
serpentine bird's-beak *Cordylanthus tenuis ssp. brunneus*	Rank 4.3	Closed-cone coniferous forest, chaparral, cismontane woodland. Elevation ranges from 1000 to 3000 feet (305 to 915 meters). Blooms Jul-Aug.	**No Potential.** The Study Area does not contain barren rocky serpentine soil.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
serpentine cryptantha *Cryptantha dissita*	Rank 1B.2	Chaparral (serpentine). Elevation ranges from 1295 to 1905 feet (395 to 580 meters). Blooms Apr-Jun.	**No Potential.** The Study Area does not contain serpentine outcrops.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
mountain lady's-slipper *Cypripedium montanum*	Rank 4.2	Broadleaved upland forest, cismontane woodland, lower montane coniferous forest, north coast coniferous forest. Elevation ranges from 605 to 7300 feet (185 to 2225 meters). Blooms Mar-Aug.	**No Potential.** The Study Area does not contain forest habitat nor slopes and only limited woodland habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
swamp larkspur *Delphinium uliginosum*	Rank 4.2	Chaparral, valley and foothill grassland. Elevation ranges from 1115 to 2000 feet (340 to 610 meters). Blooms May-Jun.	**Unlikely.** While the Study Area contains grassland habitat, this species typically occurs on serpentine soils, which are absent.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Cascade downingia *Downingia willamettensis*	Rank 2B.2	Cismontane woodland lake margins, valley and foothill grassland lake margins, vernal pools. Elevation ranges from 45 to 3640 feet (15 to 1110 meters). Blooms Jun-Jul(Sep).	**No Potential.** The Study Area does not contain vernal pools or lake margin habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Cascade downingia *Downingia willamettensis*	Rank 2B.2	Cismontane woodland lake margins, valley and foothill grassland lake margins, vernal pools. Elevation ranges from 45 to 3640 feet (15 to 1110 meters). Blooms Jun-Jul(Sep).	**No Potential.** The Study Area does not contain seasonal wetlands or vernal pool habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
marsh horsetail *Equisetum palustre*	Rank 3	Marshes and swamps. Elevation ranges from 145 to 3280 feet (45 to 1000 meters).	**Unlikely.** The Study Area does not contain marsh habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Brandegee's eriastrum *Eriastrum brandegeeae*	Rank 1B.1	Chaparral, cismontane woodland. Elevation ranges from 1390 to 2755 feet (425 to 840 meters). Blooms Apr-Aug.	**No Potential.** The Study Area does not contain chaparral habitat nor volcanic soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
streamside daisy *Erigeron biolettii*	Rank 3	Broadleaved upland forest, cismontane woodland, north coast coniferous forest. Elevation ranges from 95 to 3610 feet (30 to 1100 meters). Blooms Jun-Oct.	**No Potential.** The Study Area does not contain forest habitat nor slopes. Additionally, the Study Area does not contain rocky outcrops or ledges.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Greene's narrow-leaved daisy *Erigeron greenei*	Rank 1B.2	Chaparral (serpentine or volcanic). Elevation ranges from 260 to 3295 feet (80 to 1005 meters). Blooms May-Sep.	**Unlikely.** The Study Area does not contain chaparral habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Snow Mountain buckwheat *Eriogonum nervulosum*	Rank 1B.2	Chaparral (serpentine). Elevation ranges from 980 to 6905 feet (300 to 2105 meters). Blooms Jun-Sep.	**No Potential.** The Study Area does not contain chaparral habitat or serpentine soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
bay buckwheat *Eriogonum umbellatum var. bahiiforme*	Rank 4.2	Cismontane woodland, lower montane coniferous forest. Elevation ranges from 2295 to 7220 feet (700 to 2200 meters). Blooms Jul-Sep.	**Unlikely.** The Study Area does not contain coniferous forest nor woodland habitat on serpentine soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Loch Lomond button-celery *Eryngium constancei*	FE, SE, Rank 1B.1	Vernal pools. Elevation ranges from 1505 to 2805 feet (460 to 855 meters). Blooms Apr-Jun.	**No Potential.** The Study Area does not contain vernal pools or lake margin habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Jepson's coyote thistle *Eryngium jepsonii*	Rank 1B.2	Valley and foothill grassland, vernal pools. Elevation ranges from 5 to 985 feet (3 to 300 meters). Blooms Apr-Aug.	**No Potential.** The Study Area does not contain vernal pools or clay soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
bare monkeyflower *Erythranthe nudata*	Rank 4.3	Chaparral, cismontane woodland. Elevation ranges from 655 to 2295 feet (200 to 700 meters). Blooms May-Jun.	**Unlikely.** The Study Area does not contain moist sites on serpentine soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
St. Helena fawn lily *Erythronium helenae*	Rank 4.2	Chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 1145 to 4005 feet (350 to 1220 meters). Blooms Mar-May.	**Unlikely.** While the Study Area contains grassland habitat and a limited area of woodland habitat, this species typically occurs in chaparral on serpentine or volcanic soils which are absent.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
adobe-lily *Fritillaria pluriflora*	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 195 to 2315 feet (60 to 705 meters). Blooms Feb-Apr.	**Unlikely.** While the Study Area contains grassland habitat, this species typically occurs on clay or serpentine soils which are absent.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Purdy's fritillary *Fritillaria purdyi*	Rank 4.3	Chaparral, cismontane woodland, lower montane coniferous forest. Elevation ranges from 570 to 7400 feet (175 to 2255 meters). Blooms Mar-Jun.	**Unlikely.** The Study Area contains a limited area of woodland habitat and does not contain serpentine soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Boggs Lake hedge-hyssop *Gratiola heterosepala*	SE, Rank 1B.2	Marshes and swamps (lake margins), vernal pools. Elevation ranges from 30 to 7790 feet (10 to 2375 meters). Blooms Apr-Aug.	**No Potential.** The Study Area does not contain lake margins or vernal pool habitat, nor clay soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Toren's grimmia *Grimmia torenii*	Rank 1B.3	Chaparral, cismontane woodland, lower montane coniferous forest. Elevation ranges from 1065 to 3805 feet (325 to 1160 meters).	**No Potential.** The Study Area contains limited woodland habitat and no open, rocky volcanic rocks.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Hall's harmonia *Harmonia hallii*	Rank 1B.2	Chaparral (serpentine). Elevation ranges from 1000 to 3200 feet (305 to 975 meters). Blooms Apr-Jun.	**No Potential.** The Study Area does not contain chaparral habitat nor is located on hills.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
nodding harmonia *Harmonia nutans*	Rank 4.3	Chaparral, cismontane woodland. Elevation ranges from 245 to 3200 feet (75 to 975 meters). Blooms Mar-May.	**Unlikely.** The Study Area contains limited woodland habitat and does not contain rocky volcanic soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
serpentine sunflower *Helianthus exilis*	Rank 4.2	Chaparral, cismontane woodland. Elevation ranges from 490 to 5005 feet (150 to 1525 meters). Blooms Jun-Nov.	**Unlikely.** The Study Area does not contain serpentine seeps or chaparral habitat and has limited woodland habitat. Additionally, the species was not observed during the October site visit.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
congested-headed hayfield tarplant *Hemizonia congesta ssp. congesta*	Rank 1B.2	Valley and foothill grassland. Elevation ranges from 65 to 1835 feet (20 to 560 meters). Blooms Apr-Nov.	**Moderate Potential.** The Study Area contains grassland habitat.	**Not Observed**. This species was not observed during the May site visit. No further recommendations.
glandular western flax *Hesperolinon adenophyllum*	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 490 to 4315 feet (150 to 1315 meters). Blooms May-Aug.	**No Potential.** While the Study Area contains grassland habitat, this species typically occurs on serpentine soils which are absent.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
two-carpellate western flax *Hesperolinon bicarpellatum*	Rank 1B.2	Chaparral (serpentine). Elevation ranges from 195 to 3295 feet (60 to 1005 meters). Blooms May-Jul.	**No Potential.** The Study Area does not contain chaparral habitat nor serpentine soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Lake County western flax *Hesperolinon didymocarpum*	SE, Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 1080 to 1200 feet (330 to 365 meters). Blooms May-Jul.	**Unlikely.** While the Study Area contains grassland habitat, this species typically occurs on serpentine soils, which are absent.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
drymaria-like western flax *Hesperolinon drymarioides*	Rank 1B.2	Closed-cone coniferous forest, chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 325 to 3705 feet (100 to 1130 meters). Blooms May-Aug.	**Unlikely.** While the Study Area contains grassland habitat, this species typically occurs on serpentine soils, which are absent.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Sharsmith's western flax *Hesperolinon sharsmithiae*	Rank 1B.2	Chaparral. Elevation ranges from 885 to 985 feet (270 to 300 meters). Blooms May-Jul.	**No Potential.** The Study Area does not contain chaparral habitat nor serpentine soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Bolander's horkelia *Horkelia bolanderi*	Rank 1B.2	Chaparral, lower montane coniferous forest, meadows and seeps, valley and foothill grassland. Elevation ranges from 1475 to 3610 feet (450 to 1100 meters). Blooms (May)Jun-Aug.	**Unlikely.** While the Study Area contains grassland habitat, no vernal pools or mesic grassland habitat is present.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
California satintail *Imperata brevifolia*	Rank 2B.1	Chaparral, coastal scrub, Mojavean desert scrub, meadows and seeps (often alkali), riparian scrub. Elevation ranges from 0 to 3985 feet (0 to 1215 meters). Blooms Sep-May.	**No Potential.** While the Study Area contains riparian habitat,	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Northern California black walnut *Juglans hindsii*	Rank 1B.1	Riparian forest, riparian woodland. Elevation ranges from 0 to 1445 feet (0 to 440 meters). Blooms Apr-May.	**Present**. While the northern California black walnut was observed in the Study Area, this species is only considered rare within its native range near the Sacramento Delta.	**Present**. However, this species is not considered sensitive outside of its native range of the Sacramento Delta. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Santa Lucia dwarf rush *Juncus luciensis*	Rank 1B.2	Chaparral, great basin scrub, lower montane coniferous forest, meadows and seeps, vernal pools. Elevation ranges from 980 to 6695 feet (300 to 2040 meters). Blooms Apr-Jul.	**Unlikely.** While the Study Area contains grassland habitat, no vernal pools or mesic grassland habitat is present.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Burke's goldfields *Lasthenia burkei*	FE, SE, Rank 1B.1	Meadows and seeps (mesic), vernal pools. Elevation ranges from 45 to 1970 feet (15 to 600 meters). Blooms Apr-Jun.	**No Potential.** While the Study Area contains grassland habitat, no vernal pools or mesic grassland habitat is present.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Colusa layia *Layia septentrionalis*	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 325 to 3595 feet (100 to 1095 meters). Blooms Apr-May.	**Moderate Potential.** The Study Area contains grassland habitat on sandy soils.	**Not Observed.** This species was not observed during the April site visit. No further recommendations.
legenere *Legenere limosa*	Rank 1B.1	Vernal pools. Elevation ranges from 0 to 2885 feet (1 to 880 meters). Blooms Apr-Jun.	**No Potential.** The Study Area does not contain vernal pool habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
bristly leptosiphon *Leptosiphon acicularis*	Rank 4.2	Chaparral, cismontane woodland, coastal prairie, valley and foothill grassland. Elevation ranges from 180 to 4920 feet (55 to 1500 meters). Blooms Apr-Jul.	**Moderate Potential.** The Study Area contains grassland habitat.	**Not Observed.** This species was not observed during the April site visit. No further recommendations.
Jepson's leptosiphon *Leptosiphon jepsonii*	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 325 to 1640 feet (100 to 500 meters). Blooms Mar-May.	**Moderate Potential.** The Study Area contains grassland habitat and a small patch of oak woodland which provide suitable habitat for this species. Additionally, there is a mapped occurrence very near the Study Area.	**Not Observed.** This species was not observed during the April site visit. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
woolly-headed lessingia *Lessingia hololeuca*	Rank 3	Broadleaved upland forest, coastal scrub, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 45 to 1000 feet (15 to 305 meters). Blooms Jun-Oct.	**Unlikely.** While the Study Area contains grassland habitat, this species typically occurs on clay or serpentine soils which are absent. Additionally, no Lessingia spp. were observed during the October site visit.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Bolander's lily *Lilium bolanderi*	Rank 4.2	Chaparral, lower montane coniferous forest. Elevation ranges from 95 to 5250 feet (30 to 1600 meters). Blooms Jun-Jul.	**No Potential.** The Study Area does not contain chaparral or coniferous forest habitat, nor serpentine soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
woolly meadowfoam *Limnanthes floccosa ssp. floccosa*	Rank 4.2	Chaparral, cismontane woodland, valley and foothill grassland, vernal pools. Elevation ranges from 195 to 4380 feet (60 to 1335 meters). Blooms Mar-May(Jun).	**Unlikely.** While the Study Area contains grassland habitat, no vernal pools or mesic grassland habitat is present.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Sebastopol meadowfoam *Limnanthes vinculans*	FE, SE, Rank 1B.1	Meadows and seeps, valley and foothill grassland, vernal pools. Elevation ranges from 45 to 1000 feet (15 to 305 meters). Blooms Apr-May.	**Unlikely.** While the Study Area contains grassland habitat, no vernal pools or mesic grassland habitat is present.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Hoover's lomatium *Lomatium hooveri*	Rank 4.3	Chaparral, cismontane woodland. Elevation ranges from 980 to 2905 feet (300 to 885 meters). Blooms Apr-Jul.	**Unlikely.** The Study Area contains limited woodland habitat and no chaparral or serpentine soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Napa lomatium *Lomatium repostum*	Rank 4.3	Chaparral, cismontane woodland. Elevation ranges from 295 to 2725 feet (90 to 830 meters). Blooms Mar-Jun.	**Unlikely.** The Study Area contains limited woodland habitat and no chaparral or serpentine soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Cobb Mountain lupine *Lupinus sericatus*	Rank 1B.2	Broadleaved upland forest, chaparral, cismontane woodland, lower montane coniferous forest. Elevation ranges from 900 to 5005 feet (275 to 1525 meters). Blooms Mar-Jun.	**Unlikely.** The Study Area does not contain forest or chaparral habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Heller's bush-mallow *Malacothamnus helleri*	Rank 3.3	Chaparral (sandstone), riparian woodland (gravel). Elevation ranges from 1000 to 2085 feet (305 to 635 meters). Blooms May-Jul.	**Unlikely.** While the Study Area contains riparian habitat, it is not woodland habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
elongate copper moss *Mielichhoferia elongata*	Rank 4.3	Broadleaved upland forest, chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, subalpine coniferous forest. Elevation ranges from 0 to 6430 feet (0 to 1960 meters).	**No Potential.** The Study Area does not contain acidic, metamorphic rock.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
little mousetail *Myosurus minimus ssp. apus*	Rank 3.1	Valley and foothill grassland, vernal pools (alkaline). Elevation ranges from 65 to 2100 feet (20 to 640 meters). Blooms Mar-Jun.	**Unlikely.** While the Study Area contains grassland habitat, no alkaline soils are present.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
cotula navarretia *Navarretia cotulifolia*	Rank 4.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 10 to 6005 feet (4 to 1830 meters). Blooms May-Jun.	**Unlikely.** While the Study Area contains grassland habitat, no adobe soils are present.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Jepson's navarretia *Navarretia jepsonii*	Rank 4.3	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 570 to 2805 feet (175 to 855 meters). Blooms Apr-Jun.	**Moderate Potential.** The Study Area contains grassland habitat and edge of woodland habitat.	**Not Observed.** This species was not observed during the April site visit. No further recommendations.
Baker's navarretia *Navarretia leucocephala ssp. bakeri*	Rank 1B.1	Cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, vernal pools. Elevation ranges from 15 to 5710 feet (5 to 1740 meters). Blooms Apr-Jul.	**Unlikely.** While the Study Area contains grassland habitat, this species typically occurs on adobe or alkaline soils which are absent.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
few-flowered navarretia *Navarretia leucocephala ssp. pauciflora*	FE, ST, Rank 1B.1	Vernal pools (volcanic ash flow). Elevation ranges from 1310 to 2805 feet (400 to 855 meters). Blooms May-Jun.	**No Potential.** The Study Area does not contain vernal pool habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
many-flowered navarretia *Navarretia leucocephala ssp. plieantha*	FE, SE, Rank 1B.2	Vernal pools (volcanic ash flow). Elevation ranges from 95 to 3115 feet (30 to 950 meters). Blooms May-Jun.	**No Potential.** The Study Area does not contain vernal pool habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
small pincushion navarretia *Navarretia myersii ssp. deminuta*	Rank 1B.1	Vernal pools (clay loam). Elevation ranges from 1160 to 1165 feet (355 to 355 meters). Blooms Apr-May.	**No Potential.** The Study Area does not contain vernal pool habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
adobe navarretia *Navarretia nigelliformis ssp. nigelliformis*	Rank 4.2	Valley and foothill grassland vernally mesic, vernal pools sometimes. Elevation ranges from 325 to 3280 feet (100 to 1000 meters). Blooms Apr-Jun.	**Unlikely.** While the Study Area contains grassland habitat, this species typically occurs on clay soils which are absent.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Porter's navarretia *Navarretia paradoxinota*	Rank 1B.3	Meadows and seeps. Elevation ranges from 540 to 2755 feet (165 to 840 meters). Blooms May-Jun(Jul).	**Unlikely.** While the Study Area contains grassland habitat, this species typically occurs on serpentine soils, which are absent.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Marin County navarretia *Navarretia rosulata*	Rank 1B.2	Closed-cone coniferous forest, chaparral. Elevation ranges from 655 to 2085 feet (200 to 635 meters). Blooms May-Jul.	**No Potential.** The Study Area does not contain coniferous forest or chaparral, nor open rocky habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
slender Orcutt grass *Orcuttia tenuis*	FT, SE, Rank 1B.1	Vernal pools. Elevation ranges from 110 to 5775 feet (35 to 1760 meters). Blooms May-Sep(Oct).	**No Potential.** The Study Area does not contain vernal pools.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Howell's broomrape *Orobanche valida ssp. howellii*	Rank 4.3	Chaparral (serpentine or volcanic). Elevation ranges from 590 to 5710 feet (180 to 1740 meters). Blooms Jun-Sep.	**No Potential.** The Study Area does not contain chaparral habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Geysers panicum *Panicum acuminatum var. thermale*	SE, Rank 1B.2	Closed-cone coniferous forest, riparian forest, valley and foothill grassland. Elevation ranges from 1000 to 8105 feet (305 to 2470 meters). Blooms Jun-Aug.	**No Potential.** The Study Area does not contain hot springs.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Sonoma beardtongue *Penstemon newberryi var. sonomensis*	Rank 1B.3	Chaparral (rocky). Elevation ranges from 2295 to 4495 feet (700 to 1370 meters). Blooms Apr-Aug.	**No Potential.** The Study Area does not contain chaparral habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Michael's rein orchid *Piperia michaelii*	Rank 4.2	Coastal bluff scrub, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest. Elevation ranges from 5 to 3000 feet (3 to 915 meters). Blooms Apr-Aug.	**No Potential.** The Study Area does not contain suitable habitat types nor mudstone soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
eel-grass pondweed *Potamogeton zosteriformis*	Rank 2B.2	Marshes and swamps (assorted freshwater). Elevation ranges from 0 to 6100 feet (0 to 1860 meters). Blooms Jun-Jul.	**No Potential.** The Study Area does not contain perennial water.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Lobb's aquatic buttercup *Ranunculus lobbii*	Rank 4.2	Cismontane woodland, north coast coniferous forest, valley and foothill grassland, vernal pools. Elevation ranges from 45 to 1540 feet (15 to 470 meters). Blooms Feb-May.	**Unlikely.** While the Study Area contains grassland habitat, no mesic sites are present.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Lake County stonecrop *Sedella leiocarpa*	FE, SE, Rank 1B.1	Cismontane woodland, valley and foothill grassland, vernal pools. Elevation ranges from 1195 to 2590 feet (365 to 790 meters). Blooms Apr-May.	**Unlikely.** While the Study Area contains grassland habitat, no mesic sites are present. Additionally, the soils are not volcanic.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Cleveland's ragwort *Senecio clevelandii var. clevelandii*	Rank 4.3	Chaparral (serpentine seeps). Elevation ranges from 1195 to 2955 feet (365 to 900 meters). Blooms Jun-Jul.	**No Potential.** The Study Area does not contain chaparral habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Keck's checkerbloom *Sidalcea keckii*	FE, Rank 1B.1	Cismontane woodland, valley and foothill grassland. Elevation ranges from 245 to 2135 feet (75 to 650 meters). Blooms Apr-May(Jun).	**Moderate Potential.** The Study Area contains grassland habitat.	**Not Observed.** This species was not observed during the April site visit. No further recommendations.
marsh checkerbloom *Sidalcea oregana ssp. hydrophila*	Rank 1B.2	Meadows and seeps, riparian forest. Elevation ranges from 3605 to 7545 feet (1100 to 2300 meters). Blooms (Jun)Jul-Aug.	**Unlikely.** The Study Area does not contain meadows or riparian forest.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Kenwood Marsh checkerbloom *Sidalcea oregana ssp. valida*	FE, SE, Rank 1B.1	Marshes and swamps (freshwater). Elevation ranges from 375 to 490 feet (115 to 150 meters). Blooms Jun-Sep.	**Unlikely.** The Study Area does not contain marsh habitat.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Tamalpais jewelflower *Streptanthus batrachopus*	Rank 1B.3	Closed-cone coniferous forest, chaparral. Elevation ranges from 1000 to 2135 feet (305 to 650 meters). Blooms Apr-Jul.	**No Potential.** The Study Area does not contain serpentine soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Socrates Mine jewelflower *Streptanthus brachiatus ssp. brachiatus*	Rank 1B.2	Closed-cone coniferous forest, chaparral. Elevation ranges from 1785 to 3280 feet (545 to 1000 meters). Blooms May-Jun.	**No Potential.** The Study Area does not contain serpentine soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Freed's jewelflower *Streptanthus brachiatus ssp. hoffmanii*	Rank 1B.2	Chaparral, cismontane woodland. Elevation ranges from 1605 to 4005 feet (490 to 1220 meters). Blooms May-Jul.	**No Potential.** The Study Area does not contain serpentine soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
green jewelflower *Streptanthus hesperidis*	Rank 1B.2	Chaparral (openings), cismontane woodland. Elevation ranges from 425 to 2495 feet (130 to 760 meters). Blooms May-Jul.	**No Potential.** The Study Area does not contain serpentine soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Three Peaks jewelflower *Streptanthus morrisonii ssp. elatus*	Rank 1B.2	Chaparral (serpentine). Elevation ranges from 295 to 2675 feet (90 to 815 meters). Blooms Jun-Sep.	**No Potential.** The Study Area does not contain serpentine soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Kruckeberg's jewelflower *Streptanthus morrisonii ssp. kruckebergii*	Rank 1B.2	Cismontane woodland (serpentine). Elevation ranges from 705 to 3395 feet (215 to 1035 meters). Blooms Apr-Jul.	**No Potential.** The Study Area does not contain serpentine soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
early jewelflower *Streptanthus vernalis*	Rank 1B.2	Closed-cone coniferous forest, chaparral. Elevation ranges from 2000 to 2000 feet (610 to 610 meters). Blooms Mar-May.	**No Potential.** The Study Area does not contain serpentine soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
slender-leaved pondweed *Stuckenia filiformis ssp. alpina*	Rank 2B.2	Marshes and swamps (assorted shallow freshwater). Elevation ranges from 980 to 7055 feet (300 to 2150 meters). Blooms May-Jul.	**No Potential.** The Study Area does not contain lake margins.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
marsh zigadenus *Toxicoscordion fontanum*	Rank 4.2	Chaparral, cismontane woodland, lower montane coniferous forest, meadows and seeps, marshes and swamps. Elevation ranges from 45 to 3280 feet (15 to 1000 meters). Blooms Apr-Jul.	**Unlikely.** The Study Area does not contain marsh habitat nor serpentine soils.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
Napa bluecurls *Trichostema ruygtii*	Rank 1B.2	Chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland, vernal pools. Elevation ranges from 95 to 2230 feet (30 to 680 meters). Blooms Jun-Oct.	**Unlikely.** While the Study Area contains grassland habitat, no individuals were observed during the October site visit.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.
saline clover *Trifolium hydrophilum*	Rank 1B.2	Marshes and swamps, valley and foothill grassland (mesic, alkaline), vernal pools. Elevation ranges from 0 to 985 feet (0 to 300 meters). Blooms Apr-Jun.	**Unlikely.** While the Study Area contains grassland habitat, no mesic sites or vernal pools are present.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
oval-leaved viburnum *Viburnum ellipticum*	Rank 2B.3	Chaparral, cismontane woodland, lower montane coniferous forest. Elevation ranges from 705 to 4595 feet (215 to 1400 meters). Blooms May-Jun.	**No Potential.** While the Study Area contains woodland habitat, it is limited in extent and does not have a shrubby understory.	**Not Observed.** This species was not observed during the March, April and/or May survey. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Mammals				
American badger *Taxidea taxus*	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Requires friable soils and open, uncultivated ground. Preys on burrowing rodents.	**Unlikely.** The Study Area is mostly composed of previously disced areas and overall density of prey for badgers is low. Areas adjacent to the Study Area are primarily in agriculture or urban development. No evidence of badger was observed during the site visit. As a result, badgers are unlikely to occur in the Study Area.	No further actions are recommended for this species.
Fisher, west coast DPS *Martes pennanti (formerly Martes pennant pacifica)*	FC, SC (threatened), SSC	Intermediate to large-tree stages of coniferous forests and deciduous-riparian areas with high percent canopy closure. Use cavities, snags, logs and rocky areas for cover and denning. Need large areas of mature, dense forest.	**No Potential.** The project does not contain suitable coniferous forest and is located outside of the species range.	No further actions are recommended for this species.
Fringed myotis *Myotis thysanodes*	WBWG	Associated with a wide variety of habitats including dry woodlands, desert scrub, mesic coniferous forest, grassland, and sage-grass steppes. Buildings, mines and large trees and snags are important day and night roosts.	**Moderate Potential.** The Study Area contains agricultural lands that could provide suitable roosting and foraging for this species. A few trees within the Study Area could provide suitable roosting habitat for this species.	Recommendations for this species can be found in Section 6.3
Hoary bat *Lasiurus cinereus*	WBWG	Prefers open forested habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.	**Moderate Potential.** The Study Area contains patches of small groves and habitat mosaics, with sparse pine and oak trees. Agricultural areas bordering open water and edge habitats along forested areas provide foraging for this species.	Recommendations for this species can be found in Section 6.3

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Long-eared myotis *Myotis evotis*	WBWG	Occurs in semiarid shrublands, sage, chaparral, and agricultural areas, but is usually associated with coniferous forests from sea level to 9000 feet. Individuals roost under exfoliating tree bark, and in hollow trees, caves, mines, cliff crevices, and rocky outcrops on the ground. They also sometimes roost in buildings and under bridges.	**Moderate Potential.** The Study Area contains patches of small groves and habitat mosaics, with sparse pine and oak trees. Agricultural areas bordering open water and edge habitats along forested areas provide foraging for this species.	Recommendations for this species can be found in Section 6.3
Long-legged myotis *Myotis volans*	WBWG	Primarily found in coniferous forests, but also occurs seasonally in riparian and desert habitats. Large hollow trees, rock crevices and buildings are important day roosts. Other roosts include caves, mines and buildings.	**Unlikely.** The Study Area contains dry woodland and agricultural areas that could provide suitable foraging for this species. Typical roosting sites for this species are absent from the site.	No further actions are recommended for this species.
Pallid bat *Antrozous pallidus*	SSC, WBWG	Found in deserts, grasslands, shrublands, woodlands, and forests. Most common in open areas, forages along river channels. Roost sites include crevices in rocky outcrops and cliffs, caves, mines, trees and various human structures such as bridges, barns, and buildings (including occupied buildings). Roosts must protect bats from high temperatures. Sensitive to disturbance of roosting sites.	**Moderate Potential.** The Study Area contains limited roosting habitat in the form of a few sparse trees. Nearby Dry Creek could provide an adequate foraging area and water source.	Recommendations for this species can be found in Section 6.3
Ring-tailed cat (Ringtail) *Bassariscus astutus*	CFP	Widely distributed throughout most of California, absent from some portions of the Central Valley and northeastern California. Found in a variety of habitats throughout the western US including riparian areas, semi-arid country, deserts, chaparral, oak woodlands, pinyon pine woodlands, juniper woodlands and montane conifer forests usually under 1400m in elevation. Typically uses cliffs or large trees for shelter.	**Unlikely.** The sparse trees within the Study Area combined with its setting in an agricultural and urban environment make it unsuitable to support ringtail.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Silver-haired bat *Lasionycteris noctivagans*	WBWG	Primarily a forest dweller, feeding over streams, ponds, and open brushy areas. Summer habitats include a variety of forest and woodland types, both coastal and montane. Roosts in hollow trees, snags, buildings, rock crevices, caves, and under bark.	**Moderate Potential.** The Study Area offers limited roosting habitat in the form of several trees with cavities and exfoliated bark. Nearby Dry Creek offers some potential foraging habitat and a suitable water source for much of the year. The onsite habitat is more open than this species typically prefers.	Recommendations for this species can be found in Section 6.3
Townsend's big-eared bat *Corynorhinus townsendii*	SSC, WBWG	This species is associated with a wide variety of habitats from deserts to mid-elevation mixed coniferous-deciduous forest. Females form maternity colonies in buildings, caves and mines and males roost singly or in small groups. Foraging occurs in open forest habitats where they glean moths from vegetation.	**Unlikely.** The Study Area does not contain buildings, mines or caves that would be suitable for roosting. There are occurrences of this species within five miles of the Study Area (CDFW 2018), so the species may occasionally forage but would not roost in the Study Area.	No further actions are recommended for this species.
Western red bat *Lasiurus blossevillii*	SSC, WBWG	This species is highly migratory and is typically solitary, roosting primarily in the foliage of trees or shrubs. It is associated with broad-leaved tree species including cottonwoods, sycamores, alders, and maples. Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas.	**Moderate Potential.** The Study Area contains very few broad-leaved tree species typically associated with this species. Stream channel, riparian, open water and edge habitats provide foraging for this species. Because this species is migratory, it may occasionally forage or day roost in the Study Area.	Recommendations for this species can be found in Section 6.3
Birds				
Allen's hummingbird *Selasphorus sasin*	BCC	Summer resident along the California coast, breeding in a variety of woodland and forest habitats, including parks and gardens with abundant nectar sources. Nest in shrubs and trees with dense vegetation.	**High Potential.** The Study Area contains woodland and riparian habitats with nectar sources and may support nesting.	Recommendations for this species can be found in Section 6.3

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
American peregrine falcon *Falco peregrinus anatum*	FD, SD, CFP, BCC	Year-round resident and winter visitor. Occurs in a wide variety of habitats, though often associated with coasts, bays, marshes and other bodies of water. Nests on protected cliffs and also on man-made structures including buildings and bridges. Preys on birds, especially waterbirds. Forages widely.	**Unlikely.** The Study Area is in a flat area and does not contain cliffs or man-made structures that would support nesting. The species may occasionally pass over the Study Area but is unlikely to linger and would not nest.	No further actions are recommended for this species.
Bald eagle *Haliaeetus leucocephalus*	FD, SE, CFP, BCC	Occurs year-round in California, but primarily a winter visitor. Nests in large trees in the vicinity of larger lakes, reservoirs and rivers. Wintering habitat somewhat more variable but usually features large concentrations of waterfowl or fish.	**Unlikely.** The Study Area and its immediate vicinity to not contain large reservoirs, lakes or rivers that would support bald eagles. The species may occasionally forage in or near the Study Area, but is unlikely to linger or nest within it.	No further actions are recommended for this species.
San Clemente Spotted towhee *Pipilo maculatus clementae*	BCC	May be found only on Santa Catalina Island. May be extirpated from San Clemente Island. Found in chaparral, brushy thickets, brushy ravines and willow thickets	**No Potential.** The Study Area is outside the breeding range for this species. This species is endemic to the Channel Islands off the southern California coast.	No further actions are recommended for this species.
Wrentit *Chamaea fasciata*	BCC	Occupies coastal scrub, suburban yards, chaparral, parks, oak woodlands, mixed evergreen forests, and thickets along creeks.	**Moderate Potential.** The Study Area contains suitable habitat for this species and the species may nest within it.	Recommendations for this species can be found in Section 6.3
Burrowing owl *Athene cunicularia*	SSC, BCC	Year-round resident and winter visitor. Occurs in open, dry grasslands and scrub habitats with low-growing vegetation, perches and abundant mammal burrows. Preys upon insects and small vertebrates. Nests and roosts in old mammal burrows, most commonly those of ground squirrels.	**Unlikely.** This species does not breed in Lake County (CDFW 2018b, eBird 2018). The species may overwinter in the area, but the Study Area has more trees than habitats typically occupied by burrowing owls. Only a few burrows suitable for burrowing owl occupation were observed during the site visit, and none of these showed any evidence of having been occupied by burrowing owl.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Golden eagle *Aquila chrysaetos*	BCC, CFP	Occurs year-round in rolling foothills, mountain areas, sage-juniper flats, and deserts. Cliff-walled canyons provide nesting habitat in most parts of range; also nests in large trees, usually within otherwise open areas.	**Unlikely.** The Study Area does not contain the open expanses of habitat that golden eagles prefer. Potential prey for the species is limited due to the agricultural and urban setting that is present in and around the Study Area. This species may occasionally fly over the Study Area but is unlikely to linger or nest within it.	No further actions are recommended for this species.
Grasshopper sparrow *Ammodramus savannarum*	SSC	Summer resident. Breeds in open grasslands, generally with low- to moderate-height grasses and scattered shrubs. Well-hidden nests are placed on the ground.	**Unlikely.** The Study Area has only a small area of open grasslands and shrubs are rare. As such, the Study Area would not support this species.	No further actions are recommended for this species.
Lawrence's goldfinch *Spinus (= Carduelis) lawrencei*	BCC	Summer resident; generally uncommon and local. Typically found in arid open woodlands, including oak savannah. Breeding distribution is erratic from year to year.	**Moderate Potential.** The Study Area contains open areas which may support nesting for this species.	Recommendations for this species can be found in Section 6.3
Lewis's woodpecker *Melanerpes lewis*	BCC	Uncommon resident in California occurring on open oak savannahs, broken deciduous and coniferous habitats. Breeds primarily in ponderosa pine forests, riparian woodlands and disturbed pine forests but is also known to nest in orchards and oak woodlands.	**Moderate Potential.** The Study Area contains some oaks and pine trees to support this species, and the Study Area is within the known breeding range of this species (CDFW 2018).	Recommendations for this species can be found in Section 6.3
Loggerhead shrike *Lanius ludovicianus*	BCC, SSC	Year-round resident in open woodland, grassland, savannah and scrub. Prefers areas with sparse shrubs, trees, posts, and other suitable perches for foraging. Preys upon large insects and small vertebrates. Nests are well-concealed in densely-foliaged shrubs or trees.	**Moderate Potential.** The Study Area provides open areas for foraging as well as suitably dense vegetation in scrub and woodland communities to support nesting.	Recommendations for this species can be found in Section 6.3

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Long-eared owl *Asio otus*	SSC	Occurs year-round in California. Nests in trees in a variety of woodland habitats, including oak and riparian, as well as tree groves. Requires adjacent open land with rodents for foraging, and the presence of old nests of larger birds (hawks, crows, magpies) for breeding.	**Moderate Potential.** The Study Area contains riparian habitats adjacent to open lands that could support foraging and nesting.	Recommendations for this species can be found in Section 6.3
Northern spotted owl *Strix occidentalis caurina*	FT, SC, SSC	Year-round resident in dense, structurally complex forests, primarily those with old-growth conifers. . Nests on platform-like substrates in the forest canopy, including in tree cavities. Preys on mammals.	**No Potential.** The Study Area does not contain the dense, old growth coniferous forest this species prefers. The nearest documented occurrence of this species is near Robert Louis Stevenson State Park, 5 miles southwest of the Study Area (CDFW 2018c).	No further actions are recommended for this species.
Nuttall's woodpecker *Picoides nuttallii*	BCC	Year-round resident in lowland woodlands throughout much of California west of the Sierra Nevada. Typical habitat is dominated by oaks; also occurs in riparian woodland. Nests in tree cavities.	**Moderate Potential.** The Study Area contains sparse woodland and tree cavities suitable for nesting.	Recommendations for this species can be found in Section 6.3
Oak titmouse *Baeolophus inornatus*	BCC	Occurs year-round in woodland and savannah habitats where oaks are present, as well as riparian areas. Nests in tree cavities.	**High Potential.** Study Area contains woodland and tree cavities suitable for nesting.	Recommendations for this species can be found in Section 6.3
Olive-sided flycatcher *Contopus cooperi*	SSC, BCC	Summer resident. Typical breeding habitat is montane coniferous forests. At lower elevations, also occurs in wooded canyons and mixed forests and woodlands. Often associated with forest edges. Arboreal nest sites located well off the ground.	**Unlikely.** The Study Area contains sparse woodland and riparian habitats in a lowland position. The species may migrate through the Study Area but is unlikely to linger or nest within it.	No further actions are recommended for this species.
Prairie falcon *Falco mexicanus*	BCC	Year-round resident and winter visitor. Inhabits dry, open terrains, including foothills and valleys. Breeding sites located on steep cliffs. Forages widely.	**Unlikely.** The Study Area does not contain open areas and rocky cliffs that provide potential foraging and nesting habitat for this species.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Purple martin *Progne subis*	SSC	Inhabits woodlands and low elevation coniferous forests. Nests in old woodpecker cavities and human-made structures. Nest is often located in tall, isolated tree or snag.	**Moderate Potential.** The Study Area contains snags and cavities to support nesting, and this species has been documented to nest within 5 miles of the Study Area (CDFW 2018).	Recommendations for this species can be found in Section 6.3
Short-eared owl *Asio flammeus*	SSC	Occurs year-round, but primarily as a winter visitor; breeding very restricted in most of California. Found in open, treeless areas (e.g., marshes, grasslands) with elevated sites for foraging perches and dense herbaceous vegetation for roosting and nesting. Preys mostly on small mammals, particularly voles.	**Unlikely.** The Study Area contains agricultural areas and some grassland that the species could forage in, but it would not nest within it. This species does not breed in Lake County (CDFW 2018, eBird 2018).	No further actions are recommended for this species.
Tricolored blackbird *Agelaius tricolor*	BCC, SSC, ST	Nearly endemic to California, where it is most numerous in the Central Valley and vicinity. Highly colonial, nesting in dense aggregations over or near freshwater in emergent growth or riparian thickets. Also uses flooded agricultural fields. Abundant insect prey near breeding areas essential.	**Unlikely.** The Study Area contains only a narrow riparian without emergent macrophytes. The species may occasionally forage in the agricultural areas within the Study Area but is unlikely to linger.	No further actions are recommended for this species.
Vaux's swift *Chaetura vauxi*	SSC	Summer resident, breeding primarily in forested areas. Nests in tree cavities, favoring those with a large vertical extent; also uses chimneys and other man-made substrates. Forages aerially for insects.	**Unlikely.** The Study Area does not contain the dense coniferous forest this species prefers, and is outside of the known breeding range of the species (CDFW 2018b).	No further actions are recommended for this species.
White-tailed kite *Elanus leucurus*	CFP	Year-round resident in coastal and valley lowlands with scattered trees and large shrubs, including grasslands, marshes and agricultural areas. Nests in trees, of which the type and setting are highly variable. Preys on small mammals and other vertebrates.	**High Potential.** The Study Area provides foraging habitat for this species and large trees and shrubs that may provide suitable nesting substrates (CDFW 2017b).	Recommendations for this species can be found in Section 6.3

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Yellow warbler *Setophaga (Dendroica) petechia brewsteri*	SSC, BCC	Summer resident throughout much of California. Breeds in riparian vegetation close to water, including streams and wet meadows. Microhabitat used for nesting variable, but dense willow growth is typical. Occurs widely on migration.	**Moderate Potential.** The Study Area contains some riparian areas with dense vegetation to support nesting.	Recommendations for this species can be found in Section 6.3
Yellow-breasted chat *Icteria virens*	SSC	Summer resident, occurring in riparian areas with an open canopy, very dense understory, and trees for song perches. Nests in thickets of willow, blackberry, and wild grape.	**Moderate Potential.** The Study Area contains some riparian areas with dense vegetation to support nesting.	Recommendations for this species can be found in Section 6.3
Yellow-headed blackbird *Xanthocephalus xanthocephalus*	SSC	Summer resident. Breeds colonially in freshwater emergent wetlands with dense vegetation and deep water, often along borders of lakes or ponds. Requires abundant large insects such as dragonflies; nesting is timed for maximum emergence of insect prey.	**Unlikely.** Suitable emergent wetlands to support this colonial breeder are absent from the Study Area. This species may occasionally transit or forage in the Study Area but is unlikely to nest or linger within it.	No further actions are recommended for this species.
Reptiles and Amphibians				
California giant salamander *Dicamptodon ensatus*	SSC	Occurs in the north-central Coast Ranges. Moist coniferous and mixed forests are typical habitat; also uses woodland and chaparral. Adults are terrestrial and fossorial, breeding in cold, permanent or semi-permanent streams. Larvae usually remain aquatic for over a year.	**Unlikely.** The Study Area does not contain moist forest typically occupied by this species. Nearby Dry Creek is a wide, intermittent, low gradient stream with warmer water temperatures than is typically associated with this species.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
California red-legged frog *Rana draytonii*	FT, SSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11 to 20 weeks of permanent water for larval development. Associated with quiet perennial to intermittent ponds, stream pools and wetlands. Prefers shorelines with extensive vegetation. Disperses through upland habitats after rains.	**Unlikely.** There are no CNDDB occurrences of the species within 5-miles of the site or in Lake County (CDFW 2018). Dry creek, adjacent to the Study Area, was completely dry during the site visit. The stream does contain water for much of the year, but based on the site visit and aerial imagery, adequate slow water habitats containing emergent are rare or absent. CRLF is unlikely to occur in the Study Area.	No further actions are recommended for this species.
Foothill yellow-legged frog *Rana boylii*	SSC, SC	Found in or near rocky streams in a variety of habitats. Prefers partly-shaded, shallow streams and riffles with a rocky substrate; requires at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis. Feeds on both aquatic and terrestrial invertebrates.	**Moderate Potential.** The species has been documented in adjacent Dry Creek and nearby Putah Creek. (CDFW 2018). The section of Dry Creek that is adjacent to the Study Area was entirely dry during the site visit, but based on aerial imagery probably contains water long enough for the species to reproduce in at least some years.	Recommendations for this species can be found in Section 6.3
Red-bellied newt *Taricha rivularis*	SSC	Inhabits coastal forests from southern Sonoma County northward, with an isolated population in Santa Clara County. Redwood forest provides typical habitat, though other forest types (e.g., hardwood) are also occupied. Adults are terrestrial and fossorial. Breeding occurs in streams, usually with relatively strong flow.	**Unlikely.** The Study Area does not contain suitable redwood or hardwood forest typical of the species habitat requirements. The Study Area is outside the documented range of the species.	No further actions are recommended for this species.
Western pond turtle *Actinemys marmorata*	SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches with aquatic vegetation. Require basking sites such as partially submerged logs, vegetation mats, or open mud banks, and suitable upland habitat (sandy banks or grassy open fields) for egg-laying.	**Moderate Potential.** Adjacent Dry Creek contains suitable habitat for this species for much of the year and pond turtles have been documented nearby (CDFW 2018).	Recommendations for this species can be found in Section 6.3

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Fishes				
Chinook salmon - California coastal ESU *Oncorhynchus tshawytscha*	FT, NMFS	California Coastal Chinook Salmon ESU includes all naturally spawned populations of Chinook salmon from rivers and streams south of the Klamath River (exclusive) to the Russian River (inclusive). Adult numbers depend on pool depth and volume, amount of cover, and proximity to gravel. Water temps >27 degrees C lethal to adults.	**No Potential.** The Study Area does not contain anadromous aquatic habitat necessary to support this species. The Study Area is within the upper Putah Creek Watershed that drains into Lake Berryessa, which forms a complete fish passage barrier for fish returning from the ocean and blocks this species from the Study Area.	No further actions are recommended for this species.
Clear Lake – Russian River roach *Lavinia symmetricus ssp. 4*	SSC	Habitat generalists. Found in warm intermittent streams as well as cold, well-aerated streams.	**Unlikely.** The Study Area is within the upper Putah Creek Watershed that drains into Lake Berryessa. This species is only known for Clear Lake and associated tributaries; which is outside of the Study Area. Roach in the Study Area are within the range and distribution of Central California roach, which are not a special-status species.	No further actions are recommended for this species.
Clear Lake hitch *Lavinia exilicauda chi*	ST, SSC	Found only in Clear Lake, Lake County, and associated ponds. Spawns in streams flowing into Clear Lake. Adults found in the limnetic zone. Juveniles found in the nearshore shallow-water habitat hiding in the vegetation.	**Unlikely.** The Study Area is within the upper Putah Creek Watershed that drains into Lake Berryessa. This species is only known for Clear Lake and associated tributaries; which is outside of the Study Area.	No further actions are recommended for this species.
Clear Lake tule perch *Hysterocarpus traski lagunae*	SSC	Occurs in low elevation streams of the Russian River system. Requires clear, flowing water with abundant cover and deep (> 1 m) pools.	**Unlikely.** The Study Area is within the upper Putah Creek Watershed that drains into Lake Berryessa. This species is only known for Clear Lake and associated tributaries; which is outside of the Study Area. Tule perch is not known for the upper Putah Creek Watershed.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Coho salmon - central CA coast ESU *Oncorhynchus kisutch*	FE, SE, NMFS	Federal listing includes populations between Punta Gorda and San Lorenzo River. State listing includes populations south of San Francisco Bay only. Occurs inland and in coastal marine waters. Requires beds of loose, silt-free, coarse gravel for spawning. Also needs cover, cool water and sufficient dissolved oxygen.	**No Potential.** This species is considered extirpated from San Francisco Bay and associated tributaries, including the greater Sacramento River Watershed. The Study Area does not contain anadromous aquatic habitat necessary to support this species. The Study Area is within the upper Putah Creek Watershed that drains into Lake Berryessa, which forms a complete fish passage barrier for fish returning from the ocean and blocks this species from the Study Area.	No further actions are recommended for this species.
Navarro roach *Lavinia symmetricus navarroensis*	SSC	Occurs only in the Navarro River and its tributaries. Adaptable; found in warm, intermittent streams as well as cold, well-aerated streams.	**Unlikely.** The Study Area is within the upper Putah Creek Watershed that drains into Lake Berryessa. This species is only known for the Navarro River and its tributaries; which is outside of the Study Area.	No further actions are recommended for this species.
Pacific lamprey *Entosphenus (=Lampetra) tridentatus*	SSC	Spawns between March and July in gravel bottomed streams in riffle habitat. Larvae drift downstream to areas of low velocity and fine substrates and are relatively immobile in the stream substrates.	**No Potential.** The Study Area does not contain anadromous aquatic habitat necessary to support this species. The Study Area is within the upper Putah Creek Watershed that drains into Lake Berryessa, which forms a complete fish passage barrier for fish returning from the ocean and blocks this species from the Study Area.	No further actions are recommended for this species.
River lamprey *Lampetra ayresi*	SSC	Lower Sacramento River, San Joaquin River and Russian River. May occur in coastal streams north of San Francisco Bay. Adults need clean, gravelly riffles, Ammocoetes need sandy backwaters or stream edges, good water quality and temps < 25 degrees C.	**No Potential.** The Study Area does not contain anadromous aquatic habitat necessary to support this species. The Study Area is within the upper Putah Creek Watershed that drains into Lake Berryessa, which forms a complete fish passage barrier for fish returning from the ocean and blocks this species from the Study Area.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Russian River tule perch *Hysterocarpus traski pomo*	SSC	Occurs in low elevation streams of the Russian River system. Requires clear, flowing water with abundant cover and deep (> 1 m) pools.	**Unlikely.** The Study Area is within the upper Putah Creek Watershed that drains into Lake Berryessa. This species is only known for the Russian River and its tributaries; which is outside of the Study Area.	No further actions are recommended for this species.
Delta Smelt Hypomesus transpacificus	FT, SE,	Lives in the Sacramento-San Joaquin estuary in areas where salt and freshwater systems meet. Occurs seasonally in Suisun Bay, Carquinez Strait and San Pablo Bay. Seldom found at salinities > 10 ppt; most often at salinities < 2 ppt.	**No Potential.** The Study Area does not contain estuarine habitats and is out of the range of this species.	No further actions are recommended for this species.
Steelhead - Central Valley DPS *Oncorhynchus mykiss*	FT, NMFS	Occurs from the Russian River south to Soquel Creek and Pajaro River. Also in San Francisco and San Pablo Bay Basins. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for 1 or more years before migrating downstream to the ocean.	**Unlikely.** The Study Area does not contain anadromous aquatic habitat necessary to support this species. The Study Area is within the upper Putah Creek Watershed that drains into Lake Berryessa, which forms a complete fish passage barrier for fish returning from the ocean and blocks this species from the Study Area.	No further actions are recommended for this species.
Invertebrates				
California freshwater shrimp *Syncaris pacifica*	FE, SE	Endemic to Marin, Napa, and Sonoma counties. Found in low elevation, low gradient streams where riparian cover is moderate to heavy. Shallow pools away from mainstream flow. Winter: undercut banks with exposed roots. Summer: leafy branches touching water.	**No Potential.** The Study Area does not contain perennial streams and the Study Area is not within the documented range of occurrence for this species.	No further actions are recommended for this species.
Conservancy fairy shrimp *Branchinecta conservation*	FE	Endemic to the grasslands of the northern two-thirds of the Central Valley, found in large, turbid pools. Inhabits astatic pools located in swales formed by old, braided alluvium, filled by winter/spring rains, lasting until June.	**No Potential.** This species has not been documented in Lake County (CDFW 2018a, Erikson and Belk, 1999). Additionally, no vernal pools with soil and/or hydrological characteristics that could support this species were observed within the Study Area.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT	Occurs only in the central valley of California, in association with blue elderberry (*Sambucus mexicana*). Prefers to lay eggs in elderberry 2 to 8 inches in diameter; some preference shown for "stressed" elderberry.	**Unlikely.** The Study Area is located outside of this species' documented range in the Central Valley.	No further actions are recommended for this species.
Vernal pool fairy shrimp *Branchinecta lynchi*	FT	Endemic to the grasslands of the Central Valley, central coast mountains, and south coast mountains, in astatic rain-filled pools. Inhabits small, clear-water sandstone-depression pools, and grassy swales, earth slumps, or basalt-flow depression pools.	**No Potential.** This species has not been documented in Lake County (CDFW 2018a, Erikson and Belk, 1999). Additionally, no vernal pools with soil and/or hydrological characteristics that could support this species were observed within the Study Area.	No further actions are recommended for this species.

***Key to Conservation Status:**

FE	Federal Endangered
FT	Federal Threatened
FC	Federal Candidate
BCC	USFWS Birds of Conservation Concern
SE	State Endangered
ST	State Threatened
SC	State Candidate
SSC	CDFW Species of Special Concern
CFP	CDFW Fully Protected Animal
WBWG	Western Bat Working Group High or Medium Priority Species

The CNPS Inventory of Rare and Endangered Plants (CNPS 2019a)

Rank 1A:	Plants presumed extirpated in California and either rare or extinct elsewhere
Rank 1B:	Plants rare, threatened, or endangered in California and elsewhere
Rank 2A:	Plants presumed extirpated in California, but more common elsewhere
Rank 2B:	Plants rare, threatened, or endangered in California, but more common elsewhere
Rank 3:	Plants about which we need more information – a review list
Rank 4:	Plants of limited distribution – a watch list

****Potential to Occur:**

No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements (cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).

Unlikely. Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.

Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.

High Potential. All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

Present. Species was observed on the site or has been recorded (i.e. CNDDB, other reports) on the site recently.

APPENDIX D

REPRESENTATIVE PHOTOGRAPHS

Photo 1. Photo of Dry Creek in March 2019.

Photo 2. Photo of riparian vegetation in May 2019.

Photo 3. Photo of squirreltail grass grassland in April 2019.

Photo 4. Photo of non-native annual grassland in April 2019.

Photo 5. Photo showing valley oak woodland located in the southwest corner of the Study Area in October 2018.

Photo 6. Photo showing portion of Santa Clara Road located along the eastern boundary of the Study Area.

Photo 7. Photo showing cavities within dead trees which provide potential roosting habitat for birds and bats.

Photo 8. Photo showing level of disking disturbance regularly conducted within the Study Area.

APPENDIX CCWD

CALLAYOMI COUNTY WATER DISTRICT WILL SERVE LETTER

Callayomi County Water District

December 5, 2019

Ms. Michalyn DelValle
Director, Planning Department
County of Lake
255 N. Forbes Street
Lakeport, CA 95453

Re: Maha Santa Clara Subdivision – Middletown, CA

Dear Ms. DelValle:

This is to notify you that the Callayomi Water District (hereinafter referred to as "District") has been requested by Santa Clara Investments (hereinafter referred to as "Developer") to provide water to serve 14 duplexes (28 connections), 21 single family residential services and a community building with swimming pool on APN 014-380-09. Please be advised that based on the preliminary information provided to the District from the Developer regarding this development, the District will be able to provide water service for domestic and fire protection uses to the proposed development, subject to the following conditions:

1. **On-Site Improvements**. Developer shall design and construct, at Developer's sole expense, all water system improvements, modifications and/or corrections on Developer's site, ("the On-Site Improvement(s)") in accordance with Callayomi County Water District Design Standards and Construction Standards, in effect at the time of construction, including:

A. Developer shall submit water system improvement plans and specifications prepared by a Civil Engineer licensed in the State of California to District for District's Design Review and approval.

1) Submittals for Engineering Plan Check shall be made at the District Office.

2) All improvements shall be in accordance with the Lake County Standard Details and Specifications and the Callayomi County Water District Design Standards and Standard Details and District Master Plan. A copy of the District Standard Requirements and Details sheet shall be included in the drawings.

3) Design submittals shall include calculations indicating average and peak use, storage requirements and flow requirements including fire flow. Minimum main size shall be 6 inches. Verification of water main sizes will be dependent on a District-run analysis once design information is provided to the District to verify flows and demands.

Callayomi County Water District
P.O. Box 623
Middletown, CA 95461

4) Backflow Prevention devices will be required in accord with the requirements of the Callayomi Water District Backflow Prevention Ordinance.

5) The applicant shall indicate in writing to the District the disposition of any water well(s) and any other water that may exist within the site. If any wells are proposed to be abandoned, or if they are abandoned and have not been properly sealed, they must be shall be destroyed in accord with State of California Health Department Requirements. If a well is to be retained, the District water service to the property shall be equipped with a Backflow Prevention Device in accord with District Standards.

6) The improvement plans shall show water services to each building.

7) Existing water service laterals shall be abandoned and/or new water laterals shall be constructed in accord with Lake County and District Standards. Meter locations shall be subject to approval by the District.

8) Fire protection shall be in accord with the requirements of Fire Department. With the submittal of the improvement plans, calculations shall be provided to the District and the Fire Department to ensure that adequate water pressures are available to supply hydrant flows and sprinkler flows.

9) The improvement plans shall show fire hydrants installed on new mains at a maximum of 500-foot spacing.

10) All easements for water lines shall be a minimum of 15 ft. All easements shall be shown on the final map. The final map shall be submitted to the District for review of easement information.

11) Plan Check Deposit shall be paid at the time of submittal. Call (707) 987- 2180 for information.

B. Developer shall not commence construction without written approval by District of the proposed water system improvement plans and specifications.

C. Construction of water system improvements shall be subject to inspection and approval by District-designated personnel.

D. During construction, the following conditions shall apply:

1) All construction shall conform to the District Standard Details, the Lake County Standard Specifications and Details, all District Ordinances and the approved plans.

2) The developer shall complete all water improvements, including pressure and bacterial testing prior to connection of any buildings to the District water system.

3) All hydrants shall be covered with bags indicating that the hydrant is not active until flow tests are completed by the District and the hydrants are approved.

4) Prior to final preparation of the subgrade and placement of base materials, all underground water utilities shall be installed and service connections stubbed out behind the sidewalk. Water lines shall be installed in a manner which will not disturb the street pavement, curb, gutter and sidewalk, when future service connections or extensions are made.

5) If the existing District infrastructure is damaged during construction, the contractor/developer shall be responsible for repair at no cost to the District.

6) If, during construction, the contractor damages any existing facilities on the neighboring properties (i.e. fences, gates, landscaping, walls, etc.) contractor shall be responsible to replace all damaged facilities.

E. Project acceptance is contingent upon submission to District of as-built drawings and other documents (the "As-Built Documentation") acceptable to District as to form and content, as indicated by written approval of same. Developer and District may agree to District preparing, at Developer's expense, some or all of As-Built Documentation.

F. Developer shall reimburse District for District's costs of Design Review, Construction Inspection, and preparation and/or review of As-Built Documentation, before final inspection approval.

G. Developer shall not connect On-Site improvements to District's system until District has delivered written notice of acceptance of Developer's Improvements to Developer and any further County final approvals and/or stipulations are met.

H. Only District personnel will operate valves between Developer's Project and District's facilities.

I. District will require a Performance Bond and Warranty Bond for all On-Site Improvement(s), if all such bonds are not required by the County as improvement security, as a condition of filing of the final subdivision map.

1) Developer shall post a Performance Bond in the amount of 100% of the construction cost of the improvements as security for performance and to ensure the eventual completion of said project, or any parts or phases thereof, as a condition of filing of the final subdivision map. Said Performance Bond shall be held until said improvements have been completed to the satisfaction of the District.

2) A One-Year Warranty Bond in the amount of 10% of the final construction cost of the improvements will be required to be held for one year past completion of all phases of the project to protect the District from any defects in materials and workmanship which were not revealed prior to and/or during the final inspection.

J. The applicant shall execute a covenant running with the land on behalf of itself and its successors, heirs, and assigns agreeing to participate in the formation of an assessment district or other financing technique including, but not limited to, the payment of Water mitigation

fees, which the District may implement or adopt, to fund water improvements directly or indirectly affected by the development and agree to waive all rights of protest.

K. All costs, charges and/or fees due the District related to On-Site Improvements shall be paid to the District prior to the filing of the final subdivision map.

2. Off-Site Improvements. Off-Site Improvements may be required to be constructed by the District and/or Developer, as determined by the District. Specific conditions include, but are not limited to:

A. Off-Site Improvements Constructed by District.

1) Developer shall financially participate in the costs of Design, Design Review, Construction, Inspection, and As-Built Documentation, of all water system improvements off Developer's site ("the Off-Site Improvement(s)") made necessary by Developer's Project, whether these costs are incurred by District or District's personnel, District's consultants, by Developer, or by others.

2) Financial Participation will be required to the extent that Developer's Project contributes to the necessity of such Off-Site Improvement(s) and the costs of said improvements exceeds the amount of the Capacity Charges paid by the Developer to District, in District's sole judgment.

3) Said costs, fees and/or charges shall be paid at the time of application to the District and/or prior to the final inspection and approval by District, and/or as otherwise specified by paragraph 3, herein, and prior to the filing of the final subdivision map.

B. Off-Site Improvements Constructed by Developer. Developer shall design and construct Off-Site Improvements, modifications and/or corrections in accordance with Callayomi County Water District Design Standards and Construction Standards, in effect at the time of construction.

1) Developer shall submit water system improvement plans and specifications prepared by a civil engineer licensed in the State of California to District for District's Design Review and approval.

   a. Submittals for Engineering Plan Check shall be made at the District office.

   b. All improvements shall be in accordance with the Lake County Standard Details and Specifications and the Callayomi County Water District Design Standards and Standard Details.

   c. Design submittals shall include calculations indicating average and peak use, storage requirements and flow requirements including fire flow. Minimum main size shall be 6 inches, with final line sizing to be determined by the District based on a water analysis using the District's water model.

d. The improvement plans shall show water services to each building, if necessary, for any off-site water main.

e. Existing water service laterals shall be abandoned and/or new water laterals shall be constructed in accord with Lake County and District Standards. Meter locations shall be subject to approval by the District.

f. Fire protection shall be in accord with the requirements of Fire Department. With the submittal of the improvement plans, calculations shall be provided to the District and the Fire Department to ensure that adequate water pressures are available to supply hydrant flows and sprinkler flows.

g. The improvement plans shall show fire hydrants installed on new mains at a maximum of 500-foot spacing.

h. All easements for water lines shall be a minimum of 15 ft. All easements shall be shown on the final map. Plan Check Deposit shall be paid at the time of submittal. Call (707) 987-2180 for information.

2) Prior to approval of the improvement plans the applicant shall submit evidence that the appropriate public agency (e.g. Lake County, Caltrans, etc.) has issued encroachment permits for all work within public rights-of-way.

3) Developer shall not commence construction without written approval by District of the proposed water system improvement plans and specifications.

4) Construction of Off-Site Improvements shall be subject to inspection and approval by District-designated personnel.

5) During construction, the following conditions shall apply:

a. All construction shall conform to the District Standard Details and Lake County Standard Specifications and Details, all District Ordinances and the approved plans.

b. The developer shall complete all water improvements, including pressure and bacterial testing prior to connection of any buildings to the District water system.

c. All hydrants shall be covered with bags indicating that the hydrant is not active until flow tests are completed by the District and the hydrants are approved.

d. Prior to final preparation of the subgrade and placement of base materials, all underground water utilities shall be installed and service connections stubbed out behind the sidewalk. Water lines shall be installed in a manner which will not disturb the street pavement, curb, gutter and

sidewalk, when future service connections or extensions are made.

e. If the existing District infrastructure is damaged during construction, the contractor/developer shall be responsible for repair at no cost to the District.

f. If, during construction, the contractor damages any existing facilities on the neighboring properties (i.e. fences, gates, landscaping, walls, etc.) contractor shall be responsible to replace all damaged facilities.

6) Project acceptance is contingent upon submission to District of as-built drawings and other documents (the "As-Built Documentation") acceptable to District as to form and content, as indicated by written approval of same. Developer and District may agree to District preparing, at Developer's expense, some or all of As-Built Documentation.

7) Developer shall reimburse District for District's costs of Design Review, Construction Inspection, and preparation and/or review of Off-Site Improvements As-Built Documentation, before final inspection approval.

8) Developer shall not connect Off-Site Improvements to District's system until District has delivered written notice of acceptance of Developer's Improvements to Developer and any further County final approvals and/or stipulations are met.

9) District will require a Performance Bond and Warranty Bond for all Off-Site Improvement(s) if all such bonds are not required by the County as improvement security as a condition of filing of the final subdivision map.

10) Developer shall post a Performance Bond in the amount of 100% of the construction costs as security for performance and to ensure the eventual completion of said project, or any parts or phases thereof, as a condition of filing of the final Subdivision Map. Said Performance Bond shall be held until said improvements have been completed to the satisfaction of the District.

11) A One-Year Warranty Bond in the amount of 10% of the final construction cost will be required to be held for one year past completion of all phases of the project to protect the District from any defects in materials and workmanship which were not revealed prior to and/or during the final inspection.

12) Off-Site Improvements may include some or all of the water sources, water treatment facilities, mainline extensions, piping, storage, and/or other facilities that the District may determine to be made necessary by Developer's Project.

13) All costs, charges and/or fees due the District related to Off-Site Improvements, whether constructed by District or by Developer, shall be made to the District at the time of application to the District, and/or prior to the final inspection and approval by

District, and/or as otherwise specified by paragraph 3, herein, and prior to the filing of the final map.

14) When Off-Site Improvements are required to be constructed or funded by the Developer which the District finds will potentially serve property other than that of the Developer, the Developer will be entitled to reimbursement in an amount determined by the District Board based on the estimated number of water connections which may, in the future, be made by other property owners to the improvements constructed or financed by the Developer, which have capacity in excess of that necessitated by the present development. Refer to Mainline Extension Agreement and District policies regarding same, as/if applicable.

3. Developer Deposits. Developer may be required to post a deposit with the District (in an amount to be determined) for the Districts costs, charges and/or fees incurred relating to this project. Said deposit will be determined on a case-by-case basis and as further set out in the Projects Will-Serve Letter, Supplementary Conditions and/or Service agreement.

4. Developer Payment. Developer shall pay to District the Capacity Charges applicable to Developer's Project based on characteristics of Project, and the service connection fees for each metered and/or un-metered service, in effect at the time of payment of said fees and/or charges, or Project construction approval by the District, which ever comes later.

5. Easements, Surveys and Deeds. Before final inspection and approval of the Project, all necessary Grants of Easement, descriptions, maps, records-of-survey and/or Grant Deeds relating to or conveying interests in real property for facilities to be turned over to District, including such things as tank sites, well sites, access roads and pipeline rights-of-way, as required by the District to the District for the District's water facilities, and/or pipeline, etc., must be submitted to the District for acceptance by the District's Board of Directors and subsequently recorded with the Lake County Recorder's office.

6. Filing the Final Map. No final subdivision map should be filed or approved for this project until the Community Development Department has received written confirmation from the District that the Developer has completed all tasks, paid all required funds, and/or provided a secured agreement ensuring the completion of the District's requirements.

7. Project Specific. This "Will–Serve Letter" is only pertaining to the specific proposed Project and/or tentative subdivision map, now being considered for said Project, including any time extensions thereof, and that said "Will-Serve Letter" expires simultaneously with the expiration of the subject tentative subdivision map, if same expires prior to being approved and made final.

8. Supplementary Conditions. Any Supplementary Conditions attached to this letter become part of and in addition to the foregoing conditions, as applicable. See attachments for Supplementary Conditions that specifically apply to the Project.

9. As-Built Drawings. The District's Engineer or an engineer approved by the District will produce As-Built drawings and documentation at Developer's expense. The As-Built or

Record, improvement plans shall be on standard size sheets and shall be certified by a Civil Engineer licensed in the State of California and returned to the District Engineer's office prior to final acceptance of the public improvement. These shall show all constructive changes from the original plans including substantial changes in the size, alignment, grades, etc. during construction. The As-Built plans shall document elevations, horizontal locations, and exact type of all installed piping, valves, fittings, and other equipment. Fittings documentation shall include whether push-on, mechanical joint, or flanged, and thrust blocks. The As-Built or Record Plan drawings shall be furnished to the District with copies of the construction photographs. The Contractor shall pay a fee for having the District Engineer put the Record Drawings into the District Water Base Map and hydraulic model. The District will be reimbursed by Developer for the cost of any As-Build Drawings generated by District Engineers prior to the approval of each final subdivision map.

10. Exceptions and Variations. Any exceptions or variances from these conditions will require the written approval of the District.

11. Reservations. The District reserves the right to amend this letter to change or supplement the District's requirements for service when the District receives the project's engineered improvement plan or if the Developer undertakes any substantive modification of the project design. The provisions of this letter do not constitute an express or implied contract.

Should you have any questions regarding this readiness to serve letter, please call (707) 987-2180.

Sincerely,

John Hamner
General Manager

APPENDIX CP

CONSTRUCTION IMPLEMENTATION PLAN

Construction Implementation Plan

The following document details the work that will be completed immediately after the EIR process is completed, but before the individual general contractors begin erecting the commercial and hospitality structures. We refer to this as Phase 1A.

Construction Sequencing Plan

- The commercial aspects schedule includes all resort hotel units and accessory amenities, as well as a few model homes with the residential areas.
- The majority of the resort residential and residential villa development will be revolving and dependent on parcel sales and the market.
- The Development Agreement will authorize the sequential residential development.

1.0 Civil Infrastructure Installation:

The first stage of construction will include the development of roads. The figure below depicts the grading of temporary construction roads.

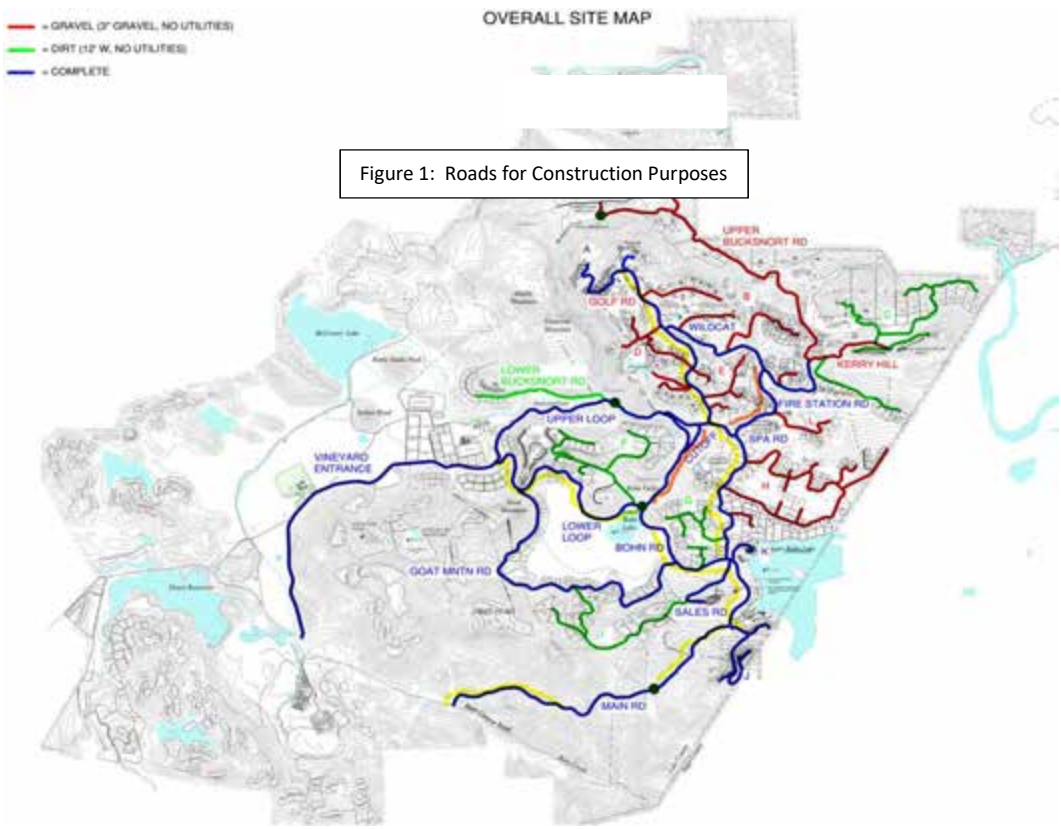


Figure 1: Roads for Construction Purposes

2.0 Site Construction Workforce Plan

2.1 Site Preparation

Construction is proposed to start after the appeals period of the final EIR ends, as early as April 15, 2020. Construction will mobilize with several different dedicated crews to perform the work necessary for the installation of access roads leading to the cluster construction sites.

- 9 Dirt Crews with 8 workers per crew, for an approximate total of 72 site contractors, dedicated to cutting and grading roads, installing sub-base and widening existing roadways where necessary.

    - Upper Loop Road – 2 weeks of work
    - Lower Loop Road
    - Main Entrance – 2 crews, one working from Butts Canyon north and another from the Farmstead Area South
    - New Road from Bohn Lake to the Sales Center
    - Minor Roads and Pads at the Farmstead Village
    - Minor Roads, removing undergrowth and cutting rough contours for the Golf Course Area
    - Minor Roads, grading field and paddock areas and cutting building pads at the Equestrian and Polo Center

- 2 Crews with 8 workers per crew, for an approximate total of 16 workers, dedicated to the preparation and installation of bridges and retaining walls.
- 3 Crew with 8 men per crew, for an approximate total of 24 workers, dedicated to the installation of sub-grade utilities
- 1 Crew with 6 men, dedicated to the on-site rock crushing facility
- 6 Engineers/Project Managers
- The operation will assume normal working hours of 6:00am to 6:00pm, however at times of schedule driven need, the operation work continuously.
- TOTAL: 4 separate crews for a total of 124 site construction personnel

2.2 Rock Crushing Operation:

- The rock crushing operation will continue at the location of the current rock crushing operation currently enclosed as Figure 2 (PLEASE CONFIRM)
- The existing operation will remain at the existing site and will cover approximately 20 acres.
- The produced aggregate and sand will be stored at this site, as well as trucked to the Golf Course and the Equestrian and Polo Center where it will be stock piled for Project use at the site of the future Polo Fields 3, 4 & 5. The aggregate for road base will be dispersed as needed for roadways, while the aggregate to be used for future concrete will be trucked to an on-site concrete batch plant for concrete.
- There will be one diesel powered rock crusher dedicated to producing aggregate rock to be used on site for road base.
- There will be a second diesel powered rock crusher that will be dedicated to producing aggregate for concrete to be used on site, as well as sand to be used on site, primarily at the Golf Course.

2.2.1 Aggregate Wash System:

- Aggregate used for concrete and sand will be washed.
- A new containment pit will be excavated adjacent to the crusher
- The "washing water" will continue the existing operations, which include an existing pit to recycle the wash water. The pit utilizes water that is trucked to the site from an existing well.
  After the water is washed over the aggregate or sand, it will be reclaimed into the adjacent pond, reclaimed and re-used for the wash operation.

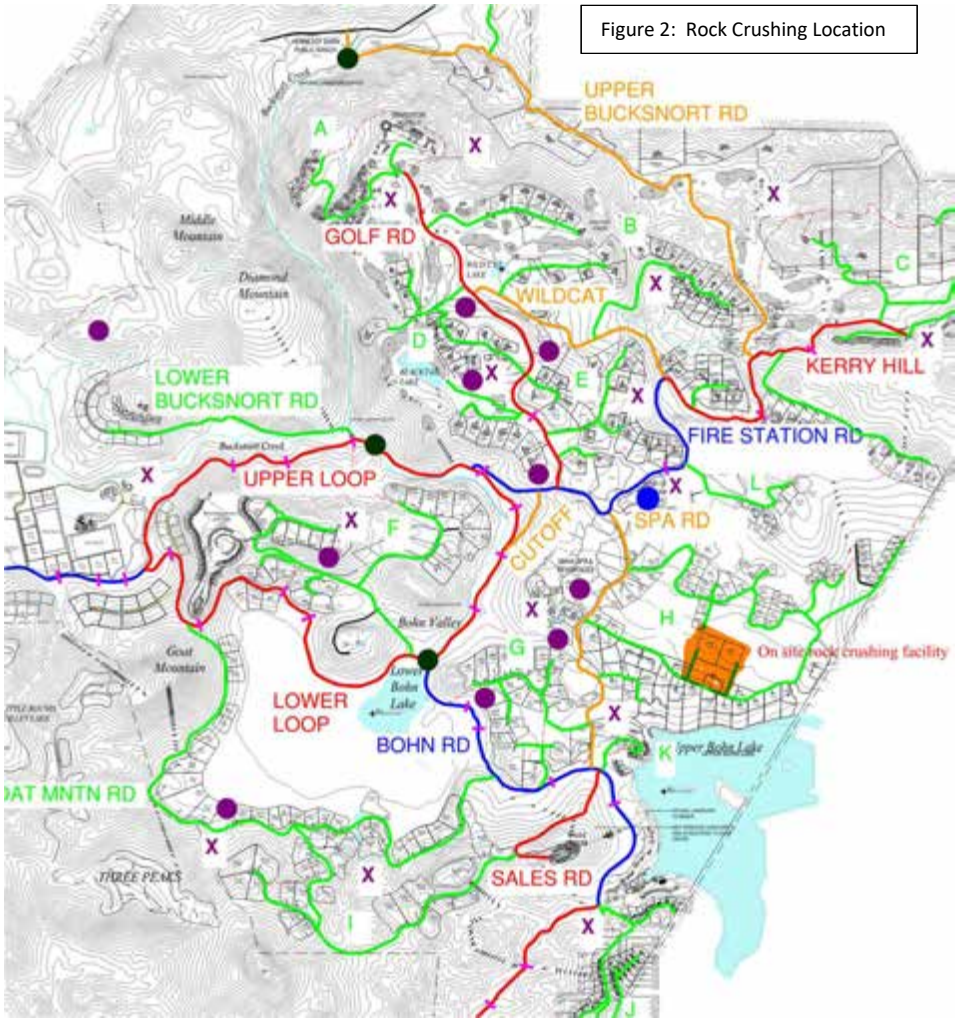


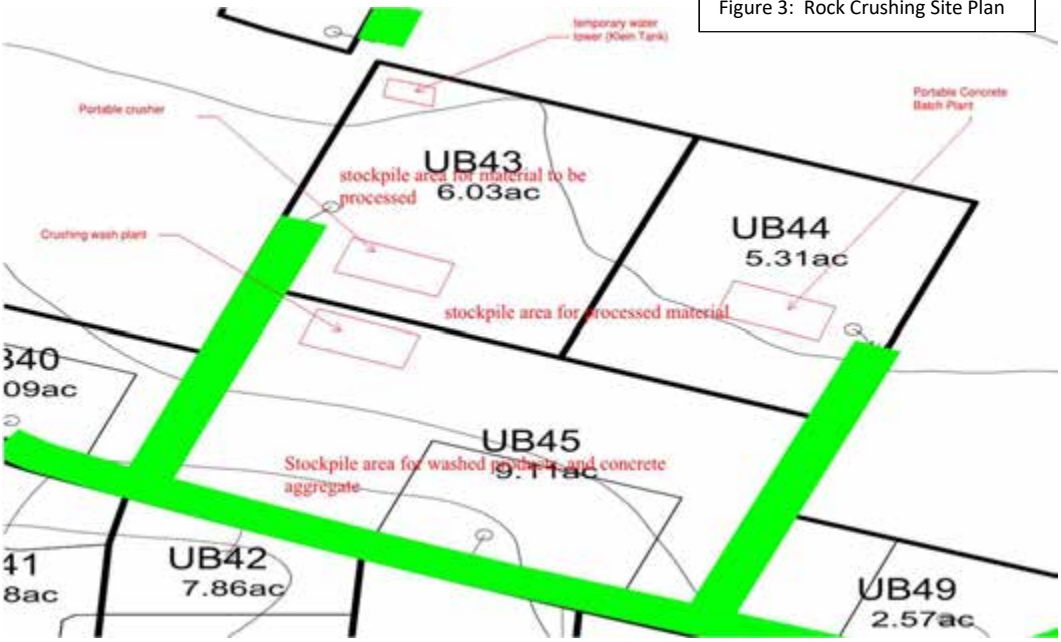
Figure 2: Rock Crushing Location

2.2.2 Rock Crushing Operational Details

- The rock crushing operation will begin approximately in April 2020 and continue until April 2023

- The operation will assume normal working hours of 6:00am to 6:00pm, however at times of schedule driven need, the operation may work continuously.
- The power for the operation will be delivered from a new temporary drop from an existing PG&E power pole adjacent to the site.
- The crushing machines are self-contained diesel powered machines.
- There will be required OSHA safety signage and perimeter lighting.

Figure 3: Rock Crushing Site Plan



3.0 General Contractor Sequencing Plan

- It is anticipated that as many as seven general contractors may be present and operational at the same time at multiple locations throughout the site.
- Receive applicable permits from responsible agencies.
- Notify the Regional Water Quality Control North Coast Region #1 (707) 576-2220 at least 3 days prior to beginning land disturbance
- Installation of construction entrance(s)
- Installation of perimeter controls (e.g. silt fence)
- Site Contractor will grade and clear the building construction area. After initial grading, site contractor will grade and compact each of the building pads. Installation of basins/traps/wattle per the approved SWPPP requirements; areas draining to these structures cannot be disturbed until the structures and permanent drainage associated with these structures are completely installed.
- The delivery and establishment of temporary jobsite power
- Each cluster will designate an area for temporary jobsite mobile storage containers, offices, and mobile toilets Each area will be located within areas previously reviewed for future development.
- The contractor will designate a location within their construction staging area where dumpsters for landfill and recycled waste will be located, within areas for future development

- Temporary lighting will be installed as needed for security within the construction site.

4.0 Construction Workforce Employee Estimation:

- Phase 1A includes construction of the commercial and resort amenities within the five different clusters. It is estimated that each cluster will have approximately 150 workers, for up to 750 workers on the total Project Site.
- The highest concentration of employees on site for phase 1A is estimated to occur between September 2020 and September 2022.
- The project is divided into Phase 1A, 1B and 1C. Market conditions and the absorption rate of residential lot sales will impact the construction commencement dates of phases 1B and 1C. Depending upon the success in attracting sales and ownership, the construction of Phase 1B and 1C will continue from 2023-2030.

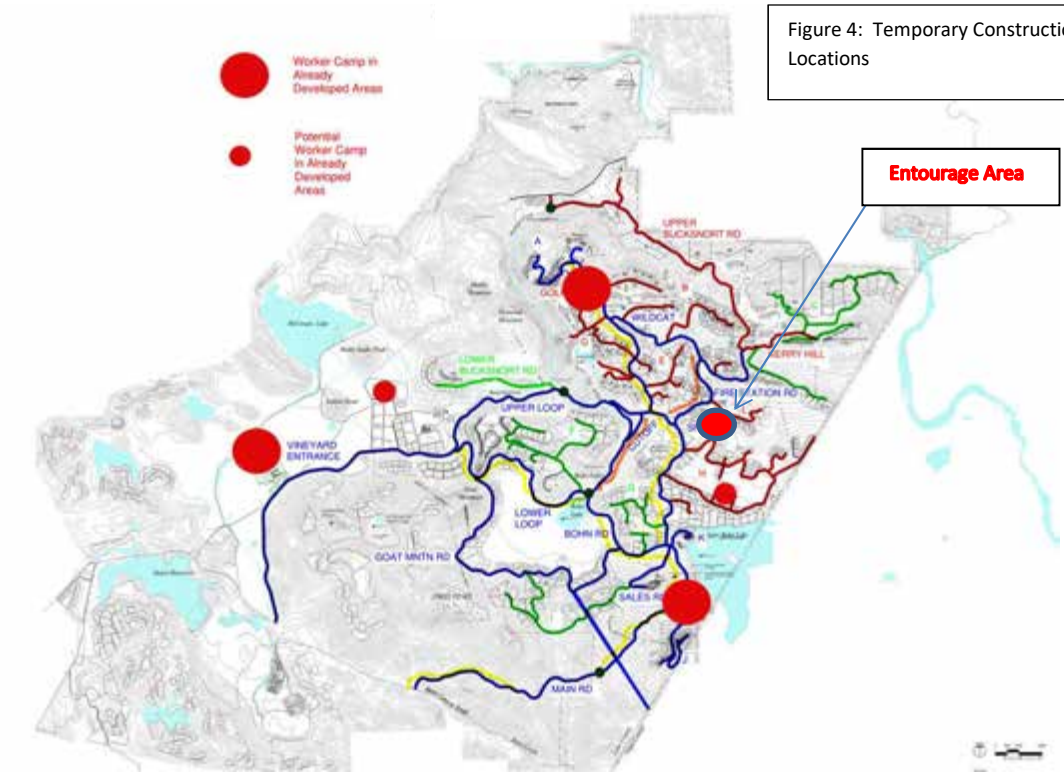


Figure 4: Temporary Construction Camp Locations

5.0 Construction Worker Housing Quantity Needs and Layout:

5.1 For the first two years it is anticipated that the site & general contactors expect to employ a maximum of 750 construction workers. To the extend feasible, it is anticipated that the construction will

rely on the local workforce, allowing our projections to anticipate 50% of the contactors to be from the area. In which case approximately 375 employees will stay onsite in temporary workforce housing.

- It is anticipated that the Civil site contractor Installation will employ approximately 132 crew members. It is anticipated that half of these employees will stay on site and sleep in modular housing or camper trailers. The other half of the employees, if they live near by the construction site, will return to their homes nightly.
- The work operation is anticipated to be a 10 hour days 6 days a week.
- Where needed during potential night work, site lighting will be utilized in order to maintain a safe worksite operation.
- All SWPPP protocols will be adhered to.
- There will be an Owner employed SWPPP oversite organization employed to monitor adherence to regulations.
- It is anticipated that the General Contractors hired to build the hospitality components of the development, will employ approximately 375-650 crew members, at any given time. It is anticipated that over half of these employees will stay on site and sleep in modular housing or camper trailers. The remainder of the employees, if they live near by the construction site, will return to their homes nightly.
- A system of rolling start times may be implemented during periods when high numbers of construction crews are working on the development site. Although all employees will be encouraged to reside in one of the modular or portable housing options, the impact of cars entering and leaving the site will be mitigated by rolling start and stop times.

5.2 On site workforce housing will consist of temporary trailers on wheels or temporary foundations, within previously dedicated development areas.

5.3 Water

5.4 Electrical

5.5 Temporary Sewer

5.6 Safety & Security

6.0 Workforce traffic circulation plan:

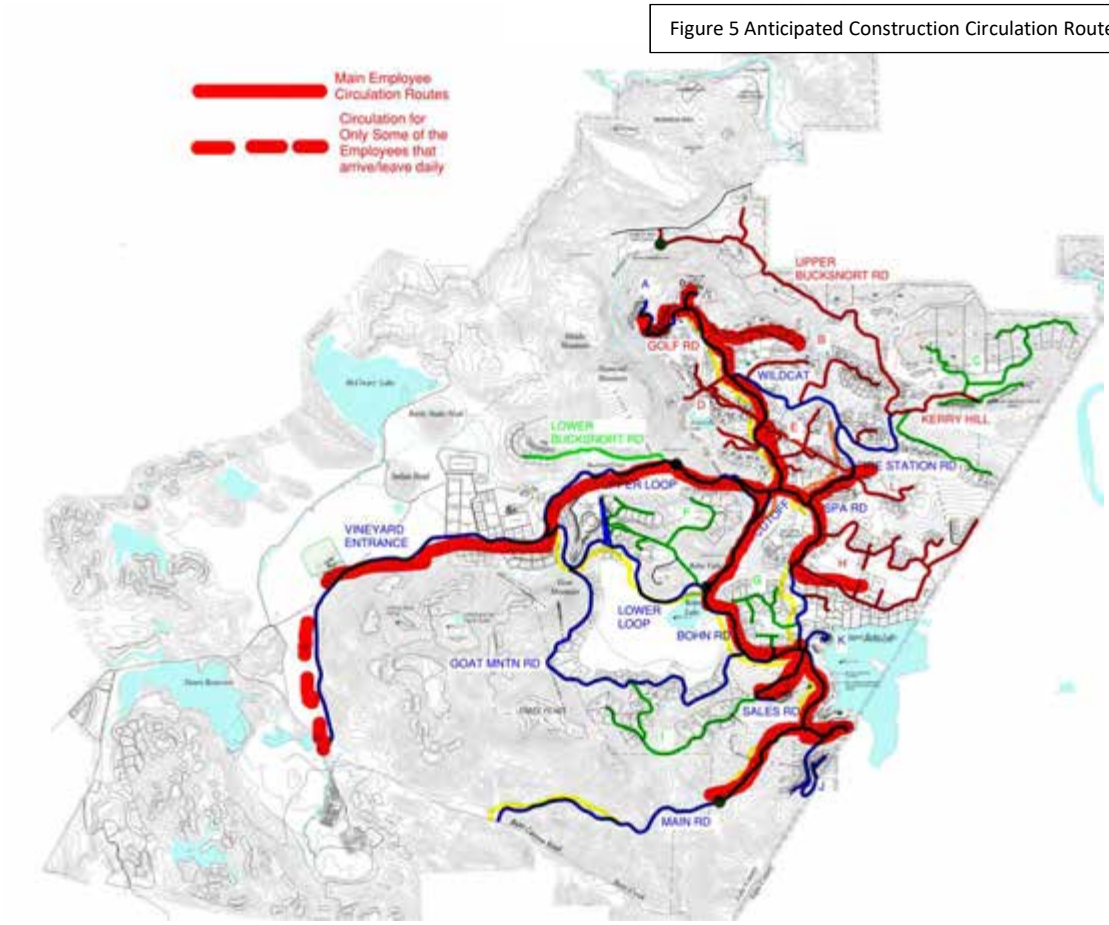
6.1 All contractors using their own car will enter through a central location at the Back of House. A system of rolling start times may be implemented during periods when high numbers of construction crews are working on the development site.

6.2 There will be a team of traffic flag operators both at the Back of House Operations Center and at the Intersection of the Vineyard Entrance Road and Butts Canyon Road.

6.3 As construction trucks leave either the Vineyard Entrance Road there will be procedures implemented for truck tire dirt containment.

6.4 During periods of construction vehicle impact, the new Main Entrance Road may be continually sprayed, as to contain dust and debris.

Figure 5 Anticipated Construction Circulation Route



7.0 Site Lighting and Power:

- Depending upon the location and needs of the site, and to the extent that technology allows feasibility, solar generators will be used. In addition, diesel powered small, medium and large generators as well as temporary connections to existing PG&E power poles will be utilized. All Air Quality Management Permits will be applied for and obtained prior to construction start dates.
- During the construction phase 1A, beginning in 2020 until September of 2023, there will be temporary down light construction lighting for safety and security in various areas. Road intersections may be illuminated by over-head lighting. The worker construction camps may be lit by over-head pole lighting, string lighting, ground lighting and/or lighting on the modular structures.
- In areas of night time operations, temporary construction lighting will be utilized, either from the ground or elevated on poles.
- Security lighting may be utilized at locations of stored materials to ensure against theft.

8.0 Construction Water, Potable Water, Waste Water and Portable Sanitary Facilities:

8.1 Depending upon the location and needs of the site, non potable water will be used during the construction of roads, for dust mitigation and for potable drinking water.

8.2 In certain instances, potable drinking water may be delivered to certain areas of the site by truck for drinking purposes

8.3 There will be portable toilets located at various locations throughout the areas of construction on the site. These facilities will be regularly maintained, and the resulting effluence will be trucked from the site and treated at an appropriate waste treatment facility located off of the site.

9.0 Access Restrictions and Site Security:

9.1 Employee safety is a priority to the MAHA group. There will be a security check point installed on the Vineyard Entrance Road, between the Back of House Operation/Construction Camp Location and the future Equestrian Center. There may be a secondary security check point installed, as necessary on the Vineyard Entrance Road before the Back of House Operation Location.

9.2 When the Main Entrance onto Butts Canyon Road becomes passable or operational, an additional security check point will be installed and will remain operational until the installation of the permanent Entry and Checkpoint are operational.

9.3 All contractor employees will only permitted on site after successful completion of an OCIP safety and procedural course.

9.4 All contractor employees will be required to complete a background evaluation.

9.5 All contractor employees will be required to obtain, carry and display digital badge technology and present these in order to pass any security check points on the site.

10.0 Parking arrangements:

Contractors, Engineers, Inspectors and their employees are being encouraged to house their out of town employees in the construction camps that will be available. There will be employee parking located adjacent to the employee camps. Employees will be encouraged to consolidate vehicles and to carpool. Employees will be shuttled throughout the site by trucks.

11.0 Removal of debris and materials off site

- California law requires businesses and other public entities to recycle as much of the waste they generate as possible. Best practices will be employed as far as may be practical when dealing with organic materials generated on site, in the effort to retain and compost on site. However, there will be instances where organic material may need to be removed from the site and transported to a commercial green recycling center.
- To the extent feasibly possible, all construction debris will be sorted and disposed of, resulting in the majority recycled by C&S Waste Solutions, who services Lake County.

12.0 Material delivery, storage and security

- The initial point of delivery for construction materials will be the Back of House/Construction Operation.
- Items to be stored will be offloaded at this location and stored in secure warehouse accommodations at this site. Larger delivery items such as pre-fabricated building components, lumber and drywall deliveries will be trucked directly on MAHA roads to the building erection location.
- General Contractors will be encouraged to supply and secure modular storage facilities at each of the building sites.
- Traffic dependent, some larger deliveries of materials to the site may occur outside of the normal 6:00am to 6:00pm time frame.
- Hazardous materials, such as gasoline, diesel and propane will be delivered to the various construction building sites, by licensed operators fully in accordance with both California and Lake County regulations.

13.0 Fire and Emergency Plan

- The Standard Operating Procedure for Fire Prevention and Protection will be in place before construction starts, and will be approved by Cal Fire.
- The Emergency Plan and Procedures will be provided to every contracting firm before they will be allowed to enter the site.
  A temporary map will be provided for all contractors entering the site.

APPENDIX CULT

CULTURAL RESOURCES STUDY INFORMATION
(CONFIDENTIAL INFORMATION REMOVED)

From:	Mark Roberts
To:	Ryan Sawyer
Subject:	FW: Notice of Preparation of an EIR for the proposed Guenoc Valley Mixed Use-Planned Development
Date:	Monday, December 16, 2019 3:25:46 PM
Attachments:	Notice of Preparation of an EIR for the proposed Guenoc Valley Mixed Use-Planned Development.pdf
Importance:	High

From: Mark Roberts
Sent: Wednesday, April 24, 2019 12:03 PM
To: 'nahc@nahc.ca.gov' <nahc@nahc.ca.gov>; 'cww281@gmail.com' <cww281@gmail.com>; 'env.tech.elem@gmail.com' <env.tech.elem@gmail.com>; 'a.garcia@elemindiancolony.org' <a.garcia@elemindiancolony.org>; 'kkarolaepa@gmail.com' <kkarolaepa@gmail.com>; 'aarroyosr@hpultribe-nsn.gov' <aarroyosr@hpultribe-nsn.gov>; 'lrosas@hpultribe-nsn.gov' <lrosas@hpultribe-nsn.gov>; 'kn@koination.com' <kn@koination.com>; 'tc@middletownrancheria.com' <tc@middletownrancheria.com>; 'jsimon@middletownrancheria.com' <jsimon@middletownrancheria.com>; 'THPDNotices@middletownrancheria.com' <THPDNotices@middletownrancheria.com>; 'btorres@middletownrancheria.com' <btorres@middletownrancheria.com>; 'speterson@middletownrancheria.com' <speterson@middletownrancheria.com>; 'admin@rvrpomo.net' <admin@rvrpomo.net>; 'drogers@robinsonrancheria.org' <drogers@robinsonrancheria.org>; 'terre.logsdon@sv-nsn.gov' <terre.logsdon@sv-nsn.gov>; 'thomas.jordan@sv-nsn.gov' <thomas.jordan@sv-nsn.gov>; 'lbill@yochadehe-nsn.gov' <lbill@yochadehe-nsn.gov>; 'rrouse@yochadehe-nsn.gov' <rrouse@yochadehe-nsn.gov>; 'jkinter@yochadehe-nsn.gov' <jkinter@yochadehe-nsn.gov>; 'aroberts@yochadehe-nsn.gov' <aroberts@yochadehe-nsn.gov>
Cc: Byron Turner <Byron.Turner@lakecountyca.gov>; Michalyn DelValle <Michalyn.DelValle@lakecountyca.gov>
Subject: Notice of Preparation of an EIR for the proposed Guenoc Valley Mixed Use-Planned Development
Importance: High

Hello Tribal Members,

This email is in regards to the Notice of Preparation of an Environmental Impact Report (EIR) for the proposed Guenoc Valley Mixed Use-Planned Development. The above attachment is a detailed Notice of Preparation Packet regarding the proposed use for you to review and provide the necessary comments. Please keep in mind, the commenting period is from April 23, 2019 through May 23, 2019. Please disregard the previous email sent on April 23, 2019 and use the above attachments when reviewing and commenting on the proposed project. We look forward to hearing from you. If you have any questions, please let me know.

Sincerely,

Mark Roberts – Senior Planner

_____

Lake County – Community Development Department
255 N. Forbes Street, Lakeport, CA 95453
County Website: www.lakecountyca.gov
Phone: (707) 263-2221

From: Mark Roberts
Sent: Tuesday, April 23, 2019 5:53 PM
To: 'nahc@nahc.ca.gov' <nahc@nahc.ca.gov>; 'cww281@gmail.com' <cww281@gmail.com>; 'env.tech.elem@gmail.com' <env.tech.elem@gmail.com>; 'a.garcia@elemindiancolony.org' <a.garcia@elemindiancolony.org>; 'kkarolaepa@gmail.com' <kkarolaepa@gmail.com>; 'aarroyosr@hpultribe-nsn.gov' <aarroyosr@hpultribe-nsn.gov>; 'lrosas@hpultribe-nsn.gov' <lrosas@hpultribe-nsn.gov>; 'kn@koination.com' <kn@koination.com>; 'tc@middletownrancheria.com' <tc@middletownrancheria.com>; 'jsimon@middletownrancheria.com' <jsimon@middletownrancheria.com>; 'THPDNotices@middletownrancheria.com' <THPDNotices@middletownrancheria.com>; 'btorres@middletownrancheria.com' <btorres@middletownrancheria.com>; 'speterson@middletownrancheria.com' <speterson@middletownrancheria.com>; 'admin@rvrpomo.net' <admin@rvrpomo.net>; 'drogers@robinsonrancheria.org' <drogers@robinsonrancheria.org>; 'terre.logsdon@sv-nsn.gov' <terre.logsdon@sv-nsn.gov>; 'thomas.jordan@sv-nsn.gov' <thomas.jordan@sv-nsn.gov>; 'lbill@yochadehe-nsn.gov' <lbill@yochadehe-nsn.gov>; 'rrouse@yochadehe-nsn.gov' <rrouse@yochadehe-nsn.gov>; 'jkinter@yochadehe-nsn.gov' <jkinter@yochadehe-nsn.gov>; 'aroberts@yochadehe-nsn.gov' <aroberts@yochadehe-nsn.gov>
Cc: Michalyn DelValle <Michalyn.DelValle@lakecountyca.gov>; Byron Turner <Byron.Turner@lakecountyca.gov>
Subject: Notice of Preparation of an EIR for the proposed Guenoc Valley Mixed Use-Planned Development
Importance: High

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Sincerely,

Mark Roberts – Senior Planner

Lake County – Community Development Department

255 N. Forbes Street, Lakeport, CA 95453
County Website: www.lakecountyca.gov
Phone: (707) 263-2221

From: Mary Camp
To: Mark Roberts
Subject: RE: Notice of Preparation of an EIR for the proposed Guenoc Valley Mixed Use-Planned Development
Date: Wednesday, April 24, 2019 2:34:26 PM

Redwood Valley thanks you for the notice. We would defer to any review, comments or concerns from Middletown Rancheria. This is a very large project and needs to be carefully studied.

From: Mark Roberts [mailto:Mark.Roberts@lakecountyca.gov]
Sent: Wednesday, April 24, 2019 12:03 PM
To: nahc@nahc.ca.gov; cww281@gmail.com; env.tech.elem@gmail.com; a.garcia@elemindiancolony.org; kkarolaepa@gmail.com; aarroyosr@hpultribe-nsn.gov; lrosas@hpultribe-nsn.gov; kn@koination.com; tc@middletownrancheria.com; jsimon@middletownrancheria.com; THPDNotices@middletownrancheria.com; btorres@middletownrancheria.com; speterson@middletownrancheria.com; admin@rvrpomo.net; drogers@robinsonrancheria.org; terre.logsdon@sv-nsn.gov; thomas.jordan@sv-nsn.gov; lbill@yochadehe-nsn.gov; rrouse@yochadehe-nsn.gov; jkinter@yochadehe-nsn.gov; aroberts@yochadehe-nsn.gov
Cc: Byron Turner <Byron.Turner@lakecountyca.gov>; Michalyn DelValle <Michalyn.DelValle@lakecountyca.gov>
Subject: Notice of Preparation of an EIR for the proposed Guenoc Valley Mixed Use-Planned Development
Importance: High

Hello Tribal Members,

This email is in regards to the Notice of Preparation of an Environmental Impact Report (EIR) for the proposed Guenoc Valley Mixed Use-Planned Development. The above attachment is a detailed Notice of Preparation Packet regarding the proposed use for you to review and provide the necessary comments. Please keep in mind, the commenting period is from April 23, 2019 through May 23, 2019. Please disregard the previous email sent on April 23, 2019 and use the above attachments when reviewing and commenting on the proposed project. We look forward to hearing from you. If you have any questions, please let me know.

Sincerely,

Mark Roberts – Senior Planner

Lake County – Community Development Department
255 N. Forbes Street, Lakeport, CA 95453
County Website: www.lakecountyca.gov
Phone: (707) 263-2221

From: Mark Roberts
Sent: Tuesday, April 23, 2019 5:53 PM
To: 'nahc@nahc.ca.gov' <nahc@nahc.ca.gov>; 'cww281@gmail.com' <cww281@gmail.com>; 'env.tech.elem@gmail.com' <env.tech.elem@gmail.com>; 'a.garcia@elemindiancolony.org' <a.garcia@elemindiancolony.org>; 'kkarolaepa@gmail.com' <kkarolaepa@gmail.com>; 'aarroyosr@hpultribe-nsn.gov' <aarroyosr@hpultribe-nsn.gov>; 'lrosas@hpultribe-nsn.gov' <lrosas@hpultribe-nsn.gov>; 'kn@koination.com' <kn@koination.com>; 'tc@middletownrancheria.com' <tc@middletownrancheria.com>; 'jsimon@middletownrancheria.com' <jsimon@middletownrancheria.com>; 'THPDNotices@middletownrancheria.com' <THPDNotices@middletownrancheria.com>; 'btorres@middletownrancheria.com' <btorres@middletownrancheria.com>; 'speterson@middletownrancheria.com' <speterson@middletownrancheria.com>; 'admin@rvrpomo.net' <admin@rvrpomo.net>; 'drogers@robinsonrancheria.org' <drogers@robinsonrancheria.org>; 'terre.logsdon@sv-nsn.gov' <terre.logsdon@sv-nsn.gov>; 'thomas.jordan@sv-nsn.gov' <thomas.jordan@sv-nsn.gov>; 'lbill@yochadehe-nsn.gov' <lbill@yochadehe-nsn.gov>; 'rrouse@yochadehe-nsn.gov' <rrouse@yochadehe-nsn.gov>; 'jkinter@yochadehe-nsn.gov' <jkinter@yochadehe-nsn.gov>; 'aroberts@yochadehe-nsn.gov' <aroberts@yochadehe-nsn.gov>
Cc: Michalyn DelValle <Michalyn.DelValle@lakecountyca.gov>; Byron Turner <Byron.Turner@lakecountyca.gov>
Subject: Notice of Preparation of an EIR for the proposed Guenoc Valley Mixed Use-Planned Development
Importance: High

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Sincerely,

Mark Roberts – Senior Planner

Lake County – Community Development Department
255 N. Forbes Street, Lakeport, CA 95453
County Website: www.lakecountyca.gov
Phone: (707) 263-2221

YOCHA DEHE
CULTURAL RESOURCES

May 9, 2019

County of Lake
Community Development Dept.
Attn: Michalyn DelValle, Director
255 N. Forbes Street
Lakeport, CA 95453

RE: Guenoc Valley Mixed-Use Planned Development

Dear Ms. DelValle:

Thank you for your project notification letter dated, April 23, 2019, regarding cultural information on or near the proposed Guenoc Valley Mixed-Use Planned Development, Lake County. We appreciate your effort to contact us.

The Cultural Resources Department has reviewed the project and concluded that it is not within the aboriginal territories of the Yocha Dehe Wintun Nation. Therefore, we respectively decline any comment on this project. However based on the information provided, please defer correspondence to the following:

Middletown Rancheria
Attn: Larry Longee, THPO
PO Box 1035
Middletown, CA 95461

Please refer to identification number YD – 04232019-04 in any future correspondence with Yocha Dehe Wintun Nation concerning this project.

Thank you for providing us with this notice and the opportunity to comment.

Sincerely,

Isaac Bojorquez
Interim Director of Cultural Resources

RECEIVED
MAY 17 2019
LAKE COUNTY COMMUNITY
DEVELOPMENT DEPT.

Yocha Dehe Wintun Nation
PO Box 18 Brooks, California 95606 p) 530.796.3400 f) 530.796.2143 www.yochadehe.org

Middletown Rancheria
Tribal Historic Preservation Department
P.O. Box 1035
Middletown, CA 95461

May 23, 2019 Via Electronic Mail

Ms. Michalyn DelValle, Director
County of Lake
Community Development Department
255 N. Forbes Street
Lakeport, CA 95453
Via Email: Michalyn.Delvalle@lakecountyca.gov

Subject: Notice of Preperation of an Environmental Impact Report for the proposed Guenoc Valley Mixed-Use Planned Development Project
MTR THPD File No. 19-04-023

Dear Ms. DelValle:

The Middletown Rancheria ("Tribe") is in receipt of your notification dated April 23, 2019 regarding the above referenced matter. The Project site and its surrounding landscape have since time immemorial been considered a site of cultural, historical, and religious significance for the Tribe. The Tribe is aware of and concerned about significant cultural and sacred resources that, while known to the Tribe, may not be properly identified through record and survey searches. Moreover, the potential for cumulative impacts to tribal cultural resources must be adequately assessed.

Due to the high likelihood of disturbing tribal cultural resources which include, but is not limited to, Native American human remains, funerary objects, items or artifacts, sites, features, places, landscapes or objects with cultural values to the Tribe, during the Project, the Middletown Rancheria is requesting to be an active participant in all aspects of the Project and development of the Environmental Impact Report (EIR).

We request that all notices and documents be mailed or personally delivered to the Tribe with an electronic copy provided, as early as possible to allow the Tribe adequate time to provide information and to facilitate meaningful consultation to ensure protection and mitigation of tribal cultural resources.

This correspondence is without prejudice to any rights and remedies of the Tribe, all of which are expressly reserved.

We appreciate your time and consideration on this matter. Please contact as soon as possible to discuss next steps.

Thank you.

Larry Longee, Jr.
THPO Director
llongee@middletownrancheria.com
Cell: (707) 230-1031

CC: Tribal Council
Project File No. 19-04-023

COUNTY OF LAKE
COMMUNITY DEVELOPMENT DEPARTMENT
Planning Division
Courthouse - 255 N. Forbes Street
Lakeport, California 95453
Telephone 707/263-2221 FAX 707/263-2225

TRIBAL CONSULTATION REQUEST
SB-18 & AB-52

Dear Tribal Representative:

The Lake County (County) Community Development Department has received a project application for the Guenoc Valley Mixed-Use Planned Development Project (Proposed Project) and is initiating contact with Native American tribes that are understood to be traditionally, culturally, and/or geographically affiliated with the project area pursuant to the statutory requirements of Senate Bill 18 (SB 18), Assembly Bill 52 (AB 52) (Chapter 532, Statutes of 2014), and Section 21080.3.1 of the California Public Resources Code (PRC). We are hereby notifying you of an opportunity to consult with the County regarding the potential for the Proposed Project to impact Tribal Cultural Resources, as defined in Section 21074 of the PRC. The purposes of tribal consultation under AB 52 are to determine, as part of the CEQA review process, whether or not Tribal Cultural Resources are present within the project area, and if so, whether or not those resources will be significantly impacted by the project. If Tribal Cultural Resources may be significantly impacted, then consultation will also help to determine the most appropriate way to avoid or mitigate those impacts. Additionally, SB 18 requires that, prior to adopting an amendment to the general plan, the County must consult with Native American tribes with respect to the possible preservation of, or the mitigation of impacts to, Native American places, features, and objects.

Below please find a description of the Proposed Project, a map showing the project location, and the name of our project point of contact, pursuant to PRC § 21080.3.1 (d). The information provided on this form is general and summary in nature. Please review the additional information included with this emailing, including the Notice of Preparation of the Environmental Impact Report for the Proposed Project, and contact the Department or the project planner for more detail if needed.

While PRC § 21080.3.1 (b)allows Native American tribes 30 days from the receipt of a notification letter to request consultation with the County related to impacts to Tribal Cultural Resources resulting the Proposed Project, SB-18 allows 90 days to request consultation for projects that will amend the General Plan. **The County requests that responses for consultation requests under both SB18 and AB52 be received within 90 days of receipt of this letter.**

REQUEST: The Applicant has requested the following entitlements and approvals from the County associated with the Proposed Project:

- Amendment to the General Plan and Special Study Area map of the Middletown Area Plan to include the area commonly known as the college parcels (GPAP 18-01)
- Zoning Ordinance Amendment to introduce a new zoning district to allow for future uses, Guenoc Valley District ("GVD"), to implement the goals of the Special Study Area, and subsequently rezoning of the Project Site from Rural Lands, Agriculture, Rural Residential, and an Agricultural Protection Zone to GVD (AM 18-04; RZ 18-01)
- Use Permit for the Specific Plan of Development (Master Development Plan) for the first phase (UP 18-01)
- Tentative Subdivision Maps for the first phase (SD 18-01)
- General Plan of Development (GPD 18-01)

- Development Agreement (DA 18-01)Environmental Impact Report (EIR 18-01);
- Grading permit for Installation of water line; and
- Tentative Subdivision Map for off-site workforce housing.

APPLICANT: Lotusland Investment Holdings, Inc.
One Embarcadero Center Suite 730
San Francisco, CA 94111

LOCATION: The **Guenoc Valley Ranch property (Project Site)** is located in southeast Lake County and is approximately bounded by Long Valley and Coyote Valley to the west, a U.S. Coast Guard LORAN station military reservation to the northwest, the Cedar Mountains to the north, the Lake County limits to the east. The Project Site is located approximately three miles east of State Route (SR) 29 and 13 miles west of SR 16. Butts Canyon Road bisects the southern portion of the Project Site. The **Off-site Workforce Housing Site** is located at 21000 Santa Clara Road in Middletown.

APNs: **Project Site:** 013-015-28, -29; 013-016-04, -05, -06, -08; 013-019-05, -09; 013-021-05, -06, -09, -10; 013-022-01, -02, -05, -08, -09, -11, -12, -13, -15, -14; 013-023-06, -07, -09, -10, -11, -12, -13, -14, -15; 013-024-10, -12, -28, -29, -30, -33, -34; 013-053-01; 014-004-25; 014-310-06, -07, -08, -09; 014-320-06, -08; 014-330-08, -09; 014-340-04. **Off-site Workforce Housing Site:** 014-380-09.

ZONING: CURRENT:
Project Site: Agriculture (A), Rural Lands (RL), and Rural Residential (RR). **Off-site Workforce Housing Site:** Single Family Residential (R1).

PROPOSED:
Project Site: Guenoc Valley District (GVD). **Off-site Workforce Housing Site:** Single Family Residential (R1).

PARCEL SIZE: **Project Site:** All 49 parcels combined equal approximately 16,000 acres. **Off- site Workforce Housing Site:** Approximately 12.75 acres.

EXISTING ACCESS: **Project Site:** Access is provided by SR 29 via Butts Canyon Road to the northwest. Six access points exist along Butts Canyon Road as it transects the Project Site. **Off-site Workforce Housing Site:** Access to the site is provided by Highway 175 via Santa Clara Road.

PROPOSAL: The Proposed Project consists of the development of a master planned mixed-use resort and residential community within the 16,000-acre Guenoc Valley Ranch property (Project Site) in southeast Lake County, off-site workforce co-housing (Off-site Workforce Housing) located in central Middletown (Off-Site Housing Site), and construction of a water supply line (Pipeline) along Butts Canyon Road to the Project Site. Proposed Project components are described in the Notice of Preparation and summarized below.

Proposed land uses for the Project Site include a destination luxury resort, consisting of five hotels, resort residential uses, single family residential villas/estates, and recreational facilities, as well as commercial centers (i.e. the Maha Farm Cluster), modified agricultural production and grazing, and associated supporting infrastructure. Proposed outdoor recreational and resort amenities include two wineries, a wellness center and spa, golf course, equestrian facilities, polo grounds, and wilderness camp. At full build out, the Proposed Project would include up to 400 hotel rooms, 450 resort residential units, 1,400 residential estates, and up to 500 workforce co-housing units. Workforce housing is anticipated to be primarily co-

living housing structures built-in single-family style residency with potential accessory dwelling units. On-site workforce housing would consist of 35 housing structures capable of accommodating approximately 100 workers and will be located on the west side of Butts Canyon Road. Off-site Workforce Housing would consist of 50 housing structures capable of accommodating up to 221 workers on the Off-Site Workforce Housing Site in Middletown. The project also includes the development of support facilities, including a centralized back of house facility, an emergency response center including a fire station, and water supply and wastewater treatment systems. Other undeveloped areas of the Project Site will also continue to be rural lands and will remain in managed grazing which is an integral part of the fire management plan being developed for the site along with an on-site fire station. The Proposed Project does not anticipate expansion of the existing vineyards within the Project Site.

Potable water supply would be provided to the Proposed Project via multiple deep water supply wells located throughout the Project Site and potentially on a nearby property owned by the Applicant northeast of the intersection of State Route 29 and Butts Canyon Road. Wastewater would be collected via a sanitary sewer collection systems and treated on site. Treated wastewater would be distributed and reused on site primarily for landscaping and irrigation to reduce overall project water demand.

Project components would be developed in phases: The first phase would be constructed in the near-term (approximately the next ten years), while future phases would be built out based on market demands after the first phase is complete.

PROJECT PLANNER:
Mark Roberts - Principal Planner
Lake County Community Development
Phone: 707-263-2221
Email: mark.roberts@lakecountyca.gov

Date December 18, 2019

Signature

Email: ALL TRIBAL GROUPS HAVE BEEN

EMAILED THIS NOTICE.

COUNTY OF LAKE
COMMUNITY DEVELOPMENT DEPARTMENT
Planning Division
Courthouse - 255 N. Forbes Street
Lakeport, California 95453
Telephone 707/263-2221 FAX 707/263-2225

December 13, 2019

Middletown Rancheria
Attn: Ryan & Sally Peterson
PO BOX 1035
Middletown, CA 95461

Via email: speterson@middletownrancheria.com
rpeterson@middleownrancheria.com

Dear Tribal Representative(s):

We have received your comment(s) from you as a result of circulation of a Notice of Preparation (NOP) of an Environmental Impact Report for the proposed Guenoc Valley Mixed-Use Planned Development Project.

As per your request for consultation, we would like to schedule a date and time for this consultation. We are available on the following dates:

- Monday, January 13, 2020
  - 1:00pm – 3:00pm
- Wednesday, January 15, 2020
  - 2:00pm – 4:00pm

Thank you for commenting on this project. If you have any further questions, please do not hesitate to contact me at mark.roberts@lakecountyca.gov or by (707) 263-2221.

Respectfully,

Mark Roberts
Principal Planner

Enc. Copy of Notice of Preparation of an Environmental Impact Report Comments dated May 23, 2019.

MONTROSE ENVIRONMENTAL

Ryan Sawyer <rsawyer@analyticalcorp.com>

FW: RE: SB-18 & AB-52 Tribal Consultation - Guenoc Valley Mixed Use Planned Development

1 message

Mark Roberts <Mark.Roberts@lakecountyca.gov> Thu, Dec 19, 2019 at 4:48 PM
To: Ryan Sawyer <rsawyer@analyticalcorp.com>, Rachel Lenihan <rl@palisadeslanduse.com>, Kirsty Shelton <ks@mahaman.com>, Pete Bontadelli <pbontadelli@analyticalcorp.com>

See below

From: THPO [mailto:thpo@big-valley.net]
Sent: Wednesday, December 18, 2019 4:51 PM
To: Mark Roberts <Mark.Roberts@lakecountyca.gov>
Cc: Sarah Ryan <sryan@big-valley.net>
Subject: [EXTERNAL]RE: SB-18 & AB-52 Tribal Consultation - Guenoc Valley Mixed Use Planned Development

Hello Mr. Roberts,

This proposed project site is located outside of the Historical Tribal Boundaries of the Big Valley Band of Pomo Indians.

Thank you,

Ronald Montez

Tribal Historic Preservation Officer

The Big Valley Band of Pomo Indians

2726 Mission Rancheria Rd.

Lakeport, CA 95453

Thpo@big-valley.net

707-263-3924 ext. 135

707-262-2690 cell

From: Mark Roberts <Mark.Roberts@lakecountyca.gov>
Sent: Wednesday, December 18, 2019 3:07 PM
To: Sally Peterson <speterson@middletownrancheria.com>; rpeterson@middletownrancheria.com; llongee@middletownrancheria.com; tc@middletownrancheria.com; jsimon@middletownrancheria.com; mshaver@middletownrancheria.com; THPO@middletownrancheria.com; btorres@middletownrancheria.com; sshope@middletownrancheria.com; scottg@mishewalwappotribe.com; admin@rvrpomo.net; drogers@robinsonrancheria.org; lbill@yochadehe-nsn.gov; jkinter@yochadehe-nsn.gov; aroberts@yochadehe-nsn.gov; Sarah Ryan <sryan@big-valley.net>; THPO <thpo@big-valley.net>; cww281@gmail.com; a.tyler@elemindiancolony.org;

aarroyosr@hpultribe-nsn.gov; lrosas@hpultribe-nsn.gov; kn@koination.com
Cc: Michalyn DelValle <Michalyn.DelValle@lakecountyca.gov>; Ryan Sawyer <rsawyer@analyticalcorp.com>; Kirsty Shelton <ks@mahaman.com>; Rachel Lenihan <rl@palisadeslanduse.com>; Pete Bontadelli <pbontadelli@analyticalcorp.com>
Subject: SB-18 & AB-52 Tribal Consultation - Guenoc Valley Mixed Use Planned Development
Importance: High

Dear Tribal Representative:

The Lake County (County) Community Development Department has received a project application for the Guenoc Valley Mixed-Use Planned Development Project (Proposed Project) and is initiating contact with Native American tribes that are understood to be traditionally, culturally, and/or geographically affiliated with the project area pursuant to the statutory requirements of Senate Bill 18 (SB 18), Assembly Bill 52 (AB 52) (Chapter 532, Statutes of 2014), and Section 21080.3.1 of the California Public Resources Code (PRC). We are hereby notifying you of an opportunity to consult with the County regarding the potential for the Proposed Project to impact Tribal Cultural Resources, as defined in Section 21074 of the PRC. The purposes of tribal consultation under AB 52 are to determine, as part of the CEQA review process, whether or not Tribal Cultural Resources are present within the project area, and if so, whether or not those resources will be significantly impacted by the project. If Tribal Cultural Resources may be significantly impacted, then consultation will also help to determine the most appropriate way to avoid or mitigate those impacts. Additionally, SB 18 requires that, prior to adopting an amendment to the general plan, the County must consult with Native American tribes with respect to the possible preservation of, or the mitigation of impacts to, Native American places, features, and objects.

Below please find a description of the Proposed Project, a map showing the project location, and the name of our project point of contact, pursuant to PRC § 21080.3.1 (d). The information provided on this form is general and summary in nature. Please review the additional information included with this emailing, including the Notice of Preparation of the Environmental Impact Report for the Proposed Project, and contact the Department or the project planner for more detail if needed.

While PRC § 21080.3.1 (b)allows Native American tribes 30 days from the receipt of a notification letter to request consultation with the County related to impacts to Tribal Cultural Resources resulting the Proposed Project, SB-18 allows 90 days to request consultation for projects that will amend the General Plan. **The County requests that responses for consultation requests under both SB18 and AB52 be received within 90 days of receipt of this letter.**

Please refer to the above attachment for further information. If you have any questions, please let me know.

Sincerely,

Mark Roberts – Principal Planner

Lake County – Community Development Department

255 N. Forbes Street, Lakeport, CA 95453

County Website: www.lakecountyca.gov

Phone: (707) 263-2221

MONTROSE ENVIRONMENTAL

Ryan Sawyer <rsawyer@analyticalcorp.com>

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1 message

Mark Roberts <Mark.Roberts@lakecountyca.gov> Thu, Dec 19, 2019 at 4:48 PM
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Cc: Michalyn DelValle <Michalyn.DelValle@lakecountyca.gov>

See below

mark

From: Mary Camp [mailto:admin@rvrpomo.net]
Sent: Wednesday, December 18, 2019 4:44 PM
To: Mark Roberts <Mark.Roberts@lakecountyca.gov>
Subject: [EXTERNAL]RE: SB-18 & AB-52 Tribal Consultation - Guenoc Valley Mixed Use Planned Development

Redwood Valley thanks you for the notice. We would defer to any review, comments or concerns from Middletown Rancheria.

From: Mark Roberts <Mark.Roberts@lakecountyca.gov>
Sent: Wednesday, December 18, 2019 3:07 PM
To: Sally Peterson <speterson@middletownrancheria.com>; rpeterson@middletownrancheria.com; llongee@middletownrancheria.com; tc@middletownrancheria.com; jsimon@middletownrancheria.com; mshaver@middletownrancheria.com; THPO@middletownrancheria.com; btorres@middletownrancheria.com; sshope@middletownrancheria.com; scottg@mishewalwappotribe.com; admin@rvrpomo.net; drogers@robinsonrancheria.org; lbill@yochadehe-nsn.gov; jkinter@yochadehe-nsn.gov; aroberts@yochadehe-nsn.gov; sryan@big-valley.net; thpo@big-valley.net; cww281@gmail.com; a.tyler@elemindiancolony.org; aarroyosr@hpultribe-nsn.gov; lrosas@hpultribe-nsn.gov; kn@koination.com
Cc: Michalyn DelValle <Michalyn.DelValle@lakecountyca.gov>; Ryan Sawyer <rsawyer@analyticalcorp.com>; Kirsty Shelton <ks@mahaman.com>; Rachel Lenihan <rl@palisadeslanduse.com>; Pete Bontadelli <pbontadelli@analyticalcorp.com>
Subject: SB-18 & AB-52 Tribal Consultation - Guenoc Valley Mixed Use Planned Development
Importance: High

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Please refer to the above attachment for further information. If you have any questions, please let me know.

Sincerely,

Mark Roberts – Principal Planner

Lake County – Community Development Department

255 N. Forbes Street, Lakeport, CA 95453

County Website: www.lakecountyca.gov

Phone: (707) 263-2221

YOCHA DEHE
CULTURAL RESOURCES

RECEIVED

JAN 17 2020

LAKE COUNTY COMMUNITY
DEVELOPMENT DEPT

January 6, 2020

County of Lake – Planning Division
Attn: Mark Roberts, Principal Planner
255 N. Forbes Street
Lakeport, CA 95453

RE: Guenoc Valley Mixed Use Planned Development

Dear Mr. Roberts:

Thank you for your project notification letter dated, December 18, 2019, regarding cultural information on or near the proposed Guenoc Valley Mixed Use Planned Development, Lake County. We appreciate your effort to contact us.

The Cultural Resources Department has reviewed the project and concluded that it is not within the aboriginal territories of the Yocha Dehe Wintun Nation. Therefore, we respectively decline any comment on this project. However, based on the information provided, please defer correspondence to the following:

Middletown Rancheria
Attn: THPO
PO Box 1035
Middletown, CA 95461

Please refer to identification number YD–12182019-02 in any future correspondence with Yocha Dehe Wintun Nation concerning this project.

Thank you for providing us with this notice and the opportunity to comment.

Sincerely,

Isaac Bojorquez
Director of Cultural Resources

cc: Middletown Rancheria

CULTURAL RESOURCES DOCUMENTS BOUND SEPARATELY*

***THE CULTURAL RESOURCES SURVEY REPORTS HAVE BEEN BOUND SEPARATELY TO PROTECT POTENTIALLY SENSITIVE INFORMATION ABOUT THE LOCATION AND NATURE OF CULTURAL RESOURCES.**

APPENDIX DG

DRAFT DESIGN GUIDELINES

MAHÁ

GUENOC VALLEY

DRAFT DESIGN GUIDELINES

FOR THE FIRST PHASE OF THE

MAHA RESORT AT GUENOC VALLEY

FEBRUARY 5, 2020

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SECTION 1 INTRODUCTION

1.1 Context & History

The vision for the Maha Resort at Guenoc Valley ("Resort") is that of a destination resort of unparalleled luxury, featuring internationally acclaimed architect-designed boutique hotels with products and amenities from local artisans and farms, providing a luxurious experience within the scope of a master-planned mixed-use development.

The new zoning designation, Guenoc Valley District ("GVD"), includes proposed development standards outlined in the draft zoning ordinance section. These are consistent with the County's existing Commercial and Residential Planned Development zoning designations as requested by the Area Plan. The proposed Entitlements utilize the Planned Development process for the long-term growth of the Resort. This recognizes efficient land utilization and preservation of open space in conjunction with fire- safe measures already required by the State and County Fire Safe Regulations. It also includes measures that the Resort proposes in the Maha Guenoc Valley Wildfire Prevention Plan.

The Resort adheres to the framework of the existing Lake County land use policies and goals as defined by the General Plan and more importantly the specific plan for this area as defined by the Middletown Area Plan ("Area Plan"). As directed by the Area Plan, the Guenoc Ranch will be rezoned to accommodate planned resort development. The planned development will be designed as mixed-use, comprising resort, resort commercial, residential, and agriculture as previously anticipated in the Area Plan.

Maha reflects the area's local stewardship, historic retreat culture and longstanding agricultural traditions. The proposed development features low-impact development as one tool to preserve the legacy and identity of the ranch for future generations. The master plan will incorporate land management practices that support open space preservation with an integrative animal husbandry and diversified agriculture element along with fuel reduction management.

1.2 Design Philosophy & Objectives

These Design Guidelines provide a set of criteria to evaluate the appropriateness of proposed development in relation to the vision, intent, and purpose of the GVD area to support the blend of resort, recreational, residential, and agricultural planned development.

The goal of these Design Guidelines is to help ensure the continuation of the vision and intent of the Special Study Area NO. 3 of the Middletown Area Plan through the implementation of the GVD.

The vision for the GVD is grounded in high-quality design that exists in harmony with the natural environment of the diverse landscape of the Guenoc Valley and surrounding landscape. The concept of "listening to the land" dictated and resulted in the creation of an exclusive and innovative low-impact development connected to nature. The vision prioritizes the character of the site through landscaping, invisible infrastructure where feasible, and the design of individual architectural clusters that respond to the variety of the landscape visually and topographically.

Visiting or living within the GVD is about being connected to nature and its immense offerings through outdoor recreation, authentic farmstead experiences such as farm-to-table dining, high end wine tastings, spa and wellness treatments, and luxury front-end service and amenities. It is the intention to attract guests and visitors to Lake County who are moved by, motivated by, and appreciative of the character of the environment. Development within the GVD shall abide by the vision of preserving the character of the landscape for both the present and future enjoyment of guests and owners.

1.3 Purpose & Intent

The following includes a series of guidelines which preserve the existing visual characteristics of the GVD and promote appropriate change and development. The focus of the these Design Guidelines outline both the architectural and landscape expectations for future development within the GVD. These guidelines respond to and support the local land use policies such as the General Plan, The Middletown Area Plan, and specifically the GVD Zoning Ordinance ("Governing Documents").

The existing, as approved, Commercial Design Guidelines that govern the Middletown Area Plan recognize the importance of development in creating positive initial impressions and increase community pride and economic viability. However, they do not apply to the Special Study Area that includes the GVD. Therefore, as part of the GVD approval process the following are the proposed Design Guidelines for the GVD zoning district.

To fulfill the vision of a world-renowned brand offering a luxurious experience in an iconic natural setting demands uncompromising excellence in all regards. This extends into all design and planning, including plans for construction, operations, and maintenance. The Design Guidelines are one such method utilized to ensure the preservation of character, quality, and vision.

These Guidelines will be the reference document to guide the design of proposed future Specific Plan of Developments (SPOD), future residential development, which is located within the area of the GVD, and general planned development design characteristics.

1.4 Landscape & Development Zones

Refer to the SPOD application for the different existing and proposed landscape zones and development philosophies.

1.5 Definitions

American with Disabilities Act (ADA): Federal act prohibiting discrimination against persons with disabilities; in relation to the project, this act most often applies to the guarantee of accessible areas and structures.

Covenants, Conditions, & Restrictions (CC&Rs): An additional legal document applying a set of rules, responsibilities, and rights to each residential parcel.

Designated Open Space: Open space area protected from any development for the purposes of preserving wildlife corridors and rural landscapes; the only development allowed within this area is cross-over roadways, trailways, and small accessory structures.

Design Guidelines: The design guidelines and other provisions set forth in this document.

Emergency Vehicle Accessway: A route that provides access specifically for emergency personal and first responders.

Governing Documents: Existing documents that dictate the allowance and intention of development as it relates to the short- and long-term development goals. Conformance with the governing documents is disclosed in both the general and specific plans of development.

Guenoc Valley District (GVD): Section XXX of County of Lake Zoning Ordinance, a district comprising of 16,000 acres within the Guenoc Valley Planned Development Area.

Master Association: The association of owners governing the Resort.

Resort: Maha Resort at Guenoc Valley as described in Section 1.1 and throughout these Design Guidelines.

Public Viewshed: Parts of the site viewable from public roadways or public viewsheds.

Residential Accessory Use: A use conducted upon the same lot or parcel as the principal use or structure to which it is accessory. The use shall be customary, incidental, appropriate and subordinate to the use of the principal building on such lot or parcel; and uses accessory to principal residential uses permitted without first obtaining a use permit shall be activated with, or subsequent to the construction of the principal structure or activation of the principal use. Uses accessory to principal uses permitted by use permit shall be activated with, or subsequent to the construction of the principal structure or activation of the principal use only if authorized by the permit and, in such case, the addition of such accessory uses shall require either an amendment to the permit authorizing the principal use or a separate use permit.

Resort Rental Program: Voluntary rental program associated with transient occupancy.

Resort Residential Parcels: Parcels with residential structures within a primary resort community; the architectural style of these residential structures will align with the Resort community's design. These may be attached or detached units with kitchens; fractional or whole ownership. These parcels can be entered into the Resort Rental Program.

Rural Landscapes: Non-developed areas during the first phase of development; area may be developed during future phases of development.

Special Event: An establishment or enterprise involving large assemblages of people or

automobiles on private land not specifically designed for such events, including but not limited to spectator sport events, outdoor concert, wedding, etc.

Specific Plan of Development (SPOD): Application requirement for planned developments within the County of Lake, that are in substantial conformity with the previously approved general plan of development as well as any other governing documents.

Villa Residential Parcels: Larger parcels for sale within a primary resort community; owners will choose from typical floor plans associated with the resort community's architectural style. Whole ownership units intended for sale that may be a part of the Resort Rental Program.

SECTION 2 OPEN SPACE & AGRICULTURAL GUIDELINES

2.1 Existing Landscape Context

The Resort is situated in a unique northern California landscape. The site's hills and valleys filled with oak woodlands, grasslands, vineyards, and grazing pastures will create an exceptional visitor and resident experience. The dramatic terrain—ranging from large fields and wetlands to steep and rocky hillsides—offers a variety of experiences and impressive views. A series of lakes, ponds, and reservoirs are filled by a site-wide network of streams and creeks. Over the years, a majority of the site has come to be used for a variety of agricultural operations, which includes a large cattle grazing operation; a portion of the site is also currently leased for vineyards. The site is set within a Mediterranean climate, defined by cool and rainy winters (30 - 60 degrees Fahrenheit) and hot and dry summers (50 - 90 degrees Fahrenheit).

2.2 Open Space

A majority of the Resort will remain as undeveloped natural and agricultural landscapes. These areas outside of parcels and development will provide an essential and unique experience and viewshed for residents and visitors. In addition, dedicated open space will be subject to long term conservation restrictions to prohibit development.

2.2.1 Rural Landscapes

The primary activities and development within rural landscapes will include hiking and walking trails, accessory structures (i.e. utility facilities and hiking stations), ecological restoration and enhancement, and landscape fire reduction management through grazing and manual vegetation removal (see *Maha Guenoc Valley Wildfire Prevention Plan* and 2.3.1).

2.2.2 Dedicated Open Space

The dedicated open space will be permanently protected from any future development for the purposes of maintaining a highly rich biological environment and protecting key wildlife corridors. Within this area, development will be limited to recreational amenities and features such as

pathways and hiking trails (see 3.3), signage (see 3.4.2), lighting (see 3.4.3) and recreational areas, structures, and furnishings (see 3.4.5). Where necessary, the dedicated open space may also be ecologically enhanced and restored. This area will also be actively managed to reduce wildfire risk through ongoing grazing and manual vegetation removal (see *Maha Guenoc Valley Wildfire Prevention Plan* and 2.3.1).

2.3 Agriculture

Cattle, sheep, and goat livestock grazing as well as agricultural crops, vineyards and operations shall be allowed features and activities within designated areas of the Resort.

2.3.1 Grazing Practices

Agricultural grazing has been a historic and long-term use of the Resort site. Cattle, sheep, and goat livestock grazing will continue with the Resort development; it will be an essential aspect of maintaining a rural lifestyle and aesthetic for residents and visitors while also serving a dual purpose of addressing wildfire risk (see *Maha Guenoc Valley Wildfire Prevention Plan*).

Livestock will be selectively and strategically moved between pastures in patterns and schedules necessary for livestock health and vegetation maintenance. All efforts will be made to minimize herd movements that present conflicts with resident and visitor experience and safety, traffic movement, and vineyard operations.

Grazing pasture fences and gates siting and material selection will support the best practices for livestock management while also being aligned with site-wide aesthetic objectives of utilizing consistent fencing types that blend and recede into the existing landscape (see 3.4.1).

Permanent and temporary barns will be strategically located throughout the site in order to provide structures necessary for supporting animal husbandry objectives.

2.3.2 Vineyard Practices

Vineyards will be oriented, planted, pruned, and maintained to create consistent, clean, and uniform appearance.

Vineyards shall be enclosed by fencing types that protect the site from key pests while allowing for wildlife movement. Vineyard fencing materials shall be consistent throughout the site; materials shall be permeable and recede into the landscape in order to retain views from commercial and residential sites (see 3.4.1).

SECTION 3 CIRCULATION & GENERAL SITE DESIGN GUIDELINES

3.1 Roadway & Pathway Landscape Corridors

Roadway and pathway corridors shall be designed to blend into the natural surroundings and feel like a rural country road highlighted by existing natural elements such as large trees or rock outcropping. A blend of complementary characteristic materials, elements, treatments, and landscaping will enrich each other to reinforce an overall cohesive site design character and aid in site navigation.

3.2 Roadways & Parking

3.2.1 Roadway Design

The Project is primarily served by two-way arterial roadways and two-way private roads and commercial drives. In addition to the main accessway, each individual parcel is accessed by driveways. Terminus of driveways which include cul-de-sacs and turnarounds will be engineered to comply with the minimum standards while maintaining the rural road feeling.

Roadways within the Resort shall be maintained by the Master Association or a sub-association in accordance with the CC&R's. Maintenance of roadways may include maintenance of vegetation to create fire breaks. Vegetation removal would be dictated by the Master Association and could be implemented at buildout of the subsequent residential or development area. Exceptions to County roadway standards will only be requested if a unique environmental feature is present or if it can be demonstrated that the proposed alternative provides safe access that is equivalent to County Standards.

3.2.2 Parking Lots

Unenclosed parking areas provide for additional resident or guest vehicular storage. These areas should be well-integrated into the residential architectural and landscape design and anticipate all future parking needs for the site. Parking areas and drives shall provide adequate space for vehicular and designated fire vehicle turnarounds.

Parking areas shall be screened with trees or vertical screens as much as possible from any off-site roadway, residential, or resort views; if these areas are used for the purpose of long-term vehicular storage, the location shall be screened as necessary. Wherever feasible, these areas shall be shaded with trees, trellises, or other types of canopies.

At commercial and recreational areas parking spots shall be adequately provided to accommodate visitors, residents, and guests. A separate employee parking area will be located at the central back of house operations with the employee shuttle service and employee vehicles offered for circulation within the site. Parking shall be adequately provided in proximity to residential or commercial structures, however this shall not restrict options for clustered or centralized parking options if located within the vicinity. For official parking requirements please see the GVD Zoning Ordinance.

3.2.3 Special Event Parking

In the instance of special events cars will be parked by a professional valet service. No parking will impede Resort entrances, private gates, agricultural ranch road entrances, management areas, or within the emergency vehicle accessways.

3.2.4 Driveways

Driveways, driveway turnouts, driveway turnarounds, bridges, culverts, and unenclosed parking areas will all be allowed within the residential parcels and shall comply with Lake County Standards, unless an exception to the standard is requested.

Each residential parcel presents a variety of unique topographic, vegetation, and drainage conditions; these factors combined create specific opportunities and constraints for locating driveway routes on each parcel. Driveway design shall be rural in character and limit visual impacts to adjacent parcels and Resort amenities where feasible. Driveway alignments shall minimize grading, tree removal, and other disruptions to the site to the extent feasible. The necessity for vertical curbs and retaining walls shall be minimized as much as possible except to preserve trees or other features. Driveways shall minimize site disturbance, while still providing required access for emergency and service vehicles.

Shared driveways between multiple residential parcels shall be as narrow as allowed by code and may include turnouts for two-way vehicular flow.

3.2.5 Paving Materials

Paving materials for roadways will meet minimum road and street standards for emergency vehicle access while highlighting the rural scenery and may include chip seal, decomposed granite overlay, or gravel. Depending on the architectural theme there could be stamped asphalt, concrete design treatment, or natural stone, which will be provided as part of the road development plan.

3.3 Pathways & Trailways

Pathways and trailways shall be designed to blend with the existing natural topography and vegetation. Materials and designs shall be subtle and complement the surrounding landscape and architecture. The site-wide network shall be divided between primary paths and secondary trails.

An existing and extensive system of ranch roads and horse trails shall be reutilized, to the extent feasible, as part of the existing secondary trail network. These existing roads and trails will offer well-defined travel routes to reach some of the most scenic areas and recreational opportunities throughout the Resort site. Existing trails shall be improved if necessary to align with the quality and maintenance standards of the secondary trail network.

New primary paths shall provide convenient pedestrian and bicycling routes to access Resort amenities. These pathways shall be typically situated near the primary roadway network in order to separate vehicular and non-vehicular users on more heavily-travelled routes. These paths shall

mostly be four to six feet in width and with a slope range of zero to eight percent.

New secondary trails shall expand upon the existing ranch road and horse trail network to offer more recreational walking, running, hiking, biking, and horseback riding opportunities. These paths shall mostly be five to 15 feet in width and with a slope range of zero to 15 percent. These paths shall primarily be surfaced with dirt and gravel.

3.4 Site Features

3.4.1 Walls, Fences, & Gates

A complementary design approach to walls, fences, and gates will reinforce the quality, continuity, and character of the development. These features will create a consistent aesthetic experience throughout each residential and commercial site, complementing its design by the use of each site's characteristic materials.

Retaining Walls

Wherever feasible, graded cut slopes conforming to existing conditions shall be implemented rather than retaining wall structures.

Retaining walls may be used in order to reduce grading impacts, preserve trees, create visual interest, terrace outdoor living areas, provide site access, and better achieve the intention of these Design Guidelines.

Retaining walls shall follow the existing contours of the land and be built to closely resemble the existing topography or otherwise reflect the geometries of nearby architecture. Stepped-back or terraced wall structures, which should include ample areas for planting, are encouraged where grade changes requires retaining walls to exceed four feet in height.

Retaining wall materials shall be well-suited for its purposes, surrounding site conditions, and the material selections of nearby infrastructure, architecture, and site features. Examples of appropriate materials include board formed concrete, rammed earth, soldier pile, and gabion wall design.

Fencing

Fencing shall be minimized along roadway and pathway corridors as well as within rural landscapes and the designated open space. The careful use of fencing will help to retain the sense of a continuous rural landscape. When fencing is used for the purposes of creating safety and security, protecting cultural or biological resources, or contributing to the site's agrarian character, siting and placement shall be carefully designed in relation to vineyard perimeters, pasture perimeters, or along grazing corridors (see section 2.3.1 for a description of grazing and vineyard fencing types). Fence lines which cross roadways may require cattle guards to limit livestock and wildlife passage.

Fencing materials shall be well-suited for its purposes, surrounding site conditions, and the material selections of nearby infrastructure, architecture, and site features. Examples of appropriate materials include various farm fencing systems, including wooden post & rail fencing and wooden or metal post & wire fencing.

Fences shall generally not exceed six feet in height. Fencing which needs to be higher than six feet will be considered on a case-by- case basis as determined by the HOA.

Gates

Vehicular and pedestrian gates shall primarily be used to control access points, manage livestock movements, and protect agricultural operations.

Gates shall utilize a similar complementary materials of materials and design vernacular and be well-suited for its purposes, surrounding site conditions, and the material selections of nearby infrastructure, architecture, and site features. Gates constructed off public or primary site access roads shall be set back from the road to allow emergency vehicle turn around.

Vehicular gates shall be used to control traffic for the purposes of safety and security. These gates shall be no less than the width of the roadway plus a one foot shoulder on each side. They may include signage markers, automatic opening and closing systems, voice intercoms, a lock box or other emergency release devices approved by the County Fire Chief, and associated outdoor lighting.

Pathway or trailway gates will occasionally be necessary for safety or security; in these circumstances, pedestrian gates shall be a minimum of three feet wide and, if possible, constructed in the same style and materials as the adjoining fence or nearby vehicular gates. Pedestrian gates will be self-closing and lockable with ADA compliant hardware.

Agricultural gates, including cattle guards, shall be used to control herd movements and identify access locations for vineyards, orchards, and gardens.

3.4.2 Signage

Resort signage shall create a consistent and intuitive wayfinding experience inspired by the Resort's land, culture, community, and architecture. All signs, sizes, locations, and quantities shall be carefully selected to minimize visual impact and avoid clutter while also maintaining functionality. Signage shall be aesthetically pleasing in design and form. Signage shall align with the best practices for wayfinding design, graphic design, and architectural sign fabrication industries.

Various types of signs shall be allowed throughout the Resort site. All signage types shall be designed using typical viewing heights and font sizes for vehicular and pedestrian navigation and be based on common signage standards and the viewing requirements for specific signage locations. This includes the following types of signage:

- ***Site Access Signage:*** Entryway signage shall be located at the Resort's primary, secondary, and winery entrances. These signs are intended to identify the Resort site and guide vehicular traffic from the public right of way onto the site.

- ***Street Name Signage:*** Street signage shall identify named roads within the Resort. The street signs shall be posted at intersections and are usually in perpendicularly oriented pairs identifying each of the crossing streets.
- ***Vehicular Wayfinding Signage:*** These free-standing signs shall be located prior to key navigation decision-making points in the vehicular travel path. They shall be strategically located for vehicular visibility with time to view and respond to directional information. They may include identification information and directional arrows.
- ***Pedestrian Wayfinding Signage:*** These signs shall be located at key pedestrian decision-making points and higher traffic areas. They shall guide pedestrians to project amenities, locations, and landmarks. This includes trail signage that marks starting points, routes, and distance markers.
- ***Building & Amenity Identification Signage:*** These signs shall identify entrances or arrival areas at building or amenity destinations for both drivers and pedestrians. These signs may include building, area name, and/or address information and may also be used for fire safety location identification.
- ***Code & Life Safety Signage:*** These signs shall be in the color, size, shape, and placement to provide for their respective function and conform to applicable codes.

Signage design shall be subtle with clean, modern touches and natural muted color palette. The material palette shall be compatible with nearby architectural styles and the Resort's general rural setting. This shall be accomplished by utilizing high-quality materials with elegantly incorporated details. Signs shall be of a high-quality and durable construction. Potential materials include steel, wood, concrete, stone, or painted metal or wood surfaces.

Signs shall be carefully and selectively illuminated to offer nighttime information. Illumination could be internal, external, or ambient depending on the location and site conditions. All signage lighting fixtures and sources shall emit a color-balanced, consistent, and uniform light with no browning, flickering, haloing, or other uneven effect. The use of high quality signage lighting shall follow key criteria:

- Where signs are internally illuminated, light-transmitting surfaces shall be non-gloss, matte materials.
- Only letters and logos shall transmit light. Illuminated backgrounds or boxes shall be avoided.
- Lighting signage shall be controlled by a time clock or photocell.
- All signs shall be fabricated and installed with UL approved components in compliance with all applicable building and electrical codes.

Signs shall be designed using typical viewing heights and font sizes for vehicular navigation, based on common ADA standards and the viewing requirements for specific signage locations.

Sign locations shall be carefully chosen to optimize functionality, visibility, and legibility. Although specific placement will vary based on site conditions, the following are general guidelines for sign placement:

- ***Site Preparation:*** Sign placement shall primarily be in locations selected for optimal functionality. It may be necessary to relocate any obstructions or otherwise clear rocks, shrubs, or bushes.
- ***Straight Ahead:*** Signs shall be placed in locations straight ahead of an approaching driver or pedestrian's immediate cone-of-vision. In particular, drivers cannot be expected to turn their heads to read a sign.

- ***Perpendicular:*** Signs shall be perpendicular to the approaching viewer. Signs shall never be placed parallel to passing traffic.
- ***Right Side:*** Signs shall be placed on the right side of the roadway or pedestrian path wherever possible. Drivers are not conditioned to look to the left side of the road for driving information. An exception to this rule is the use of a double-face sign mounted perpendicular to a roadway or walkway. In this situation, the sign shall be clearly legible from both directions.
- ***Advance Warning:*** Roadway signs which communicate critical information shall be placed in advance of intersections to afford a safe distance for reaction to and execution of the maneuver.

Signs spacing shall prioritize creating an organized experience throughout the Resort. Signage sites shall be carefully selected so that groups of signs do not create cluttered appearance and communicate priorities. Drivers shall be provided time to read and react to one sign before another is presented.

3.4.3 Lighting

Site-wide lighting design shall promote dark sky policies through the mindful selection of lighting fixtures and controls to ensure sensible and appropriate light. Lighting shall be selectively used to illuminate and differentiate outdoor areas; guide nighttime navigation along roadway and pathway corridors; direct access to commercial, residential, and building entries; highlight signage and address markers; and improve safety and security. Emphasis will be placed on the implementation of the energy efficient outdoor lighting technologies, that will enhance safety and security, support surrounding ecosystems, and follow dark sky preservation guidelines.

Lighting along roadways and pathways and within parking areas shall only be used to the extent necessary to guide nighttime navigation and ensure safety and security. In general, lighting shall be more prominent at intersections and commercial or residential access points to enhance safety. Lighting fixtures and patterns along roadways and pathways shall complement nearby architectural styles while also creating a thematic site-wide experience for visitors and residents. Lighting shall be no higher than necessary to provide efficient lighting for its intended purpose.

Accent lighting may be used in limited circumstances to emphasize prominent site features, such as boulders, artwork, or plantings. This type of lighting shall generally avoid directly illuminating buildings, except for facade features, and favor the use of hidden light sources, including fixtures that are recessed into the ground or fixtures hidden by plant materials.

Site-wide lighting shall avoid lighting or glare which is directed onto nearby residences, commercial buildings, or amenities. Lighting design shall also be carefully designed to avoid unnecessary illumination of natural habitats. The use of intense, bright, blinking, or flashing lights shall be avoided.

Wherever possible, landscape lighting fixtures shall be equipped with cut-off shields to minimize visibility from adjacent areas. Lighting fixtures shall be durable and easily maintained. As much as possible, lighting fixtures shall utilize energy-efficient lamps that provide light color temperatures that promote the health of humans and wildlife. On-demand photocell and motion-sensing lighting systems shall also be prioritized to minimize unnecessary nighttime lighting.

3.4.5 Recreational Areas, Structures, & Furnishings

In order to provide additional amenities and resort opportunities throughout the site, recreational areas will be allowed throughout the Resort, particularly along roadway and pathway corridors and in the nearby vicinity. This includes spaces such as hiking stations, picnicking areas, and scenic overlooks.

Within these areas, small structures such as trellises, gazebos, pergolas, and pavilions may be constructed. These areas may also accommodate various types of outdoor site furnishings, including benches, picnic areas, trash urns, bicycle racks, shade canopies, or other common elements serving Resort visitors. These areas shall be designed to be clearly visible and accessible, but not disruptive to the overall resort experience. These areas shall be designed to be reflective of nearby architecture, but also compliment into the overall resort experience.

Site furnishings shall be of high quality and durable construction. All trash and recycling bins and enclosures should be covered, unobtrusive, and located in areas that minimize visual impacts.

3.4.6 Outdoor Artwork, Monuments, & Landmarks

Outdoor artwork, monuments, landmarks, and other types of free-standing objects will be allowed throughout the Resort. These will be particularly encouraged at focal points such as roadway and pathway intersections, scenic overlooks, and arrival areas.

3.4.7 Accessory & Utility Structures

Accessory and utility structures shall be located throughout the Resort site. These may include wastewater treatment facilities, solar fields, energy substations, cisterns, wells, and propane tanks. Wherever feasible, utility facilities and structures shall be placed in locations that are not visible from the public viewshed. If required to be located in a site visible from the public viewshed, utilities facilities and structures shall be enclosed by thoughtfully detailed shielding and fencing devices, which may include quality materials and landscape elements. Wherever possible, these utilities and structures shall be landscape screened.

SECTION 4 RESIDENTIAL ARCHITECTURAL DESIGN GUIDELINES

This section applies to future residential architecture within residential estate and Resort Residential Parcels dictated by the Tentative Maps; commercial architecture and land uses are mostly dictated by the SPOD.

The Resort shall be characterized by high quality architecture designed in response to the natural beauty and diversity of the landscape. High quality design characterizes the intent of the Resort to prioritize quality materials and attention to detail that establish the Resort as a world-

renowned destination. The design of the Resort should lend itself to the creation of independent clusters that become diverse communities under the same concepts of ultra-luxury elements. Designers are tasked with the opportunity to respond to the existing landscape creating unique senses of place in conjunction with the elegance and refined taste of the Maha brand.

A collection of building and community concepts have been developed and presented in the SPOD submittal for the first phase of the Resort. The proposed design elements, elevations, and architectural typologies are representative in their design and detail. Site planning, streetscapes, community clusters, and recreational uses have been integrated into the master planning of the site and overall design to foster a quality community and experience. The Resort typologies are based on the mixed-use design intentions critical to the character of the Resort.

These guidelines should be utilized to assist in the preservation and assurance of high quality architectural and landscape design and are not intended to limit or contradict the vision of diversity in design, space, and architecture. Instead these guidelines invite creative design interpretations and encourages unique structures within the GVD.

4.1 Residential Typologies

The design for the residential buildings at the Resort envisions building typologies that have been developed in order to activate the highest potential of the landscape and respect for the site. Designed in harmony with the slope, vistas, and surrounding landscape the site planning, streetscapes, community clusters have been refined to foster a unique and awe-inspiring experience for guests and residences.

4.2 Height

Building height should be measured from the vertical distance from the average level of the highest and lowest point of the portion of the lot covered by the enclosed building footprint to the average point of the roof. Residential structures shall have a maximum height no greater than 40 feet. Dormers, chimneys, maintenance features, or alternative energy production materials are exempt from height calculations.

4.3 Lot Coverage & Density

The master development plan is centered around the concept of a light touch on the land. This design principle shall extend into planning of individual residential lots. As part of cluster development Resort Residential Parcels will not have restrictions of lot coverage, except as set forth below. Restrictions to lot development coverage shall only apply to lots within oak woodlands, which will restrict the development footprint to one acre without additional review & mitigation. Any residential parcel outside of identified oak woodlands shall have a lot coverage of no more than one and one half acres, Any residential lot can opt to develop a larger portion of their parcel as long as additional environmental review under pursuant to the California Environmental Quality Act (CEQA) such as surveys and additional mitigation for impacts are abided by.

Lot coverage includes principal and accessory structures, swimming pools and hot tubs (over 6' out of grade), as well as impermeable hardscape such as: pool decks, private water storage tanks or cisterns, garages, barns, sheds, guest houses, trellises, decks, covered and uncovered hardscape patios, and driveways. Lot coverage shall not include underground accessory structures such as septic, gas, or water lines, landscaping, or agriculture. Lot coverage shall not include structures for Resort-wide functions such as community water tanks or alternative energy production areas, which may be located on a private parcel easement.

4.4 Massing & Scale

The existing topography should inspire the architectural design. Buildings are to be sited to conscientiously acknowledge existing contours. Residential structures shall differ in their massing and scale in response to programming and site context through the Resort based on the cluster area they belong to. Residences within the same cluster shall have a similar and recognizable style to associate them with that specific commercial cluster.

4.5 Setbacks

The Project shall maintain a 50 foot setback from the Napa County line as directed by the SPOD and the Tentative Maps. Setbacks from individual property lines will be dictated by the planned development zoning of this area and shall follow the minimum fire code clearance from structures.

4.6 Building Materials & Criteria

Materials should be high quality, low-luster and enhance the vision of The Resort and Resort architecture. All building materials will abide by relevant California Building Codes "CBC" and Wildland Urban Interface "WUI" Standards. Emphasis will be placed in actively preventing the spread of fire, ember, or ashes between structures and maintaining the preservation of the principal structure. Where a connection point exists, it should be made with a fire resistive or noncombustible connector so that there is no conduit between homes and landscape structures such as fences, trellises, gazebos or porches.

4.7 Porches & Decks

Architectural projections and recesses can provide a variety of depths and features to residential homes. Porches and decks are encouraged and increase the massing of the structure. Architectural projections off the principal structure shall also abide by CBC standards. For instance, when decks are utilized measures shall be implemented to consider fire protection and prevention measures. Evidence of non-combustible, fire resistive materials, or materials with the same overall practical effect shall be provided as part of the building permit process.

4.8 Roofs & Rooflines

A variety of roof materials and styles are allowed if they are congruent with the architectural cluster in which they are being utilized. Flat or sloped roofs as well as green roofs covered with plant materials and adequate soil or growth medium are encouraged through the Site. The use of synthetic turf for roofs is prohibited. Rooftop solar panels are encouraged but shall be mindfully integrated with the roof design. Similarly, roof penetrations of primary structures (vents, chimneys, turbines, flues, sprinklers, etc.) shall be considered in the design and large rooftop mechanical equipment shall be masked as much as possible.

4.9 Exterior Fire Suppression Systems

Exterior fire suppression systems will be encouraged for all primary residential structures; these systems will be required for primary residential structures on residential access roads that exceed ¼ mile in length. Fire suppression systems are remote or heat activated. During a fire, they prevent substantial damage to the primary building as well as nearby outdoor features. Screening of equipment roof projections shall occur as much as necessary from all properties within the GVD including residential, commercial, or right of ways. In the event that the exterior fire suppression system does not blend into the architectural aesthetic and cannot be masked, an alternative may be requested as long as it is found to meet the same overall and practical effect.

4.10 Photovoltaic Panels

Solar panels are encouraged and shall be integrated with the site design when installed within the GVD. Solar panels may be located on the building roofs or set on frames in the landscape. Solar panels may not be used where they would produce a direct glare or redirect sunlight into adjacent or nearby residential or commercial properties. The incorporation of sustainable design elements such as solar will be influenced by technology and the market of innovative solar technology. All electrical conduit from solar frames to the primary structure shall be underground, where feasible.

4.11 Exterior Lighting

The Exterior lighting approach shall implement the strategies of the Dark Sky Association guidelines. By controlling lighting levels and operation, the lighting design will take careful consideration of energy efficient outdoor lighting technologies to achieve community safety, security, and acknowledge surrounding ecosystems. Adaptive lighting controls shall be provided, in combination with lighting fixtures designed to reduce glare and attenuate harsh lighting that may create shadows. All interior and exterior light sources shall be designed so that no direct beam illumination leaves the residential property line. Exterior lighting includes fixtures on the exterior of buildings, all landscape lighting fixtures, pool lighting and pathway illumination.

4.12 Accessory to Residential

Accessory Use structures shall be designed in context with the surrounding architecture and primary structure. Accessory Uses may include but are not limited to the following: garage, pool houses, accessory dwelling units, storage facilities, art studios, yoga studios, etc. The Accessory Use structure may be designed appropriately to provide visual interest and cohesion with the surrounding landscape. Measures should be taken to mask and contain Accessory Use structures that serve to function as service areas, such as housekeeping cottages. Accessory Use structures are included in lot coverage, see above for limitations on lot coverage.

SECTION 5 RESIDENTIAL LANDSCAPE DESIGN GUIDELINES

5.1 Residential Landscape Design Objectives

Residential landscape design shall be closely integrated with the existing landscape character using a 'light-touch' approach that complements and elevates the site's inherent qualities. Wherever possible, existing native and agricultural landscape patterns and landforms shall be preserved and maintained and unnecessary site disturbance shall be minimized. Wherever necessary, residential landscapes shall be restored to enhance both ecological functioning and viewsheds.

5.2 Vehicular Access & Parking

See section 3.2 for guidance on residential vehicular access and parking.

5.3 Pools & Water Features

Pools and water features—including swimming pools, infinity pools, lap pools, reflecting pools, hot tubs, and fountains as well as their required equipment—will be allowed within residential parcels and subject to local building ordinances.

Pools and water features shall be designed to visually compliment surrounding residential landscape and architectural design. Exposed walls and edges that are visible from off-site shall use a material palette that is well incorporated into the larger landscape and is compatible with building design and materials. They shall be sited to minimize grading and significant disruption to the natural landscape.

Pools and water features shall be designed and maintained to utilize water efficiently and minimize evaporation loss. Wherever possible, water features will reply upon non-potable water sources.

Pool equipment shall be located behind walls or in underground vaults so as to reduce equipment noise. Noise-absorbing covers may also be required if it the equipment is audible from adjacent properties after installation.

5.4 Pool Decks, Courtyards & Terraces

Patios, courtyards, terraces, and other similar types of outdoor areas are encouraged to accommodate a wide range of activities; these outdoor "rooms" can provide for seating and eating areas, cabanas, fire pits, foundations, pool lounging and diving areas, and other similar uses. These areas shall be designed to compliment with the site's natural topography, vegetation, and water conditions.

5.5 Walls, Fences & Gates

See 3.4.1 for guidance which also applies to residential walls and gates. See below for design guidelines for residential fences.

5.6 Residential Fences

Fencing used for the purposes of creating safety and security and contributing to the site's agrarian character will help to both retain the sense of a continuous rural landscape and mindfully preserve wildlife corridors as to not restrict special specie wildlife movement. Residential fencing locations shall also be coordinated with common area fencing throughout the Resort site.

Fencing materials shall be well-suited for its purposes, surrounding site conditions, and the material selections of nearby infrastructure, architecture, and site features. Materials shall generally be visually permeable and preserve views from roadways, pathways, commercial buildings, and nearby residential parcels. Examples of appropriate materials include various farm fencing systems, including wooden post & rail fencing and wooden or metal post & wire fencing. Fences shall generally not exceed six feet in height; fencing higher than six feet will be considered on a case-by-case basis as determined by the HOA.

5.1 Recreational Amenities

Residential parcels are allowed to include various types of outdoor recreational areas, such as tennis courts, croquet courts, bocce ball courts, lawn bowling, or polo fields. These types of recreational amenities shall not create a noise or visual nuisance for property owners outside of the Project Site. Where necessary, recreational amenities within residential parcels, shall be landscape screened.

5.2 Planting Selection & Design

As much as possible, existing landscape patterns shall be preserved and enhanced within the residential parcel. This strategy aligns with the overall Resort objective of creating a 'light-touch' approach to integrating development into the area's existing woodland, grassland, and agricultural character. To the extent feasible, the removal of mature and healthy vegetation shall be limited and disturbed areas restored to healthy and pre-development, natural conditions.

New planting designs shall be arranged in a way which improved upon the existing site condition, including shading exposed areas during the summer and providing solar access to key locations during the winter months.

The landscape design should prioritize the use of plants which are native or well-adapted to the local northern California climate and setting. Native species will become better integrated with the existing landscape and become important food sources and habitat for native birds, butterflies and wildlife. As much as possible, selected plantings shall be drought-tolerant and require limited irrigation, fertilization, and maintenance. Appendix A provides a recommended residential planting palette list. Non-native invasive species shall be avoided; in addition, planting designs shall avoid using tree species with invasive root systems near utility lines and paving.

The use of ornamental planting shall be selectively used to provide contrast and interest within the planting design. Trees and shrubs shall occasionally be used to screen certain features within the site (i.e. utility structures, parking areas, sport courts, etc.).

Any new planting design and selected species shall follow landscape wildfire prevention objectives (see 5.10), especially in terms of recommendations for plant selection, clearance, and spacing. To the extent feasible, planting design and selection shall avoid fire-prone plantings (See Appendix B).

5.3 Residential Vineyards

See 2.3.2; the guidance provided within this section will also apply to private, residential vineyards.

5.4 Irrigation & Water Conservation

Water is a valuable resource within the Guenoc Valley District. Residential landscape design shall minimize water use and irrigation requirements. In order to create a water efficient landscape, irrigation design for residential parcels shall conform to the Water Efficient Landscape Ordinance (WELO).

Landscape design shall prioritize the use of drought-tolerant, climate-appropriate, native, and adaptive plants with low water use requirements. Designs shall emphasize grouping plantings according to water consumption needs and site microclimates. Planting areas shall be mulched with locally sourced bark or gravel mulch to retain soil moisture and provide weed control. Until planting areas become established, erosion control measures such as jute-netting, straw wattles, hydroseed mixes, and erosion control groundcovers may be used.

Residential landscape design shall minimize the necessity for ongoing irrigation; as much as possible, ongoing irrigation shall be limited to plant establishment periods and be terminated thereafter. However, irrigation systems installed primarily for planting establishment could be maintained and re-activated during wildfire seasons or during wildfires for additional site and structure protection.

Irrigation distribution systems may be undergrounded and other sub-surface irrigation techniques—such as capillary systems—should be used where appropriate to limit water evaporation and run-off. Irrigation systems shall use a central, computerized controller to maximize efficiency; computerized systems with rain and soil moisture sensors and connections to evapotranspiration weather stations will facilitate efficient water use.

Wherever feasible, residential landscape design shall utilize cisterns and other applications to harvest and store stormwater for irrigation needs.

5.5 Wildfire Prevention

Wildfire is a continuous risk throughout the Resort. The following steps shall be taken in order to reduce wildfire risk on each individual residential parcel. Please refer to the *Wildfire Prevention Plan* for additional information on residential wildfire prevention strategies.

Determine Total Defensible Space and Defensible Zones

Defensible space and zones shall be established and maintained for the purposes of reducing fire risk in the immediate vicinity of the residential structure. As detailed below, the recommended approach for determining total defensible space and zones will depend on the conditions and configurations of each residential parcel.

Determining Total Defensible Space

The total defensible space will depend on the unique topographic and vegetated conditions of each parcel. The guideline below provides information on determining total defensible space:

		General Parcel Slope		
		0 - 20% *Flat to Gently Sloping*	21 - 40% *Moderately Steep*	40% + *Very Steep*
General Parcel Vegetation Coverage	Grass-Dominated	50 feet	100 feet	100+ feet
	Shrub-Dominated	100 feet	150 feet	150+ feet
	Tree-Dominated	50 feet	100 feet	150+ feet

- Grass-Dominated Coverage: Landscapes dominated by grasses, weeds, and widely scattered shrubs
- Shrub-Dominated Coverage: Landscapes dominated by shrubs, scrub, or chaparral
- Tree-Dominated Coverage: Landscapes dominated by trees; if understory is substantially shrubs, follow "shrub-dominated coverage" category

Determining Defensible Zones

Two defensible zones shall be established and maintained within the total defensible space:

- Zone 1: Regardless of the total defensible space, the first defense zone will be maintained zero to 30 feet from the edge of the residential structure.
- Zone 2: The second defense zone will be maintained from 30 feet from the edge of the building to the edge of the total defensible space (e.g. 50 feet, 100 feet, 150 feet); this includes a defensible space of zero to 15 feet from the driveway edge.

Wherever necessary or possible, adjacent residential parcel owners and the Resort ownership will cooperatively address defensible space concerns which cannot be fully established or maintained within the residential parcel line.

Prepare Site by Removing & Reducing Flammable Vegetation

Once the total defensible area and zones are established, the following fuel reduction strategies shall be prioritized to prepare the site for residential dwellings:

Zone 1: Remove Flammable Vegetation

Within this zone, highly flammable vegetation shall be removed. This includes removing all standing dead trees and shrubs. All downed dead trees, tree branches, and shrubs shall also be removed if not yet decayed. All dead tree and shrub branches shall be removed. Trees shall generally be pruned up to a height of 10 feet, depending on tree species and understory conditions. Flammable shrub species which are not removed shall be thoroughly pruned.

Zone 2: Reduce Flammable Vegetation

Within this zone, flammable vegetation shall be reduced. Trees and shrubs shall be selectively pruned to reduce flammable parts, such as low-hanging or dead branches. Dead vegetation shall also be selectively removed within this wider zone. To adequately protect the parcel from wildfire risk, selective clearing and thinning of existing vegetation to create well-separated groupings of plantings may be necessary.

Establish New Landscape and Site Design

Various actions shall be prioritized to create a fire safe landscape and site design surrounding the residential structure.

Fire-Resistant Planting Design and Selection

Planting designs shall accommodate adequate planting spacing and clearance strategies in order to reduce the risk of fire spreading horizontally or vertically (see *Wildfire Prevention Plan* for further spacing and clearance recommendations). Planting designs and patterns shall anticipate the mature size of new trees and shrubs. Simple, low-volume, and well-separated planting arrangements will generally achieve these spacing and clearance objectives. All efforts shall be made to avoid tree limbs touching the residential structure or powerlines; tree limbs shall also not be within 10 feet of the chimney.

Planting selection shall avoid fire-prone species and instead prioritize fire-resistant species (see Appendix B). In general, fire-resistant species are low-growing with a high moisture content and have stems or leaves that are not resinous, oily, or waxy.

Small-Scale Fire Breaks: Hardscapes and Irrigation

Wherever possible, the landscape design shall be configured in a way to create a series of smaller-scale fire breaks in the immediate vicinity of the residential structure. This includes selectively using a pattern of non-combustible materials (such as gravel mulch, boulders, and rocks) as well as driveways, walkways, patios, and parking areas to reduce fire risk. Pools, water features, ponds, or streams shall also be creatively used for this purpose.

Additional Strategies

Additional landscape design strategies shall also be prioritized to reduce fire risk within the residential parcel and improve emergency response. This includes the following:

- Constructing fencing with non-combustible materials, such as stone or metal, rather than wood;
- Enclosing areas below decks to reduce the risk of debris ignition;
- Clearly marking the address number on the house itself and at the driveway entry to aid in identification in the case of a fire emergency; and
- As much as possible, designing residential driveways and bridges to allow for large-scale emergency vehicle access.

Manage Landscape to Reduce Risk

Various landscape management practices shall be prioritized to address wildfire hazards within the residential landscape. This includes the following recommendations for residential property owners:

- Periodically inspect the residential property to maintain defensible space—which includes ongoing removal and reduction of flammable vegetation and reestablishment of vegetation clearance and spacing standards;
- Prune tree limbs which are within 10 feet of buildings or chimneys or are otherwise encroaching on powerlines;
- Within the defensible space, trim tree limbs below 10 feet in height; for smaller trees, prune the lower 1/3 of the branches;
- Routinely mow grasses and wildflowers within the defensible space to a maximum height of 4 inches, particularly during dry seasons;
- Keep vegetation well-irrigated, particularly within the first defense zone;
- Where feasible, irrigation systems used for plant establishment should be maintained for additional wildfire protection;
- Remove vegetation debris that accumulates on the roof or within the rain gutters;
- Place combustible debris (firewood, wood scraps, grass clippings, leaf piles, or garbage cans) and propane tanks outside of the first defense zone; and
- Keep any ignitable outdoor furniture and equipment (i.e. wooden brooms and shovels) 10 feet away from the residential structure or in an enclosure.

Fire prevention landscape maintenance shall be a permanent and ongoing requirement of individual homeowners and will be incorporated into the CC&Rs.

5.6 Exterior Service Areas

Exterior service areas—such as trash and recycling enclosures, work areas, and outdoor storage—contribute to the functionality of residential parcels. These areas shall be located and designed to be discrete and screened from the public viewshed. Wherever feasible, these areas shall be integrated into the residential building design. Trash and recycling storage areas shall be easily accessible to service personnel, contain odor, and be secured from wildlife.

5.7 Landscape Structures & Furnishings

Residential landscapes may include outdoor structures such as trellises, gazebos, pergolas, pavilions, and play equipment. The landscape may also include outdoor site furnishings, including benches, picnic tables, trash urns, bicycle racks, shade canopies, or other common elements. Where feasible and aligned with the site design, these structures and furnishings should be

designed to appear as extensions of buildings or building components. To the greatest extent possible, freestanding elements should be sited so as to not be visible from adjacent residences or the public right of ways. Furnishings shall be of high-quality and durable.

5.8 Landscape Lighting

Residential lighting design shall preserve nighttime dark skies by minimizing exterior lighting. Lighting shall be selectively used to illuminate and differentiate outdoor areas, guide nighttime navigation, direct access to building entries, highlight signage and address markers, and improve safety and security.

Accent lighting may be used in limited circumstances to emphasize prominent site features, such as boulders, artwork, or plantings..

Wherever possible, light fixtures and sources shall be hidden from direct daytime or nighttime view by being recessed into the ground or hidden by plant materials. Lighting levels shall be no higher than necessary to provide efficient lighting of various landscape areas. Low-level, pedestrian-scale lighting shall be used to the greatest extent possible.

Landscape lighting fixtures should be equipped with cut-off shields to limit visibility from adjacent areas. Lighting fixtures shall be durable and easily maintained. As much as possible, outdoor lighting shall utilize energy-efficient light sources that provide appropriate light color temperatures. On-demand, photocell and motion-sensing lighting systems shall also be prioritized to minimize unnecessary nighttime lighting.

Residential landscape lighting shall avoid lighting or glare which is directed onto the roadway or nearby residences, commercial buildings, or amenities. Lighting design shall also be carefully designed to avoid unnecessary illumination of natural habitats. The use of intense, bright, blinking, or flashing lights shall be avoided.

5.9 Outdoor Artwork & Monuments

Outdoor artwork, monuments, and other types of free-standing objects may be allowed on residential parcels. These will be allowed to provide visual interest and opportunities for personal expression by homeowners. These types of objects shall be placed in locations which limit visibility from the public right of way.

5.10 Address Markers

Residential parcels shall have an address marker or monument at driveway entrances. In the case of shared or closely aligned driveways, a single address marker may serve multiple residential parcels. An address marker may also be placed on the residential structure.

Address markers shall be designed to compatible with nearby architecture. Markers shall minimize visual impact and only be used where necessary.

They shall be constructed of high-quality materials. Text and number size shall be visible and legible, particularly at the eye-level for vehicles travelling in both directions; text and number colors shall contrast with their background for optimal viewing from a variety of distances. In order to aid nighttime navigation and safety, address markers shall include either a backlight or downlight lighting treatment; text shall also be reflective for emergency purposes.

SECTION 6 IMPLEMENTATION PLAN

6.1 Applicability & Use

The basic land use standards for the Resort site are established under several documents that have been approved by the County of Lake Board of Supervisors. These include: 1) Lake County General Plan General Plan designation Resort Commercial, 2) The proposed Guenoc Valley District Zoning Ordinance, 3) the Specific Plan of Development ("SPOD"), 4) the Maha Wildfire Prevention Plan, 5) the Tentative Subdivision Maps, and 6) the Maha Resort Guenoc Valley Development Agreement (collectively, the "Governing Documents").

These Design Guidelines constitute a companion document intended to supplement the GVD, as it applies to future development within the Resort site. In the event of a conflict between these Design Guidelines and the Governing Documents, the provisions of the Governing Documents shall control. All uses, construction and improvements permitted under these Design Guidelines are subject to review and approval of the architectural committee established under the CC&Rs and if there is no such committee established, then by the board of directors of the Master Association.

6.2 Conformance with Design Guidelines

Each future building permit submittal shall be reviewed for conformance with these Design Guidelines at time of submittal with the County of Lake. Conformance and completeness shall be assessed and verified by the development team or managing party of the Resort. Conformance to standards established for the Resort are subject to the qualifications set forth in the Development Agreement.

A determination of such conformance is not intended to be deemed an approval as to the compliance of design or construction plans or documents with any applicable building codes and standards, including engineering, building codes, or any applicable state or federal law or regulation.

6.3 Maintenance & Enforcement

The provisions of these Design Guidelines, in conjunction with the Governing Documents, shall apply to future development within the Guenoc Valley District. This document provides general design guidelines that property owners/project applicants must use in applications for individual projects within the Guenoc Valley District. Maintenance and enforcement of these guidelines will be detailed by the CC&R's.

APPENDICES

Appendix A: Recommended Plant Palette List

Note: The final version of the Design Guidelines will include further define this recommended planting palette by categories such as evergreen/deciduous, flowering, fruiting, California native, and Water Use Classification of Landscape Species (WUCOLS).

TYPE	SCIENTIFIC NAME	COMMON NAME
TREE	Acer spp.	Maple
TREE	Aesculus californica	Buckeye
TREE	Aesculus indica	Asian Buckeye
TREE	Alnus spp.	Alder
TREE	Arbutus spp.	Strawberry Tree, Cultivars
TREE	Betula pendula	European White Birch
TREE	Calocedrus decurrens	Incense Cedar
TREE	Camellia sinensis	Tea
TREE	Carpinus betulus	European Hornbeam
TREE	Carpinus caroliniana	North American Hornbeam
TREE	Cercidiphyllum japonicum	Katsura
TREE	Cercis canadensis 'Forest Pansy'	Forest Pansy RedBud
TREE	Cercis occidentalis	Red Bud
TREE	Citrus hystrix	Kieffer lime
TREE	Corylus cornuta var. californica	California Hazel
TREE	Fagus sylvatica	European Beech
TREE	Fraxinus spp.	Ash
TREE	Gleditsia spp.	Locust
TREE	Juglans californica	California Walnut Groves
TREE	Koelreuteria paniculata	Golden Rain Tree
TREE	Lagerstroemia spp.	Crape Myrtle, Cultivars
TREE	Laurus nobilis	Sweet Bay
TREE	Magnolia spp.	Magnolia, Cultivars
TREE	Malus spp.	Apple or Crabapple
TREE	Olea europaea	Olive , Cultivars
TREE	Owari Satsuma	Satsuma
TREE	Platanus × acerifolia	London Plane
TREE	Platanus acerifolia 'Columbia'	London Plane Tree
TREE	Platanus racemosa	California Sycamore
TREE	Prunus blireana	Pink Flowering Plum
TREE	Prunus ilicifolia	Hollyleaf Cherry
TREE	Prunus mume	Japanese Flowering Apricot
TREE	Sequoia sempervirens	Coast Redwood

TYPE	SCIENTIFIC NAME	COMMON NAME
TREE	Sorbus alnifolia	Korean Mountain Ash
TREE	Sorbus alnifolia	Korean Mountain Ash
TREE	Styrax japonicus	Japanese Snowbell
SHRUB/VINE	Achillea melefolium	Yarrow
SHRUB/VINE	Adenostoma fasciculatum	Chamise
SHRUB/VINE	Artemisia californica 'Canyon Gray'	Trailing California Sagebrush
SHRUB/VINE	Asclepias spp.	Milkweeds
SHRUB/TREE	Atriplex canescens	Saltbush, fourwing
SHRUB/TREE	Bergenia crassifolia	Winter-Blooming Bergenia
SHRUB/TREE	Brunfelsia pauciflora 'Floribunda'	Yesterday-Today-Tomorrow
SHRUB/GROUNDCOVER	Buddleja davidii	Butterfly Bush
SHRUB/GROUNDCOVER	Buxus spp.	Japanese Boxwood
SHRUB/GROUNDCOVER	Callistemon	Bottlebrush
SHRUB/GROUNDCOVER	Calycanthus occidentalis	Spicebush
SHRUB/GROUNDCOVER	Calycanthus occidentalis	Western Spice Bush
SHRUB/GROUNDCOVER	Caragana arborescens	Siberian Pea-Shrub
SHRUB/GROUNDCOVER	Carpenteria californica	Bush Anemone
SHRUB/GROUNDCOVER	Carpenteria californica	California Bush Anemone
SHRUB/GROUNDCOVER	Ceanothus spp.	Ceanothus, Cultivars
SHRUB/GROUNDCOVER	Cenothus spp.	California Lilac
SHRUB	Cephalanathus occidentalis	Button Willow
SHRUB	Cercis occidentalis	Western Redbud
SHRUB	Chaenomeles japonica	Japanese Flowering Quince
SHRUB	Chamaemelum nobile	Roman Chamomile
SHRUB	Cistus salviifolius	Sage-leaf Rockrose
SHRUB	Cistus spp.	Rockrose 'Victor Reiter'
SHRUB	Clematis ligusticifolia	Pipestem
SHRUB	Convolvulus cneorum	Silverbush
SHRUB	Convolvulus sabatius	Ground Italian Glory
SHRUB	Cornus sericea spp.	Dogwood
SHRUB	Cynara cardunculus	Artichoke
SHRUB	Echeveria x imbricata	Hens and Chicks
SHRUB	Echinacea purpurea	Purple Cone Flower
SHRUB	Eleutherococcus senticosus	Siberian Ginseng
SHRUB	Encelia californica	CA Bush Sunflower
SHRUB	Epilobium californica	California Fuchsia
SHRUB	Epilobium canum	Fuschia
SHRUB	Erigeron glaucus	Seaside Daisy
SHRUB	Erigeron karvinskianus	Santa Barbara Daisy
SHRUB	Eriodictyon californicum	California Yerba Santa Scrub

TYPE	SCIENTIFIC NAME	COMMON NAME
SHRUB	Eriogonum fasciculatum	California Buckwheat
SHRUB	Eryngos spp.	Sea Holly
SHRUB	Fragaria chiloensis	Wild Strawberry
SHRUB	Frageria vesca	strawberry
SHRUB	Frangula californica	California Coffeeberry
SHRUB	Fremontodendron	Flannel Bush
SHRUB	Gaillardia grandiflora	Gaillardia
SHRUB	Galvezia speciosa	Island snapdragon
SHRUB	Garrya elliptica	Coast Silktassel 'James Roof'
SHRUB	Gazania 'Mitsawa Orange'	Orange Trailing Gazania
SHRUB	Grindelia stricta	Gumplant
SHRUB	Hemerocallis hybrid	Daylily
SHRUB	Hemerocallis spp.	Daylily
SHRUB	Heteromeles arbutifolia	California Holly, Toyon
SHRUB	Hoytia macrostachya	Leather Root
SHRUB	Lavandula spp.	Lavender
SHRUB	Liriope spicata 'Silver Dragon'	Lily Turf
SHRUB	Lonicera hispidula	honeysuckle
SHRUB	Lonicera involucrata	Twinberry
SHRUB	Lonicera japonica 'Halliana'	Hall's Japanese Honeysuckle
SHRUB	Mahonia pinnata	California holly grape
SHRUB	Mahonia repens	Creeping Mahonia
SHRUB	Mahonia spp.	Oregon Grape
SHRUB	Malacothamus fremontii	Bush Mallow
SHRUB	Marrubium vulgare	Horehound
PERENNIAL/SHRUB	Mentha × piperita	Double Mint
PERENNIAL/SHRUB	Mentha suaveolens	Applemint
GROUNDCOVER	Mimulus aurantiacus	Bush Monkey Flower
GROUNDCOVER	Miscanthus sinensis	Silver Grass
GROUNDCOVER	Monarda fistulosa	Wild Bergamot- Bee balm
GROUNDCOVER	Myrica californica	Pacific Wax Myrtle
GROUNDCOVER	Nassella spp. - Melica spp.	Purple Needle Grass
GROUNDCOVER	Origanum vulgare	Sweet Marjoram
GROUNDCOVER	Pelargonium peltatum	Trailing Geranium
GROUNDCOVER	Penstemon heterophyllus var.	Foothill Penstemon
GROUNDCOVER	Philadelphus ssp	Mock Orange
GROUNDCOVER	Phlomis fruticosa	Jerusalem Sage
GROUNDCOVER	Pholmis lanata	Wooly Jerusalem Sage
GROUNDCOVER	Phormium tenax	New Zealand Flax
PERENNIAL	Plumbago auriculata	Cape Plumbago

TYPE	SCIENTIFIC NAME	COMMON NAME
PERENNIAL	Prunus laurocerasus 'Zabeliana'	Zabel Laurel
PERENNIAL	Punica spp.	Pomegranate
PERENNIAL	Pycnanthemum	Mountain Mint
PERENNIAL	Rhamnus Eve Case	low coffeeberry
PERENNIAL	Rhamnus Mound San Bruno	low coffeeberry
PERENNIAL	Rhamnus purshina	Cascara Buckthorn
PERENNIAL	Rhododendron occidentale	Western Azalea
PERENNIAL	Rhus ovata	Sugar Sumac
PERENNIAL	Ribes aureum	Golden Currant
PERENNIAL	Ribes californicum	Hillside Gooseberry
PERENNIAL	Ribes malvaceum	Chaparral Currant
PERENNIAL	Ribes sanguinium	Red Flowering Currant
PERENNIAL	Ribes ssp.	Gooseberry and Currant
PERENNIAL	Rosa banksiae	Flowering Lady Banks' Rose
PERENNIAL	Rosa x Noatraum	Carpet Rose
PERENNIAL	Rudbeckia hirta	Black-Eyed Susan
PERENNIAL	Rudbeckia spp.	Ox-Eye Daisy
PERENNIAL	Salix breweri	Brewer’s Willow
PERENNIAL	Salvia spp.	Sage
PERENNIAL	Sambucus nigra ssp. caerulea	Blue Elderberry
PERENNIAL	Soleirolia soleirolii	Baby's Tears
PERENNIAL	Stachys byzantina	Lamb's Ear
PERENNIAL	Styrax rediviva	California Snowdrop Bush
PERENNIAL	Symphoricarpos albus var. laevigatus	Snowberry
PERENNIAL	Tagetes lemmonii	Bush Marigold
PERENNIAL	Teucrium cossonii majoricum	Majorcan Germander
PERENNIAL	Teucrium fruticans	Bush Germander
PERENNIAL	Teucrium x lucidrys	Germander
PERENNIAL	Thymus vulgaris	English Thyme
PERENNIAL	Tulbaghia violacea	Society Garlic
PERENNIAL	Vitis californica	California Wild Grape
FRUIT	Actinidia spp.	Kiwi, Cultivars
FRUIT	Amelanchier spp.	Serviceberry
FRUIT	Carya illinoinensis	Pecan Seedling
FRUIT	Castanea spp.	Chestnut, Cultivars
FRUIT	Citrus aurantiifolia 'Thornless'	Mexican Thornless Lime
FRUIT	Citrus limon 'Improved Meyer'	Improved Meyer Lemon
FRUIT	Corylus avellana	Hazel, Cultivars
FRUIT	Crataegeus mexicana	Tejocote
FRUIT	Crataegus azarolus	Azarole

TYPE	SCIENTIFIC NAME	COMMON NAME
FRUIT	Crataegus monogyna	Hawthorn
FRUIT	Diospyros spp.	Persimmon, Cultivars
FRUIT	Elaeagnus ebengii	Silver Berry, Cultivars
FRUIT	Eriobotyra japonica	Loquat
FRUIT	Feijoa spp.	Pineapple Guava
FRUIT	Ficus spp.	Figs, Cultivars
FRUIT	Hippophae rhamnoides	Sea Buckthorne, Cultivars
FRUIT	Ideaobatus spp.	Blackberry, Cultivars
FRUIT	Malus spp.	Apples and Crabapples, Cultivars
FRUIT	Mespilus germanica	Medlar, Cultivars
FRUIT	Morus nigra	Persian Mulberry
FRUIT	Oemleria cerasiformis	Oso Berry
FRUIT	Prunica granatum	Pomegranate, Cultivars
FRUIT	Prunus Varities and Species	Peach, Plum, and other Stonefruit
FRUIT	Pyrus communis spp.	Fruiting Pear Cultivars
FRUIT	Ribes viburniflium	Catalina Currant
FRUIT	Sambucus spp.	Elderberry
FRUIT	Vaccinium spp.	Blueberry
FLOWER	Aster chilensis	Aster
FLOWER	Bidens ferulifolia	Fern-leaved Beggarticks
FLOWER	Borago officinalis	Borage
FLOWER	Caesalpinia	Peacock Flower
FLOWER	Calendula spp.	Calendula flower
FLOWER	Calochortus venustus	Mariposa Lily
FLOWER	Centaurea cyanus	Bachelor Buttons
FLOWER	Cichorium intybus	Chicory
FLOWER	Clarkia concina	Clarkia
FLOWER	Coreopis spp.	Tickseed
FLOWER	Dorychium hirsutism	Canary Clover
FLOWER	EschscholzIa spp.	Poppy
FLOWER	Iris macrosiphon	Bowltube Iris
FLOWER	Lomatium dasycarpum	Desert Parsley
FLOWER	Lupinus sericstus	Cobb Lupine
FLOWER	Lupinus albifrons	Silver Lupine
FLOWER	Penstemon heterophyllus	Penstemon
FLOWER	Phacelia californica	Phacelia
FLOWER	Solidago californica	California Goldenrod
FLOWER	Tropaeolum majus	Nasturtium
FLOWER	Zinnia spp.	Sunflowers
GRASS	Agrostis pallens	Seashore Bent Grass

TYPE	SCIENTIFIC NAME	COMMON NAME
GRASS	Asclepia erocarpa	Indian Milkweed
GRASS	Bromus carinatus	California Brome
GRASS	Calamagrostis nutkaensis	Pacific Reed Grass
GRASS	Carex barbarae	Santa Barbara Sedge
GRASS	Carex spp.	Sedge
GRASS	Dantonia californica	California Oatgrass
GRASS	Deschampsia caepitosa	Tufted Hairgrass
GRASS	Eleocharis macrostachya	Common Spikerush
GRASS	Elymus condensatus	Giant Wildrye
GRASS	Elymus glaucus	Blue Wild Rye
GRASS	Equisetum hyemale ssp.affine	Giant Scouring Rush
GRASS	Festuca glauca	Blue Fescue
GRASS	Festuca glauca	Blue Fescue 'Siskiyou Blue'
GRASS	Festuca californica	California Fescue
GRASS	Festuca iadaohensis	Idaho Fescue
GRASS	Festuca mairei	Atlas Fescue
GRASS	Festuca rubra	Creeping Red Fescue 'Patrick's Point'
GRASS	Helictotrichon sempervirens	Blue Oat Grass
GRASS	Hordeum brachyantherum	Meadow Barley
GRASS	Juncus bufonius	Toad Rush
GRASS	Juncus effusus	Soft Rush
GRASS	Juncus patens	California Gray Rush 'Elk Blue'
GRASS	Koeleria macranta	June Grass
GRASS	Leymus triticoides	Creeping Wild Rye
GRASS	Melica californica	California Onion Grass
GRASS	Muhlenbergia capillaris	Muhly Grass
GRASS	Muhlenbergia rigens	Deer Grass
GRASS	Nassella (Stipa) pulchra	Purple Needle Grass
GRASS	Poa secunda	Pine Bluegrass
GRASS	Schoenoplectus acutus	Hardstem Bulrush
GRASS	Scirpus acutus	Hardstem Bulrush
GRASS	Scirpus californicus	California BuIrush
GRASS	Sporobolus airoides	Alkali Sacaton
GRASS	Stipa cemua	Nodding Needle Grass
GRASS	Stipa pulchra	Purple Needle Grass
FERN	Athyrium filix-femina	Lady Fern
FERN	Polystichum munitum	Western Sword Fern
VINE	Bougainvillea spp.	Paper Flower
VINE	Clematis armandii	Evergreen clematis
VINE	Clytostoma callistegioides	Violet Trumpet Vine

TYPE	SCIENTIFIC NAME	COMMON NAME
VINE	Distictis buccinatoria	Blood-Red Trumpet Vine
VINE	Gelsemium sempervirens	Carolina Yellow Jessamine
VINE	Humilus lupulus	Hops
VINE	Lonicera hildebrandiana	Giant Burmese Honeysuckle
VINE	Lonicera japonica 'Purpurea'	Purple-Leaf Honeysuckle
VINE	Parthenocissus tricuspidata	Boston Ivy
VINE	Rosa banksiae	'Lady Banks' Rose
VINE	Rubus spp.	Bramble Fruits, "Berries"
VINE	Vitis spp.	Grapes, Cultivars
ANNUAL	Antirrhinum majus 'Dwarf Varieties'	Snapdragon
ANNUAL	Begonia semperflorens-cultorum	Wax Begonia
ANNUAL	Brassica oleracea acephala	Flowering Kale
ANNUAL	Celosia cristata 'Dwarf Varieties'	Feather Crested Cockscomb
ANNUAL	Centaurea cineraria	Dusty Miller
ANNUAL	Clarkia unguiculata	Purple Clarkia
ANNUAL	Coleus hybridus	Coleus
ANNUAL	Dianthus spp.	Dianthus Flowers
ANNUAL	Euphorbia pulcherrima	Poinsettia
ANNUAL	Iberis sempervirens	Candytuft, Cultivars
ANNUAL	Lobelia erinus	Edging Lobelia
ANNUAL	Lobularia maritima	Sweet Alice
ANNUAL	Matricaria recutita	Common Chamomile
ANNUAL	Petunia hybrida	Petunia
ANNUAL	Phacelia tanacetifolia	Phacelia
ANNUAL	Primula polyantha	English Primrose
ANNUAL	Salvia splendens	Scarlet Sage
ANNUAL	Tagetes patula	French Marigold
ANNUAL	Viola wittrockiana	Pansy
ANNUAL	Zinnia elegans	Zinnia

Appendix B: Fire-Prone Plant List

The following plants shall generally be avoided when establishing new landscape designs as to reduce wildfire risk.

TYPE	SCIENTIFIC NAME	COMMON NAME
TREE	Acacia spp.	Acacia species
TREE	Abies spp.	Firs
TREE	Cedrus spp.	Cedars
TREE	Chamaecyparis spp.	False Cypress
TREE	Cupressus spp.	Cypress
TREE	Eucalyptus spp.	Eucalyptus
TREE	Larix spp.	Larch
TREE	Notholithocarpus densiflorus	Tan Oak, Tanbark Oak
TREE	Palms	Palm (if dry fronds)
TREE	Picea spp.	Spruces
TREE	Pinus coulteri	Coulter Pine
TREE	Pinus muricata	Bishop Pine
TREE	Pinus radiata	Monterey Pine
TREE	Pinus sabiniana	Gray Pine
TREE	Pinus serotina	Pond Pine
TREE	Pinus spp.	Pines
TREE	Pinus sylvestris	Scots Pine
TREE	Pinus torreyana	Torrey Pine
TREE	Pseudotsuga menziesii	Douglas-Fir
TREE	Thuja spp.	Arborvitae
TREE	Tsuga spp.	Hemlock
TREE	Umbellularia californica	California Bay
SHURB	Arctostaphylos spp.	Manzanita
SHRUB	Adenostoma fasciculatum	Chamise, Greasewood
SHRUB	Artemisia californica	Coastal Sagebrush
SHRUB	Baccharis spp.	Coyote Brush
SHRUB	Cytisus scoparius	Scotch Broom
SHRUB	Ecchium	Pride of Madeira
SHRUB	Erigonum fasciculatum	California Buckwheat
SHRUB	Genista monspessulana	French Broom
SHRUB	Pickeringia montana	Chaparral Pea
SHRUB	Quercus spp.	Scrub Oak (brushy oaks)
SHRUB	Rosmarinus officinalis	Rosemary
SHRUB	Salvia mellifera	Black Sage
SHRUB	Spartium junceum	Spanish Broom

TYPE	SCIENTIFIC NAME	COMMON NAME
SHRUB	Ulex europea	Gorse
SHRUB	Vaccinium ovatum	Evergreen Huckleberry
TREE/SHRUB	Chrysolepis chrysophylla	Qinquapin,Giant
TREE/SHRUB	Juniperus spp.	Junipers
TREE/SHRUB	Taxus spp.	Yew
GRASS	Cortaderia jubata	Jubata Grass
GRASS	Cortaderia selloana	Pampas Grass
GRASS	Pennisetum spp.	Fountain Grass
SHRUB/GRASS	Bamboo	Bamboo, all species

Appendix C: Design Guidelines Checklist

APPENDIX EDR

EDR REPORT

Guenoc Valley Site
Multiple APN s
Middletown, CA 95461

Inquiry Number: 5821474.2s
October 09, 2019

EDR Area / Corridor Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

SUBJECT PROPERTY INFORMATION

ADDRESS

MULTIPLE APN S
MIDDLETOWN, CA 95461

TARGET PROPERTY SEARCH RESULTS

The Target Property was identified in the following databases.

Page Numbers and Map Identifcations refer to the EDR Area/Corridor Report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

STANDARD ENVIRONMENTAL RECORDS

State and tribal leaking storage tank lists

LUST: Geotracker's Leaking Underground Fuel Tank Report

A review of the LUST list, as provided by EDR, has revealed that there is 1 LUST site within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
MAGOON ESTATE LIMITE	***22000 BUTTS CANYON R***	***B3 / 20***	***78***
Database: LUST REG 5, Date of Government Version: 07/01/2008 Database: LUST, Date of Government Version: 06/10/2019 Status: Completed - Case Closed Status: Case Closed Global Id: T0603300084			

State and tribal registered storage tank lists

AST: Aboveground Petroleum Storage Tank Facilities

A review of the AST list, as provided by EDR, has revealed that there are 2 AST sites within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
UNITED STATES COAST	22627 GRANGE RD	A2 / 13	77
Database: AST, Date of Government Version: 07/06/2016			

EXECUTIVE SUMMARY

Site	Address	Map ID / Focus Map(s)	Page
LANGTRY FARMS, LLC	22000 BUTTS CANYON R	B8 / 20	88
Database: AST, Date of Government Version: 07/06/2016			

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Hazardous waste / Contaminated Sites

CERS HAZ WASTE: CERS HAZ WASTE

A review of the CERS HAZ WASTE list, as provided by EDR, and dated 08/14/2019 has revealed that there are 2 CERS HAZ WASTE sites within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
LANGTRY FARMS, LLC	***22000 BUTTS CANYON R***	***B11 / 20***	***89***
GUENOC WINERY CLASS	***21000 BUTTS CANYON R***	***C15 / 19***	***96***

Local Lists of Registered Storage Tanks

SWEEPS UST: SWEEPS UST Listing

A review of the SWEEPS UST list, as provided by EDR, and dated 06/01/1994 has revealed that there is 1 SWEEPS UST site within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
MAGOON ESTATE LIMITE	***22000 BUTTS CANYON R***	***B3 / 20***	***78***
Status: A			
Tank Status: A			
Comp Number: 44561			

HIST UST: Hazardous Substance Storage Container Database

A review of the HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there is 1 HIST UST site within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
MAGOON ESTATE LIMITE	***22000 BUTTS CANYON R***	***B3 / 20***	***78***
Facility Id: 00000044561			

CERS TANKS: California Environmental Reporting System (CERS) Tanks

A review of the CERS TANKS list, as provided by EDR, and dated 08/14/2019 has revealed that there is 1 CERS TANKS site within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
LANGTRY FARMS, LLC	***22000 BUTTS CANYON R***	***B11 / 20***	***89***

EXECUTIVE SUMMARY

Records of Emergency Release Reports

LDS: Land Disposal Sites Listing

A review of the LDS list, as provided by EDR, and dated 06/10/2019 has revealed that there is 1 LDS site within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
GUENOC WINERY CLASS Global Id: T10000009547 Status: Open - Active	***21000 BUTTS CANYON R***	***C15 / 19***	***96***

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 03/25/2019 has revealed that there is 1 RCRA NonGen / NLR site within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
LANGTRY FARMS LLC EPA ID:: CAL000429912	22000 BUTTS CANYON R	B5 / 20	85

FINDS: Facility Index System/Facility Registry System

A review of the FINDS list, as provided by EDR, and dated 05/03/2019 has revealed that there are 5 FINDS sites within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
LANGTRY FARMS LLC Registry ID:: 110070429560	***22000 BUTTS CANYON R***	***B9 / 20***	***89***
GUENOC RANCH Registry ID:: 110065580721	22000 BUTTS CANYON R	B10 / 20	89
LANGTRY FARMSNA LLC Registry ID:: 110066199740	22000 BUTTS CANYON R	B12 / 20	95
GUENOC WINERY INC. Registry ID:: 110055669389	21000 BUTTS CANYON R	C13 / 19	95
GUENOC WINERY CLASS Registry ID:: 110066056001	21000 BUTTS CANYON	C14 / 19	96

ECHO: Enforcement & Compliance History Information

A review of the ECHO list, as provided by EDR, and dated 07/06/2019 has revealed that there is 1 ECHO site within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
LANGTRY FARMS LLC	***22000 BUTTS CANYON R***	***B9 / 20***	***89***

EXECUTIVE SUMMARY

Registry ID: 110070429560

Cortese: "Cortese" Hazardous Waste & Substances Sites List

A review of the Cortese list, as provided by EDR, and dated 06/24/2019 has revealed that there is 1 Cortese site within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
GUENOC WINERY CLASS	***21000 BUTTS CANYON R***	***C15 / 19***	***96***

CUPA Listings: CUPA Resources List

A review of the CUPA Listings list, as provided by EDR, has revealed that there are 2 CUPA Listings sites within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
MAGOON ESTATE LIMITE	***22000 BUTTS CANYON R***	***B3 / 20***	***78***
Database: CUPA LAKE, Date of Government Version: 05/30/2019 Facility: FA0001071			
GUENOC WINERY CLASS	***21000 BUTTS CANYON R***	***C15 / 19***	***96***
Database: CUPA LAKE, Date of Government Version: 05/30/2019 Facility: FA0000078			

ENF: Enforcement Action Listing

A review of the ENF list, as provided by EDR, and dated 07/19/2019 has revealed that there is 1 ENF site within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
GUENOC WINERY CLASS	***21000 BUTTS CANYON R***	***C15 / 19***	***96***
Status: Historical Status: Active Facility Id: 654934 Facility Id: 228116			

HAZNET: Facility and Manifest Data

A review of the HAZNET list, as provided by EDR, and dated 12/31/2017 has revealed that there are 2 HAZNET sites within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
US COAST GUARD LORAN GEPAID: CAL000312554	22627 GRANGE RD	A1 / 13	76
GUENOC RANCH GEPAID: CAL000000474	22000 BUTTS CANYON R	B6 / 20	86

EXECUTIVE SUMMARY

HIST CORTESE: Hazardous Waste & Substance Site List

A review of the HIST CORTESE list, as provided by EDR, and dated 04/01/2001 has revealed that there is 1 HIST CORTESE site within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
GUENOC RANCH Reg Id: 170105	22000 BUTTS CNYN	B7 / 20	88

WDS: Waste Discharge System

A review of the WDS list, as provided by EDR, and dated 06/19/2007 has revealed that there is 1 WDS site within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
GUENOC WINERY CLASS Facility Status: A Facility Id: 5A172012001	***21000 BUTTS CANYON R***	***C15 / 19***	***96***

CIWQS: California Integrated Water Quality System

A review of the CIWQS list, as provided by EDR, and dated 06/04/2019 has revealed that there is 1 CIWQS site within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
GUENOC WINERY CLASS	***21000 BUTTS CANYON R***	***C15 / 19***	***96***

CERS: CERS

A review of the CERS list, as provided by EDR, and dated 08/14/2019 has revealed that there are 4 CERS sites within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
MAGOON ESTATE LIMITE	***22000 BUTTS CANYON R***	***B3 / 20***	***78***
LANGTRY FARMS, LLC	***22000 BUTTS CANYON R***	***B11 / 20***	***89***
GUENOC WINERY CLASS	***21000 BUTTS CANYON R***	***C15 / 19***	***96***
GUENOC WINERY CLASS	21000 BUTTS CANYON	C16 / 19	131

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

A review of the RGA LUST list, as provided by EDR, has revealed that there is 1 RGA LUST site within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
GUENOC RANCH	22000 BUTTS CANYON R	B4 / 20	84

EXECUTIVE SUMMARY

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Page Numbers and Map Identifcations refer to the EDR Area/Corridor Report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

A review of the SEMS-ARCHIVE list, as provided by EDR, and dated 07/19/2019 has revealed that there is 1 SEMS-ARCHIVE site within approximately 0.5 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
GEOTHERMAL INDUSTRIE Site ID: 0901692 EPA Id: CAD098080484	***BUTTS CANYON RD***	***WSW 1/4 - 1/2 (0.480 mi.)***	***E25 / 18***	***151***

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

A review of the CORRACTS list, as provided by EDR, and dated 03/25/2019 has revealed that there is 1 CORRACTS site within approximately1 mile of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
GEOTHERMAL INDUSTRIE EPA ID:: CAD098080484	***BUTTS CANYON RD***	***WSW 1/4 - 1/2 (0.480 mi.)***	***E25 / 18***	***151***

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

A review of the RCRA-TSDF list, as provided by EDR, and dated 03/25/2019 has revealed that there is 1 RCRA-TSDF site within approximately 0.5 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
GEOTHERMAL INDUSTRIE EPA ID:: CAD098080484	***BUTTS CANYON RD***	***WSW 1/4 - 1/2 (0.480 mi.)***	***E25 / 18***	***151***

EXECUTIVE SUMMARY

State- and tribal - equivalent CERCLIS

ENVIROSTOR: EnviroStor Database

A review of the ENVIROSTOR list, as provided by EDR, and dated 07/29/2019 has revealed that there are 3 ENVIROSTOR sites within approximately1 mile of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
USCG LORAN C STA Status: No Action Required Facility Id: 17960001	E. GRANGE ROAD	NW 1/8 - 1/4 (0.131 mi.)	17 / 7	134
GEOTHERMAL, INC Status: Refer: RWQCB Facility Id: 17490002	19020 BUTTS CANYON R	WSW 1/4 - 1/2 (0.480 mi.)	E21 / 18	141
GEOTHERMAL INC Status: Refer: RWQCB Facility Id: 80001735	***19020 BUTTS CANYON R***	***WSW 1/4 - 1/2 (0.480 mi.)***	***E27 / 18***	***189***

State and tribal leaking storage tank lists

LUST: Geotracker's Leaking Underground Fuel Tank Report

A review of the LUST list, as provided by EDR, has revealed that there are 2 LUST sites within approximately 0.5 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
MIDDLETOWN ENTERPRIS Database: LUST, Date of Government Version: 06/10/2019 Status: Completed - Case Closed Global Id: T0603300046	***18975 BUTTS CANYON R***	***W 1/4 - 1/2 (0.374 mi.)***	***D19 / 18***	***136***
MIDDLETOWN AIR STRIP Database: LUST REG 5, Date of Government Version: 07/01/2008 Status: Case Closed	***18975 BUTTS CNYN***	***W 1/4 - 1/2 (0.374 mi.)***	***D20 / 18***	***140***

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT: Waste Management Unit Database

A review of the WMUDS/SWAT list, as provided by EDR, and dated 04/01/2000 has revealed that there is 1 WMUDS/SWAT site within approximately 0.5 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
BUTTS CANYON RD. FAC	***19020 BUTTS CANYON R***	***WSW 1/4 - 1/2 (0.480 mi.)***	***E22 / 18***	***142***

EXECUTIVE SUMMARY

Local Lists of Hazardous waste / Contaminated Sites

Toxic Pits: Toxic Pits Cleanup Act Sites

A review of the Toxic Pits list, as provided by EDR, and dated 07/01/1995 has revealed that there is 1 Toxic Pits site within approximately1 mile of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
GEOTHERMAL, BUTTS CA Closure Date: 06/30/93 Task #: 85017 Status: CLOSED	19020 BUTTS CANYON R	WSW 1/4 - 1/2 (0.480 mi.)	E23 / 18	151

Local Lists of Registered Storage Tanks

HIST UST: Hazardous Substance Storage Container Database

A review of the HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there is 1 HIST UST site within approximately 0.25 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
LORAN C STATION MIDD Facility Id: 00000054201	END OF GRANGE ROAD	NW 1/8 - 1/4 (0.190 mi.)	18 / 13	136

Other Ascertainable Records

Cortese: "Cortese" Hazardous Waste & Substances Sites List

A review of the Cortese list, as provided by EDR, and dated 06/24/2019 has revealed that there is 1 Cortese site within approximately 0.5 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
BUTTS CANYON RD FACI	***19020 BUTTS CANYON***	***WSW 1/4 - 1/2 (0.480 mi.)***	***E26 / 18***	***165***

HIST CORTESE: Hazardous Waste & Substance Site List

A review of the HIST CORTESE list, as provided by EDR, and dated 04/01/2001 has revealed that there are 2 HIST CORTESE sites within approximately 0.5 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
MIDDLETOWN AIR STRIP Reg Id: 170066	***18975 BUTTS CNYN***	***W 1/4 - 1/2 (0.374 mi.)***	***D20 / 18***	***140***
BUTTS CANYON RD. FAC Reg Id: 5A170304001	19020 BUTTS CNYN	WSW 1/4 - 1/2 (0.480 mi.)	E24 / 18	151

EXECUTIVE SUMMARY

HWP: EnviroStor Permitted Facilities Listing

A review of the HWP list, as provided by EDR, and dated 05/20/2019 has revealed that there is 1 HWP site within approximately1 mile of the requested target property.

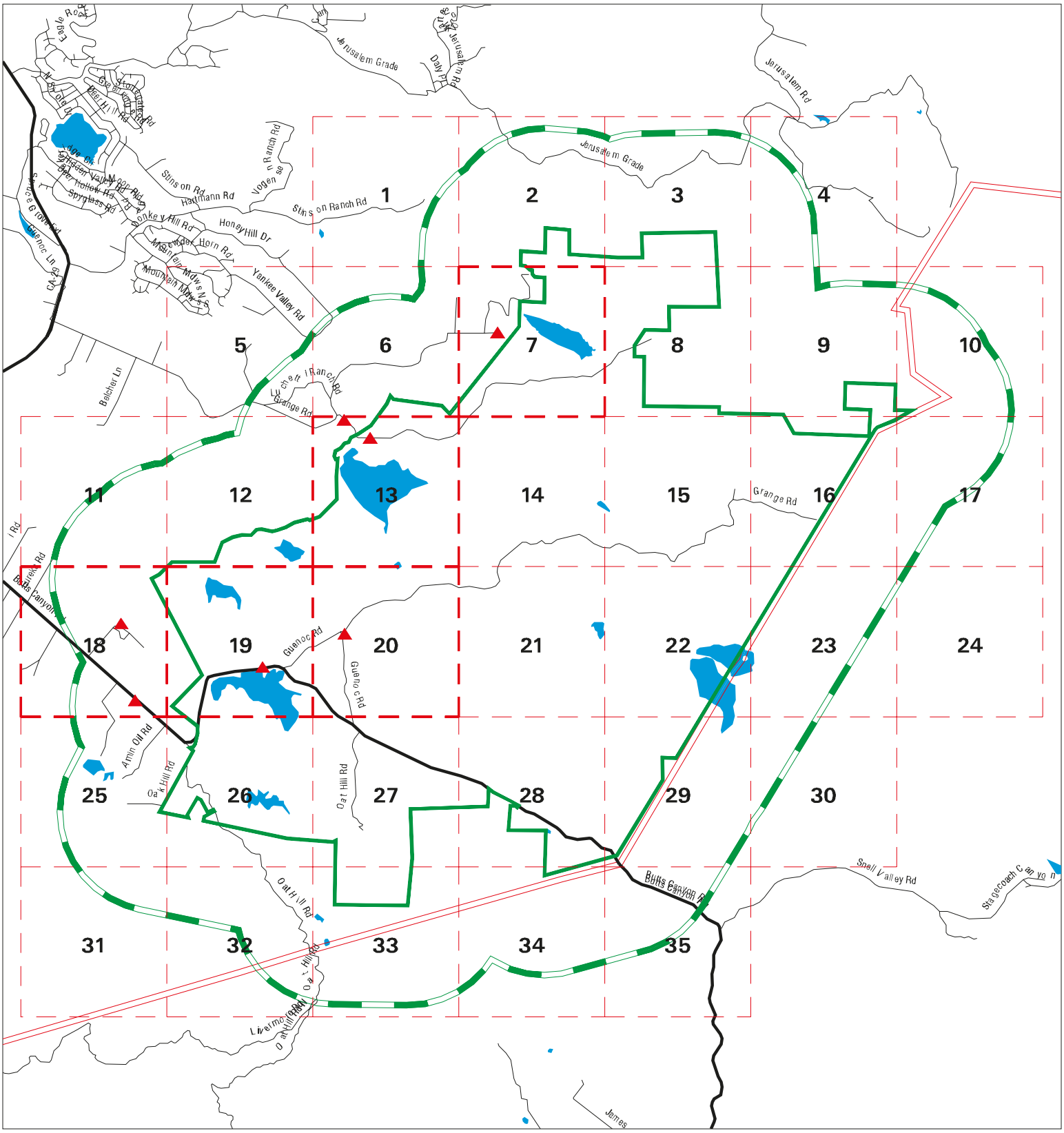
Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
GEOTHERMAL INC EPA Id: CAD098080484 Cleanup Status: CLOSED	***19020 BUTTS CANYON R***	***WSW 1/4 - 1/2 (0.480 mi.)***	***E27 / 18***	***189***

MAPPED SITES SUMMARY

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION		
A1 / 13	US COAST GUARD LORAN	22627 GRANGE RD	HAZNET	TP		
A2 / 13	UNITED STATES COAST	22627 GRANGE RD	AST	TP		
B3 / 20	MAGOON ESTATE LIMITE	22000 BUTTS CANYON R	LUST, SWEEPS UST, HIST UST, CUPA Listing...	TP		
B4 / 20	GUENOC RANCH	22000 BUTTS CANYON R	RGA LUST	TP		
B5 / 20	LANGTRY FARMS LLC	22000 BUTTS CANYON R	RCRA NonGen / NLR	TP		
B6 / 20	GUENOC RANCH	22000 BUTTS CANYON R	HAZNET	TP		
B7 / 20	GUENOC RANCH	22000 BUTTS CNYN	HIST CORTESE	TP		
B8 / 20	LANGTRY FARMS, LLC	22000 BUTTS CANYON R	AST	TP		
B9 / 20	LANGTRY FARMS LLC	22000 BUTTS CANYON R	FINDS, ECHO	TP		
B10 / 20	GUENOC RANCH	22000 BUTTS CANYON R	FINDS	TP		
B11 / 20	LANGTRY FARMS, LLC	22000 BUTTS CANYON R	CERS HAZ WASTE, CERS TANKS, CERS	TP		
B12 / 20	LANGTRY FARMSNA LLC	22000 BUTTS CANYON R	FINDS	TP		
C13 / 19	GUENOC WINERY INC.	21000 BUTTS CANYON R	FINDS	TP		
C14 / 19	GUENOC WINERY CLASS	21000 BUTTS CANYON	FINDS	TP		
C15 / 19	GUENOC WINERY CLASS	21000 BUTTS CANYON R	CERS HAZ WASTE, LDS, Cortese, CUPA Listi...	TP		
C16 / 19	GUENOC WINERY CLASS	21000 BUTTS CANYON	CERS	TP		
17 / 7	USCG LORAN C STA	E. GRANGE ROAD	ENVIROSTOR	694	0.131	NW
18 / 13	LORAN C STATION MIDD	END OF GRANGE ROAD	HIST UST	1002	0.190	NW
D19 / 18	MIDDLETOWN ENTERPRIS	18975 BUTTS CANYON R	LUST, SWEEPS UST, HIST UST	1975	0.374	West
D20 / 18	MIDDLETOWN AIR STRIP	18975 BUTTS CNYN	LUST, HIST CORTESE, CERS	1975	0.374	West
E21 / 18	GEOTHERMAL, INC	19020 BUTTS CANYON R	ENVIROSTOR	2532	0.480	WSW
E22 / 18	BUTTS CANYON RD. FAC	19020 BUTTS CANYON R	WMUDS/SWAT, HAZNET, NPDES, WDS, CIWQS	2532	0.480	WSW
E23 / 18	GEOTHERMAL, BUTTS CA	19020 BUTTS CANYON R	Toxic Pits	2532	0.480	WSW
E24 / 18	BUTTS CANYON RD. FAC	19020 BUTTS CNYN	HIST CORTESE	2532	0.480	WSW
E25 / 18	GEOTHERMAL INDUSTRIE	BUTTS CANYON RD	SEMS-ARCHIVE, CORRACTS, RCRA-TSDF, RCRA	2532	0.480	WSW
E26 / 18	BUTTS CANYON RD FACI	19020 BUTTS CANYON	LDS, Cortese, ENF, CIWQS, CERS	2532	0.480	WSW
E27 / 18	GEOTHERMAL INC	19020 BUTTS CANYON R	ENVIROSTOR, HWP, CERS	2532	0.480	WSW

Key Map - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1 2 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19 12:21 PM

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	0	1	NR	NR	1
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	1	0	NR	1
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	1	NR	NR	1
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-VSQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
RESPONSE	1.000		0	0	0	0	NR	0
State- and tribal - equivalent CERCLIS								
ENVIROSTOR	1.000		0	1	2	0	NR	3
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500	1	0	0	2	NR	NR	3

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN LUST	0.500		0	0	0	NR	NR	0
CPS-SLIC	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	0	NR	NR	NR	0
AST	0.250	2	0	0	NR	NR	NR	2
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal voluntary cleanup sites								
VCP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
WMUDS/SWAT	0.500		0	0	1	NR	NR	1
SWRCY	0.500		0	0	0	NR	NR	0
HAULERS	TP		NR	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	TP		NR	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	0	NR	NR	NR	0
CDL	TP		NR	NR	NR	NR	NR	0
Toxic Pits	1.000		0	0	1	0	NR	1
CERS HAZ WASTE	0.250	2	0	0	NR	NR	NR	2
US CDL	TP		NR	NR	NR	NR	NR	0
PFAS	0.500		0	0	0	NR	NR	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.250	1	0	0	NR	NR	NR	1
HIST UST	0.250	1	0	1	NR	NR	NR	2
CERS TANKS	0.250	1	0	0	NR	NR	NR	1
CA FID UST	0.250		0	0	NR	NR	NR	0
Local Land Records								
LIENS	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
LIENS 2	TP		NR	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
CHMIRS	TP		NR	NR	NR	NR	NR	0
LDS	TP	1	NR	NR	NR	NR	NR	1
MCS	TP		NR	NR	NR	NR	NR	0
SPILLS 90	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250	1	0	0	NR	NR	NR	1
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	TP	5	NR	NR	NR	NR	NR	5
ECHO	TP	1	NR	NR	NR	NR	NR	1
UXO	1.000		0	0	0	0	NR	0
DOCKET HWC	TP		NR	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	0	NR	0
Cortese	0.500	1	0	0	1	NR	NR	2
CUPA Listings	0.250	2	0	0	NR	NR	NR	2

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
EMI	TP		NR	NR	NR	NR	NR	0
ENF	TP	1	NR	NR	NR	NR	NR	1
Financial Assurance	TP		NR	NR	NR	NR	NR	0
HAZNET	TP	2	NR	NR	NR	NR	NR	2
ICE	TP		NR	NR	NR	NR	NR	0
HIST CORTESE	0.500	1	0	0	2	NR	NR	3
HWP	1.000		0	0	1	0	NR	1
HWT	0.250		0	0	NR	NR	NR	0
MINES	0.250		0	0	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0
PEST LIC	TP		NR	NR	NR	NR	NR	0
PROC	0.500		0	0	0	NR	NR	0
Notify 65	1.000		0	0	0	0	NR	0
UIC	TP		NR	NR	NR	NR	NR	0
UIC GEO	TP		NR	NR	NR	NR	NR	0
WASTEWATER PITS	0.500		0	0	0	NR	NR	0
WDS	TP	1	NR	NR	NR	NR	NR	1
WIP	0.250		0	0	NR	NR	NR	0
MILITARY PRIV SITES	TP		NR	NR	NR	NR	NR	0
PROJECT	TP		NR	NR	NR	NR	NR	0
WDR	TP		NR	NR	NR	NR	NR	0
CIWQS	TP	1	NR	NR	NR	NR	NR	1
CERS	TP	4	NR	NR	NR	NR	NR	4
NON-CASE INFO	TP		NR	NR	NR	NR	NR	0
OTHER OIL GAS	TP		NR	NR	NR	NR	NR	0
PROD WATER PONDS	TP		NR	NR	NR	NR	NR	0
SAMPLING POINT	TP		NR	NR	NR	NR	NR	0
WELL STIM PROJ	TP		NR	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	TP		NR	NR	NR	NR	NR	0
RGA LUST	TP	1	NR	NR	NR	NR	NR	1
- Totals --		30	0	2	13	0	0	45

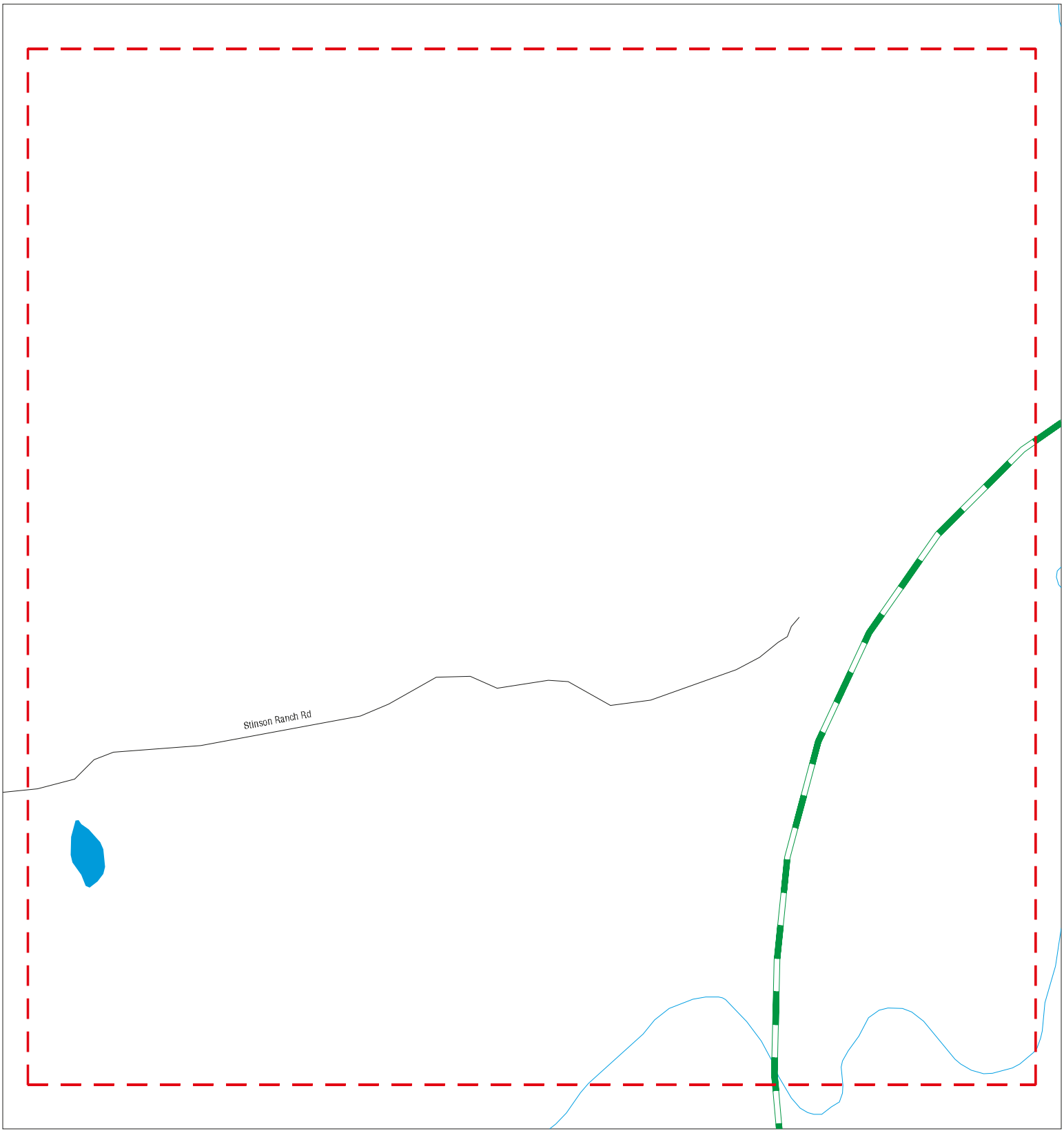
NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

Focus Map - 1 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME:	Guenoc Valley Site	CLIENT:	ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS:	Multiple APN s	CONTACT:	Kristin Miner
CITY/STATE:	Middletown CA	INQUIRY #:	5821474.2s
ZIP:	95461	DATE:	10/09/19

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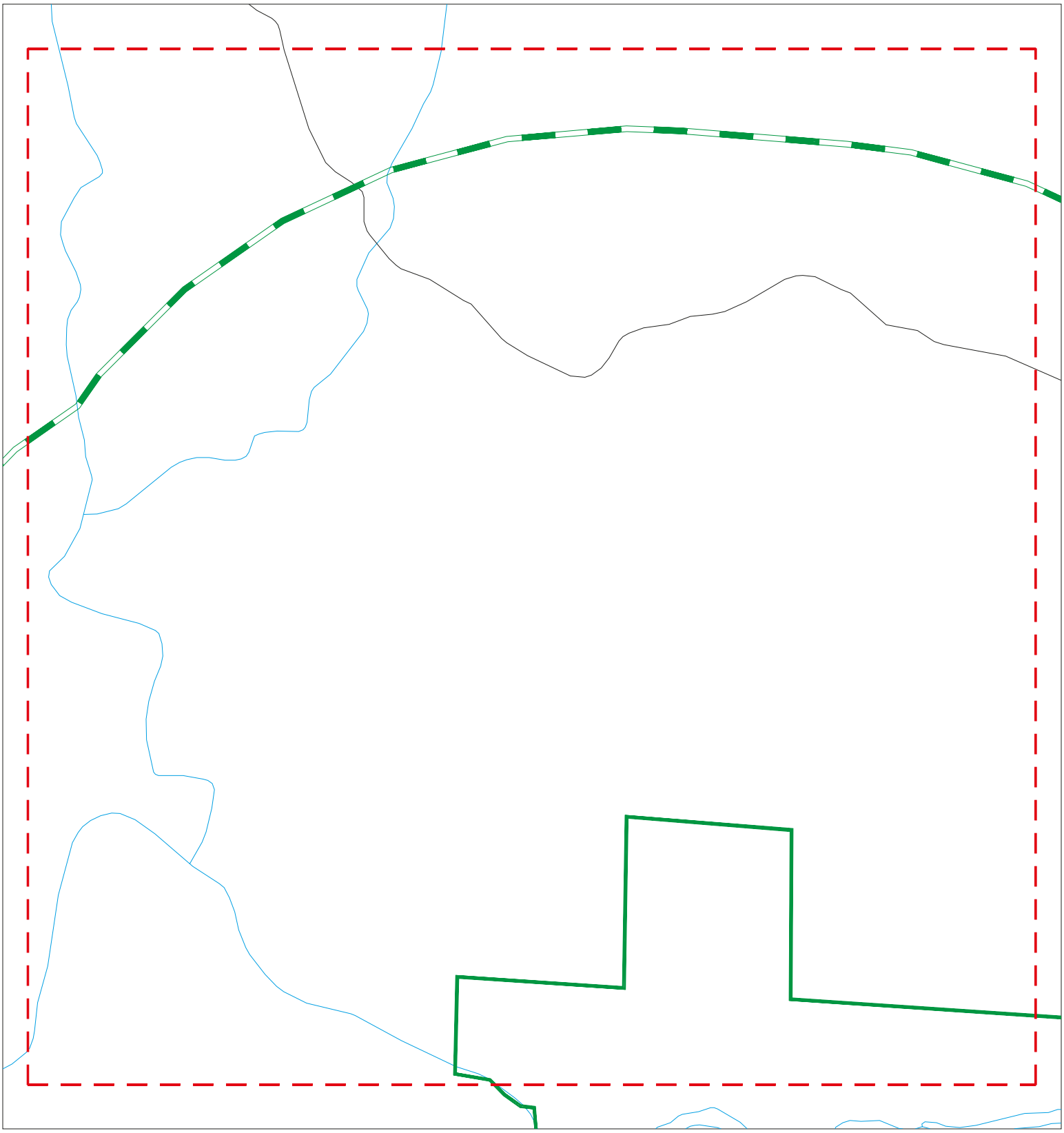
MAPPED SITES SUMMARY - FOCUS MAP 1

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 2 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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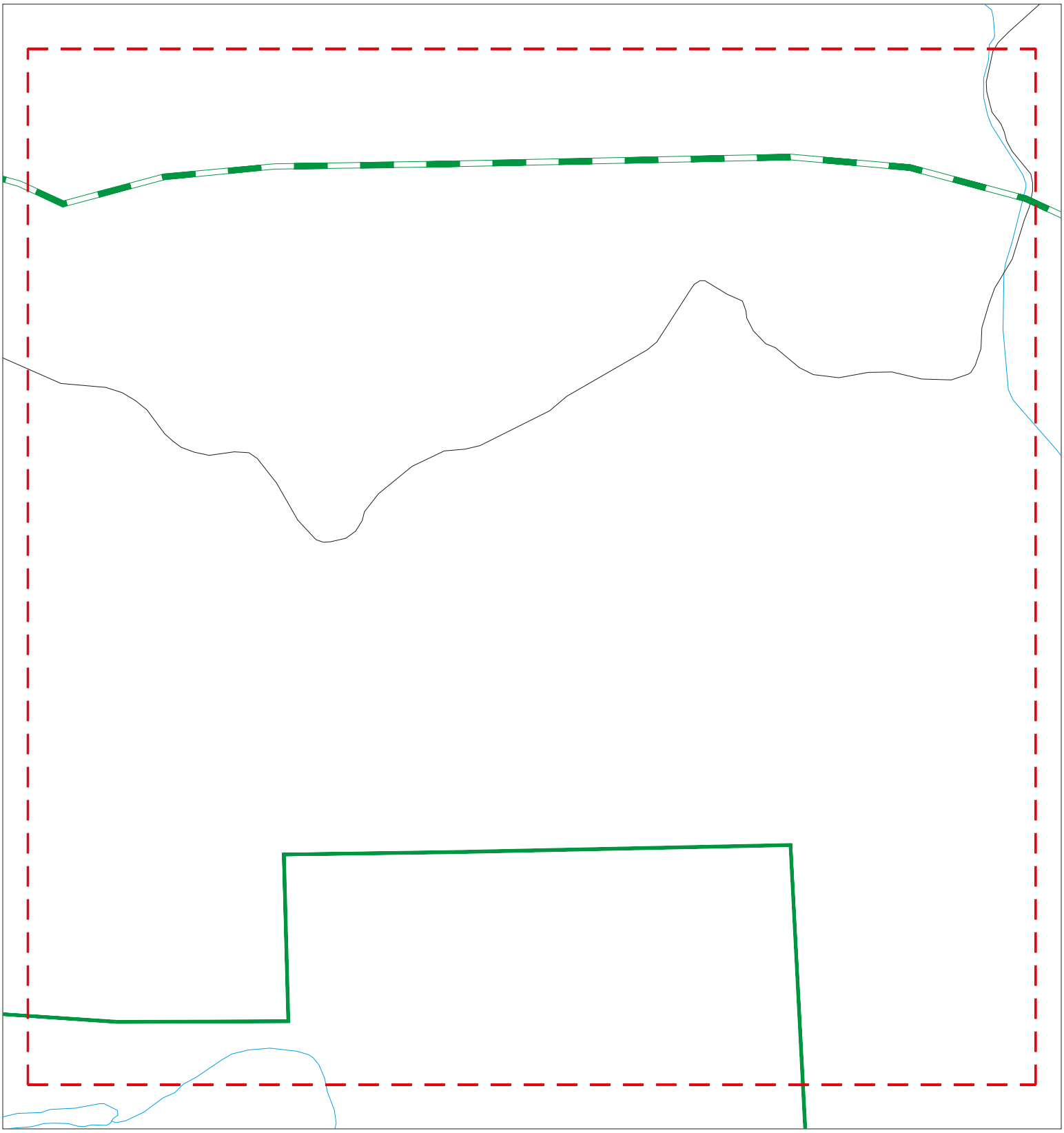
MAPPED SITES SUMMARY - FOCUS MAP 2

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 3 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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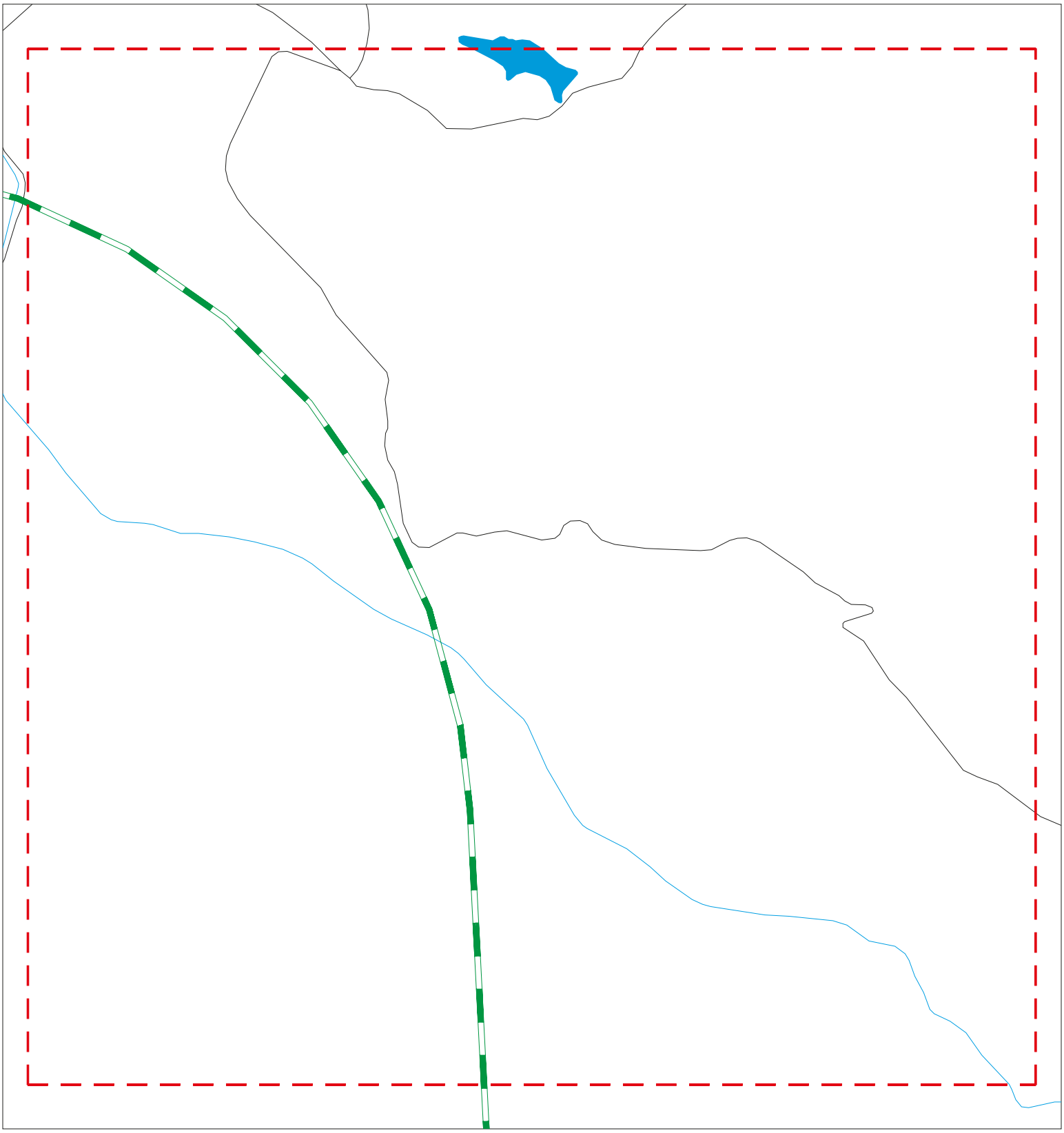
MAPPED SITES SUMMARY - FOCUS MAP 3

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 4 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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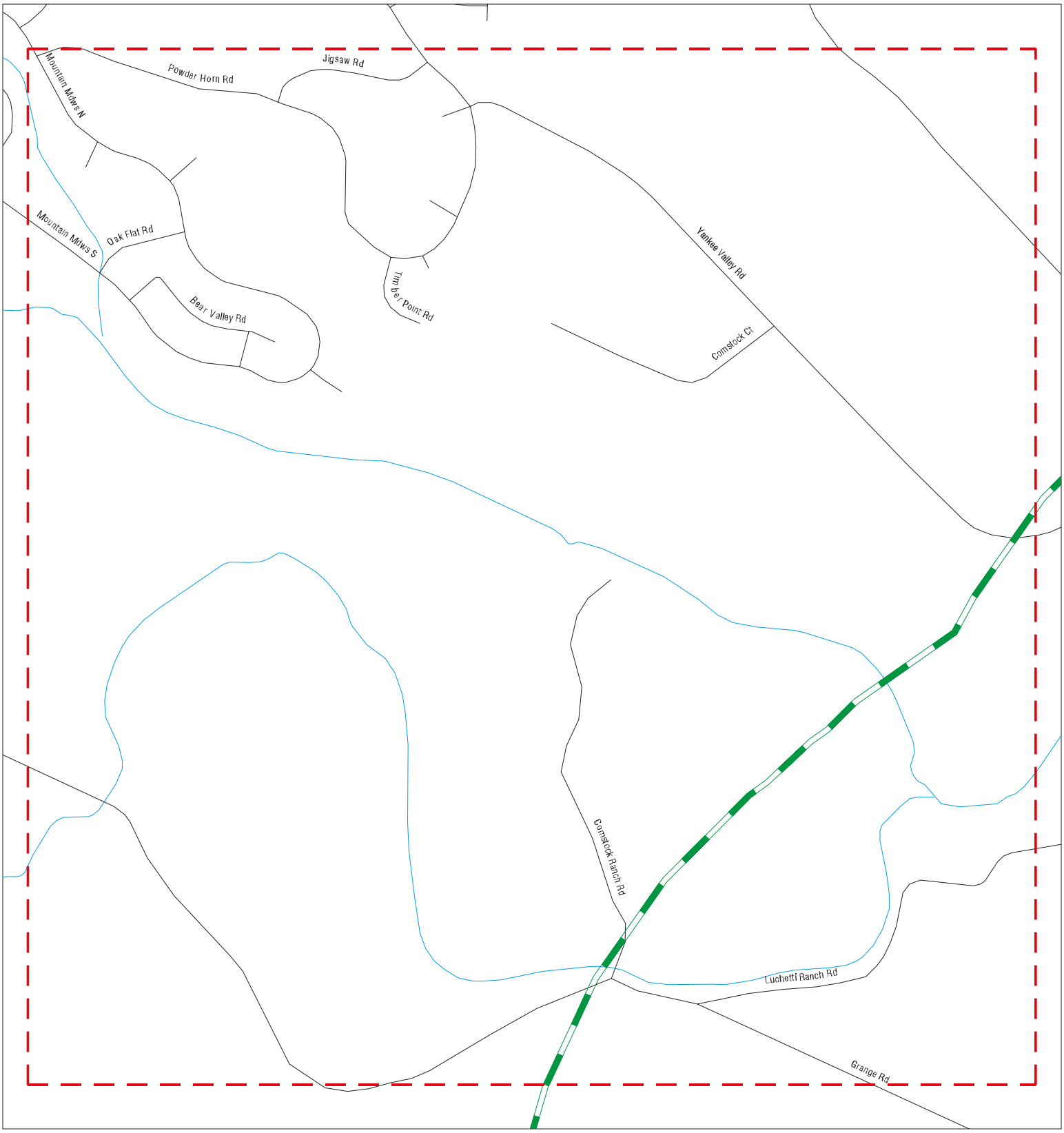
MAPPED SITES SUMMARY - FOCUS MAP 4

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 5 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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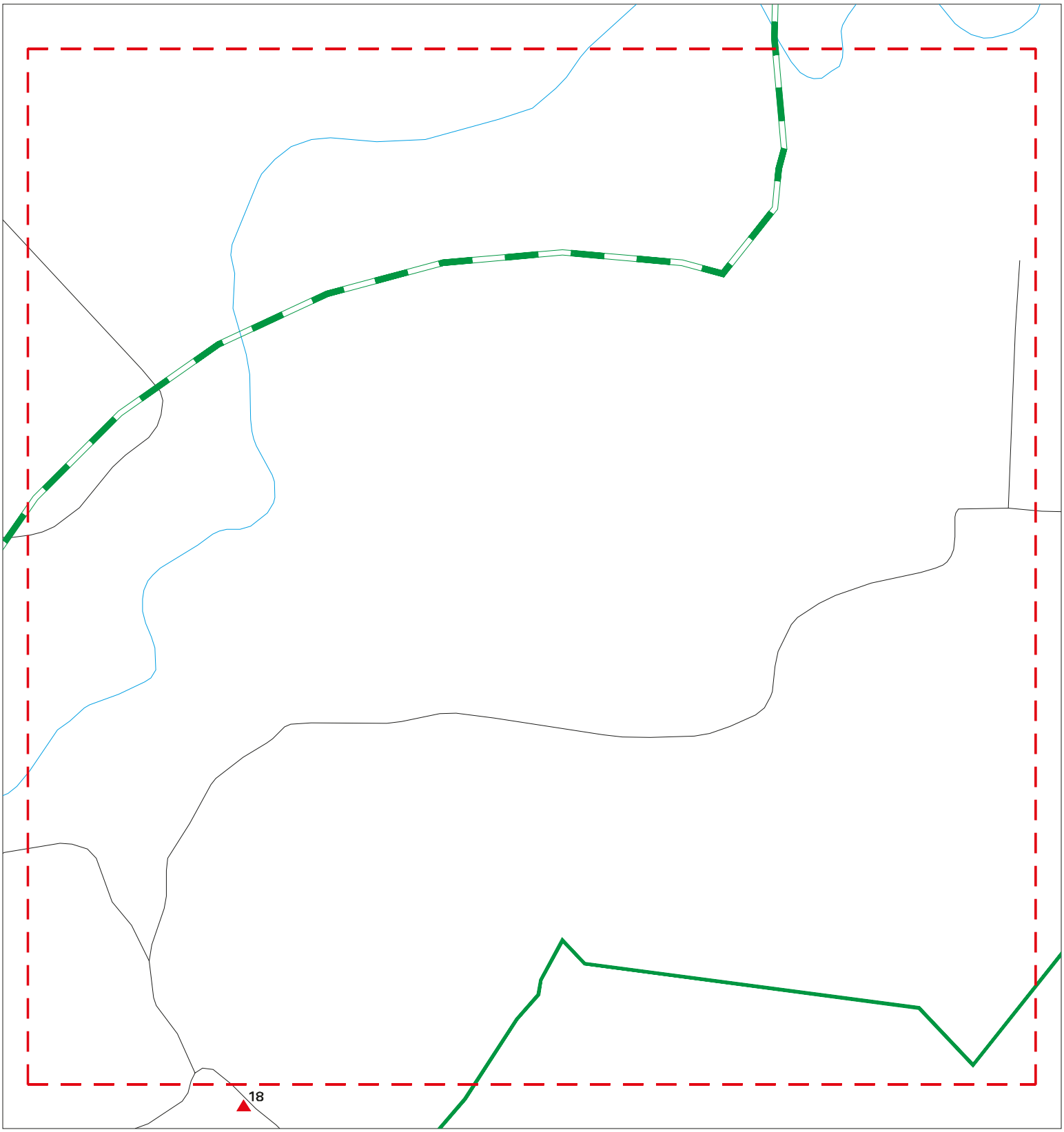
MAPPED SITES SUMMARY - FOCUS MAP 5

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 6 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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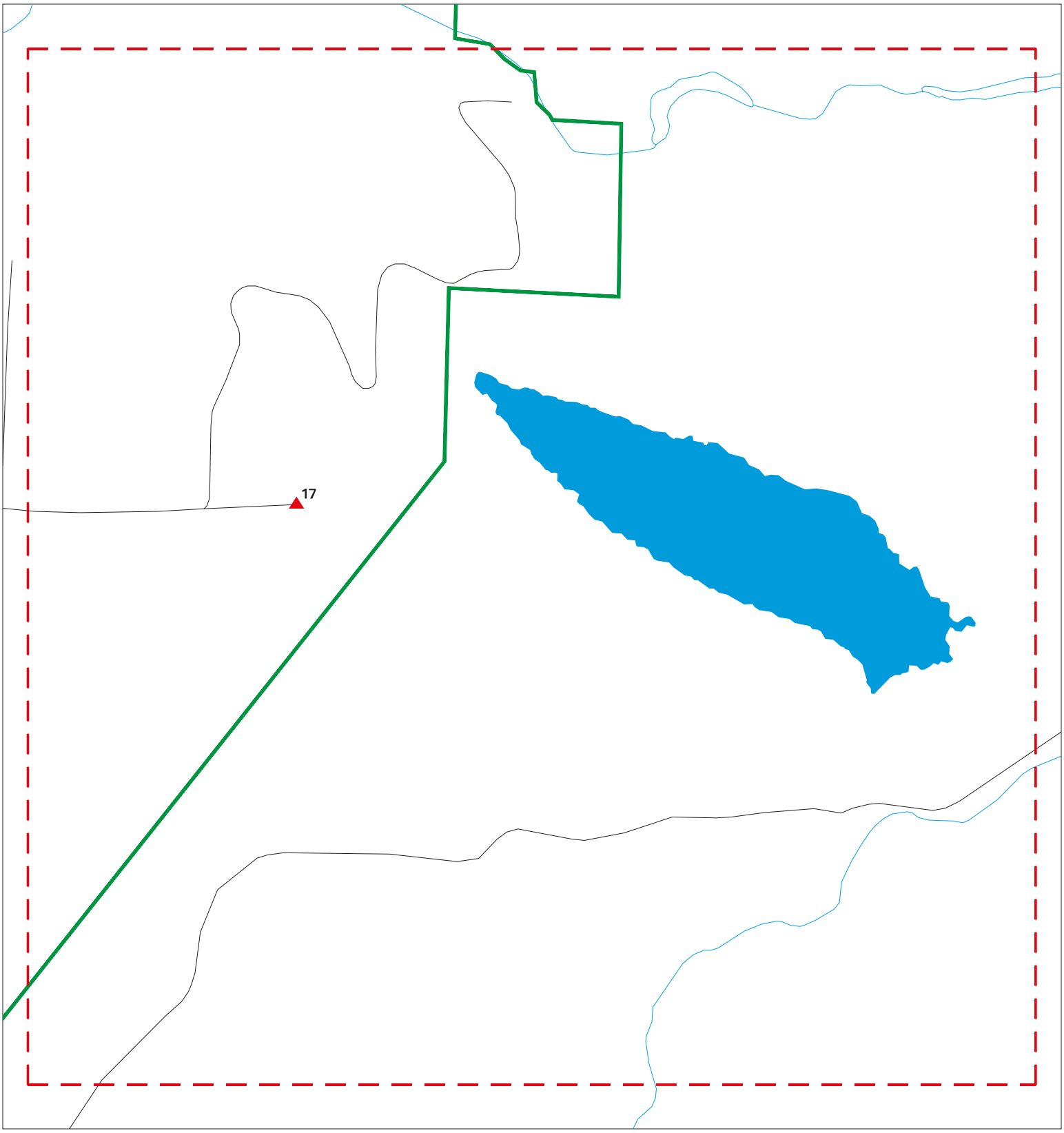
MAPPED SITES SUMMARY - FOCUS MAP 6

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 7 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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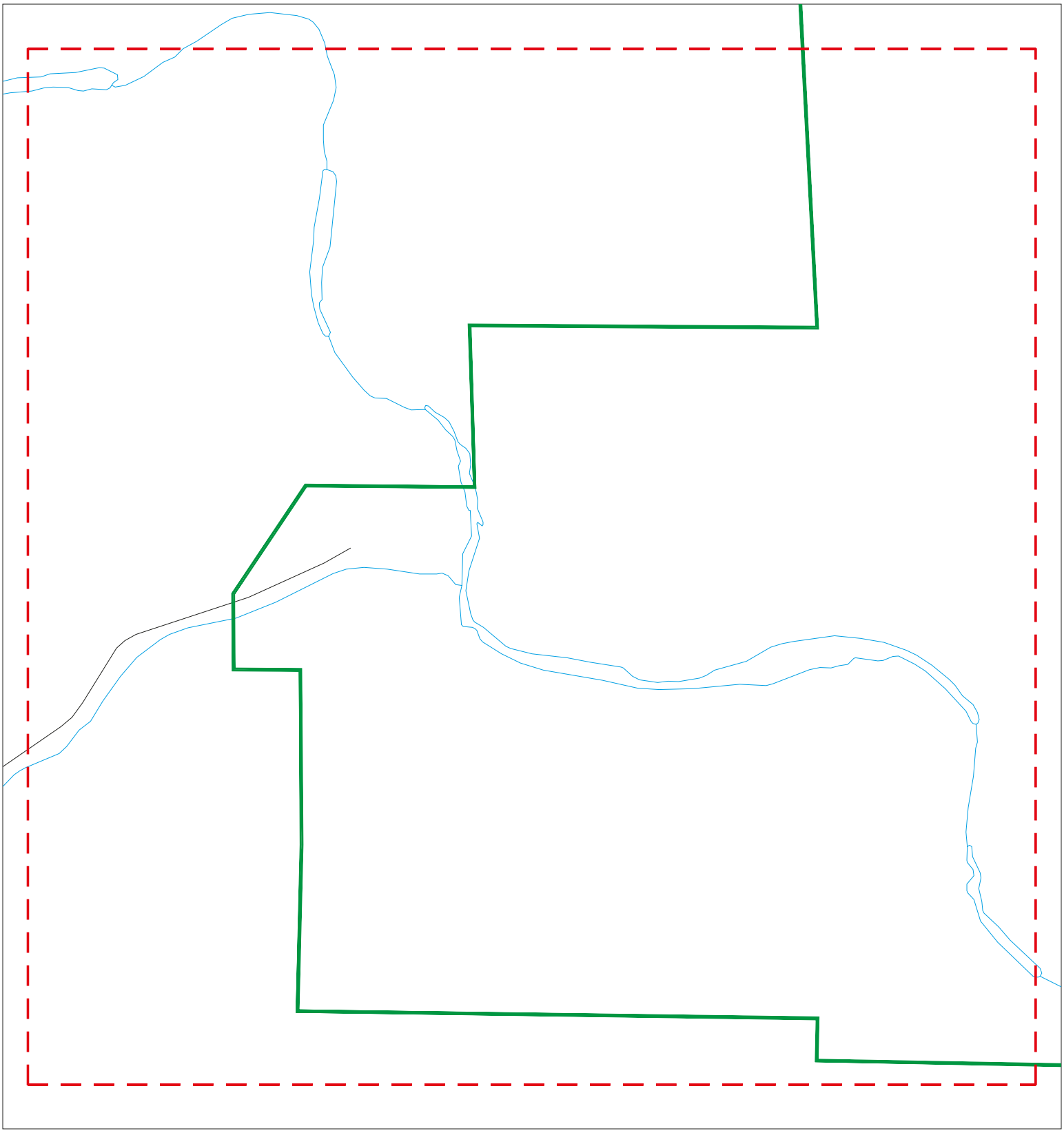
MAPPED SITES SUMMARY - FOCUS MAP 7

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
17 / 7	USCG LORAN C STA	E. GRANGE ROAD	ENVIROSTOR	694 0.131 NW

Focus Map - 8 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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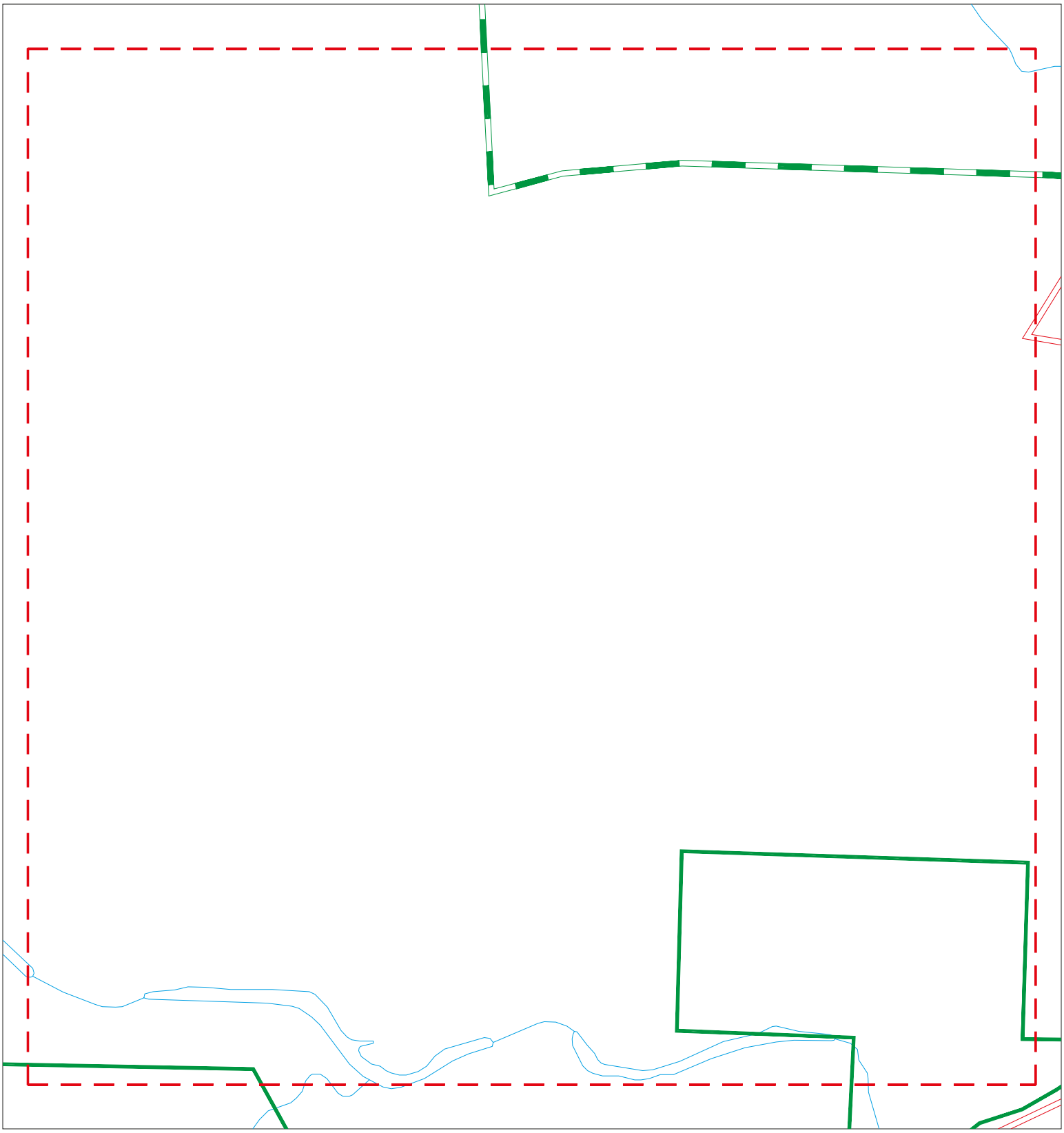
MAPPED SITES SUMMARY - FOCUS MAP 8

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 9 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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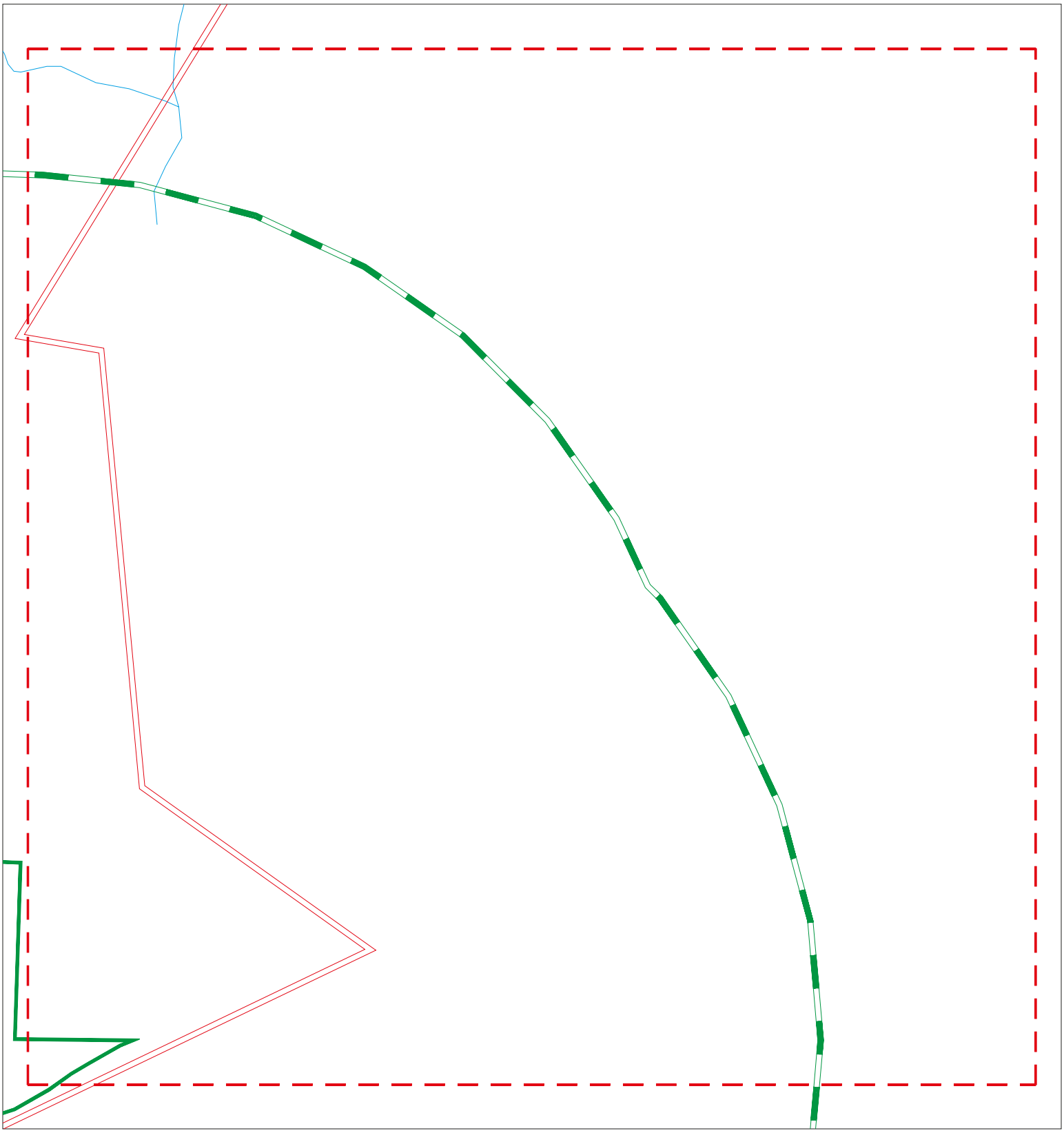
MAPPED SITES SUMMARY - FOCUS MAP 9

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 10 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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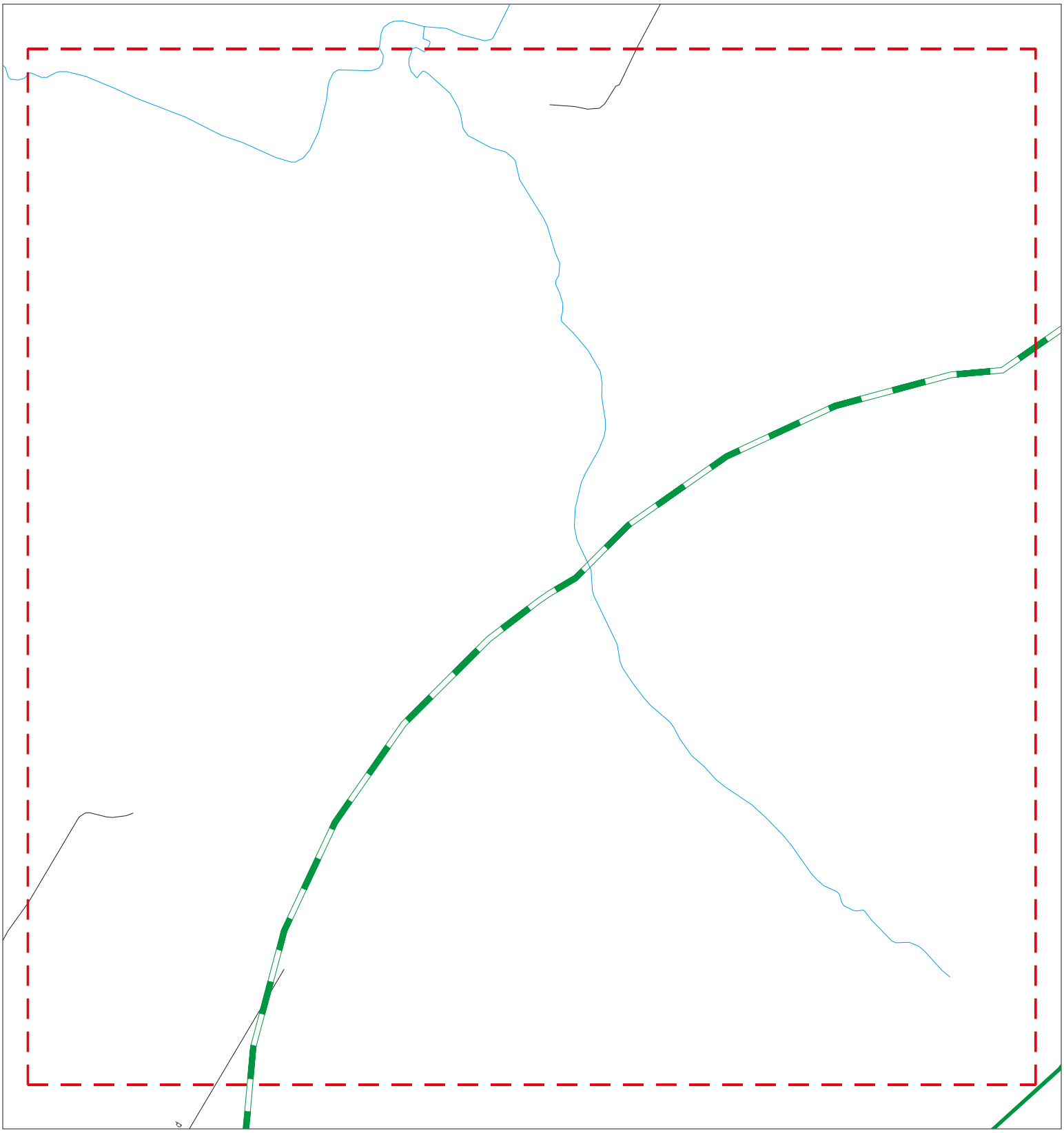
MAPPED SITES SUMMARY - FOCUS MAP 10

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 11 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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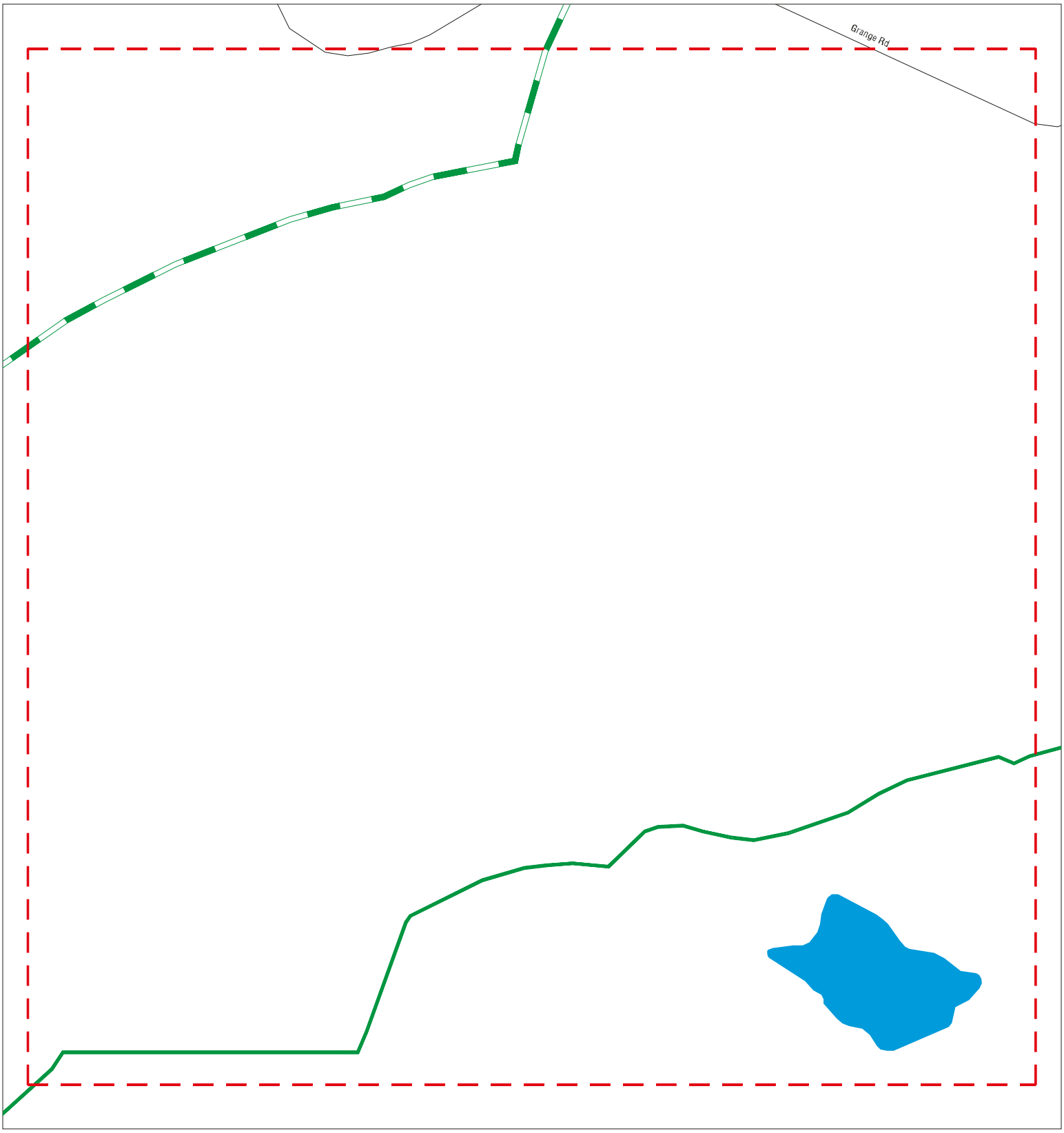
MAPPED SITES SUMMARY - FOCUS MAP 11

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 12 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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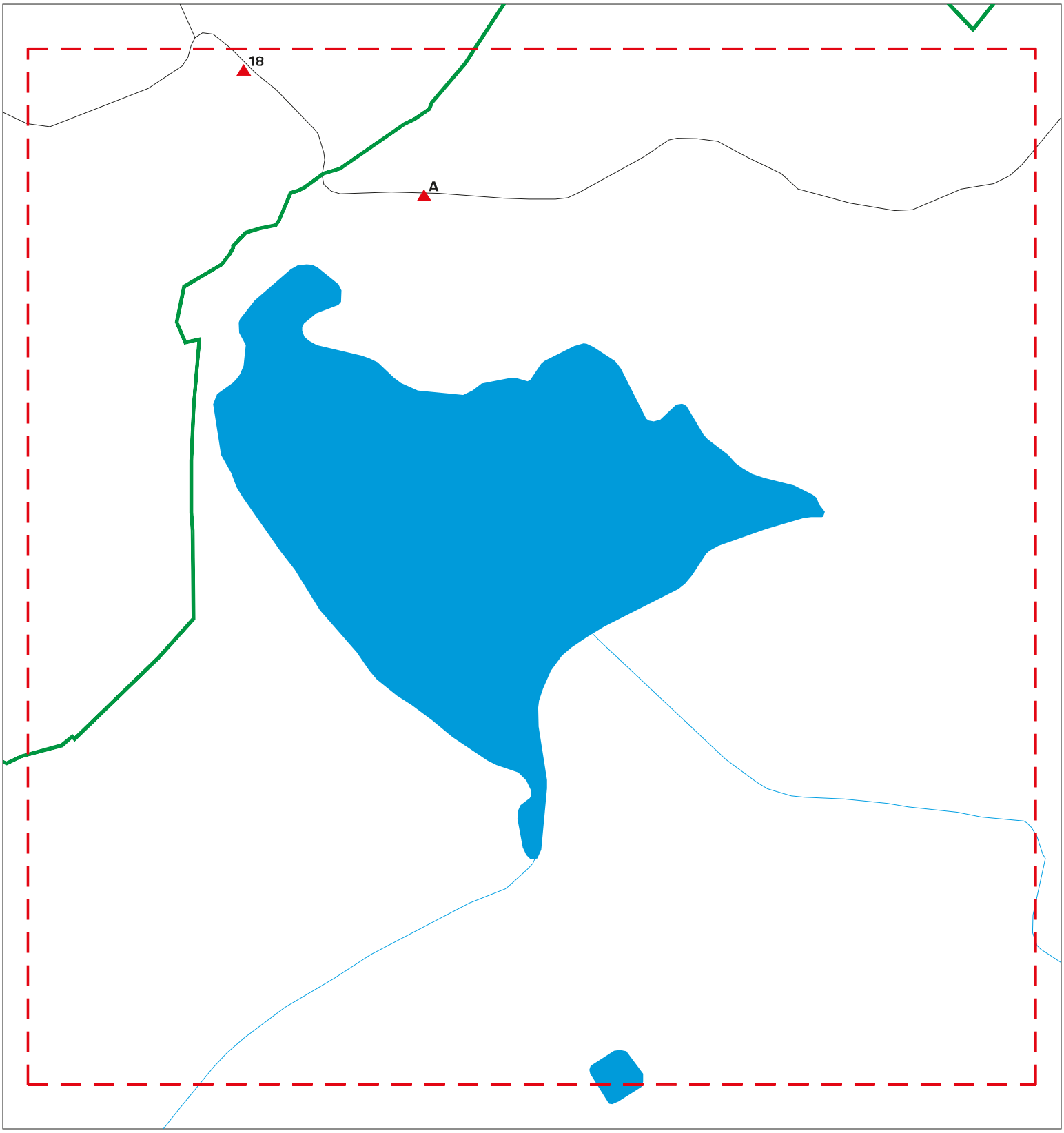
MAPPED SITES SUMMARY - FOCUS MAP 12

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 13 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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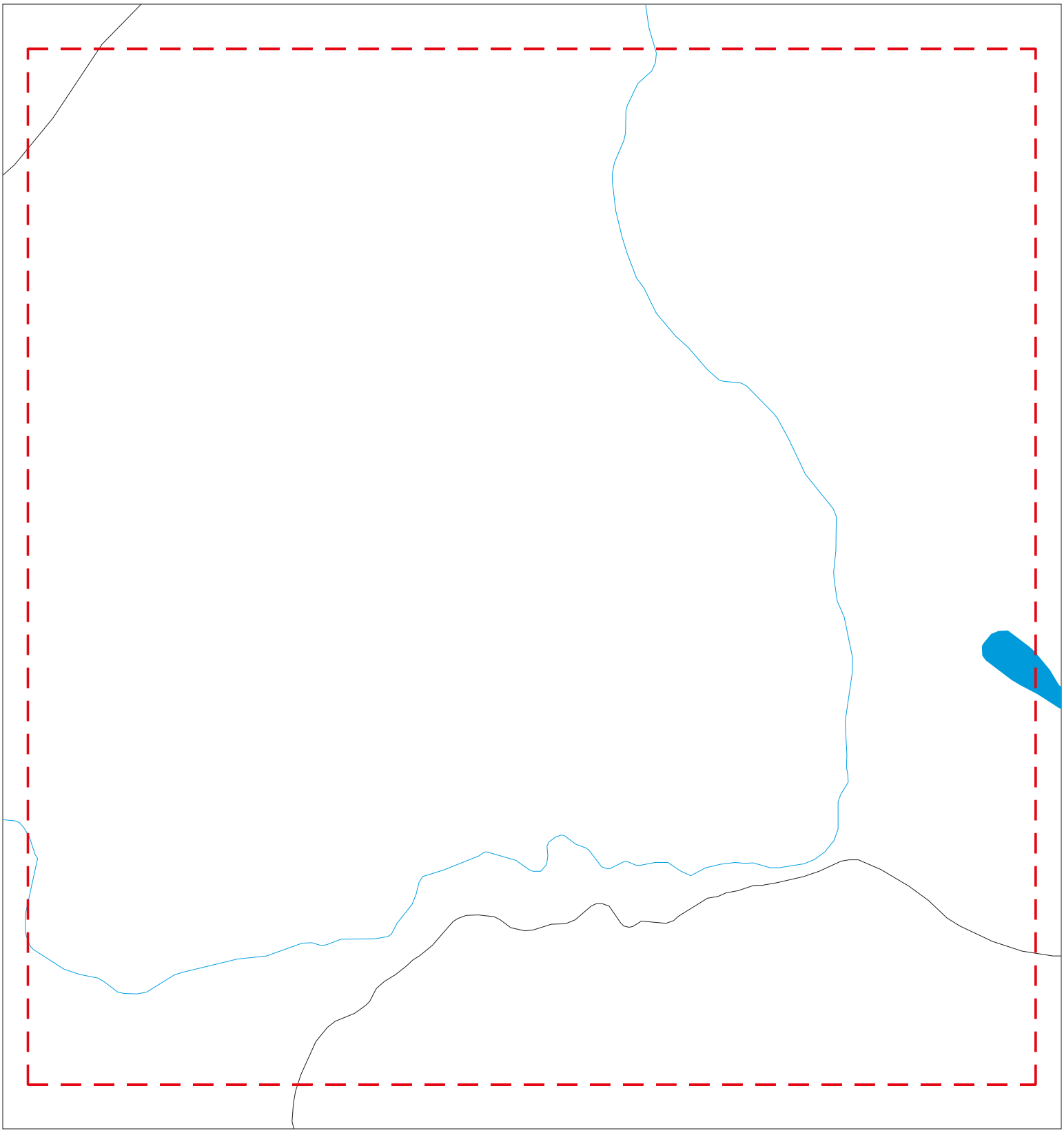
MAPPED SITES SUMMARY - FOCUS MAP 13

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
A1 / 13	US COAST GUARD LORAN	22627 GRANGE RD	HAZNET	TP
A2 / 13	UNITED STATES COAST	22627 GRANGE RD	AST	TP
18 / 13	LORAN C STATION MIDD	END OF GRANGE ROAD	HIST UST	1002 0.190 NW

Focus Map - 14 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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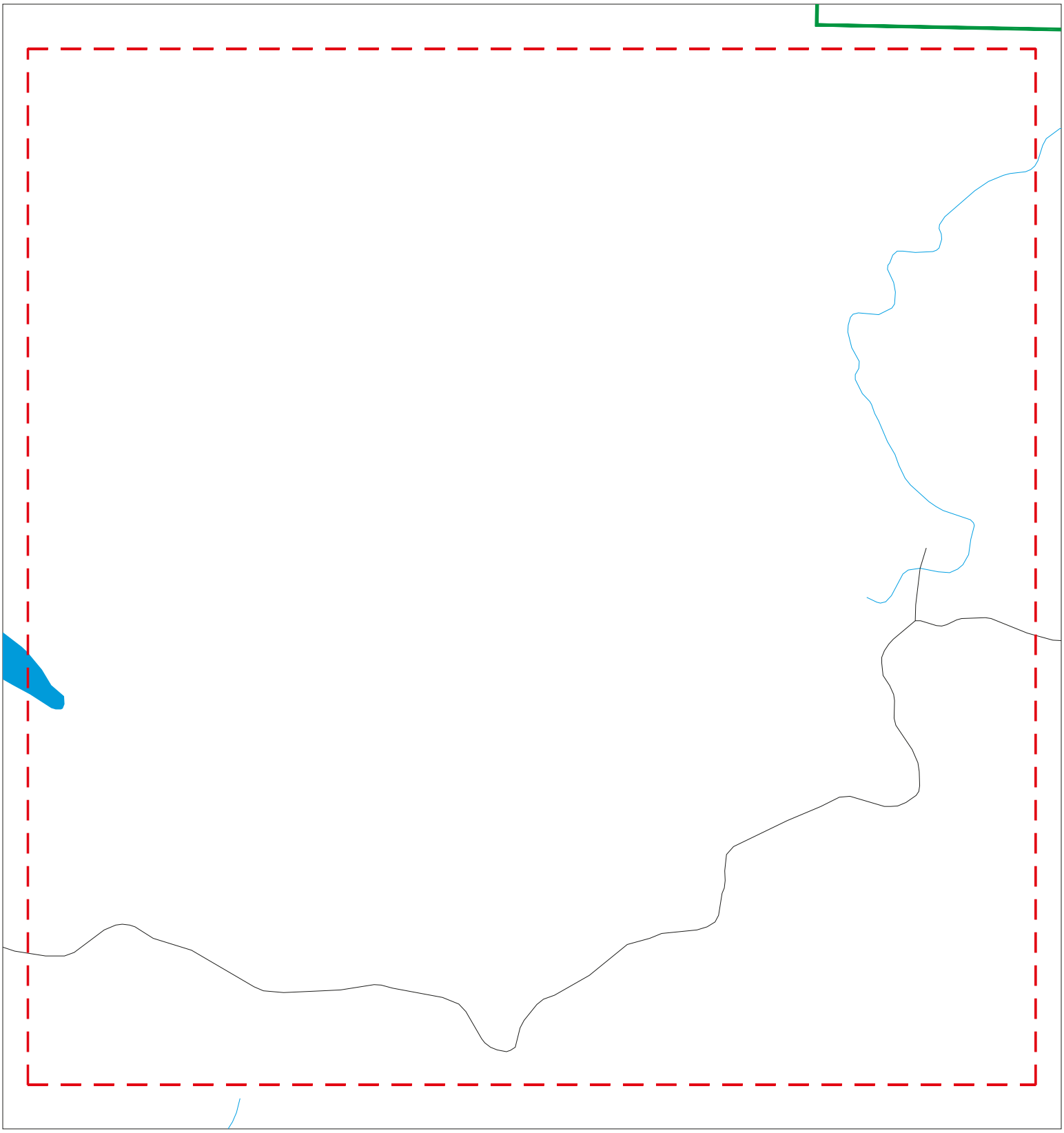
MAPPED SITES SUMMARY - FOCUS MAP 14

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 15 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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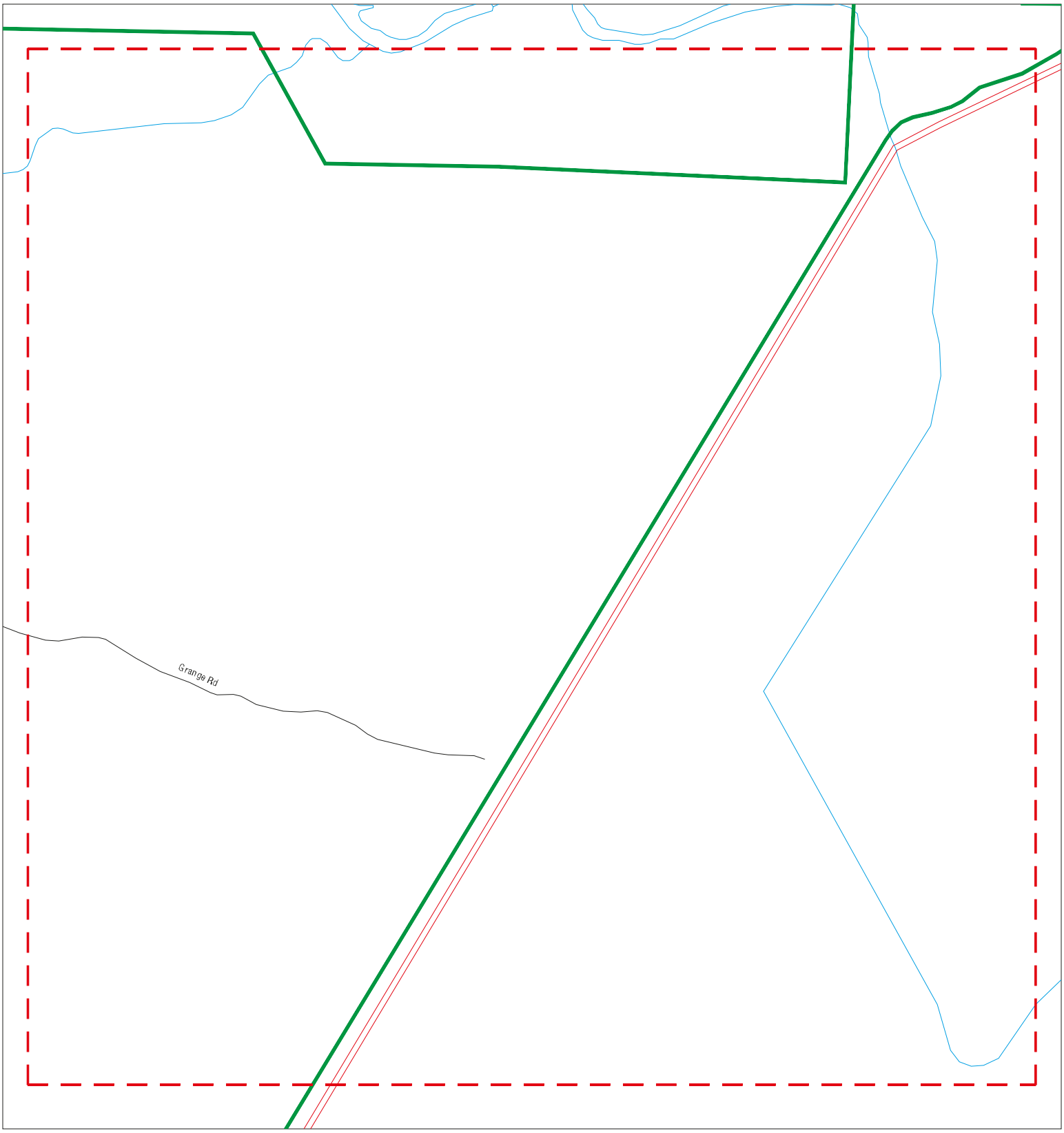
MAPPED SITES SUMMARY - FOCUS MAP 15

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 16 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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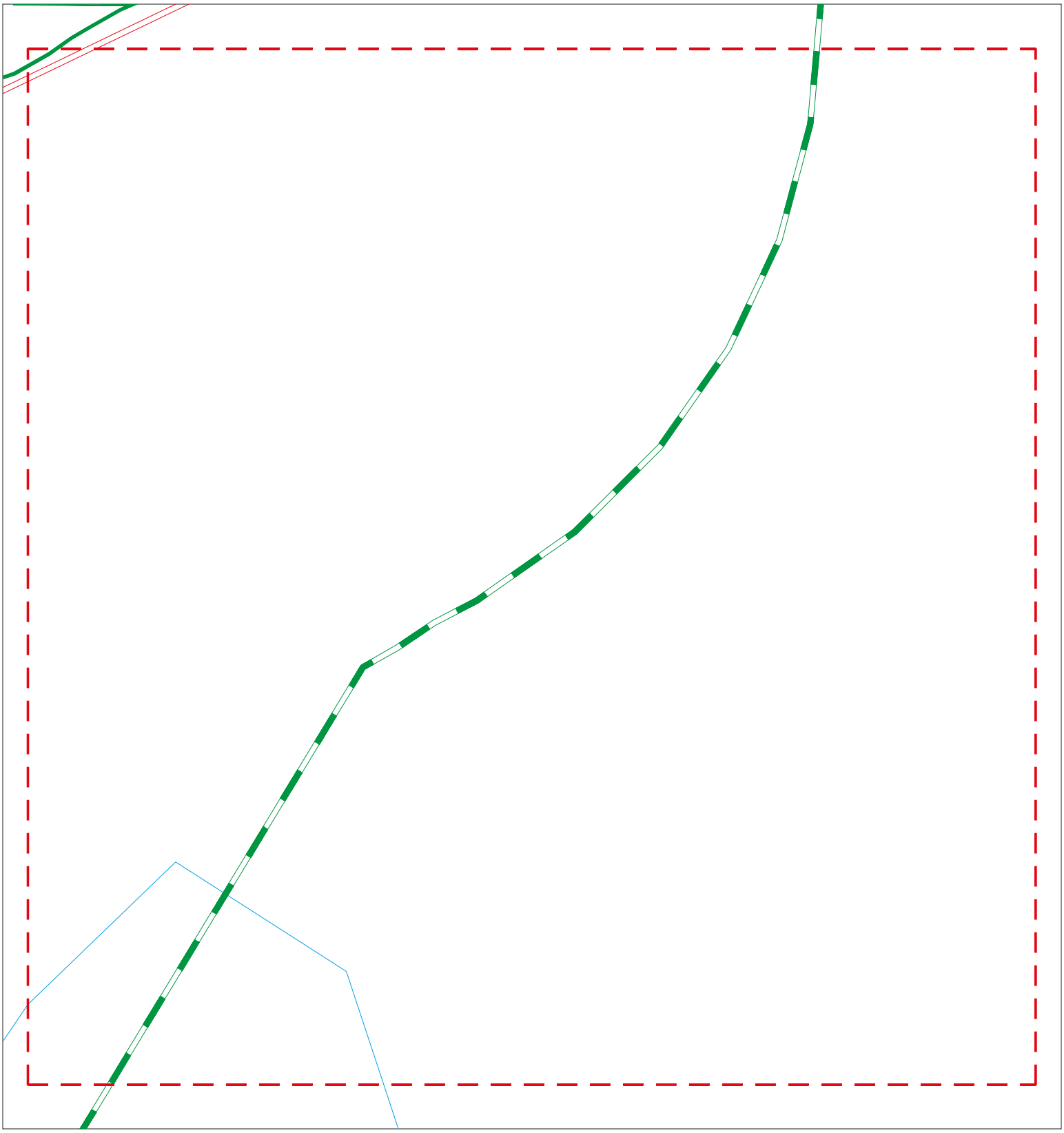
MAPPED SITES SUMMARY - FOCUS MAP 16

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 17 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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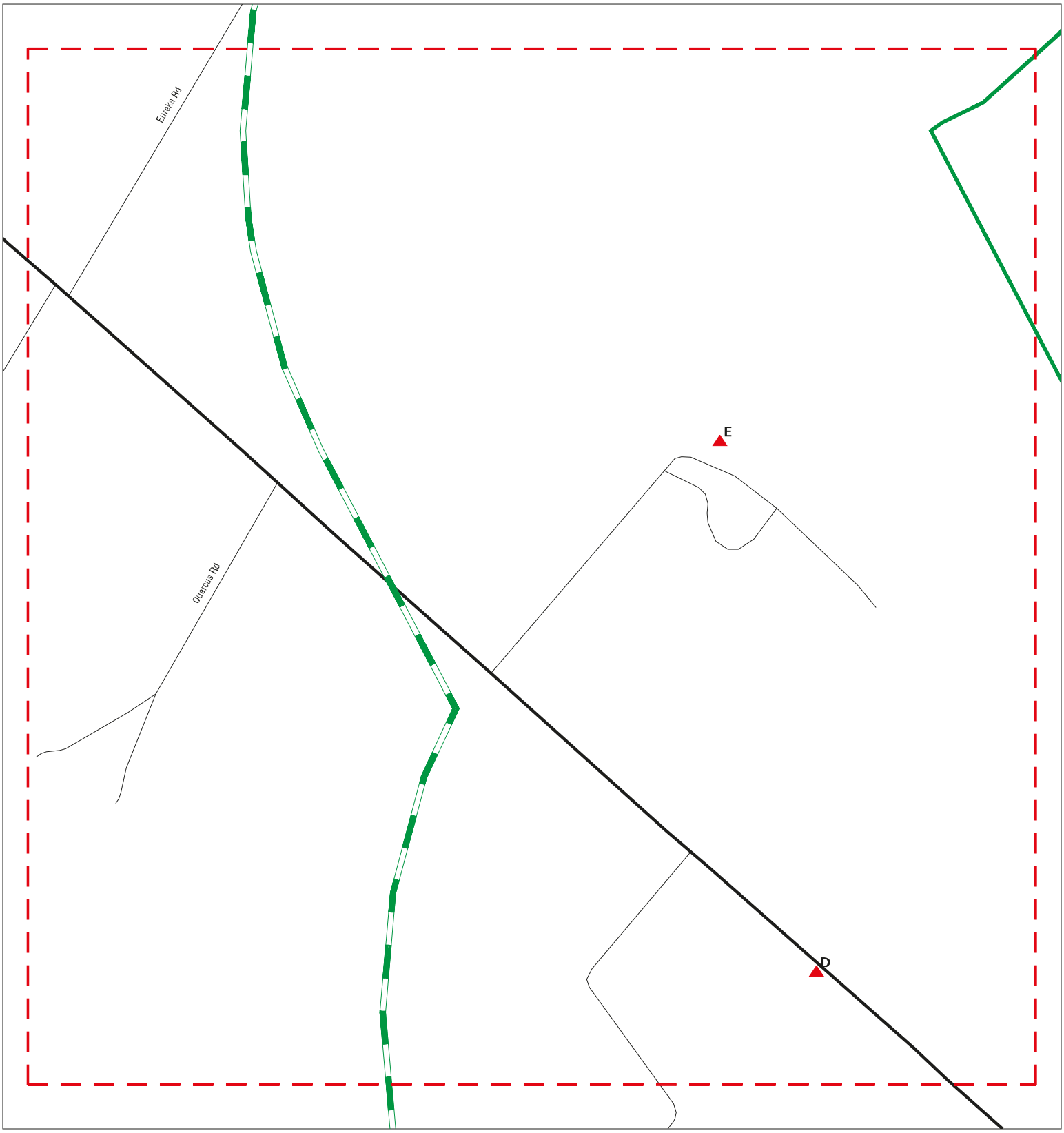
MAPPED SITES SUMMARY - FOCUS MAP 17

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 18 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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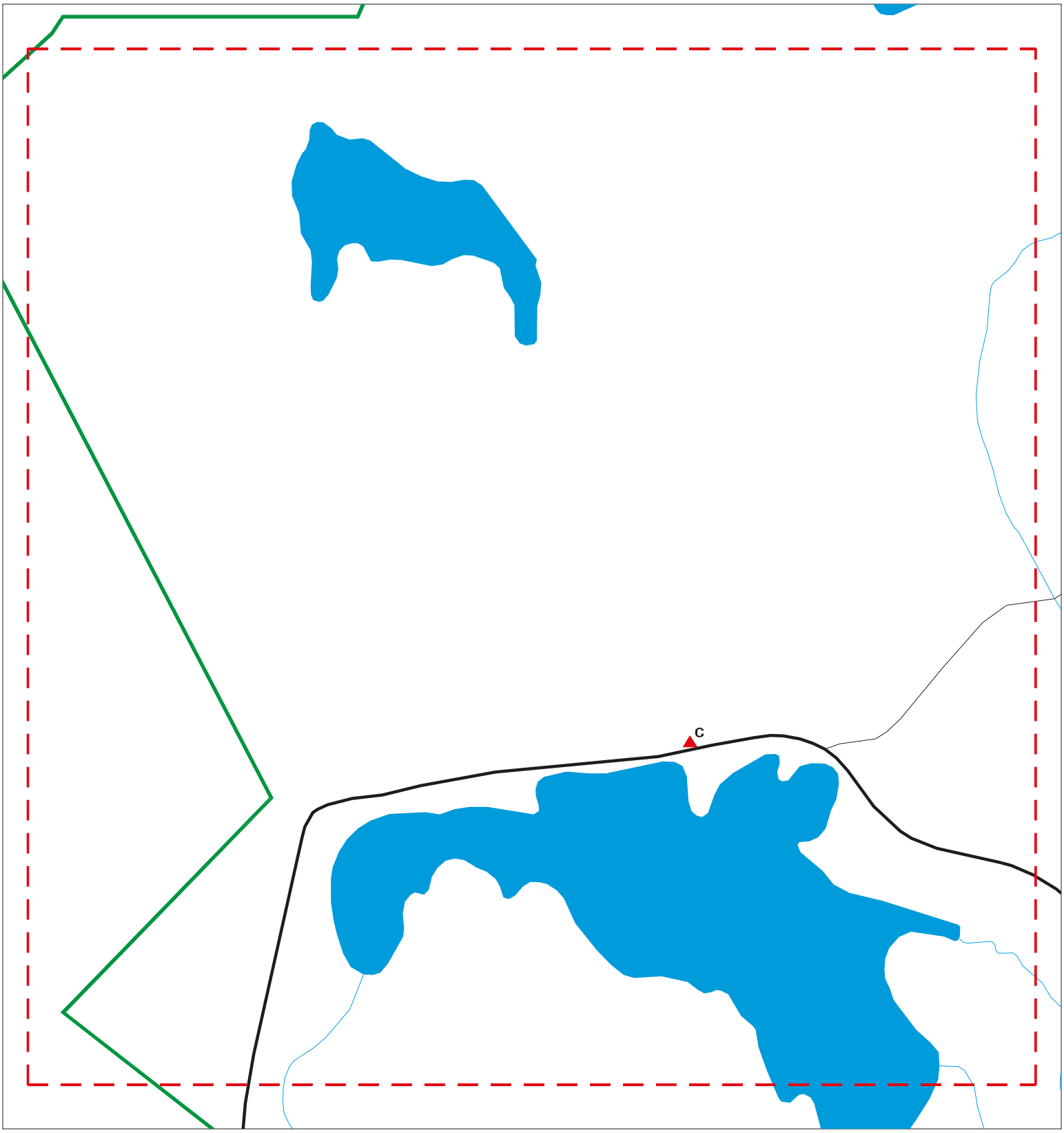
MAPPED SITES SUMMARY - FOCUS MAP 18

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION		
D19 / 18	MIDDLETOWN ENTERPRIS	18975 BUTTS CANYON R	LUST, SWEEPS UST, HIST UST	1975	0.374	West
D20 / 18	MIDDLETOWN AIR STRIP	18975 BUTTS CNYN	LUST, HIST CORTESE, CERS	1975	0.374	West
E21 / 18	GEOTHERMAL, INC	19020 BUTTS CANYON R	ENVIROSTOR	2532	0.480	WSW
E22 / 18	BUTTS CANYON RD. FAC	19020 BUTTS CANYON R	WMUDS/SWAT, HAZNET, NPDES, WDS, CIWQS	2532	0.480	WSW
E23 / 18	GEOTHERMAL, BUTTS CA	19020 BUTTS CANYON R	Toxic Pits	2532	0.480	WSW
E24 / 18	BUTTS CANYON RD. FAC	19020 BUTTS CNYN	HIST CORTESE	2532	0.480	WSW
E25 / 18	GEOTHERMAL INDUSTRIE	BUTTS CANYON RD	SEMS-ARCHIVE, CORRACTS, RCRA-TSDF, RCRA	2532	0.480	WSW
E26 / 18	BUTTS CANYON RD FACI	19020 BUTTS CANYON	LDS, Cortese, ENF, CIWQS, CERS	2532	0.480	WSW
E27 / 18	GEOTHERMAL INC	19020 BUTTS CANYON R	ENVIROSTOR, HWP, CERS	2532	0.480	WSW

Focus Map - 19 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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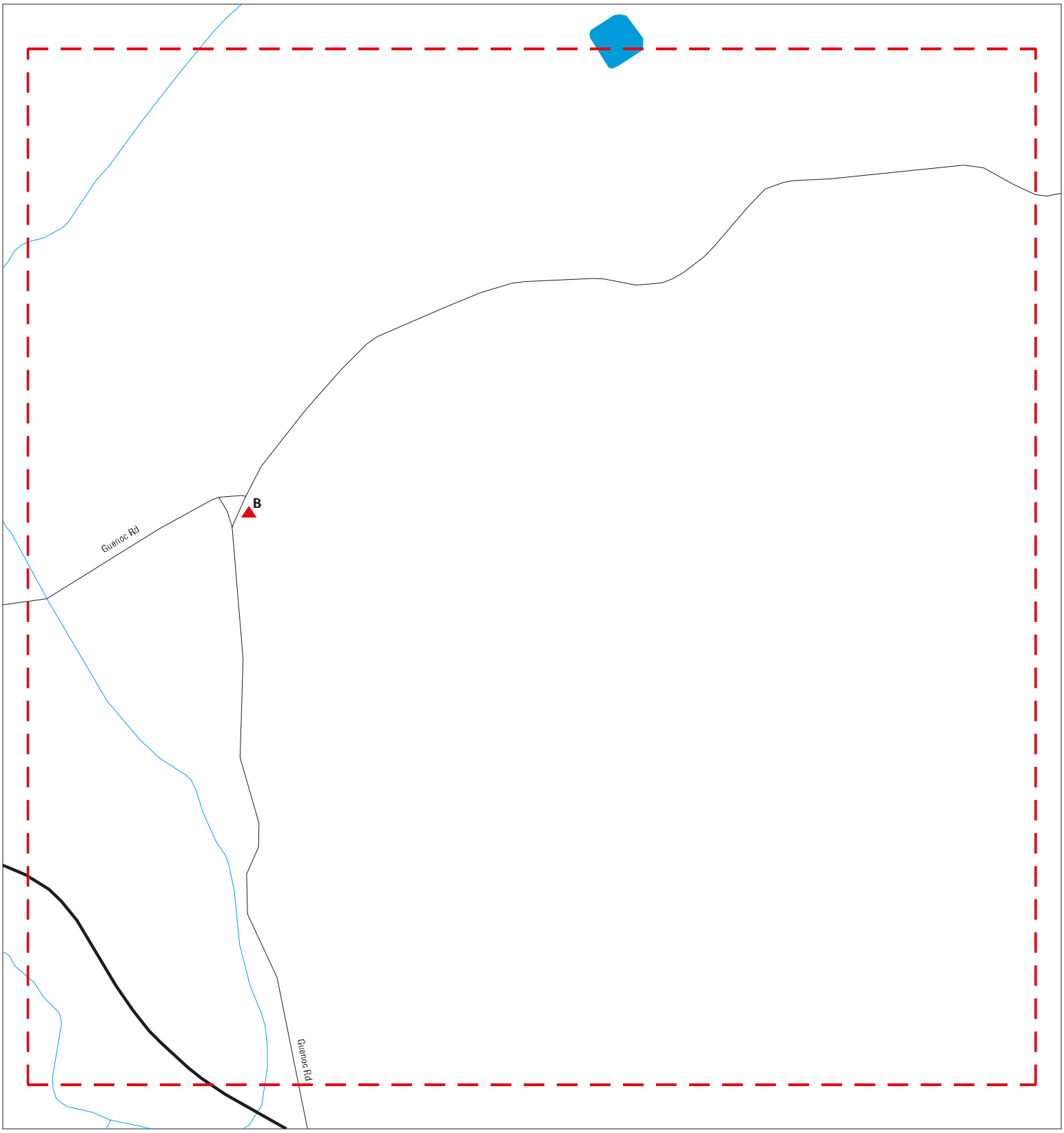
MAPPED SITES SUMMARY - FOCUS MAP 19

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
C13 / 19	GUENOC WINERY INC.	21000 BUTTS CANYON R	FINDS	TP
C14 / 19	GUENOC WINERY CLASS	21000 BUTTS CANYON	FINDS	TP
C15 / 19	GUENOC WINERY CLASS	21000 BUTTS CANYON R	CERS HAZ WASTE, LDS, Cortese, CUPA Listi...	TP
C16 / 19	GUENOC WINERY CLASS	21000 BUTTS CANYON	CERS	TP

Focus Map - 20 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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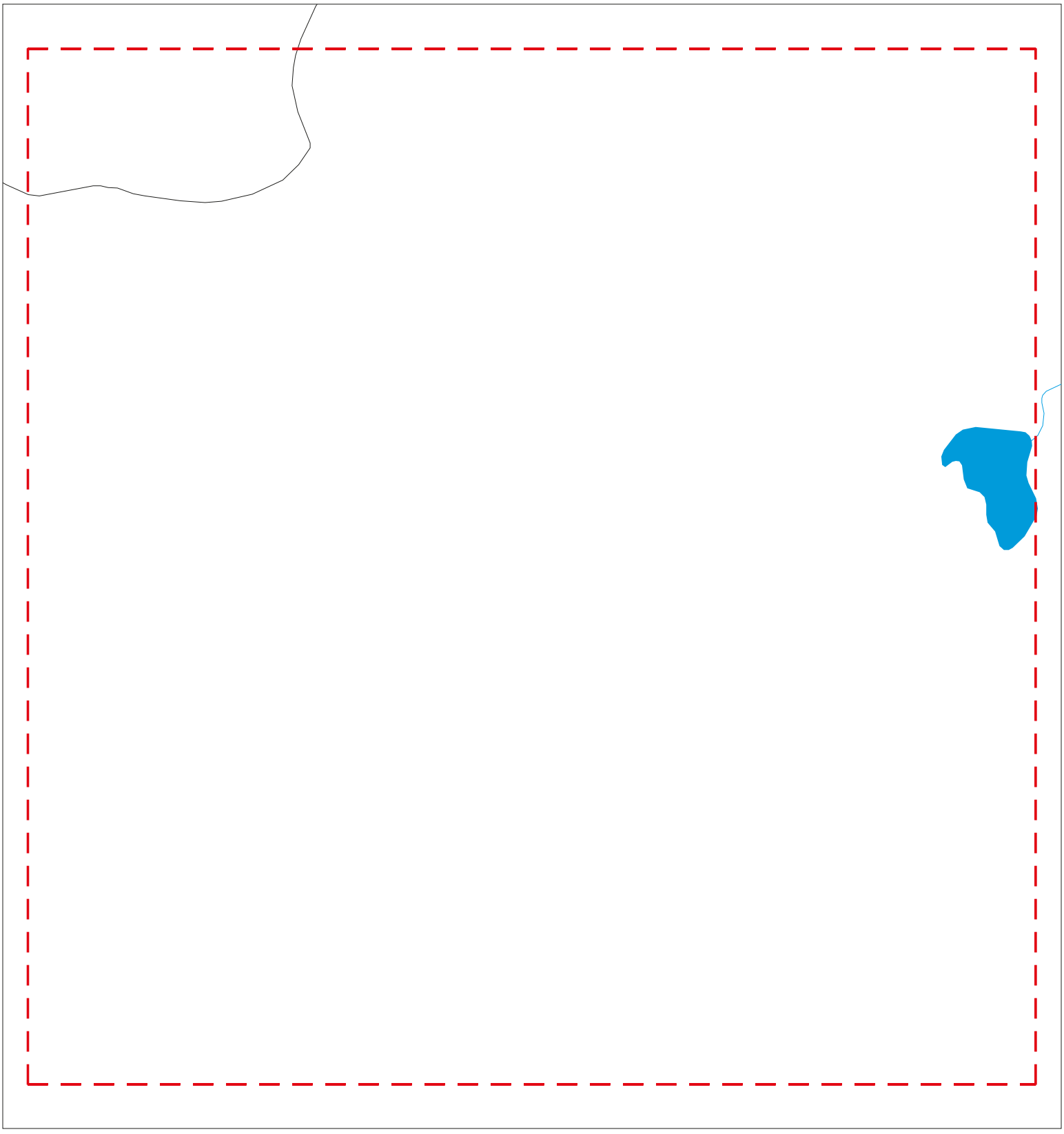
MAPPED SITES SUMMARY - FOCUS MAP 20

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
B3 / 20	MAGOON ESTATE LIMITE	22000 BUTTS CANYON R	LUST, SWEEPS UST, HIST UST, CUPA Listing...	TP
B4 / 20	GUENOC RANCH	22000 BUTTS CANYON R	RGA LUST	TP
B5 / 20	LANGTRY FARMS LLC	22000 BUTTS CANYON R	RCRA NonGen / NLR	TP
B6 / 20	GUENOC RANCH	22000 BUTTS CANYON R	HAZNET	TP
B7 / 20	GUENOC RANCH	22000 BUTTS CNYN	HIST CORTESE	TP
B8 / 20	LANGTRY FARMS, LLC	22000 BUTTS CANYON R	AST	TP
B9 / 20	LANGTRY FARMS LLC	22000 BUTTS CANYON R	FINDS, ECHO	TP
B10 / 20	GUENOC RANCH	22000 BUTTS CANYON R	FINDS	TP
B11 / 20	LANGTRY FARMS, LLC	22000 BUTTS CANYON R	CERS HAZ WASTE, CERS TANKS, CERS	TP
B12 / 20	LANGTRY FARMSNA LLC	22000 BUTTS CANYON R	FINDS	TP

Focus Map - 21 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME:	Guenoc Valley Site	CLIENT:	ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS:	Multiple APN s	CONTACT:	Kristin Miner
CITY/STATE:	Middletown CA	INQUIRY #:	5821474.2s
ZIP:	95461	DATE:	10/09/19

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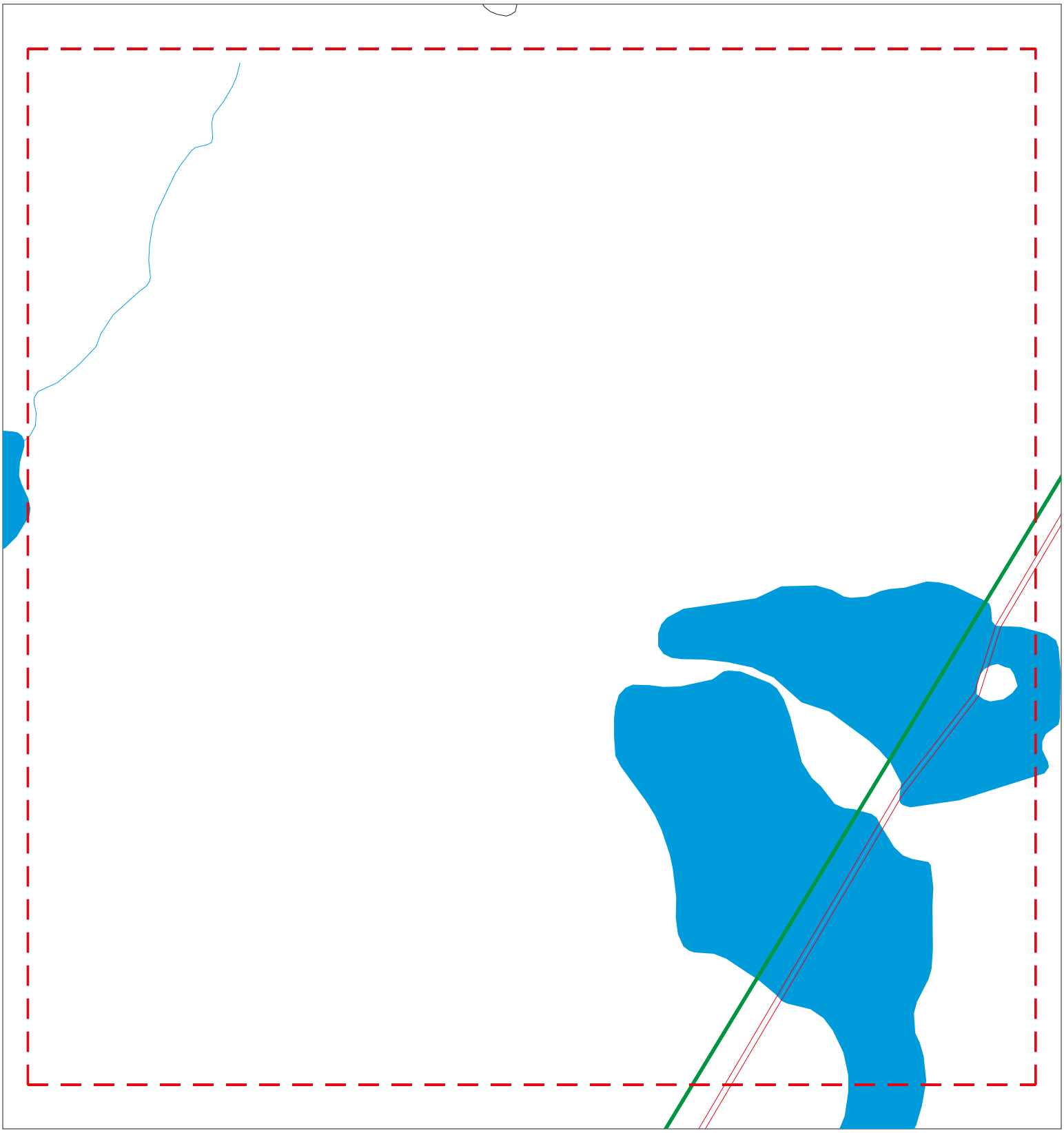
MAPPED SITES SUMMARY - FOCUS MAP 21

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 22 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME:	Guenoc Valley Site	CLIENT:	ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS:	Multiple APN s	CONTACT:	Kristin Miner
CITY/STATE:	Middletown CA	INQUIRY #:	5821474.2s
ZIP:	95461	DATE:	10/09/19

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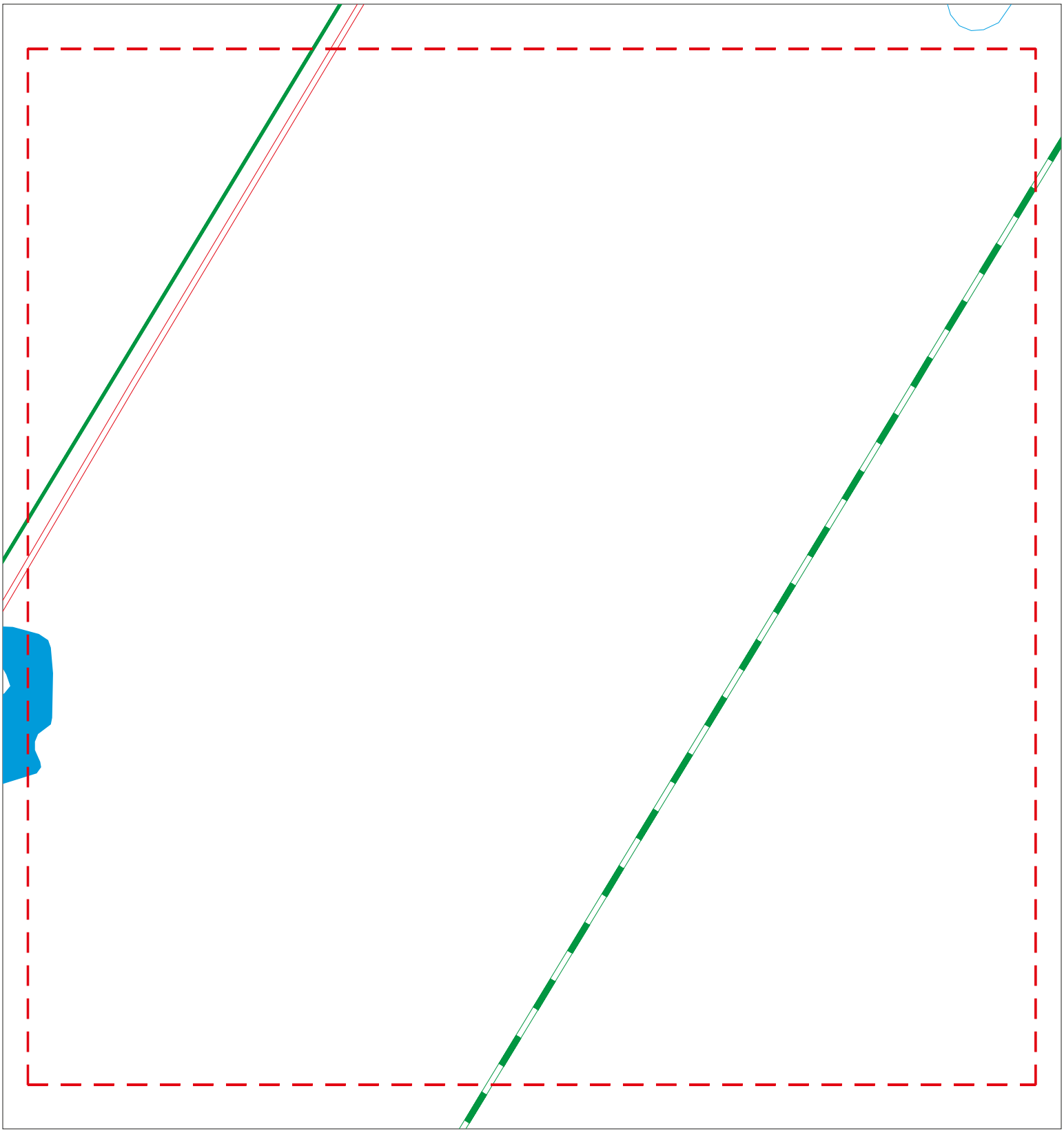
MAPPED SITES SUMMARY - FOCUS MAP 22

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 23 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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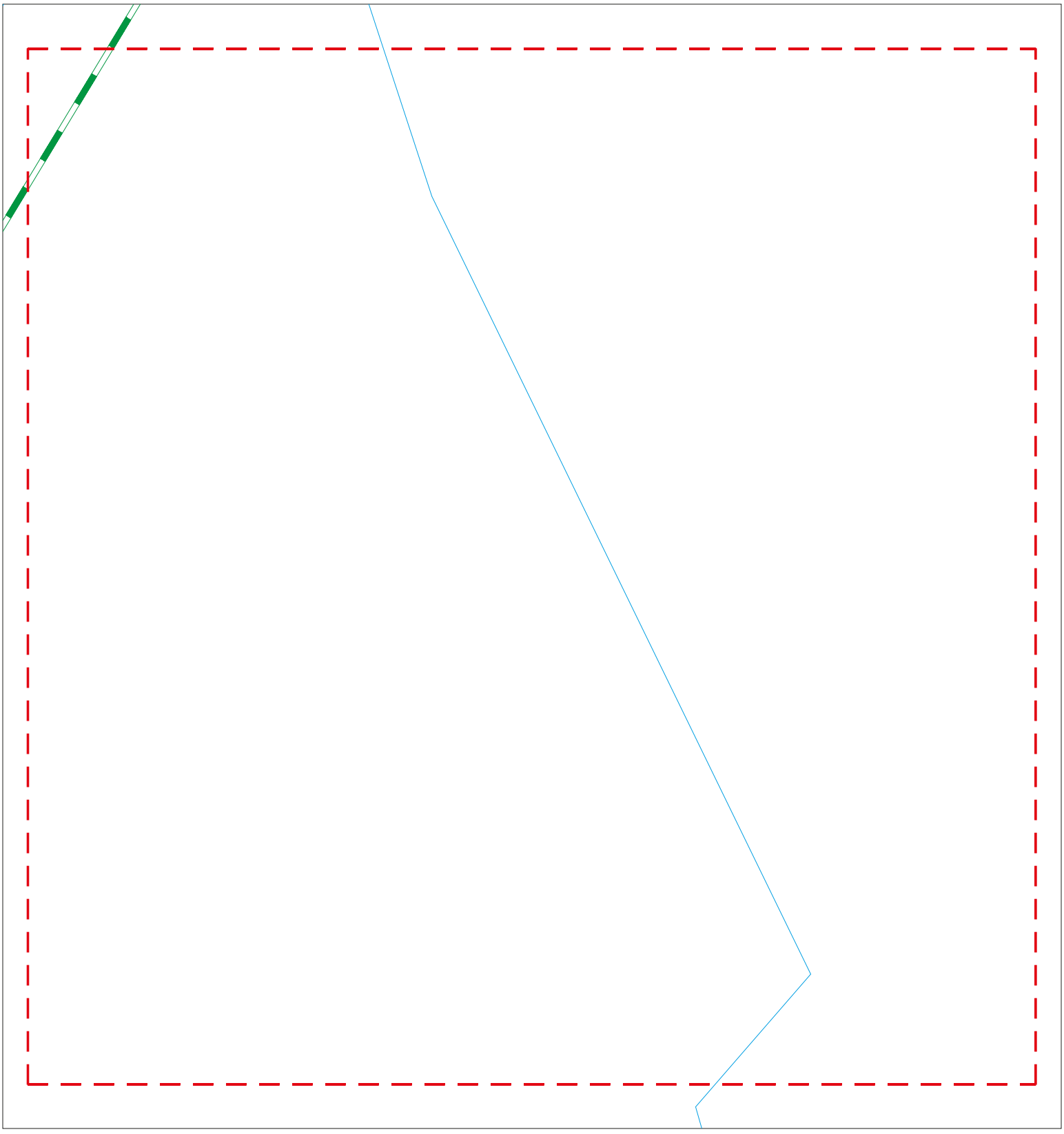
MAPPED SITES SUMMARY - FOCUS MAP 23

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 24 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME:	Guenoc Valley Site	CLIENT:	ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS:	Multiple APN s	CONTACT:	Kristin Miner
CITY/STATE:	Middletown CA	INQUIRY #:	5821474.2s
ZIP:	95461	DATE:	10/09/19

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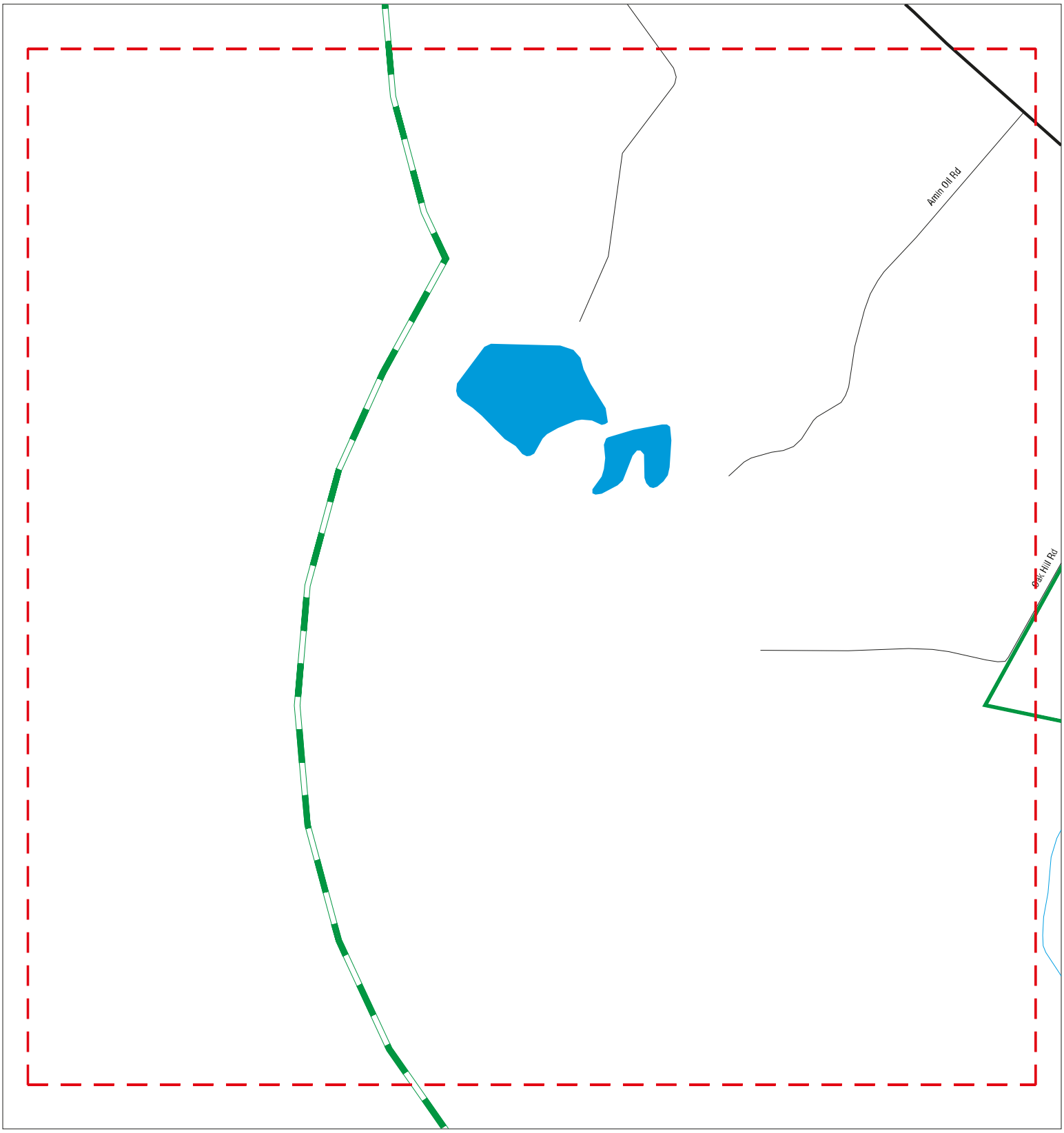
MAPPED SITES SUMMARY - FOCUS MAP 24

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 25 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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MAPPED SITES SUMMARY - FOCUS MAP 25

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 26 - 5821474.2s

Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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MAPPED SITES SUMMARY - FOCUS MAP 26

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 27 - 5821474.2s

Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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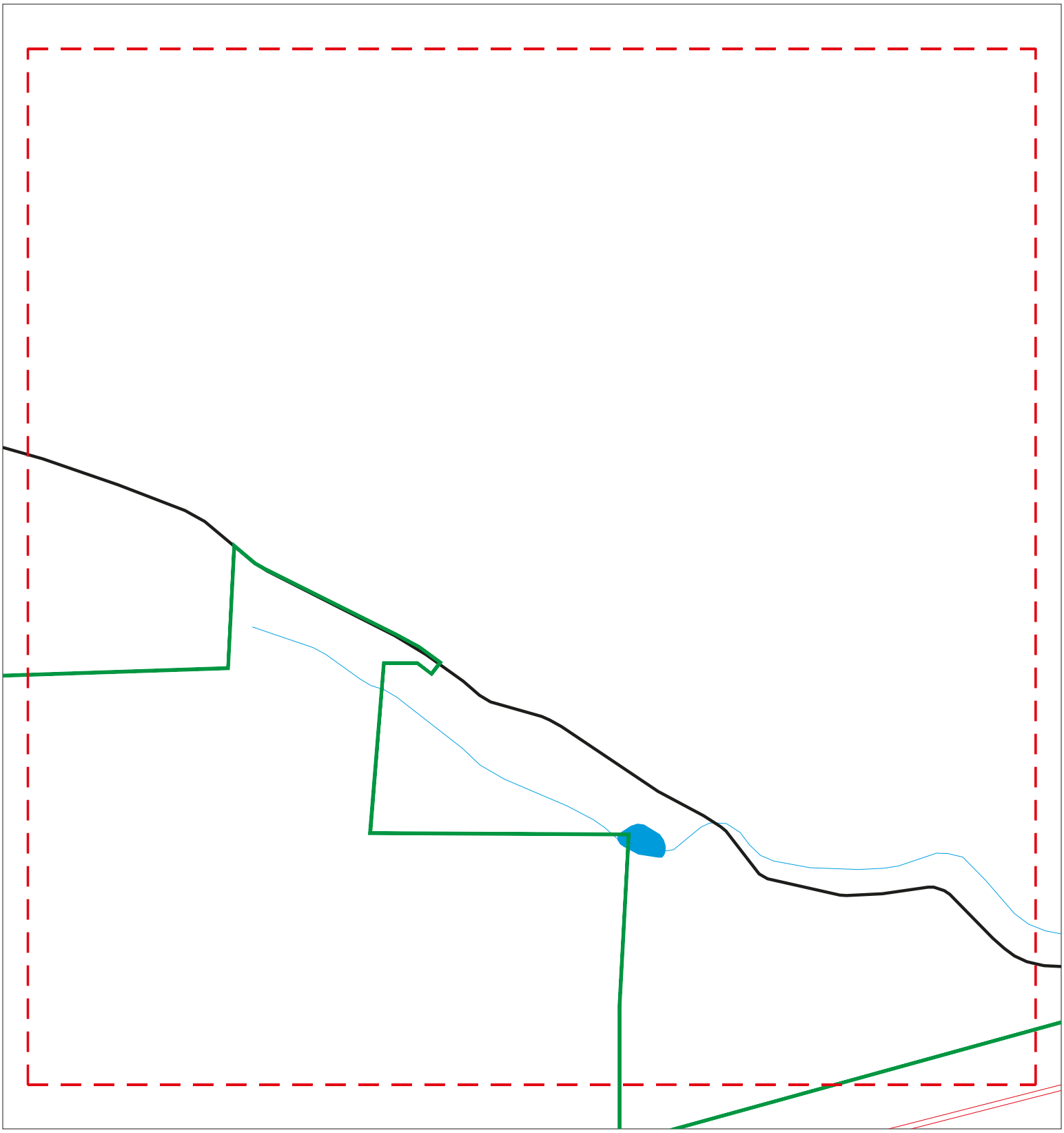
MAPPED SITES SUMMARY - FOCUS MAP 27

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 28 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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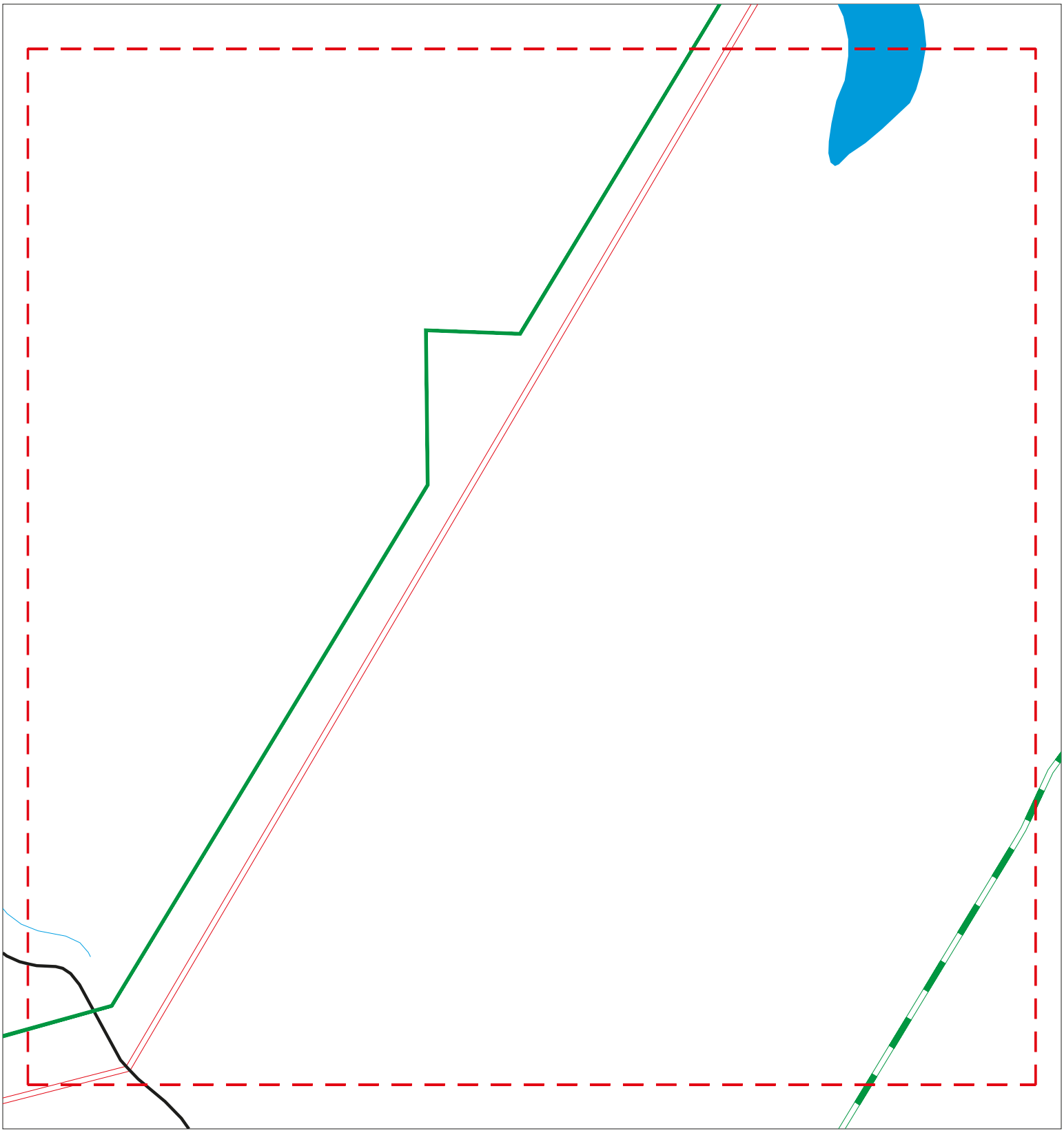
MAPPED SITES SUMMARY - FOCUS MAP 28

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 29 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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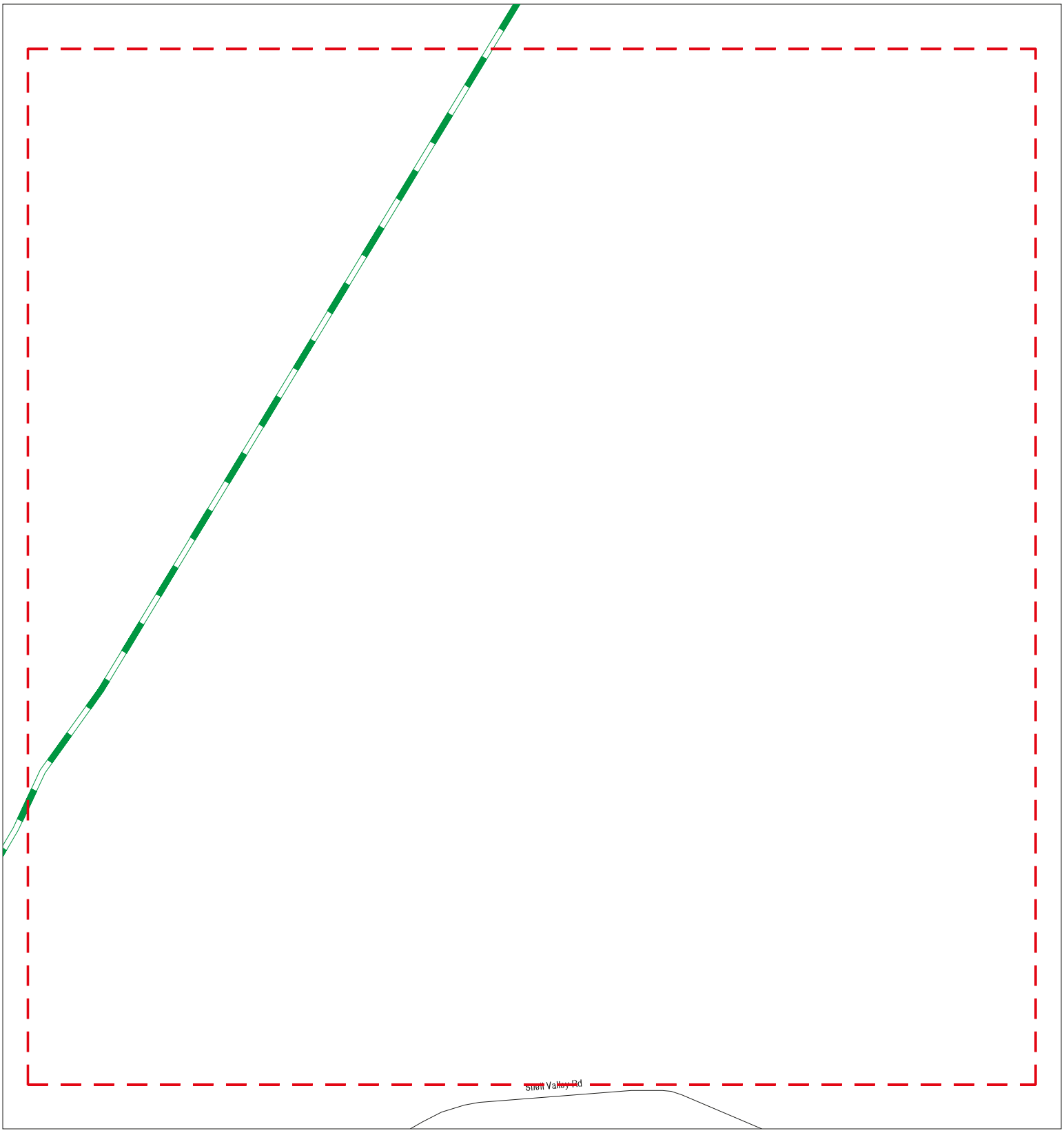
MAPPED SITES SUMMARY - FOCUS MAP 29

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 30 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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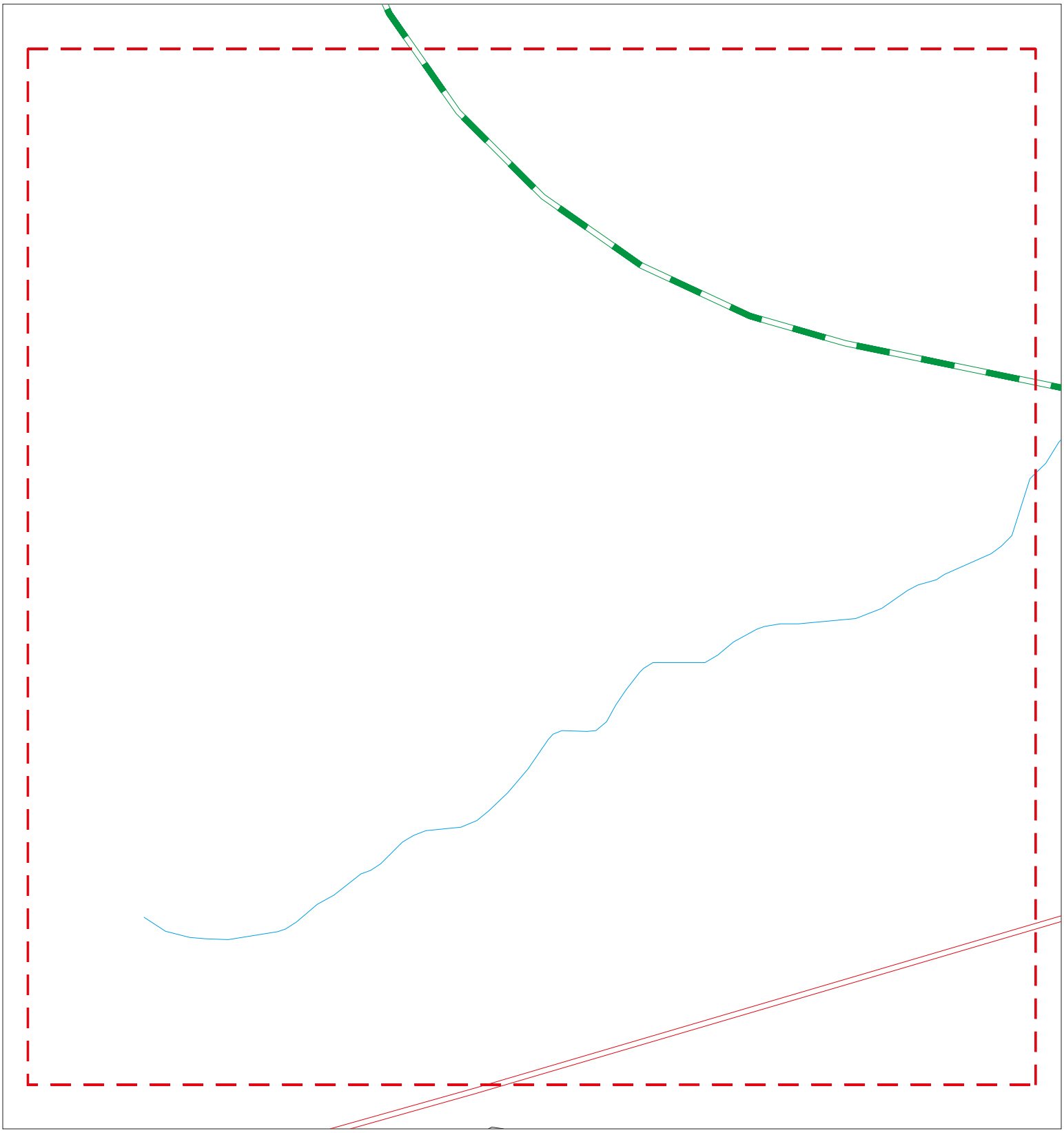
MAPPED SITES SUMMARY - FOCUS MAP 30

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 31 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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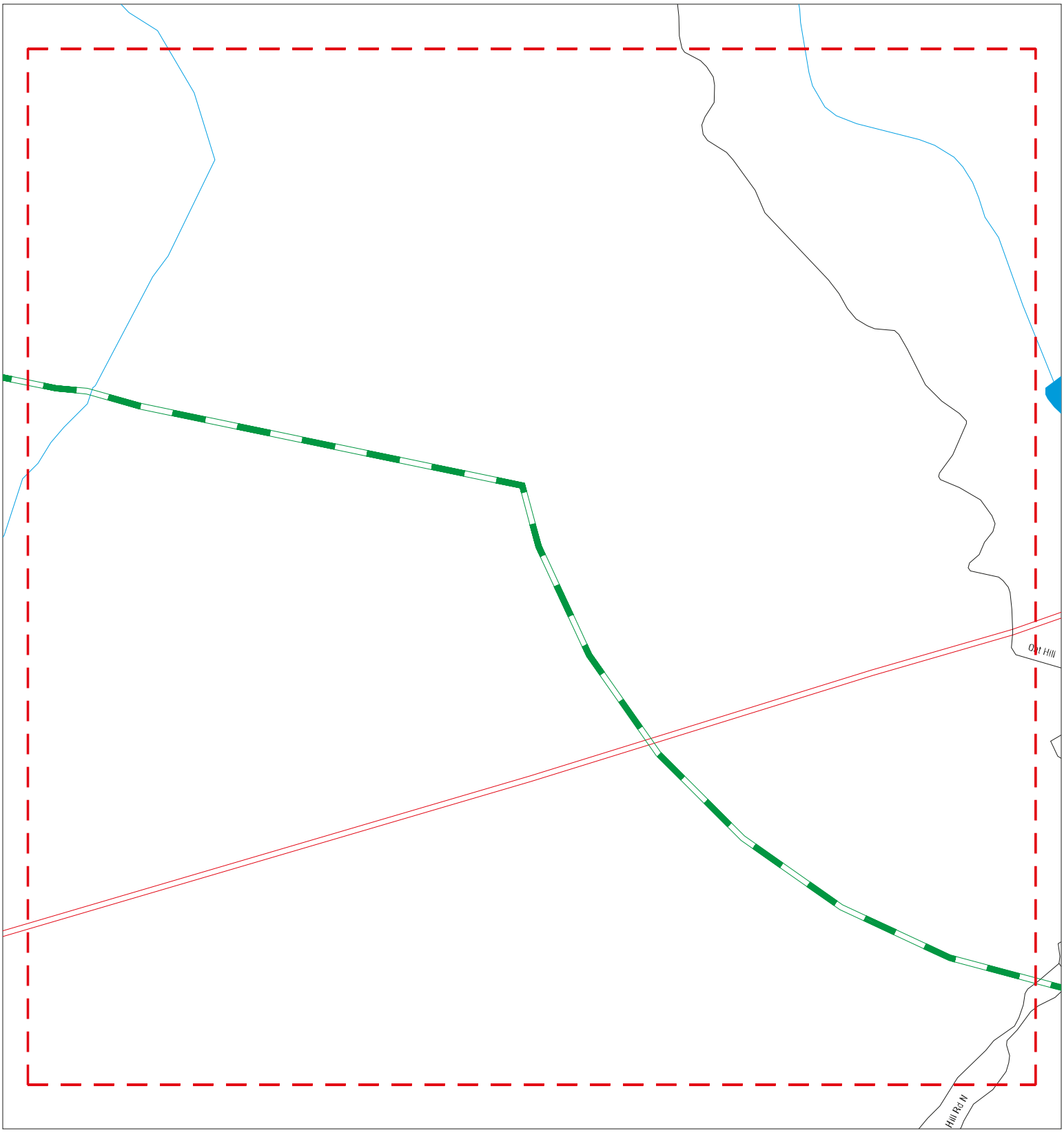
MAPPED SITES SUMMARY - FOCUS MAP 31

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 32 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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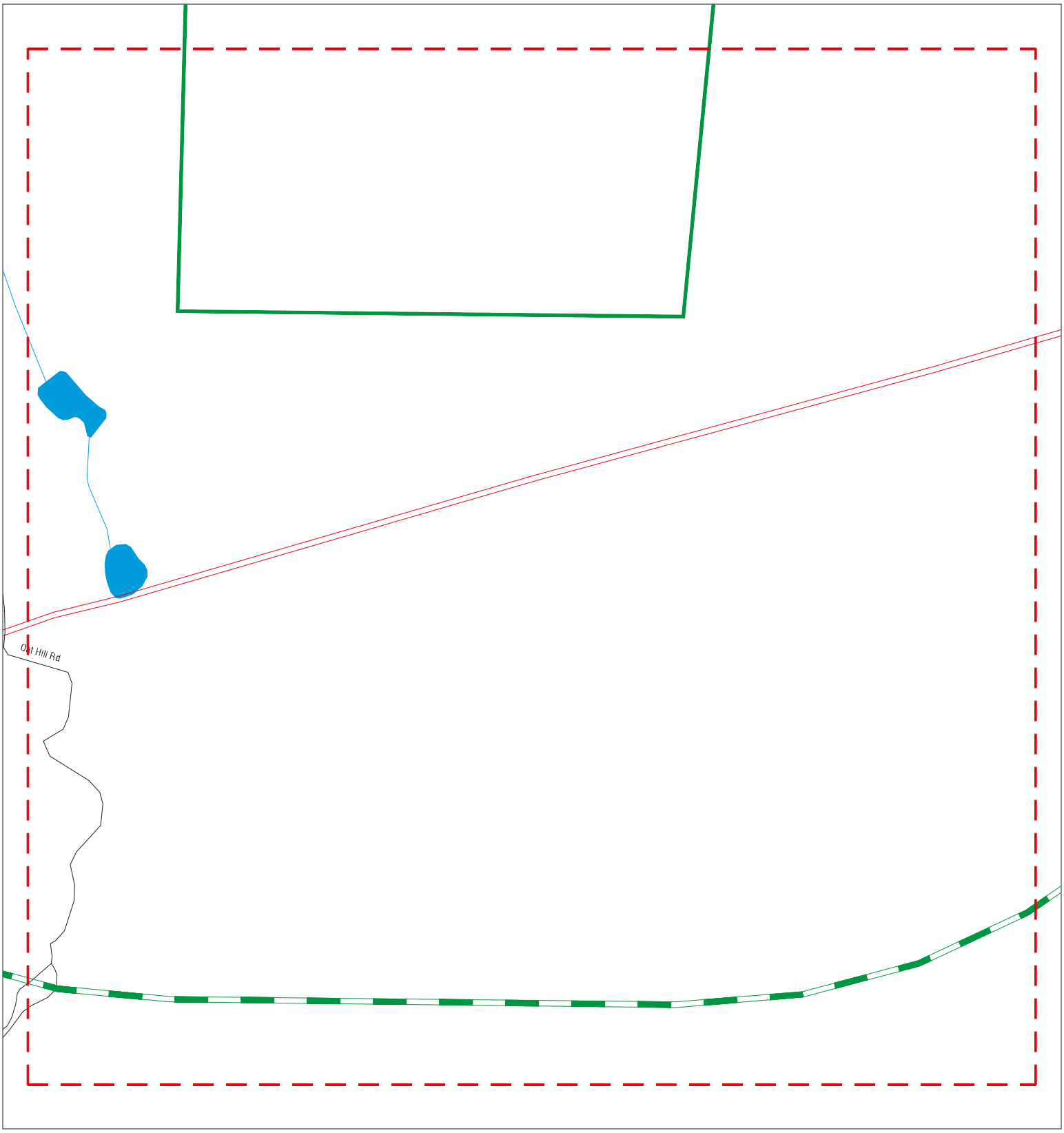
MAPPED SITES SUMMARY - FOCUS MAP 32

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 33 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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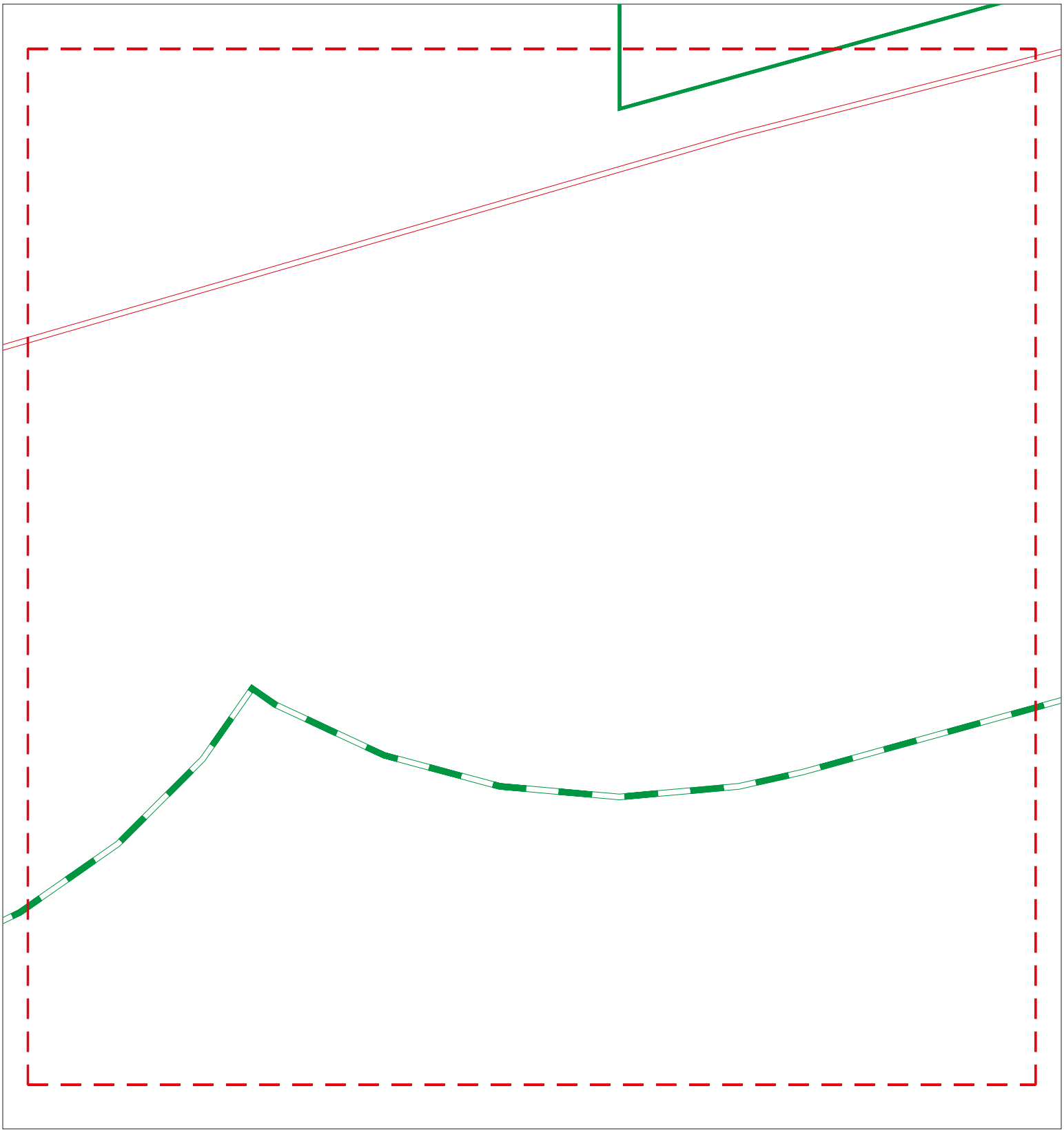
MAPPED SITES SUMMARY - FOCUS MAP 33

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 34 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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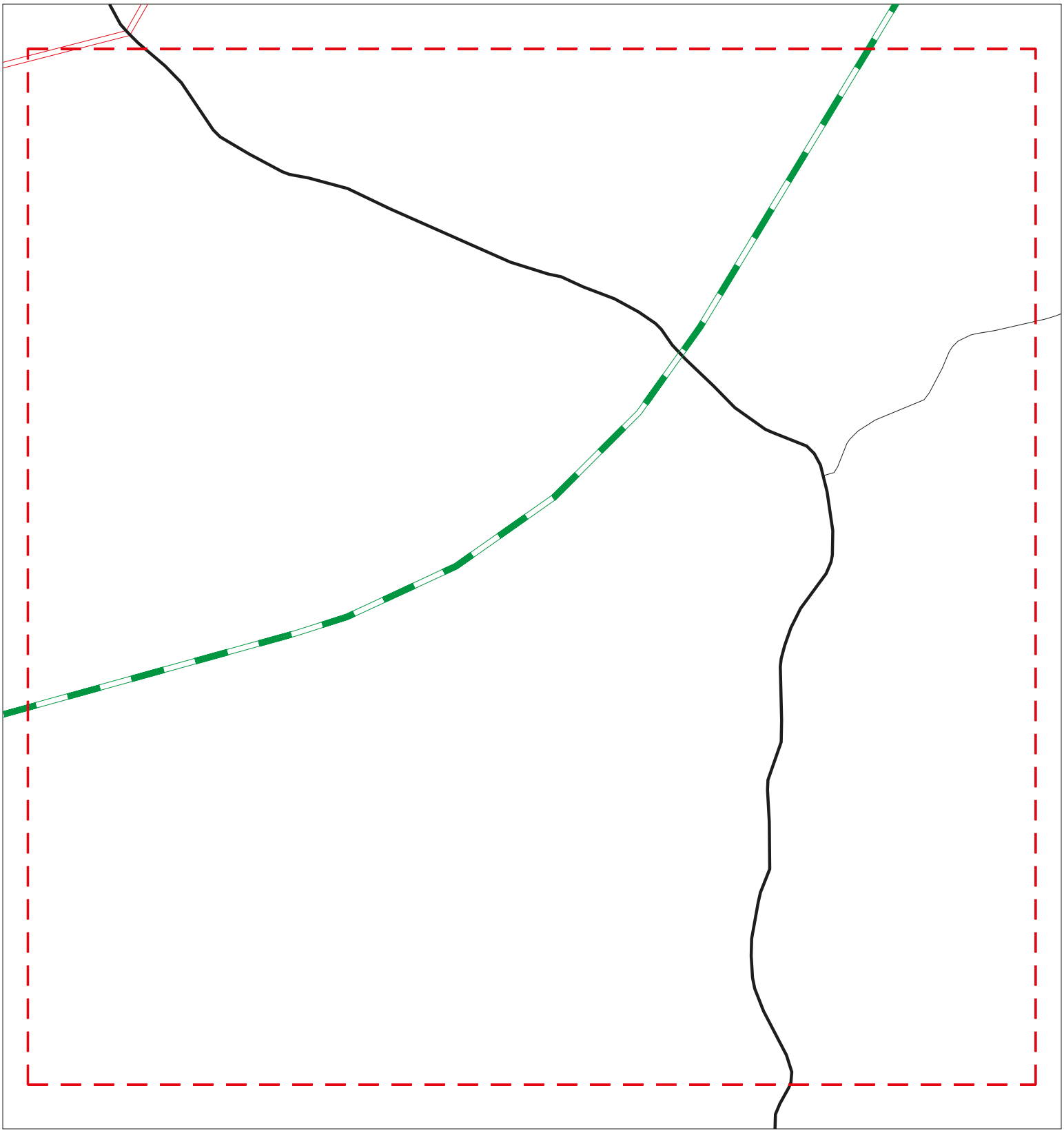
MAPPED SITES SUMMARY - FOCUS MAP 34

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 35 - 5821474.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Guenoc Valley Site	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: Multiple APN s	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5821474.2s
ZIP: 95461	DATE: 10/09/19

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MAPPED SITES SUMMARY - FOCUS MAP 35

Target Property:
MULTIPLE APN S
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

A1 **US COAST GUARD LORAN STATION - MIDDLETOWN** **HAZNET** **S113144833**
Target **22627 GRANGE RD** **N/A**
Property **MIDDLETOWN, CA 95461**

Site 1 of 2 in cluster A

Actual: **1027 ft.**

Focus Map: **13**

HAZNET:

Name:	US COAST GUARD LORAN STATION - MIDDLETOWN
Address:	22627 GRANGE RD
City,State,Zip:	MIDDLETOWN, CA 95461
Year:	2010
GEPAID:	CAL000312554
Contact:	Bruce Schultz
Telephone:	5105357222
Mailing Name:	Not reported
Mailing Address:	000 COAST GUARD ISLAND
Mailing City,St,Zip:	ALAMEDA, CA 94501
Gen County:	Lakes
TSD EPA ID:	CAD097030993
TSD County:	Los Angeles
Tons:	0.005
CA Waste Code:	223-Unspecified oil-containing waste
Method:	H141-Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Facility County:	Lakes

Name:	US COAST GUARD LORAN STATION - MIDDLETOWN
Address:	22627 GRANGE RD
City,State,Zip:	MIDDLETOWN, CA 95461
Year:	2010
GEPAID:	CAL000312554
Contact:	Bruce Schultz
Telephone:	5105357222
Mailing Name:	Not reported
Mailing Address:	000 COAST GUARD ISLAND
Mailing City,St,Zip:	ALAMEDA, CA 94501
Gen County:	Lakes
TSD EPA ID:	NVD980893663
TSD County:	99
Tons:	0.34
CA Waste Code:	343-Unspecified organic liquid mixture
Method:	-
Facility County:	Lakes

Name:	US COAST GUARD LORAN STATION - MIDDLETOWN
Address:	22627 GRANGE RD
City,State,Zip:	MIDDLETOWN, CA 95461
Year:	2010
GEPAID:	CAL000312554
Contact:	Bruce Schultz
Telephone:	5105357222
Mailing Name:	Not reported
Mailing Address:	000 COAST GUARD ISLAND
Mailing City,St,Zip:	ALAMEDA, CA 94501
Gen County:	Lakes
TSD EPA ID:	CAD982444481
TSD County:	San Bernardino
Tons:	0.02
CA Waste Code:	352-Other organic solids

US COAST GUARD LORAN STATION - MIDDLETOWN (Continued) **S113144833**

Method:	H129-Other Treatment
Facility County:	Lakes
Name:	US COAST GUARD LORAN STATION - MIDDLETOWN
Address:	22627 GRANGE RD
City,State,Zip:	MIDDLETOWN, CA 95461
Year:	2010
GEPAID:	CAL000312554
Contact:	Bruce Schultz
Telephone:	5105357222
Mailing Name:	Not reported
Mailing Address:	000 COAST GUARD ISLAND
Mailing City,St,Zip:	ALAMEDA, CA 94501
Gen County:	Lakes
TSD EPA ID:	CAT080013352
TSD County:	Los Angeles
Tons:	0.23
CA Waste Code:	343-Unspecified organic liquid mixture
Method:	H039-Other Recovery Of Reclamation For Reuse Including Acid Regeneration, Organics Recovery Ect
Facility County:	Lakes
Name:	US COAST GUARD LORAN STATION - MIDDLETOWN
Address:	22627 GRANGE RD
City,State,Zip:	MIDDLETOWN, CA 95461
Year:	2010
GEPAID:	CAL000312554
Contact:	Bruce Schultz
Telephone:	5105357222
Mailing Name:	Not reported
Mailing Address:	000 COAST GUARD ISLAND
Mailing City,St,Zip:	ALAMEDA, CA 94501
Gen County:	Lakes
TSD EPA ID:	CAT080013352
TSD County:	Los Angeles
Tons:	0.2975
CA Waste Code:	134-Aqueous solution with total organic residues less than 10 percent
Method:	H039-Other Recovery Of Reclamation For Reuse Including Acid Regeneration, Organics Recovery Ect
Facility County:	Lakes

Click this hyperlink while viewing on your computer to access
4 additional CA_HAZNET: record(s) in the EDR Site Report.

A2 **UNITED STATES COAST GUARD** **AST** **A100337066**
Target **22627 GRANGE RD** **N/A**
Property **MIDDLETOWN, CA**

Site 2 of 2 in cluster A

Actual: AST:
1027 ft.

Name:	UNITED STATES COAST GUARD
Address:	22627 GRANGE RD
City/Zip:	MIDDLETOWN,
Certified Unified Program Agencies:	Lake
Owner:	UNITED STATES COAST GUARD
Total Gallons:	6,737
CERSID:	Not reported

Focus Map: 13

UNITED STATES COAST GUARD (Continued) **A100337066**

Facility ID:	Not reported
Business Name:	Not reported
Phone:	Not reported
Fax:	Not reported
Mailing Address:	Not reported
Mailing Address City:	Not reported
Mailing Address State:	Not reported
Mailing Address Zip Code:	Not reported
Operator Name:	Not reported
Operator Phone:	Not reported
Owner Phone:	Not reported
Owner Mail Address:	Not reported
Owner State:	Not reported
Owner Zip Code:	Not reported
Owner Country:	Not reported
Property Owner Name:	Not reported
Property Owner Phone:	Not reported
Property Owner Mailing Address:	Not reported
Property Owner City:	Not reported
Property Owner Stat :	Not reported
Property Owner Zip Code:	Not reported
Property Owner Country:	Not reported
EPAID:	Not reported

B3 **MAGOON ESTATE LIMITED** **LUST** **U001610509**
Target **22000 BUTTS CANYON RD** **SWEEPS UST** **N/A**
Property **MIDDLETOWN, CA 95461** **HIST UST**
CUPA Listings
Site 1 of 10 in cluster B **CERS**

Actual:
1003 ft.

Focus Map:
20

LUST REG 5:

Name:	GUENOC RANCH
Address:	22000 BUTTS CANYON RD
City:	MIDDLETOWN
Region:	5
Status:	Case Closed
Case Number:	170105
Case Type:	Drinking Water Aquifer affected
Substance:	GASOLINE
Staff Initials:	GTM
Lead Agency:	Regional
Program:	LUST
MTBE Code:	3

LUST:

Name:	GUENOC RANCH
Address:	22000 BUTTS CANYON RD
City,State,Zip:	MIDDLETOWN, CA 95461
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0603300084
Global Id:	T0603300084
Latitude:	38.738148
Longitude:	-122.50939
Status:	Completed - Case Closed
Status Date:	09/24/2002
Case Worker:	GTM

MAGOON ESTATE LIMITED (Continued) **U001610509**

RB Case Number: 170105
Local Agency: LAKE COUNTY
File Location: Not reported
Local Case Number: Not reported
Potential Media Affect: Aquifer used for drinking water supply
Potential Contaminants of Concern: Gasoline
Site History: Not reported

LUST:
Global Id: T0603300084
Contact Type: Regional Board Caseworker
Contact Name: GLENN T. MEEKS
Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: gmeeks@waterboards.ca.gov
Phone Number: Not reported

Global Id: T0603300084
Contact Type: Local Agency Caseworker
Contact Name: MANUEL RAMIREZ
Organization Name: LAKE COUNTY
Address: Not reported
City: r5 UNKNOWN
Email: Not reported
Phone Number: Not reported

LUST:
Global Id: T0603300084
Action Type: ENFORCEMENT
Date: 09/24/2002
Action: Closure/No Further Action Letter

Global Id: T0603300084
Action Type: ENFORCEMENT
Date: 05/01/2002
Action: Notice to Comply

Global Id: T0603300084
Action Type: Other
Date: 02/28/2000
Action: Leak Discovery

Global Id: T0603300084
Action Type: ENFORCEMENT
Date: 11/13/2000
Action: Staff Letter

Global Id: T0603300084
Action Type: ENFORCEMENT
Date: 12/08/2000
Action: Staff Letter

Global Id: T0603300084
Action Type: ENFORCEMENT
Date: 04/02/2001
Action: Staff Letter

MAGOON ESTATE LIMITED (Continued) **U001610509**

Global Id: T0603300084
Action Type: Other
Date: 02/28/2000
Action: Leak Stopped

Global Id: T0603300084
Action Type: ENFORCEMENT
Date: 06/15/2000
Action: Staff Letter

Global Id: T0603300084
Action Type: ENFORCEMENT
Date: 04/03/2000
Action: Staff Letter

Global Id: T0603300084
Action Type: Other
Date: 03/08/2000
Action: Leak Reported

Global Id: T0603300084
Action Type: RESPONSE
Date: 07/15/2002
Action: Monitoring Report - Quarterly

LUST:
Global Id: T0603300084
Status: Open - Case Begin Date
Status Date: 02/28/2000

Global Id: T0603300084
Status: Open - Site Assessment
Status Date: 02/28/2000

Global Id: T0603300084
Status: Open - Site Assessment
Status Date: 06/05/2001

Global Id: T0603300084
Status: Open - Verification Monitoring
Status Date: 06/16/2002

Global Id: T0603300084
Status: Completed - Case Closed
Status Date: 09/24/2002

SWEEPS UST:
Name: MAGOON ESTATE LIMITED
Address: 22000 BUTTS CANYON RD
City: MIDDLETOWN
Status: Active
Comp Number: 44561
Number: 9
Board Of Equalization: Not reported
Referral Date: 11-08-91

MAGOON ESTATE LIMITED (Continued) **U001610509**

Action Date: 11-08-91
Created Date: 02-29-88
Owner Tank Id: 2
SWRCB Tank Id: 17-000-044561-000001
Tank Status: A
Capacity: 500
Active Date: 07-01-85
Tank Use: M.V. FUEL
STG: P
Content: REG UNLEADED
Number Of Tanks: 1

Name: MAGOON ESTATE LIMITED
Address: 22000 BUTTS CANYON RD
City: MIDDLETOWN
Status: Not reported
Comp Number: 44561
Number: Not reported
Board Of Equalization: Not reported
Referral Date: Not reported
Action Date: Not reported
Created Date: Not reported
Owner Tank Id: Not reported
SWRCB Tank Id: 17-000-044561-000002
Tank Status: Not reported
Capacity: 10000
Active Date: Not reported
Tank Use: M.V. FUEL
STG: PRODUCT
Content: DIESEL
Number Of Tanks: 2

Name: MAGOON ESTATE LIMITED
Address: 22000 BUTTS CANYON RD
City: MIDDLETOWN
Status: Not reported
Comp Number: 44561
Number: Not reported
Board Of Equalization: Not reported
Referral Date: Not reported
Action Date: Not reported
Created Date: Not reported
Owner Tank Id: Not reported
SWRCB Tank Id: 17-000-044561-000003
Tank Status: Not reported
Capacity: 1000
Active Date: Not reported
Tank Use: M.V. FUEL
STG: PRODUCT
Content: REG UNLEADED
Number Of Tanks: Not reported

HIST UST:
Name: GUENOC RANCH
Address: 22000 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
File Number: 000259A8

MAGOON ESTATE LIMITED (Continued) **U001610509**

URL:	http://geotracker.waterboards.ca.gov/ustpdfs/pdf/000259A8.pdf
Region:	STATE
Facility ID:	00000044561
Facility Type:	Other
Other Type:	RANCH
Contact Name:	EARL HOUSTON, MANAGER
Telephone:	7079873217
Owner Name:	MAGOON ESTATE LTD
Owner Address:	22000 BUTTS CANYON RD.
Owner City,St,Zip:	MIDDLETOWN, CA 95461
Total Tanks:	0003
Tank Num:	001
Container Num:	2
Year Installed:	1977
Tank Capacity:	00000500
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	1/4
Leak Detection:	None
Tank Num:	002
Container Num:	3
Year Installed:	1974
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	DIESEL
Container Construction Thickness:	3/8
Leak Detection:	None
Tank Num:	003
Container Num:	4
Year Installed:	1974
Tank Capacity:	00001000
Tank Used for:	PRODUCT
Type of Fuel:	PREMIUM
Container Construction Thickness:	1/4
Leak Detection:	None

Click here for Geo Tracker PDF:

CUPA LAKE:

Name:	LANGTRY FARMS
Address:	22000 BUTTS CANYON RD
City,State,Zip:	MIDDLETOWN, CA 95461
Facility:	FA0001071
Business Type:	1 - CUPA
Program Element:	2009 - HMRRP Category 9 (Agricultural operation, haz
Mailing Address:	22000 BUTTS CANYON RD MIDDLETOWN, CA 95461 USA
Mailing Telephone:	Not reported
Entered Date:	07/08/2014
Program Identifier:	CUPA
Record ID:	PR0002211
Billing Status:	01 - ACTIVE, BILLABLE
Total Fee Amount:	204.00
Current Inspection Date:	04/30/2022
Contact Name:	Not reported

MAGOON ESTATE LIMITED (Continued) **U001610509**

Mailing Address: MIDDLETOWN, CA 95461
APN: Not reported
Program/Element Code: 2009

Name: LANGTRY FARMS
Address: 22000 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
Facility: FA0001071
Business Type: 1 - CUPA
Program Element: 2800 - CUPA Hazardous Waste Generator Program
Mailing Address: 22000 BUTTS CANYON RD MIDDLETOWN, CA 95461 USA
Mailing Telephone: 7074892288
Entered Date: 07/08/2014
Program Identifier: CUPA SQG
Record ID: PR0002212
Billing Status: 01 - ACTIVE, BILLABLE
Total Fee Amount: 0.00
Current Inspection Date: 04/30/2022
Contact Name: Not reported
Mailing Address: MIDDLETOWN, CA 95461
APN: Not reported
Program/Element Code: 2800

CERS:
Name: GUENOC RANCH
Address: 22000 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
Site ID: 226224
CERS ID: T0603300084
CERS Description: Leaking Underground Storage Tank Cleanup Site

Affiliation:
Affiliation Type Desc: Local Agency Caseworker
Entity Name: MANUEL RAMIREZ - LAKE COUNTY
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: r5 UNKNOWN
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

Affiliation Type Desc: Regional Board Caseworker
Entity Name: GLENN T. MEEKS - CENTRAL VALLEY RWQCB (REGION 5S)
Entity Title: Not reported
Affiliation Address: 11020 SUN CENTER DRIVE #200
Affiliation City: RANCHO CORDOVA
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

B4 **GUENOC RANCH** **RGA LUST** **S114629732**
Target **22000 BUTTS CANYON RD** **N/A**
Property **MIDDLETOWN, CA**

Site 2 of 10 in cluster B

Actual: **1003 ft.**

Focus Map: **20**

RGA LUST:

Name:	GUENOC RANCH		
Address:	22000 BUTTS CANYON RD		
City:	MIDDLETOWN		
State:	MIDDLETOWN		
	2012	GUENOC RANCH	22000 BUTTS CANYON RD
Name:	GUENOC RANCH		
Address:	22000 BUTTS CANYON RD		
City:	MIDDLETOWN		
State:	MIDDLETOWN		
	2011	GUENOC RANCH	22000 BUTTS CANYON RD
Name:	GUENOC RANCH		
Address:	22000 BUTTS CANYON RD		
City:	MIDDLETOWN		
State:	MIDDLETOWN		
	2010	GUENOC RANCH	22000 BUTTS CANYON RD
Name:	GUENOC RANCH		
Address:	22000 BUTTS CANYON RD		
City:	MIDDLETOWN		
State:	MIDDLETOWN		
	2009	GUENOC RANCH	22000 BUTTS CANYON RD
Name:	GUENOC RANCH		
Address:	22000 BUTTS CANYON RD		
City:	MIDDLETOWN		
State:	MIDDLETOWN		
	2008	GUENOC RANCH	22000 BUTTS CANYON RD
Name:	GUENOC RANCH		
Address:	22000 BUTTS CANYON RD		
City:	MIDDLETOWN		
State:	MIDDLETOWN		
	2007	GUENOC RANCH	22000 BUTTS CANYON RD
Name:	GUENOC RANCH		
Address:	22000 BUTTS CANYON RD		
City:	MIDDLETOWN		
State:	MIDDLETOWN		
	2006	GUENOC RANCH	22000 BUTTS CANYON RD
Name:	GUENOC RANCH		
Address:	22000 BUTTS CANYON RD		
City:	MIDDLETOWN		
State:	MIDDLETOWN		
	2005	GUENOC RANCH	22000 BUTTS CANYON RD
Name:	GUENOC RANCH		
Address:	22000 BUTTS CANYON RD		
City:	MIDDLETOWN		
State:	MIDDLETOWN		
	2003	GUENOC RANCH	22000 BUTTS CANYON RD
Name:	GUENOC RANCH		
Address:	22000 BUTTS CANYON RD		
City:	MIDDLETOWN		
State:	MIDDLETOWN		
	2002	GUENOC RANCH	22000 BUTTS CANYON RD
Name:	GUENOC RANCH		
Address:	22000 BUTTS CANYON RD		

GUENOC RANCH (Continued) **S114629732**

City: MIDDLETOWN
State: MIDDLETOWN
2001 GUENOC RANCH 22000 BUTTS CANYON RD
Name: GUENOC RANCH
Address: 22000 BUTTS CANYON RD
City: MIDDLETOWN
State: MIDDLETOWN
2000 GUENOC RANCH 22000 BUTTS CANYON RD

B5 **LANGTRY FARMS LLC** **RCRA NonGen / NLR** **1024861435**
Target Property **22000 BUTTS CANYON RD** **CAL000429912**
MIDDLETOWN, CA 95461

Site 3 of 10 in cluster B

Actual: 1003 ft.

Focus Map: 20

RCRA NonGen / NLR:
Date form received by agency: 08/08/2017
Facility name: LANGTRY FARMS LLC
Facility address: 22000 BUTTS CANYON RD
MIDDLETOWN, CA 95461
EPA ID: CAL000429912
Contact: DAVID JORDAN
Contact address: 22000 BUTTS CANYON RD
MIDDLETOWN, CA 95461
Contact country: Not reported
Contact telephone: 707-987-2772
Contact email: DAVE@LANGTRYFARMS.COM
EPA Region: 09
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: DAVID JORDAN
Owner/operator address: 22000 BUTTS CANYON RD
MIDDLETOWN, CA 95461
Owner/operator country: Not reported
Owner/operator telephone: 707-987-2772
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Other
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Owner/operator name: LANGTRY FARMS LLC
Owner/operator address: 22000 BUTTS CANYON RD
MIDDLETOWN, CA 95461
Owner/operator country: Not reported
Owner/operator telephone: 707-987-2772
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Other
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

LANGTRY FARMS LLC (Continued) **1024861435**

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: Yes
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Violation Status: No violations found

B6 **GUENOC RANCH** **HAZNET** **S113021816**
Target **22000 BUTTS CANYON ROAD** **N/A**
Property **MIDDLETOWN, CA 95461**

Site 4 of 10 in cluster B

Actual: **1003 ft.**
Focus Map: **20**

HAZNET:
Name: GUENOC RANCH
Address: 22000 BUTTS CANYON ROAD
City,State,Zip: MIDDLETOWN, CA 954610000
Year: 2005
GEPAID: CAL000000474
Contact: RANDY STERNBERG RANCH MANAGER
Telephone: 7079872772
Mailing Name: Not reported
Mailing Address: 22000 BUTTS CANYON RD
Mailing City,St,Zip: MIDDLETOWN, CA 954619612
Gen County: Lakes
TSD EPA ID: CAT080033681
TSD County: Los Angeles
Tons: 0.2
CA Waste Code: 352-Other organic solids
Method: R01-Recycler
Facility County: Lakes

Name: GUENOC RANCH
Address: 22000 BUTTS CANYON ROAD
City,State,Zip: MIDDLETOWN, CA 954610000
Year: 2005
GEPAID: CAL000000474
Contact: RANDY STERNBERG RANCH MANAGER
Telephone: 7079872772
Mailing Name: Not reported
Mailing Address: 22000 BUTTS CANYON RD
Mailing City,St,Zip: MIDDLETOWN, CA 954619612
Gen County: Lakes
TSD EPA ID: CAT080033681
TSD County: Los Angeles
Tons: 1.5

GUENOC RANCH (Continued) **S113021816**

CA Waste Code: 343-Unspecified organic liquid mixture
Method: R01-Recycler
Facility County: Lakes

Name: GUENOC RANCH
Address: 22000 BUTTS CANYON ROAD
City,State,Zip: MIDDLETOWN, CA 954610000
Year: 2002
GEPAID: CAL000000474
Contact: RANDY STERNBERG RANCH MANAGER
Telephone: 7079872772
Mailing Name: Not reported
Mailing Address: 22000 BUTTS CANYON RD
Mailing City,St,Zip: MIDDLETOWN, CA 954619612
Gen County: Lakes
TSD EPA ID: CAT080033681
TSD County: Los Angeles
Tons: 0.187
CA Waste Code: 343-Unspecified organic liquid mixture
Method: R01-Recycler
Facility County: Lakes

Name: GUENOC RANCH
Address: 22000 BUTTS CANYON ROAD
City,State,Zip: MIDDLETOWN, CA 954610000
Year: 2001
GEPAID: CAL000000474
Contact: RANDY STERNBERG RANCH MANAGER
Telephone: 7079872772
Mailing Name: Not reported
Mailing Address: 22000 BUTTS CANYON RD
Mailing City,St,Zip: MIDDLETOWN, CA 954619612
Gen County: Lakes
TSD EPA ID: CAT080033681
TSD County: Los Angeles
Tons: 0.2293
CA Waste Code: 223-Unspecified oil-containing waste
Method: R01-Recycler
Facility County: Lakes

Name: GUENOC RANCH
Address: 22000 BUTTS CANYON ROAD
City,State,Zip: MIDDLETOWN, CA 954610000
Year: 2000
GEPAID: CAL000000474
Contact: RANDY STERNBERG RANCH MANAGER
Telephone: 7079872772
Mailing Name: Not reported
Mailing Address: 22000 BUTTS CANYON RD
Mailing City,St,Zip: MIDDLETOWN, CA 954619612
Gen County: Lakes
TSD EPA ID: CAD028409019
TSD County: Los Angeles
Tons: 0.4
CA Waste Code: 181-Other inorganic solid waste
Method: H01-Transfer Station
Facility County: Lakes

GUENOC RANCH (Continued) **S113021816**

Click this hyperlink while viewing on your computer to access
17 additional CA_HAZNET: record(s) in the EDR Site Report.

B7 **GUENOC RANCH** **HIST CORTESE** **S105024960**
Target **22000 BUTTS CNYN** **N/A**
Property **MIDDLETOWN, CA 95461**

Site 5 of 10 in cluster B

Actual: **1003 ft.**
Focus Map: **20**

HIST CORTESE:

edr_fname:	GUENOC RANCH
edr_fadd1:	22000 BUTTS CNYN
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	CORTESE
Facility County Code:	17
Reg By:	LTNKA
Reg Id:	170105

B8 **LANGTRY FARMS, LLC** **AST** **A100421667**
Target **22000 BUTTS CANYON RD** **N/A**
Property **MIDDLETOWN, CA 95461**

Site 6 of 10 in cluster B

Actual: **1003 ft.**
Focus Map: **20**

AST:

Name:	LANGTRY FARMS, LLC
Address:	22000 BUTTS CANYON RD
City/Zip:	MIDDLETOWN,95461
Certified Unified Program Agencies:	Not reported
Owner:	Langtry Farms, LLC
Total Gallons:	Not reported
CERSID:	10588261
Facility ID:	Not reported
Business Name:	Langtry Farms, LLC
Phone:	707-987-2772
Fax:	707-9879-772
Mailing Address:	22000 Butts Canyon Road
Mailing Address City:	Middletown
Mailing Address State:	CA
Mailing Address Zip Code:	95461
Operator Name:	David Jordan
Operator Phone:	707-987-2772
Owner Phone:	707-987-2772
Owner Mail Address:	22000 Butts Canyon Road
Owner State:	CA
Owner Zip Code:	95461
Owner Country:	United States
Property Owner Name:	Langtry Farms, LLC
Property Owner Phone:	707-987-2772
Property Owner Mailing Address:	22000 Butts Canyon Rd
Property Owner City:	Middletown
Property Owner Stat :	CA
Property Owner Zip Code:	95461
Property Owner Country:	United States
EPAID:	CAL000000474

B9 **LANGTRY FARMS LLC** **FINDS** **1024641173**
Target **22000 BUTTS CANYON RD** **ECHO** **N/A**
Property **MIDDLETOWN, CA 95461**

Site 7 of 10 in cluster B

Actual: **1003 ft.**

FINDS:

Focus Map: **20**

Registry ID: 110070429560

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:
Envid: 1024641173
Registry ID: 110070429560
DFR URL: http://echo.epa.gov/detailed-facility-report?fid=110070429560

B10 **GUENOC RANCH** **FINDS** **1023268361**
Target **22000 BUTTS CANYON RD** **N/A**
Property **MIDDLETOWN, CA 95461**

Site 8 of 10 in cluster B

Actual: **1003 ft.**

FINDS:

Focus Map: **20**

Registry ID: 110065580721

Environmental Interest/Information System
STATE MASTER

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

B11 **LANGTRY FARMS, LLC** **CERS HAZ WASTE** **S121774055**
Target **22000 BUTTS CANYON RD** **CERS TANKS** **N/A**
Property **MIDDLETOWN, CA 95461** **CERS**

Site 9 of 10 in cluster B

Actual: **1003 ft.**

CERS HAZ WASTE:
Name: LANGTRY FARMS, LLC
Address: 22000 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
Site ID: 396276
CERS ID: 10588261
CERS Description: Hazardous Waste Generator

Focus Map: **20**

LANGTRY FARMS, LLC (Continued) **S121774055**

CERS TANKS:
Name: LANGTRY FARMS, LLC
Address: 22000 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
Site ID: 396276
CERS ID: 10588261
CERS Description: Aboveground Petroleum Storage

CERS:
Name: LANGTRY FARMS, LLC
Address: 22000 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
Site ID: 396276
CERS ID: 10588261
CERS Description: Chemical Storage Facilities

Violations:
Site ID: 396276
Site Name: Langtry Farms, LLC
Violation Date: 12-02-2014
Citation: 22 CCR 12 66262.40(a) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.40(a)
Violation Description: Failure to maintain uniform hazardous waste manifest, consolidated manifest, or bills of lading copies for three years.
Violation Notes: Returned to compliance on 01/27/2015. At least three years of waste disposal manifests should be kept on site and available for review during a routine inspection.
Violation Division: Lake County Environmental Health
Violation Program: HW
Violation Source: CERS

Site ID: 396276
Site Name: Langtry Farms, LLC
Violation Date: 12-02-2014
Citation: 22 CCR 12 66262.34(f) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.34(f)
Violation Description: Failure to properly label hazardous waste accumulation containers with the following requirements: "Hazardous Waste", name and address of the generator, physical and chemical characteristics of the Hazardous Waste, and starting accumulation date.
Violation Notes: Returned to compliance on 01/27/2015. All hazardous waste containers should be properly labeled.
Violation Division: Lake County Environmental Health
Violation Program: HW
Violation Source: CERS

Site ID: 396276
Site Name: Langtry Farms, LLC
Violation Date: 03-09-2017
Citation: HSC 6.95 25508.2 - California Health and Safety Code, Chapter 6.95, Section(s) 25508.2
Violation Description: Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date.
Violation Notes: Not reported
Violation Division: Lake County Environmental Health
Violation Program: HMRRP

LANGTRY FARMS, LLC (Continued) **S121774055**

Violation Source:	CERS
Site ID:	396276
Site Name:	Langtry Farms, LLC
Violation Date:	12-02-2014
Citation:	22 CCR 12 66262.34(d) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.34(d)
Violation Description:	Failure to dispose of hazardous waste within 180 days (or 270 if waste is transported over 200 miles) for the generator who generates less than 1000 kilogram per month, but more than 100 kilograms per month.
Violation Notes:	Returned to compliance on 01/27/2015. the amount of time that a waste generator may keep waste on site before it must be shipped varies according to how much waste is generated each month. Please see the provided brochure that explains the waste storage rules for hazardous waste generators. In some cases used oil has its own set of time limits.
Violation Division:	Lake County Environmental Health
Violation Program:	HW
Violation Source:	CERS
Site ID:	396276
Site Name:	Langtry Farms, LLC
Violation Date:	12-02-2014
Citation:	22 CCR 12 66262.40(c) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.40(c)
Violation Description:	Failure to determine if the waste generated is a hazardous waste and to maintain analysis results for three years.
Violation Notes:	Returned to compliance on 01/27/2015. We discussed the use of a power washer to degrease farming equipment in the field rather than bringing the equipment back to the shop. Occasionaly this is necessary due to th location of equipment at distant locations around the ranch. Consideration should be made to collect contaminated runnoff from the cleaning process if it is dermined to constitute a hazardous waste. In some cases contaminent levels may be too low to meet the definition of hazardous waste. On occasion these low levels of hazardous materials may still be prohibited from land disposal because of water quality regulations. For example water containing benzene at 1 part per billion would prevent disposal to the grround in some areas of California. You may also wish to research wheather or not your onsite waste water treatment system is permitted to accept the waste water from your equipment cleaning operations.
Violation Division:	Lake County Environmental Health
Violation Program:	HW
Violation Source:	CERS
Site ID:	396276
Site Name:	Langtry Farms, LLC
Violation Date:	03-01-2018
Citation:	HSC 6.95 25508.2 - California Health and Safety Code, Chapter 6.95, Section(s) 25508.2
Violation Description:	Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date.
Violation Notes:	OBSERVATION: Owner/Operator failed to submit inventory reports by March 1 to CERS. (Activities, Inventory, Map, Emergency Response and Contingency) CORRECTIVE ACTION: Owner/Operator shall submit inventory reports in CERS within 30 Days of this notice.

LANGTRY FARMS, LLC (Continued) **S121774055**

Violation Division: Lake County Environmental Health
Violation Program: HMRRP
Violation Source: CERS

Evaluation:
Eval General Type: Other/Unknown
Eval Date: 03-09-2017
Violations Found: Yes
Eval Type: Other, not routine, done by local agency
Eval Notes: Not reported
Eval Division: Lake County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Other/Unknown
Eval Date: 04-11-2018
Violations Found: Yes
Eval Type: Other, not routine, done by local agency
Eval Notes: NOV
Eval Division: Lake County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-02-2014
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: No violations noted at time of inspection.
Eval Division: Lake County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-02-2014
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: This business qualifies for an agricultural exemption from California requirements for a SPCC under the Above Ground Petroleum Storage Act. Farms are not exempt from the Federal EPA requirement to prepare a SPCC. Please see the information provided from Fed EPA about this requirement. We as the local enforcemnt agency for the California Above Ground Petroleum Storage Act are limited to asking a farm to inspect their tanks for leaks and to provide secondary containment but not a full SPCC. Please provide our office with a document on company letterhead or some other offical communication that states all tanks on the farm have secondary containment and that any drains on the secondary containment are closed. (These drains are only opened to drain uncontaminated water and not left open during the winter season.)
Eval Division: Lake County Environmental Health
Eval Program: APSA
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-02-2014
Violations Found: Yes
Eval Type: Routine done by local agency

LANGTRY FARMS, LLC (Continued) **S121774055**

Eval Notes: Not reported
Eval Division: Lake County Environmental Health
Eval Program: HW
Eval Source: CERS

Enforcement Action:
Site ID: 396276
Site Name: Langtry Farms, LLC
Site Address: 22000 BUTTS CANYON RD
Site City: MIDDLETOWN
Site Zip: 95461
Enf Action Date: 03-09-2017
Enf Action Type: Notice of Violation (Unified Program)
Enf Action Description: Notice of Violation Issued by the Inspector at the Time of Inspection
Enf Action Notes: Not reported
Enf Action Division: Lake County Environmental Health
Enf Action Program: HMRRP
Enf Action Source: CERS

Site ID: 396276
Site Name: Langtry Farms, LLC
Site Address: 22000 BUTTS CANYON RD
Site City: MIDDLETOWN
Site Zip: 95461
Enf Action Date: 04-11-2018
Enf Action Type: Notice of Violation (Unified Program)
Enf Action Description: Notice of Violation Issued by the Inspector at the Time of Inspection
Enf Action Notes: Not reported
Enf Action Division: Lake County Environmental Health
Enf Action Program: HMRRP
Enf Action Source: CERS

Coordinates:
Site ID: 396276
Facility Name: Langtry Farms, LLC
Env Int Type Code: APSA
Program ID: 10588261
Coord Name: Not reported
Ref Point Type Desc: Center of a facility or station.
Latitude: 38.738670
Longitude: -122.510440

Affiliation:
Affiliation Type Desc: Facility Mailing Address
Entity Name: Mailing Address
Entity Title: Not reported
Affiliation Address: 22000 Butts Canyon Road
Affiliation City: Middletown
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 95461
Affiliation Phone: Not reported

Affiliation Type Desc: Identification Signer
Entity Name: David Jordan
Entity Title: Vice President of Ranch Operations

LANGTRY FARMS, LLC (Continued) **S121774055**

Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported
Affiliation Type Desc:	Legal Owner
Entity Name:	Langtry Farms, LLC
Entity Title:	Not reported
Affiliation Address:	22000 Butts Canyon Road
Affiliation City:	Middletown
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	95461
Affiliation Phone:	(707) 987-2772
Affiliation Type Desc:	Document Preparer
Entity Name:	David Jordan
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported
Affiliation Type Desc:	Property Owner
Entity Name:	Langtry Farms, LLC
Entity Title:	Not reported
Affiliation Address:	22000 Butts Canyon Rd
Affiliation City:	Middletown
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	95461
Affiliation Phone:	(707) 987-2772
Affiliation Type Desc:	CUPA District
Entity Name:	Lake County Environmental Health
Entity Title:	Not reported
Affiliation Address:	922 Bevins Court
Affiliation City:	Lakeport
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	95453
Affiliation Phone:	(707) 263-1164
Affiliation Type Desc:	Environmental Contact
Entity Name:	David Jordan
Entity Title:	Not reported
Affiliation Address:	22000 Butts Canyon Rd
Affiliation City:	Middletown
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	95461
Affiliation Phone:	Not reported

LANGTRY FARMS, LLC (Continued) **S121774055**

Affiliation Type Desc:	Operator
Entity Name:	David Jordan
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	(707) 987-2772

Affiliation Type Desc:	Parent Corporation
Entity Name:	Langtry Farms, LLC
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

B12 **LANGTRY FARMSNA LLC** **FINDS** **1023325803**
Target Property **22000 BUTTS CANYON RD** **N/A**
MIDDLETOWN, CA 95461

Site 10 of 10 in cluster B

Actual: 1003 ft.

FINDS:

Focus Map: 20

Registry ID: 110066199740

Environmental Interest/Information System
STATE MASTER

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

C13 **GUENOC WINERY INC.** **FINDS** **1016419979**
Target Property **21000 BUTTS CANYON ROAD** **N/A**
MIDDLETOWN, CA 95461

Site 1 of 4 in cluster C

Actual: 1073 ft.

FINDS:

Focus Map: 19

Registry ID: 110055669389

Environmental Interest/Information System
STATE MASTER

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

C14 **GUENOC WINERY CLASS II SURFACE IMPOUNDMENT** **FINDS** **1023312662**
Target Property **21000 BUTTS CANYON** **N/A**
MIDDLETOWN, CA 95461

Site 2 of 4 in cluster C

Actual: 1073 ft.

Focus Map: 19

FINDS:

Registry ID: 110066056001

Environmental Interest/Information System
STATE MASTER

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

C15 **GUENOC WINERY CLASS II SURFACE IMPOUNDMENT** **CERS HAZ WASTE** **S105036852**
Target Property **21000 BUTTS CANYON ROAD** **LDS** **N/A**
MIDDLETOWN, CA 95461 **Cortese**
CUPA Listings
Site 3 of 4 in cluster C **ENF**
WDS
Actual: 1073 ft. **CIWQS**
CERS

Focus Map: 19

CERS HAZ WASTE:

Name:	GUENOC WINERY INC.
Address:	21000 BUTTS CANYON ROAD
City,State,Zip:	MIDDLETOWN, CA 95461
Site ID:	394232
CERS ID:	10136941
CERS Description:	Hazardous Chemical Management

Name:	GUENOC WINERY INC.
Address:	21000 BUTTS CANYON ROAD
City,State,Zip:	MIDDLETOWN, CA 95461
Site ID:	394232
CERS ID:	10136941
CERS Description:	Hazardous Waste Generator

LDS:

Name:	GUENOC WINERY CLASS II SURFACE IMPOUNDMENT
Address:	21000 BUTTS CANYON ROAD
City,State,Zip:	MIDDLETOWN, CA 95461
Global Id:	T10000009547
Latitude:	38.73911
Longitude:	-122.5261
Case Type:	Land Disposal Site
Status:	Open - Active
Status Date:	10/26/2016
Lead Agency:	Not reported
Caseworker:	Not reported
Local Agency:	Not reported
RB Case Number:	Not reported
LOC Case Number:	Not reported
File Location:	Not reported
Potential Media Affect:	Not reported

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

EDR Link ID: T10000009547
Potential Contaminants of Concern: Not reported
Site History: Not reported

Click here to access the California GeoTracker records for this facility:

CORTESE:
Name: GUENOC WINERY
Address: 21000 BUTTS CANYON
City,State,Zip: MIDDLETOWN, CA 95461
Region: CORTESE
Envirostor Id: Not reported
Global ID: Not reported
Site/Facility Type: Not reported
Cleanup Status: Not reported
Status Date: Not reported
Site Code: Not reported
Latitude: Not reported
Longitude: Not reported
Owner: Not reported
Enf Type: Not reported
Swat R: Not reported
Flag: CORTESE
Order No: R5-2006-0037
Waste Discharge System No: Not reported
Effective Date: 05/05/2006
Region 2: 5S
WID Id: 5A172012001
Solid Waste Id No: Not reported
Waste Management Uit Name: Not reported
File Name: Cease Desist Orders & Cleanup Abatement Orders

CUPA LAKE:
Name: GUENOC - FOLEY FAMILY WINES
Address: 21000 BUTTS CANYON ROAD
City,State,Zip: MIDDLETOWN, CA 95461
Facility: FA0000078
Business Type: 4 - CUPA CAL ARP
Program Element: 2004 - HMRRP Category 4 (1,001-5,000 gal, 10,001-100
Mailing Address: PO BOX 81467 c/o Garry McClure LAS VEGAS, NV 89180
Mailing Telephone: 7077088147
Entered Date: 11/14/2012
Program Identifier: CUPA-21000 BUTTS CANYON ROAD., MIDDLETOWN
Record ID: PR0000271
Billing Status: 01 - ACTIVE, BILLABLE
Total Fee Amount: 852.00
Current Inspection Date: 05/21/2021
Contact Name: FOLEY FAMILY WINES
Mailing Address: LAS VEGAS, NV 89180
APN: 014-310-061
Program/Element Code: 2004

Name: GUENOC - FOLEY FAMILY WINES
Address: 21000 BUTTS CANYON ROAD
City,State,Zip: MIDDLETOWN, CA 95461

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Facility:	FA0000078
Business Type:	4 - CUPA CAL ARP
Program Element:	2700 - CAL ARP STATE PROGRAM
Mailing Address:	PO BOX 81467 c/o Garry McClure LAS VEGAS, NV 89180
Mailing Telephone:	7079872385
Entered Date:	11/14/2012
Program Identifier:	CUPA CAL ARP
Record ID:	PR0000272
Billing Status:	01 - ACTIVE, BILLABLE
Total Fee Amount:	270.00
Current Inspection Date:	07/22/2024
Contact Name:	FOLEY FAMILY WINES
Mailing Address:	LAS VEGAS, NV 89180
APN:	014-310-061
Program/Element Code:	2700

Name:	GUENOC - FOLEY FAMILY WINES
Address:	21000 BUTTS CANYON ROAD
City,State,Zip:	MIDDLETOWN, CA 95461
Facility:	FA0000078
Business Type:	4 - CUPA CAL ARP
Program Element:	2800 - CUPA Hazardous Waste Generator Program
Mailing Address:	PO BOX 81467 c/o Garry McClure LAS VEGAS, NV 89180
Mailing Telephone:	7079872385
Entered Date:	11/14/2012
Program Identifier:	CUPA
Record ID:	PR0000274
Billing Status:	01 - ACTIVE, BILLABLE
Total Fee Amount:	0.00
Current Inspection Date:	05/21/2021
Contact Name:	FOLEY FAMILY WINES
Mailing Address:	LAS VEGAS, NV 89180
APN:	014-310-061
Program/Element Code:	2800

ENF:

Name:	GUENOC WINERY CLASS II SURFACE IMPOUNDMENT
Address:	21000 BUTTS CANYON ROAD
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	654934
Agency Name:	Magoon Estates Limited
Place Type:	Waste Management Unit
Place Subtype:	Surface Impoundment
Facility Type:	Solid Waste Class II - designated wastes
Agency Type:	Privately-Owned Business
# Of Agencies:	2
Place Latitude:	38.73615
Place Longitude:	-122.52866
SIC Code 1:	4953
SIC Desc 1:	Refuse Systems
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	Not reported
Threat To Water Quality:	2
Complexity:	B
Pretreatment:	X - Facility is not a POTW
Facility Waste Type:	Not reported
Facility Waste Type 2:	Not reported
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	LFNONOPER
Program Category1:	LNDISP
Program Category2:	LNDISP
# Of Programs:	1
WDID:	5A17SC00001
Reg Measure Id:	332635
Reg Measure Type:	WDR
Region:	Not reported
Order #:	R5-2007-0026
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	9810
Status:	Active
Status Date:	02/05/2014
Effective Date:	03/16/2007
Expiration/Review Date:	03/16/2017
Termination Date:	Not reported
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	Not reported
WDR Review - No Action Required:	Not reported
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	59 - Land Disposal Site not paying tipping fee
Direction/Voice:	Passive
Enforcement Id(EID):	409488
Region:	Not reported
Order / Resolution Number:	Not reported
Enforcement Action Type:	Notice of Violation
Effective Date:	09/27/2016
Adoption/Issuance Date:	09/27/2016
Achieve Date:	Not reported
Termination Date:	09/27/2016
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Historical
Title:	NOV 09/27/2016 for Magoon Estates Limited

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Description:	Not reported
Program:	LFNONOPER
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

Name:	GUENOC WINERY CLASS II SURFACE IMPOUNDMENT
Address:	21000 BUTTS CANYON ROAD
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	654934
Agency Name:	Magoon Estates Limited
Place Type:	Waste Management Unit
Place Subtype:	Surface Impoundment
Facility Type:	Solid Waste Class II - designated wastes
Agency Type:	Privately-Owned Business
# Of Agencies:	2
Place Latitude:	38.73615
Place Longitude:	-122.52866
SIC Code 1:	4953
SIC Desc 1:	Refuse Systems
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	Not reported
Threat To Water Quality:	2
Complexity:	B
Pretreatment:	X - Facility is not a POTW
Facility Waste Type:	Not reported
Facility Waste Type 2:	Not reported
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	LFNONOPER
Program Category1:	LNDISP
Program Category2:	LNDISP
# Of Programs:	1
WDID:	5A17SC00001
Reg Measure Id:	332635
Reg Measure Type:	WDR
Region:	Not reported
Order #:	R5-2007-0026
Npdes# CA#:	Not reported

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	9810
Status:	Active
Status Date:	02/05/2014
Effective Date:	03/16/2007
Expiration/Review Date:	03/16/2017
Termination Date:	Not reported
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	Not reported
WDR Review - No Action Required:	Not reported
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	59 - Land Disposal Site not paying tipping fee
Direction/Voice:	Passive
Enforcement Id(EID):	390361
Region:	Not reported
Order / Resolution Number:	Not reported
Enforcement Action Type:	Notice of Violation
Effective Date:	05/21/2013
Adoption/Issuance Date:	05/21/2013
Achieve Date:	Not reported
Termination Date:	05/21/2013
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Historical
Title:	NOV 05/21/2013 for Magoon Estates Limited
Description:	Not reported
Program:	LNDISP
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

Name:	GUENOC WINERY
Address:	21000 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	228116
Agency Name:	Not reported
Place Type:	Food Processor
Place Subtype:	Winery
Facility Type:	Industrial
Agency Type:	Not reported
# Of Agencies:	Not reported
Place Latitude:	38.722019

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Place Longitude:	-122.506262
SIC Code 1:	2084
SIC Desc 1:	Wines, Brandy, and Brandy Spirits
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	31213
NAICS Desc 1:	Wineries (pt)
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Enf Action
Design Flow:	Not reported
Threat To Water Quality:	Not reported
Complexity:	Not reported
Pretreatment:	Not reported
Facility Waste Type:	Not reported
Facility Waste Type 2:	Not reported
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	Not reported
Program Category1:	Not reported
Program Category2:	WDR
# Of Programs:	Not reported
WDID:	Not reported
Reg Measure Id:	Not reported
Reg Measure Type:	Not reported
Region:	Not reported
Order #:	Not reported
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	Not reported
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Not reported
Status Date:	Not reported
Effective Date:	Not reported
Expiration/Review Date:	Not reported
Termination Date:	Not reported
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	Not reported
WDR Review - No Action Required:	Not reported
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	Not reported
Individual/General:	Not reported
Fee Code:	Not reported
Direction/Voice:	Not reported
Enforcement Id(EID):	245697
Region:	Not reported
Order / Resolution Number:	Not reported

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Enforcement Action Type:	Notice of Violation
Effective Date:	01/22/2003
Adoption/Issuance Date:	01/22/2003
Achieve Date:	Not reported
Termination Date:	01/22/2003
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Historical
Title:	NOV 01/22/2003 for MAGOON ESTATE LTD, Guenoc Winery
Description:	TDS, specific conductance, and chloride concentrations in groundwater from MW-2, and MW-3 significantly higher than concentrations reported in MW-1. Chloride in MW-3 at concentrations significantly higher than MW-1, and MW-2.
Program:	WDR
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

Name:	GUENOC WINERY
Address:	21000 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	228116
Agency Name:	Guenoc Winery Inc
Place Type:	Food Processor
Place Subtype:	Winery
Facility Type:	Industrial
Agency Type:	Privately-Owned Business
# Of Agencies:	1
Place Latitude:	38.722019
Place Longitude:	-122.506262
SIC Code 1:	2084
SIC Desc 1:	Wines, Brandy, and Brandy Spirits
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	31213
NAICS Desc 1:	Wineries (pt)
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	0.011
Threat To Water Quality:	2
Complexity:	B
Pretreatment:	N - POTW does not have EPA approved pretreatment prog.
Facility Waste Type:	Not reported
Facility Waste Type 2:	Not reported

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	WDR
Program Category1:	WDR
Program Category2:	WDR
# Of Programs:	1
WDID:	5A172012001
Reg Measure Id:	133003
Reg Measure Type:	WDR
Region:	Not reported
Order #:	03-175
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Historical
Status Date:	08/18/2010
Effective Date:	12/05/2003
Expiration/Review Date:	05/04/2006
Termination Date:	05/04/2006
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	Not reported
WDR Review - No Action Required:	Not reported
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	58 - Non15 Based on (TTWQ)/CPLX)
Direction/Voice:	Passive
Enforcement Id(EID):	253084
Region:	Not reported
Order / Resolution Number:	Not reported
Enforcement Action Type:	Notice of Violation
Effective Date:	09/01/2004
Adoption/Issuance Date:	09/01/2004
Achieve Date:	Not reported
Termination Date:	09/01/2004
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Historical
Title:	NOV 09/01/2004 for Magoon Estate LTD, Guenoc Winery
Description:	Discharger failed to submit the Title 27 Complance Report, A pH Neutralization Evaluation Report, a DDA-2 Modification Report, an the O&M Plan as required by the WDRs. Also, the GW workplan and report of results was incomplete.
Program:	WDR
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Project $ Completed:	0
Total $ Paid/Completed Amount:	0
Name:	GUENOC WINERY
Address:	21000 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	228116
Agency Name:	Guenoc Winery Inc
Place Type:	Food Processor
Place Subtype:	Winery
Facility Type:	Industrial
Agency Type:	Privately-Owned Business
# Of Agencies:	1
Place Latitude:	38.722019
Place Longitude:	-122.506262
SIC Code 1:	2084
SIC Desc 1:	Wines, Brandy, and Brandy Spirits
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	31213
NAICS Desc 1:	Wineries (pt)
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	0.011
Threat To Water Quality:	2
Complexity:	B
Pretreatment:	N - POTW does not have EPA approved pretreatment prog.
Facility Waste Type:	Not reported
Facility Waste Type 2:	Not reported
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	WDR
Program Category1:	WDR
Program Category2:	WDR
# Of Programs:	1
WDID:	5A172012001
Reg Measure Id:	133003
Reg Measure Type:	WDR
Region:	Not reported
Order #:	03-175
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Historical
Status Date:	08/18/2010
Effective Date:	12/05/2003

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Expiration/Review Date:	05/04/2006
Termination Date:	05/04/2006
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	Not reported
WDR Review - No Action Required:	Not reported
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	58 - Non15 Based on (TTWQ)/CPLX)
Direction/Voice:	Passive
Enforcement Id(EID):	230629
Region:	Not reported
Order / Resolution Number:	Not reported
Enforcement Action Type:	Oral Communication
Effective Date:	11/11/1999
Adoption/Issuance Date:	Not reported
Achieve Date:	Not reported
Termination Date:	11/11/1999
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Historical
Title:	OC 11/11/1999 for Guenoc Winery
Description:	Failure to submit monthly monitoring reports. WDR No. 98-083
	Not reported
Program:	WDR
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

Name:	GUENOC WINERY
Address:	21000 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	228116
Agency Name:	Guenoc Winery Inc
Place Type:	Food Processor
Place Subtype:	Winery
Facility Type:	Industrial
Agency Type:	Privately-Owned Business
# Of Agencies:	1
Place Latitude:	38.722019
Place Longitude:	-122.506262
SIC Code 1:	2084
SIC Desc 1:	Wines, Brandy, and Brandy Spirits
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	31213

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

NAICS Desc 1:	Wineries (pt)
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	0.007
Threat To Water Quality:	2
Complexity:	B
Pretreatment:	X - Facility is not a POTW
Facility Waste Type:	Process waste, NEC
Facility Waste Type 2:	Not reported
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	WDRINDFP
Program Category1:	WDR
Program Category2:	WDR
# Of Programs:	1
WDID:	5A172012001
Reg Measure Id:	312509
Reg Measure Type:	WDR
Region:	Not reported
Order #:	R5-2006-0037-001
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Active
Status Date:	09/10/2018
Effective Date:	05/05/2006
Expiration/Review Date:	05/05/2016
Termination Date:	Not reported
WDR Review - Amend:	6/8/2012
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	Not reported
WDR Review - No Action Required:	Not reported
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	58 - Non15 Based on (TTWQ)/CPLX)
Direction/Voice:	Passive
Enforcement Id(EID):	417322
Region:	Not reported
Order / Resolution Number:	Not reported
Enforcement Action Type:	Notice of Violation
Effective Date:	12/05/2017
Adoption/Issuance Date:	12/05/2017
Achieve Date:	Not reported
Termination Date:	12/05/2017
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Historical

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Title:	NOV 12/05/2017 for Guenoc Winery Inc
Description:	Not reported
Program:	WDRINDFP
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

Name:	GUENOC WINERY
Address:	21000 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	228116
Agency Name:	Guenoc Winery Inc
Place Type:	Food Processor
Place Subtype:	Winery
Facility Type:	Industrial
Agency Type:	Privately-Owned Business
# Of Agencies:	1
Place Latitude:	38.722019
Place Longitude:	-122.506262
SIC Code 1:	2084
SIC Desc 1:	Wines, Brandy, and Brandy Spirits
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	31213
NAICS Desc 1:	Wineries (pt)
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	0.007
Threat To Water Quality:	2
Complexity:	B
Pretreatment:	X - Facility is not a POTW
Facility Waste Type:	Process waste, NEC
Facility Waste Type 2:	Not reported
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	WDRINDFP
Program Category1:	WDR
Program Category2:	WDR
# Of Programs:	1
WDID:	5A172012001
Reg Measure Id:	312509
Reg Measure Type:	WDR
Region:	Not reported
Order #:	R5-2006-0037-001

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Active
Status Date:	09/10/2018
Effective Date:	05/05/2006
Expiration/Review Date:	05/05/2016
Termination Date:	Not reported
WDR Review - Amend:	6/8/2012
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	Not reported
WDR Review - No Action Required:	Not reported
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	58 - Non15 Based on (TTWQ)/CPLX)
Direction/Voice:	Passive
Enforcement Id(EID):	376059
Region:	Not reported
Order / Resolution Number:	Not reported
Enforcement Action Type:	Notice of Violation
Effective Date:	10/20/2010
Adoption/Issuance Date:	10/20/2010
Achieve Date:	Not reported
Termination Date:	10/20/2010
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Historical
Title:	NOV for Guenoc Winery Inc
Description:	NOV issued for Deficient reports, and effluent limits violations.
Program:	WDR
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

Name:	GUENOC WINERY
Address:	21000 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	228116
Agency Name:	Guenoc Winery Inc
Place Type:	Food Processor
Place Subtype:	Winery
Facility Type:	Industrial
Agency Type:	Privately-Owned Business

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

# Of Agencies:	1
Place Latitude:	38.722019
Place Longitude:	-122.506262
SIC Code 1:	2084
SIC Desc 1:	Wines, Brandy, and Brandy Spirits
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	31213
NAICS Desc 1:	Wineries (pt)
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	0.007
Threat To Water Quality:	2
Complexity:	B
Pretreatment:	X - Facility is not a POTW
Facility Waste Type:	Process waste, NEC
Facility Waste Type 2:	Not reported
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	WDRINDFP
Program Category1:	WDR
Program Category2:	WDR
# Of Programs:	1
WDID:	5A172012001
Reg Measure Id:	312509
Reg Measure Type:	WDR
Region:	Not reported
Order #:	R5-2006-0037-001
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Active
Status Date:	09/10/2018
Effective Date:	05/05/2006
Expiration/Review Date:	05/05/2016
Termination Date:	Not reported
WDR Review - Amend:	6/8/2012
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	Not reported
WDR Review - No Action Required:	Not reported
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	58 - Non15 Based on (TTWQ)/CPLX)
Direction/Voice:	Passive
Enforcement Id(EID):	330968

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Region:	Not reported
Order / Resolution Number:	Not reported
Enforcement Action Type:	Notice of Violation
Effective Date:	08/23/2007
Adoption/Issuance Date:	Not reported
Achieve Date:	Not reported
Termination Date:	08/23/2007
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Historical
Title:	NOV 8/23/2007 for Guenoc Winery Inc, Guenoc Winery
Description:	NOV sent for failure to submit reports required by CDO.
Program:	WDR
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

Name:	GUENOC WINERY
Address:	21000 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	228116
Agency Name:	Guenoc Winery Inc
Place Type:	Food Processor
Place Subtype:	Winery
Facility Type:	Industrial
Agency Type:	Privately-Owned Business
# Of Agencies:	1
Place Latitude:	38.722019
Place Longitude:	-122.506262
SIC Code 1:	2084
SIC Desc 1:	Wines, Brandy, and Brandy Spirits
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	31213
NAICS Desc 1:	Wineries (pt)
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	0.007
Threat To Water Quality:	2
Complexity:	B
Pretreatment:	X - Facility is not a POTW
Facility Waste Type:	Process waste, NEC
Facility Waste Type 2:	Not reported
Facility Waste Type 3:	Not reported

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Facility Waste Type 4:	Not reported
Program:	WDRINDFP
Program Category1:	WDR
Program Category2:	WDR
# Of Programs:	1
WDID:	5A172012001
Reg Measure Id:	312509
Reg Measure Type:	WDR
Region:	Not reported
Order #:	R5-2006-0037-001
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Active
Status Date:	09/10/2018
Effective Date:	05/05/2006
Expiration/Review Date:	05/05/2016
Termination Date:	Not reported
WDR Review - Amend:	6/8/2012
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	Not reported
WDR Review - No Action Required:	Not reported
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	58 - Non15 Based on (TTWQ)/CPLX)
Direction/Voice:	Passive
Enforcement Id(EID):	316452
Region:	Not reported
Order / Resolution Number:	R5-2006-0038
Enforcement Action Type:	Cease and Desist Order
Effective Date:	05/05/2006
Adoption/Issuance Date:	05/05/2006
Achieve Date:	Not reported
Termination Date:	10/09/2014
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Historical
Title:	CDO R5-2006-0038 for Guenoc Winery, Inc.
Description:	Discharger has discharged waste in volation of previous WDRs, and will not be able to fully comply with new WDRs No. R5-2006-0037 until certain technical studies and modifications to WW treatment, storage, and disposal system are completed.
Program:	WDR
Latest Milestone Completion Date:	11/1/2006
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Project $ Completed: 0
Total $ Paid/Completed Amount: 0

WDS:

Name:	GUENOC ESTATE VINEYARD &WINERY
Address:	21000 BUTTS CANYON RD
City:	MIDDLETOWN
Facility ID:	Sacramento River 172012001
Facility Type:	Industrial - Facility that treats and/or disposes of liquid or semisolid wastes from any servicing, producing, manufacturing or processing operation of whatever nature, including mining, gravel washing, geothermal operations, air conditioning, ship building and repairing, oil production, storage and disposal operations, water pumping.
Facility Status:	Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements.
NPDES Number:	Not reported
Subregion:	0
Facility Telephone:	7079872123
Facility Contact:	MALCOLM SEIBLY
Agency Name:	MAGOON ESTATE LTD
Agency Address:	PO BOX 1146
Agency City,St,Zip:	MIDDLETOWN 95461
Agency Contact:	ORVILLE MAGOON
Agency Telephone:	7079872385
Agency Type:	Private
SIC Code:	2084
SIC Code 2:	Not reported
Primary Waste Type:	Not reported
Primary Waste:	Not reported
Waste Type2:	Not reported
Waste2:	Not reported
Primary Waste Type:	Not reported
Secondary Waste:	Not reported
Secondary Waste Type:	Not reported
Design Flow:	0
Baseline Flow:	0
Reclamation:	No reclamation requirements associated with this facility.
POTW:	The POTW Does not have an approved pretreatment program. Some POTWs may have local pretreatment programs that have not been approved by the regional board and/or EPA.
Treat To Water:	Moderate Threat to Water Quality. A violation could have a major adverse impact on receiving biota, can cause aesthetic impairment to a significant human population, or render unusable a potential domestic or municipal water supply. Awsthetic impairment would include nuisance from a waste treatment facility.
Complexity:	Category B - Any facility having a physical, chemical, or biological waste treatment system (except for septic systems with subsurface disposal), or any Class II or III disposal site, or facilities without treatment systems that are complex, such as marinas with petroleum products, solid wastes, and sewage pump out facilities.

CIWQS:

Name:	GUENOC WINERY
Address:	21000 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Agency:	Magoon Estate Ltd
Agency Address:	Po Box 1146, Middletown, CA 95461
Place/Project Type:	Winery
SIC/NAICS:	2084
Region:	5S
Program:	WDR
Regulatory Measure Status:	Historical
Regulatory Measure Type:	WDR
Order Number:	98-083
WDID:	5A172012001
NPDES Number:	Not reported
Adoption Date:	04/17/1998
Effective Date:	04/17/1998
Termination Date:	12/04/2003
Expiration/Review Date:	04/14/2008
Design Flow:	0.011
Major/Minor:	Not reported
Complexity:	B
TTWQ:	2
Enforcement Actions within 5 years:	1
Violations within 5 years:	16
Latitude:	38.722019
Longitude:	-122.506262

Name:	GUENOC WINERY CLASS II SURFACE IMPOUNDMENT
Address:	21000 BUTTS CANYON ROAD
City,State,Zip:	MIDDLETOWN, CA 95461
Agency:	Magoon Estates Limited
Agency Address:	22000 Butts Canyon Road, Middletown, CA 95461
Place/Project Type:	Surface Impoundments
SIC/NAICS:	4953
Region:	5S
Program:	LFNONOPER
Regulatory Measure Status:	Active
Regulatory Measure Type:	WDR
Order Number:	R5-2007-0026
WDID:	5A17SC00001
NPDES Number:	Not reported
Adoption Date:	03/16/2007
Effective Date:	03/16/2007
Termination Date:	Not reported
Expiration/Review Date:	03/16/2017
Design Flow:	Not reported
Major/Minor:	Not reported
Complexity:	B
TTWQ:	2
Enforcement Actions within 5 years:	1
Violations within 5 years:	4
Latitude:	38.73615
Longitude:	-122.52866

Name:	GUENOC WINERY
Address:	21000 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Agency:	Guenoc Winery Inc
Agency Address:	21000 Butts Canyon Road, Middletown, CA 95461
Place/Project Type:	Winery

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

SIC/NAICS:	2084
Region:	5S
Program:	WDR, WDRINDFP
Regulatory Measure Status:	Active
Regulatory Measure Type:	WDR
Order Number:	R5-2006-0037-001
WDID:	5A172012001
NPDES Number:	Not reported
Adoption Date:	05/05/2006
Effective Date:	05/05/2006
Termination Date:	Not reported
Expiration/Review Date:	05/05/2016
Design Flow:	0.007
Major/Minor:	Not reported
Complexity:	B
TTWQ:	2
Enforcement Actions within 5 years:	1
Violations within 5 years:	16
Latitude:	38.722019
Longitude:	-122.506262

Name:	GUENOC WINERY CLASS II SURFACE IMPOUNDMENT
Address:	21000 BUTTS CANYON ROAD
City,State,Zip:	MIDDLETOWN, CA 95461
Agency:	Langtry Farms LLC
Agency Address:	22000 Butts Canyon Road, Middletown, CA 95461
Place/Project Type:	Surface Impoundments
SIC/NAICS:	4953
Region:	5S
Program:	LFNONOPER
Regulatory Measure Status:	Active
Regulatory Measure Type:	WDR
Order Number:	R5-2007-0026
WDID:	5A17SC00001
NPDES Number:	Not reported
Adoption Date:	03/16/2007
Effective Date:	03/16/2007
Termination Date:	Not reported
Expiration/Review Date:	03/16/2017
Design Flow:	Not reported
Major/Minor:	Not reported
Complexity:	B
TTWQ:	2
Enforcement Actions within 5 years:	1
Violations within 5 years:	4
Latitude:	38.73615
Longitude:	-122.52866

CERS:

Name:	GUENOC WINERY
Address:	21000 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Site ID:	34714
CERS ID:	228116
CERS Description:	Waste Discharge Requirements

Violations:

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Site ID:	34714
Site Name:	Guenoc Winery
Violation Date:	05-13-2002
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	low freeboard
Violation Division:	Water Boards
Violation Program:	WDR
Violation Source:	CIWQS

Site ID:	34714
Site Name:	Guenoc Winery
Violation Date:	05-13-2002
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	pH out of compliance-some high and some low
Violation Division:	Water Boards
Violation Program:	WDR
Violation Source:	CIWQS

Site ID:	34714
Site Name:	Guenoc Winery
Violation Date:	02-02-2008
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	Discharger has failed to submit required 4/2007 quarterly monitoring report by due date of 1 February 2008. As of the date of this entry, this report is 248 days late.
Violation Division:	Water Boards
Violation Program:	WDR
Violation Source:	CIWQS

Site ID:	34714
Site Name:	Guenoc Winery
Violation Date:	01-22-2003
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	TDS, specific conductance, and chloride reported in groundwater samples collected from MW-2 and MW-3 at concentrations significantly higher than those concentrations reported in MW-1. Sulfate concentrations in MW-3 significantly higher than MW-1 & MW-2.
Violation Division:	Water Boards
Violation Program:	WDR
Violation Source:	CIWQS

Site ID:	34714
Site Name:	Guenoc Winery
Violation Date:	02-02-2008
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	Discharger has failed to submit required 12/2007 monthly monitoring report by due date of 1 February 2008. As of the date of this entry, this report is 248 days late.
Violation Division:	Water Boards
Violation Program:	WDR
Violation Source:	CIWQS

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Site ID:	34714
Site Name:	Guenoc Winery
Violation Date:	05-13-2002
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	pH out of compliance-some high some low
Violation Division:	Water Boards
Violation Program:	WDR
Violation Source:	CIWQS

Site ID:	34714
Site Name:	Guenoc Winery
Violation Date:	08-15-2002
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	High pH
Violation Division:	Water Boards
Violation Program:	WDR
Violation Source:	CIWQS

Site ID:	34714
Site Name:	Guenoc Winery
Violation Date:	02-02-2008
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	Discharger has failed to submit required 3/2007 quarterly monitoring report by due date of 1 November 2007. As of the date of this entry, this report is 340 days late.
Violation Division:	Water Boards
Violation Program:	WDR
Violation Source:	CIWQS

Site ID:	34714
Site Name:	Guenoc Winery
Violation Date:	02-25-2002
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	Discharger had high pH violations for the month of December 2001
Violation Division:	Water Boards
Violation Program:	WDR
Violation Source:	CIWQS

Site ID:	34714
Site Name:	Guenoc Winery
Violation Date:	08-31-2004
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	Discharger submitted an incomplete Groundwater Well Installation Report of Results as required by Provision G.3.f of the WDRs.
Violation Division:	Water Boards
Violation Program:	WDR
Violation Source:	CIWQS

Site ID:	34714
Site Name:	Guenoc Winery
Violation Date:	10-22-2002
Citation:	California Water Code

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Violation Description: Not reported
Violation Notes: Flow exceeded 6,400 maximum average for the month of September.
Violation Division: Water Boards
Violation Program: WDR
Violation Source: CIWQS

Site ID: 34714
Site Name: Guenoc Winery
Violation Date: 04-20-2001
Citation: California Water Code
Violation Description: Not reported
Violation Notes: Minor pH violations.
Violation Division: Water Boards
Violation Program: WDR
Violation Source: CIWQS

Site ID: 34714
Site Name: Guenoc Winery
Violation Date: 05-13-2002
Citation: California Water Code
Violation Description: Not reported
Violation Notes: High pH
Violation Division: Water Boards
Violation Program: WDR
Violation Source: CIWQS

Site ID: 34714
Site Name: Guenoc Winery
Violation Date: 05-30-2001
Citation: California Water Code
Violation Description: Not reported
Violation Notes: Minor pH violations.
Violation Division: Water Boards
Violation Program: WDR
Violation Source: CIWQS

Site ID: 34714
Site Name: Guenoc Winery
Violation Date: 04-11-2001
Citation: California Water Code
Violation Description: Not reported
Violation Notes: Minor pH violations.
Violation Division: Water Boards
Violation Program: WDR
Violation Source: CIWQS

Site ID: 34714
Site Name: Guenoc Winery
Violation Date: 08-31-2004
Citation: California Water Code
Violation Description: Not reported
Violation Notes: Discharger submitted an incomplete Groundwater Well Installation Workplan as required by Provision G.3.a of the WDRs.
Violation Division: Water Boards
Violation Program: WDR
Violation Source: CIWQS

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Site ID:	34714
Site Name:	Guenoc Winery
Violation Date:	08-31-2004
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	Discharger failed to submit Title 27 Compliance Report as required by Provision G.3.a of the WDRs.
Violation Division:	Water Boards
Violation Program:	WDR
Violation Source:	CIWQS

Site ID:	34714
Site Name:	Guenoc Winery
Violation Date:	10-11-2000
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	pH <6.5 and >8.5 for September Monitoring Report
Violation Division:	Water Boards
Violation Program:	WDR
Violation Source:	CIWQS

Site ID:	34714
Site Name:	Guenoc Winery
Violation Date:	06-06-2002
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	High pH - Week 3 - Pond 5
Violation Division:	Water Boards
Violation Program:	WDR
Violation Source:	CIWQS

Site ID:	34714
Site Name:	Guenoc Winery
Violation Date:	08-31-2004
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	Discharger failed to submit DDA-2 Modification Report as required by Provision G.3.d of the WDRs. Report was due of 1 April 2004.
Violation Division:	Water Boards
Violation Program:	WDR
Violation Source:	CIWQS

Site ID:	34714
Site Name:	Guenoc Winery
Violation Date:	10-11-2000
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	pH ranges from 8.96-9.2 for the month of August 2000
Violation Division:	Water Boards
Violation Program:	WDR
Violation Source:	CIWQS

Site ID:	34714
Site Name:	Guenoc Winery
Violation Date:	08-31-2004
Citation:	California Water Code
Violation Description:	Not reported

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Violation Notes:	Discharger failed to submit Operation and Management Plan as required by Provision G.3.e of the WDRs. Report was due of 1 April 2004.
Violation Division:	Water Boards
Violation Program:	WDR
Violation Source:	CIWQS
Site ID:	34714
Site Name:	Guenoc Winery
Violation Date:	06-06-2002
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	High pH - Week 2 - Pond 5
Violation Division:	Water Boards
Violation Program:	WDR
Violation Source:	CIWQS
Site ID:	34714
Site Name:	Guenoc Winery
Violation Date:	06-06-2002
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	High pH - Week 1 - Pond 5
Violation Division:	Water Boards
Violation Program:	WDR
Violation Source:	CIWQS
Site ID:	34714
Site Name:	Guenoc Winery
Violation Date:	11-15-2002
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	low pond pH in pond 1, high ave monthly flow
Violation Division:	Water Boards
Violation Program:	WDR
Violation Source:	CIWQS
Site ID:	34714
Site Name:	Guenoc Winery
Violation Date:	06-06-2002
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	High pH - Week 3 - Pond 4
Violation Division:	Water Boards
Violation Program:	WDR
Violation Source:	CIWQS
Site ID:	34714
Site Name:	Guenoc Winery
Violation Date:	10-11-2000
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	Flow is 8453, over the 6400 gallon/ day limit.
Violation Division:	Water Boards
Violation Program:	WDR
Violation Source:	CIWQS
Site ID:	34714

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Site Name: Guenoc Winery
Violation Date: 06-06-2002
Citation: California Water Code
Violation Description: Not reported
Violation Notes: Low pH - Week 4 - Pond 1
Violation Division: Water Boards
Violation Program: WDR
Violation Source: CIWQS

Site ID: 34714
Site Name: Guenoc Winery
Violation Date: 06-06-2002
Citation: California Water Code
Violation Description: Not reported
Violation Notes: High pH - Week 4 - Pond 4
Violation Division: Water Boards
Violation Program: WDR
Violation Source: CIWQS

Site ID: 34714
Site Name: Guenoc Winery
Violation Date: 05-13-2002
Citation: California Water Code
Violation Description: Not reported
Violation Notes: low pH
Violation Division: Water Boards
Violation Program: WDR
Violation Source: CIWQS

Site ID: 34714
Site Name: Guenoc Winery
Violation Date: 11-11-1999
Citation: California Water Code
Violation Description: Not reported
Violation Notes: Failure to submit monthly monitoring reports. WDR No. 98-083
Violation Division: Water Boards
Violation Program: WDR
Violation Source: CIWQS

Site ID: 34714
Site Name: Guenoc Winery
Violation Date: 10-11-2000
Citation: California Water Code
Violation Description: Not reported
Violation Notes: Flow is 8545, over the 6400 gallon/ day limit.
Violation Division: Water Boards
Violation Program: WDR
Violation Source: CIWQS

Site ID: 34714
Site Name: Guenoc Winery
Violation Date: 08-31-2004
Citation: California Water Code
Violation Description: Not reported
Violation Notes: Discharger failed to submit pH Neutralization Evaluation Report as required by Provision G.3.c of the WDRs.
Violation Division: Water Boards

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Violation Program: WDR
Violation Source: CIWQS

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-30-2003
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: WDRINDFP
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 06-27-2001
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: WDRINDFP
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-11-2007
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: WDRINDFP
Eval Source: CIWQS

Eval General Type: Compliance Sampling Inspection
Eval Date: 09-24-2001
Violations Found: No
Eval Type: RWQCB Type A compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: WDRINDFP
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-28-1992
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: WDRINDFP
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-19-2017
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: WDRINDFP
Eval Source: CIWQS

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	10-25-1995
Violations Found:	No
Eval Type:	RWQCB Type B compliance inspection
Eval Notes:	Not reported
Eval Division:	Water Boards
Eval Program:	WDRINDFP
Eval Source:	CIWQS

Enforcement Action:

Site ID:	34714
Site Name:	Guenoc Winery
Site Address:	21000 BUTTS CANYON
Site City:	MIDDLETOWN
Site Zip:	95461
Enf Action Date:	01-22-2003
Enf Action Type:	Notice of Violation (Water)
Enf Action Description:	Notice of Violation Letter (Informal)
Enf Action Notes:	Not reported
Enf Action Division:	Water Boards
Enf Action Program:	WDRINDFP
Enf Action Source:	CIWQS

Site ID:	34714
Site Name:	Guenoc Winery
Site Address:	21000 BUTTS CANYON
Site City:	MIDDLETOWN
Site Zip:	95461
Enf Action Date:	05-05-2006
Enf Action Type:	Cease and Desist Order
Enf Action Description:	Cease and Desist Order
Enf Action Notes:	Not reported
Enf Action Division:	Water Boards
Enf Action Program:	WDRINDFP
Enf Action Source:	CIWQS

Site ID:	34714
Site Name:	Guenoc Winery
Site Address:	21000 BUTTS CANYON
Site City:	MIDDLETOWN
Site Zip:	95461
Enf Action Date:	08-23-2007
Enf Action Type:	Notice of Violation (Water)
Enf Action Description:	Notice of Violation Letter (Informal)
Enf Action Notes:	Not reported
Enf Action Division:	Water Boards
Enf Action Program:	WDRINDFP
Enf Action Source:	CIWQS

Site ID:	34714
Site Name:	Guenoc Winery
Site Address:	21000 BUTTS CANYON
Site City:	MIDDLETOWN
Site Zip:	95461
Enf Action Date:	09-01-2004
Enf Action Type:	Notice of Violation (Water)
Enf Action Description:	Notice of Violation Letter (Informal)

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: WDRINDFP
Enf Action Source: CIWQS

Site ID: 34714
Site Name: Guenoc Winery
Site Address: 21000 BUTTS CANYON
Site City: MIDDLETOWN
Site Zip: 95461
Enf Action Date: 10-20-2010
Enf Action Type: Notice of Violation (Water)
Enf Action Description: Notice of Violation Letter (Informal)
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: WDRINDFP
Enf Action Source: CIWQS

Site ID: 34714
Site Name: Guenoc Winery
Site Address: 21000 BUTTS CANYON
Site City: MIDDLETOWN
Site Zip: 95461
Enf Action Date: 11-11-1999
Enf Action Type: Oral Communication
Enf Action Description: Oral Communication
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: WDRINDFP
Enf Action Source: CIWQS

Site ID: 34714
Site Name: Guenoc Winery
Site Address: 21000 BUTTS CANYON
Site City: MIDDLETOWN
Site Zip: 95461
Enf Action Date: 12-05-2017
Enf Action Type: Notice of Violation (Water)
Enf Action Description: Notice of Violation Letter (Informal)
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: WDRINDFP
Enf Action Source: CIWQS

Name: GUENOC WINERY CLASS II SURFACE IMPOUNDMENT
Address: 21000 BUTTS CANYON ROAD
City,State,Zip: MIDDLETOWN, CA 95461
Site ID: 411427
CERS ID: T10000009547
CERS Description: Land Disposal Site

Affiliation:
Affiliation Type Desc: Regional Board Caseworker
Entity Name: KENNY CROYLE - CENTRAL VALLEY RWQCB (REGION 5S)
Entity Title: Not reported
Affiliation Address: 11020 Sun Center Drive, Suite 200
Affiliation City: RANCHO CORDOVA

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: 9164644676

Name: GUENOC WINERY INC.
Address: 21000 BUTTS CANYON ROAD
City,State,Zip: MIDDLETOWN, CA 95461
Site ID: 394232
CERS ID: 10136941
CERS Description: Chemical Storage Facilities

Violations:

Site ID: 394232
Site Name: Guenoc Winery Inc.
Violation Date: 12-02-2014
Citation: 19 CCR 4.5 2745.1(a) - California Code of Regulations, Title 19, Chapter 4.5, Section(s) 2745.1(a)
Violation Description: Failure to submit an RMP which includes all requirements described in Section 2745.3 through 2745.9.
Violation Notes: Not reported
Violation Division: Lake County Environmental Health
Violation Program: CalARP
Violation Source: CERS

Site ID: 394232
Site Name: Guenoc Winery Inc.
Violation Date: 05-21-2018
Citation: 22 CCR 12 66262.12 - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.12
Violation Description: Failure to obtain an Identification Number prior to treating, storing, disposing of, transporting or offering for transportation any hazardous waste.
Violation Notes: OBSERVATION: This facility?s EPA ID number is inactive. A hazardous waste generator shall not treat, store, dispose of, transport or offer for transportation, hazardous waste without an EPA ID number. CORRECTIVE ACTION: Please call the Department of Toxic Substance Control at 800-618-6942 or visit http://www.dtsc.ca.gov/IDManifest/ReactivateID.cfm to update your number. Notify CUPA within 30 days of violation to report reactivation of the EPA ID number.
Violation Division: Lake County Environmental Health
Violation Program: HW
Violation Source: CERS

Site ID: 394232
Site Name: Guenoc Winery Inc.
Violation Date: 03-01-2017
Citation: HSC 6.95 25508.2 - California Health and Safety Code, Chapter 6.95, Section(s) 25508.2
Violation Description: Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date.
Violation Notes: Returned to compliance on 07/03/2017.
Violation Division: Lake County Environmental Health
Violation Program: HMRRP
Violation Source: CERS

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Site ID:	394232
Site Name:	Guenoc Winery Inc.
Violation Date:	12-02-2014
Citation:	HSC 6.95 25508(d) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(d)
Violation Description:	Failure to complete and/or electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities.
Violation Notes:	Returned to compliance on 01/20/2015. All hazardous material business plan information must be submitted on line. www.cers.calepa.ca.gov Gary and I worked on the submittal while I was there.
Violation Division:	Lake County Environmental Health
Violation Program:	HMRRP
Violation Source:	CERS

Site ID:	394232
Site Name:	Guenoc Winery Inc.
Violation Date:	05-21-2018
Citation:	40 CFR 1 265.31 - U.S. Code of Federal Regulations, Title 40, Chapter 1, Section(s) 265.31
Violation Description:	Failure to maintain and operate the facility to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment.
Violation Notes:	OBSERVATION: Generator failed to maintain and operate the facility to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to the air, soil, or surface water which could threaten human health or the environment. Secondary containment for diesel tank was not free of waste material. CORRECTIVE ACTION: Owner/Operator shall immediately maintain the facility to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to the air, soil, or surface water which could threaten human health or the environment. Immediately clean all hazardous waste from the secondary containment of the Diesel Tank within 30 days.
Violation Division:	Lake County Environmental Health
Violation Program:	HW
Violation Source:	CERS

Site ID:	394232
Site Name:	Guenoc Winery Inc.
Violation Date:	12-02-2014
Citation:	19 CCR 4.5 2745.1(d) - California Code of Regulations, Title 19, Chapter 4.5, Section(s) 2745.1(d)
Violation Description:	Failure of an existing stationary source to submit a Risk Management Plan to the Administering Agency after the owner or operator has received a notice from the Administering Agency requesting submission of a Risk Management Plan. The Administering Agency shall not require submission of the Risk Management Plan earlier the 12 months or later than 3 years after the notice has been issued to the owner or operator.
Violation Notes:	The frist notice to prepare a Risk Management Plan was made in April of 2007. On April 28, 2014 we provided notice that your submitted RMP, October 30, 2013, was incomplete in several imporant areas. All of the deficiencies have not been addressed.

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Violation Division: Lake County Environmental Health
Violation Program: CalARP
Violation Source: CERS

Site ID: 394232
Site Name: Guenoc Winery Inc.
Violation Date: 05-21-2018
Citation: HSC 6.95 25508.2 - California Health and Safety Code, Chapter 6.95, Section(s) 25508.2
Violation Description: Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date.
Violation Notes: OBSERVATION: Owner/Operator failed to submit inventory reports (Activities, Owner/Operator, Hazardous Materials Descriptions and Map pages, if required. Documentation must be resubmitted by March 1. CORRECTIVE ACTION: Owner/Operator shall submit inventory reports (Activities, Owner/Operator, Hazardous Materials Descriptions and Map pages, if required. Documentation must be resubmitted within 30 days of this notice.
Violation Division: Lake County Environmental Health
Violation Program: HMRRP
Violation Source: CERS

Site ID: 394232
Site Name: Guenoc Winery Inc.
Violation Date: 05-21-2018
Citation: HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description: Failure to complete and electronically submit hazardous material inventory information for all reportable hazardous materials on site at or above reportable quantities.
Violation Notes: OBSERVATION: The business failed to complete and/or submit chemical inventory forms for all reportable hazardous materials on site. A diesel tank located in the pump room must be added to the chemical inventory and map. CORRECTIVE ACTION: Complete the chemical inventory forms for all reportable hazardous materials on site and submit in CERS.
Violation Division: Lake County Environmental Health
Violation Program: HMRRP
Violation Source: CERS

Evaluation:
Eval General Type: Other/Unknown
Eval Date: 03-09-2017
Violations Found: Yes
Eval Type: Other, not routine, done by local agency
Eval Notes: Not reported
Eval Division: Lake County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Other/Unknown
Eval Date: 04-21-2015
Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: Follow up letter to Eric Stine at Langtry ? past deadline with no request for extension. Review submittals and past notices and letters.

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Eval Division:	Lake County Environmental Health
Eval Program:	CalARP
Eval Source:	CERS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	05-21-2018
Violations Found:	Yes
Eval Type:	Routine done by local agency
Eval Notes:	Routine inspection.
Eval Division:	Lake County Environmental Health
Eval Program:	HMRRP
Eval Source:	CERS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	05-21-2018
Violations Found:	Yes
Eval Type:	Routine done by local agency
Eval Notes:	Routine Inspection.
Eval Division:	Lake County Environmental Health
Eval Program:	HW
Eval Source:	CERS
Eval General Type:	Other/Unknown
Eval Date:	06-30-2015
Violations Found:	No
Eval Type:	Other, not routine, done by local agency
Eval Notes:	Sent message to Doug Herren re cityof clearlake corp yard. Not listed as a cupa but it has hazmat? Epa number is inactive?
Eval Division:	Lake County Environmental Health
Eval Program:	CalARP
Eval Source:	CERS
Eval General Type:	Other/Unknown
Eval Date:	08-11-2015
Violations Found:	No
Eval Type:	Other, not routine, done by local agency
Eval Notes:	Call to reschedule Langtry follow up on RMP development.
Eval Division:	Lake County Environmental Health
Eval Program:	CalARP
Eval Source:	CERS
Eval General Type:	Other/Unknown
Eval Date:	08-19-2015
Violations Found:	No
Eval Type:	Other, not routine, done by local agency
Eval Notes:	Email to Kevin at Apex Ref. to provide comments and resources to help with prep of the RMP. For Langtry Vineyards.
Eval Division:	Lake County Environmental Health
Eval Program:	CalARP
Eval Source:	CERS
Eval General Type:	Occupational Safety and Health Administration Inspection
Eval Date:	09-14-2011
Violations Found:	No
Eval Type:	Cal/OSHA Inspection
Eval Notes:	Not reported
Eval Division:	Cal/OSHA

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Eval Program:	OSHA
Eval Source:	CERS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	12-02-2014
Violations Found:	No
Eval Type:	Routine done by local agency
Eval Notes:	No violations noted. CESQG - less than 27 gallons a month of used oil from compressors. The used oil is being included with the used oil from the farming operations. Gary said that they would removed the 55 gallon drums that used to be used for storage and they would only have a 5 gallon bucket on site and transport that to the farm waste consolidation site.
Eval Division:	Lake County Environmental Health
Eval Program:	HW
Eval Source:	CERS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	12-02-2014
Violations Found:	Yes
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	Lake County Environmental Health
Eval Program:	HMRRP
Eval Source:	CERS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	12-02-2014
Violations Found:	Yes
Eval Type:	Routine done by local agency
Eval Notes:	Although work is being done on the RMP the document is still incomplete.
Eval Division:	Lake County Environmental Health
Eval Program:	CalARP
Eval Source:	CERS

Enforcement Action:

Site ID:	394232
Site Name:	Guenoc Winery Inc.
Site Address:	21000 BUTTS CANYON ROAD
Site City:	MIDDLETOWN
Site Zip:	95461
Enf Action Date:	03-09-2017
Enf Action Type:	Notice of Violation (Unified Program)
Enf Action Description:	Notice of Violation Issued by the Inspector at the Time of Inspection
Enf Action Notes:	Not reported
Enf Action Division:	Lake County Environmental Health
Enf Action Program:	HMRRP
Enf Action Source:	CERS
Site ID:	394232
Site Name:	Guenoc Winery Inc.
Site Address:	21000 BUTTS CANYON ROAD
Site City:	MIDDLETOWN
Site Zip:	95461
Enf Action Date:	05-21-2018
Enf Action Type:	Notice of Violation (Unified Program)

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Enf Action Description: Notice of Violation Issued by the Inspector at the Time of Inspection
Enf Action Notes: Not reported
Enf Action Division: Lake County Environmental Health
Enf Action Program: HMRRP
Enf Action Source: CERS

Site ID: 394232
Site Name: Guenoc Winery Inc.
Site Address: 21000 BUTTS CANYON ROAD
Site City: MIDDLETOWN
Site Zip: 95461
Enf Action Date: 05-21-2018
Enf Action Type: Notice of Violation (Unified Program)
Enf Action Description: Notice of Violation Issued by the Inspector at the Time of Inspection
Enf Action Notes: Not reported
Enf Action Division: Lake County Environmental Health
Enf Action Program: HW
Enf Action Source: CERS

Affiliation:
Affiliation Type Desc: Parent Corporation
Entity Name: Guenoc Winery Inc.
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

Affiliation Type Desc: Document Preparer
Entity Name: Garry McClure
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

Affiliation Type Desc: Environmental Contact
Entity Name: Garry McClure
Entity Title: Not reported
Affiliation Address: 21000 butts canyon rd
Affiliation City: Middletown
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 95461
Affiliation Phone: Not reported

Affiliation Type Desc: Operator
Entity Name: Garry McClure
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S105036852**

Affiliation Zip:	Not reported
Affiliation Phone:	(707) 367-5769
Affiliation Type Desc:	Identification Signer
Entity Name:	Garry McClure
Entity Title:	Director of Operations
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported
Affiliation Type Desc:	Legal Owner
Entity Name:	Guenoc Winery Inc.
Entity Title:	Not reported
Affiliation Address:	21000 Butts Canyon Road
Affiliation City:	Middletown
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	95461
Affiliation Phone:	(707) 995-7521
Affiliation Type Desc:	CUPA District
Entity Name:	Lake County Environmental Health
Entity Title:	Not reported
Affiliation Address:	922 Bevins Court
Affiliation City:	Lakeport
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	95453
Affiliation Phone:	(707) 263-1164
Affiliation Type Desc:	Facility Mailing Address
Entity Name:	Mailing Address
Entity Title:	Not reported
Affiliation Address:	21000 Butts Canyon Road
Affiliation City:	Middletown
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	95461
Affiliation Phone:	Not reported

C16 **GUENOC WINERY CLASS II SURFACE IMPOUNDMENT** **CERS** **S121764119**
Target Property **21000 BUTTS CANYON** **N/A**
MIDDLETOWN, CA 95461

Site 4 of 4 in cluster C

Actual: 1073 ft.
Focus Map: 19

CERS:

Name:	GUENOC WINERY CLASS II SURFACE IMPOUNDMENT
Address:	21000 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Site ID:	34715
CERS ID:	654934
CERS Description:	Land Disposal

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S121764119**

Violations:

Site ID:	34715
Site Name:	Guenoc Winery Class II Surface Impoundment
Violation Date:	05-21-2013
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	Failure to maintain 5 feet of separation between bottom of LCRS and groundwater elevation
Violation Division:	Water Boards
Violation Program:	LNDISP
Violation Source:	CIWQS

Site ID:	34715
Site Name:	Guenoc Winery Class II Surface Impoundment
Violation Date:	09-22-2016
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	The 1Q 2016 SMR makes reference to several appendices that are not included in the report, including: ? Appendix C-1: Field Sampling Data Sheets ? Appendix C-2: Summary of Concentration Limits ? Appendix C-3: Tabulated Data Summaries ? Appendix C-4: Certified Analytical Report ? Appendix C-5: Groundwater Elevation Hydrographs ? Appendix C-6
Violation Division:	Water Boards
Violation Program:	LFNONOPER
Violation Source:	CIWQS

Site ID:	34715
Site Name:	Guenoc Winery Class II Surface Impoundment
Violation Date:	05-21-2013
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	Failure to conduct and report the annual LCRs tests.
Violation Division:	Water Boards
Violation Program:	LNDISP
Violation Source:	CIWQS

Site ID:	34715
Site Name:	Guenoc Winery Class II Surface Impoundment
Violation Date:	09-22-2016
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	The Monitoring and Reporting Program (MRP) requires that the surface impoundment be sampled and analyzed every quarter. Sampling did not occur in fourth quarter 2015 or first quarter 2016, which is a violation of the WDRs and the Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Industrial Facilities Regulated unde
Violation Division:	Water Boards
Violation Program:	LFNONOPER
Violation Source:	CIWQS

Site ID:	34715
Site Name:	Guenoc Winery Class II Surface Impoundment
Violation Date:	09-22-2016
Citation:	California Water Code
Violation Description:	Not reported
Violation Notes:	The monitoring report that was reviewed, as well as all previous

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S121764119**

monitoring reports, was not uploaded via Geotracker as required by the Standard Provisions. However, reports dating back to 3rd Quarter 2014 were submitted via the electronic submittal email to the Water Board. All the monitoring reports dating back to 3rd Quarter 2014 should be uploa

Violation Division: Water Boards
Violation Program: LFNONOPER
Violation Source: CIWQS

Site ID: 34715
Site Name: Guenoc Winery Class II Surface Impoundment
Violation Date: 09-22-2016
Citation: California Water Code
Violation Description: Not reported
Violation Notes: Q1 and Q2 2016 SMRs show significant groundwater impacts in wells MW-1, 2, 3, and 4. These impacts appear to be caused by the former percolation basins that were used prior to the construction of the Class II Surface Impoundment. When compared to the historical data cited in the WDRs Information Sheet (collected from November 2002 through September
Violation Division: Water Boards
Violation Program: LFNONOPER
Violation Source: CIWQS

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-17-2016
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LFNONOPER
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-23-2007
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LFNONOPER
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-07-2012
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LFNONOPER
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-11-2017
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported

GUENOC WINERY CLASS II SURFACE IMPOUNDMENT (Continued) **S121764119**

Eval Division: Water Boards
Eval Program: LFNONOPER
Eval Source: CIWQS

Enforcement Action:
Site ID: 34715
Site Name: Guenoc Winery Class II Surface Impoundment
Site Address: 21000 BUTTS CANYON
Site City: MIDDLETOWN
Site Zip: 95461
Enf Action Date: 05-21-2013
Enf Action Type: Notice of Violation (Water)
Enf Action Description: Notice of Violation Letter (Informal)
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: LFNONOPER
Enf Action Source: CIWQS

Site ID: 34715
Site Name: Guenoc Winery Class II Surface Impoundment
Site Address: 21000 BUTTS CANYON
Site City: MIDDLETOWN
Site Zip: 95461
Enf Action Date: 09-27-2016
Enf Action Type: Notice of Violation (Water)
Enf Action Description: Notice of Violation Letter (Informal)
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: LFNONOPER
Enf Action Source: CIWQS

17
NW
1/8-1/4
0.131 mi.
694 ft.

USCG LORAN C STA
E. GRANGE ROAD
MIDDLETOWN, CA 95461

ENVIROSTOR **S118756494**
N/A

Actual:
1450 ft.

Focus Map:
7

ENVIROSTOR:
Name: USCG LORAN C STA
Address: E. GRANGE ROAD
City,State,Zip: MIDDLETOWN, CA 95461
Facility ID: 17960001
Status: No Action Required
Status Date: 02/29/2016
Site Code: Not reported
Site Type: Historical
Site Type Detailed: * Historical
Acres: 438.32
NPL: NO
Regulatory Agencies: NONE SPECIFIED
Lead Agency: NONE SPECIFIED
Program Manager: Not reported
Supervisor: Referred - Not Assigned
Division Branch: Cleanup Sacramento
Assembly: , 04
Senate: , 02

USCG LORAN C STA (Continued) **S118756494**

Special Program: * Rural County Survey Program
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: Not reported
Latitude: 38.78230
Longitude: -122.4862
APN: 01301607
Past Use: EQUIPMENT/INSTRUMENT REPAIR
Potential COC: Polychlorinated biphenyls (PCBs
Confirmed COC: Polychlorinated biphenyls (PCBs
Potential Description: SOIL
Alias Name: LAKE COUNTY GENERAL
Alias Type: Alternate Name
Alias Name: 01301607
Alias Type: APN
Alias Name: CA3690330771
Alias Type: EPA Identification Number
Alias Name: 17960001
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Discovery
Completed Date: 04/12/1988
Comments: FACILITY IDENTIFIED COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY INFORMATION SYSTEM (CERCLIS)-LIST 8. INSPECTION (FED) SITE SCREENING DONE: PONDS

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 04/12/1988
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 12/03/2001
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

18
NW
1/8-1/4
0.190 mi.
1002 ft.

LORAN C STATION MIDDLETOWN (12
END OF GRANGE ROAD
MIDDLETOWN, CA 95461

HIST UST **U001610515**
N/A

Actual:
975 ft.

Focus Map:
13

HIST UST:

Name:	LORAN C STATION MIDDLETOWN (12
Address:	END OF GRANGE ROAD
City,State,Zip:	MIDDLETOWN, CA 95461
File Number:	00025892
URL:	http://geotracker.waterboards.ca.gov/ustpdfs/pdf/00025892.pdf
Region:	STATE
Facility ID:	00000054201
Facility Type:	Other
Other Type:	U.S. GOVERNMENT
Contact Name:	COMMANDING OFFICER
Telephone:	7079873144
Owner Name:	DEPARTMENT OF TRANSPORTATION,
Owner Address:	GOVERNMENT ISLAND
Owner City,St,Zip:	ALAMEDA, CA 94501
Total Tanks:	0001
Tank Num:	001
Container Num:	1
Year Installed:	1977
Tank Capacity:	00006000
Tank Used for:	PRODUCT
Type of Fuel:	DIESEL
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor

Click here for Geo Tracker PDF:

D19
West
1/4-1/2
0.374 mi.
1975 ft.

MIDDLETOWN ENTERPRISES
18975 BUTTS CANYON RD
MIDDLETOWN, CA 95461

Site 1 of 2 in cluster D

LUST **U001610520**
SWEEPS UST **N/A**
HIST UST

Actual:
1138 ft.

Focus Map:
18

LUST:

Name:	MIDDLETOWN AIR STRIP
Address:	18975 BUTTS CANYON RD
City,State,Zip:	MIDDLETOWN, CA 95461
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0603300046
Global Id:	T0603300046
Latitude:	38.7292948
Longitude:	-122.5541162
Status:	Completed - Case Closed
Status Date:	12/12/1994
Case Worker:	GTM
RB Case Number:	170066
Local Agency:	LAKE COUNTY
File Location:	Not reported
Local Case Number:	Not reported
Potential Media Affect:	Aquifer used for drinking water supply
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

MIDDLETOWN ENTERPRISES (Continued) **U001610520**

LUST:
Global Id: T0603300046
Contact Type: Regional Board Caseworker
Contact Name: GLENN T. MEEKS
Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: gmeeks@waterboards.ca.gov
Phone Number: Not reported

Global Id: T0603300046
Contact Type: Local Agency Caseworker
Contact Name: MANUEL RAMIREZ
Organization Name: LAKE COUNTY
Address: Not reported
City: r5 UNKNOWN
Email: Not reported
Phone Number: Not reported

LUST:
Global Id: T0603300046
Action Type: Other
Date: 08/13/1993
Action: Leak Discovery

Global Id: T0603300046
Action Type: Other
Date: 08/13/1993
Action: Leak Stopped

Global Id: T0603300046
Action Type: Other
Date: 09/23/1993
Action: Leak Reported

LUST:
Global Id: T0603300046
Status: Open - Case Begin Date
Status Date: 08/13/1993

Global Id: T0603300046
Status: Open - Site Assessment
Status Date: 09/23/1993

Global Id: T0603300046
Status: Open - Site Assessment
Status Date: 01/18/1994

Global Id: T0603300046
Status: Open - Verification Monitoring
Status Date: 11/07/1994

Global Id: T0603300046
Status: Completed - Case Closed
Status Date: 12/12/1994

MIDDLETOWN ENTERPRISES (Continued) **U001610520**

SWEEPS UST:

Name:	MIDDLETOWN ENTERPRISES
Address:	18975 BUTTS CANYON RD
City:	MIDDLETOWN
Status:	Active
Comp Number:	51664
Number:	9
Board Of Equalization:	44-006871
Referral Date:	Not reported
Action Date:	11-08-88
Created Date:	02-29-88
Owner Tank Id:	404
SWRCB Tank Id:	17-000-051664-000004
Tank Status:	A
Capacity:	10000
Active Date:	11-08-88
Tank Use:	M.V. FUEL
STG:	P
Content:	AVIA. GAS
Number Of Tanks:	1

Name:	MIDDLETOWN ENTERPRISES
Address:	18975 BUTTS CANYON RD
City:	MIDDLETOWN
Status:	Not reported
Comp Number:	51664
Number:	Not reported
Board Of Equalization:	44-006871
Referral Date:	Not reported
Action Date:	Not reported
Created Date:	Not reported
Owner Tank Id:	Not reported
SWRCB Tank Id:	17-000-051664-000001
Tank Status:	Not reported
Capacity:	1000
Active Date:	Not reported
Tank Use:	M.V. FUEL
STG:	PRODUCT
Content:	REG UNLEADED
Number Of Tanks:	3

Name:	MIDDLETOWN ENTERPRISES
Address:	18975 BUTTS CANYON RD
City:	MIDDLETOWN
Status:	Not reported
Comp Number:	51664
Number:	Not reported
Board Of Equalization:	44-006871
Referral Date:	Not reported
Action Date:	Not reported
Created Date:	Not reported
Owner Tank Id:	Not reported
SWRCB Tank Id:	17-000-051664-000002
Tank Status:	Not reported
Capacity:	10000
Active Date:	Not reported
Tank Use:	M.V. FUEL

MIDDLETOWN ENTERPRISES (Continued) **U001610520**

STG: PRODUCT
Content: REG UNLEADED
Number Of Tanks: Not reported

Name: MIDDLETOWN ENTERPRISES
Address: 18975 BUTTS CANYON RD
City: MIDDLETOWN
Status: Not reported
Comp Number: 51664
Number: Not reported
Board Of Equalization: 44-006871
Referral Date: Not reported
Action Date: Not reported
Created Date: Not reported
Owner Tank Id: Not reported
SWRCB Tank Id: 17-000-051664-000003
Tank Status: Not reported
Capacity: 10000
Active Date: Not reported
Tank Use: M.V. FUEL
STG: PRODUCT
Content: AVIA. GAS
Number Of Tanks: Not reported

HIST UST:
Name: MIDDLETOWN ENTERPRISES
Address: 18975 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
File Number: 000259CF
URL: http://geotracker.waterboards.ca.gov/ustpdfs/pdf/000259CF.pdf
Region: STATE
Facility ID: 00000051664
Facility Type: Other
Other Type: RANCH
Contact Name: LARRY GABRIELSON
Telephone: 7079873079
Owner Name: MIDDLETOWN ENTERPRISES
Owner Address: 18975 BUTTS CANYON RD.
Owner City,St,Zip: MIDDLETOWN, CA 95461
Total Tanks: 0004

Tank Num: 001
Container Num: 101
Year Installed: 1979
Tank Capacity: 00004000
Tank Used for: PRODUCT
Type of Fuel: UNLEADED
Container Construction Thickness: 3/16
Leak Detection: Pressure Test

Tank Num: 002
Container Num: 202
Year Installed: 1980
Tank Capacity: 00010000
Tank Used for: PRODUCT
Type of Fuel: UNLEADED
Container Construction Thickness: 1/4

MIDDLETOWN ENTERPRISES (Continued) **U001610520**

Leak Detection: Pressure Test

Tank Num: 003
Container Num: 303
Year Installed: 1980
Tank Capacity: 00010000
Tank Used for: PRODUCT
Type of Fuel: UNLEADED
Container Construction Thickness: 1/4
Leak Detection: Pressure Test

Tank Num: 004
Container Num: 404
Year Installed: 1980
Tank Capacity: 00010000
Tank Used for: PRODUCT
Type of Fuel: UNLEADED
Container Construction Thickness: 1/4
Leak Detection: Pressure Test

Click here for Geo Tracker PDF:

D20 **MIDDLETOWN AIR STRIP** **LUST** **S105024958**
West **18975 BUTTS CNYN** **HIST CORTESE** **N/A**
1/4-1/2 **MIDDLETOWN, CA 95461** **CERS**
0.374 mi.
1975 ft. **Site 2 of 2 in cluster D**

Actual:
1138 ft.

Focus Map:
18

LUST REG 5:
Name: MIDDLETOWN AIR STRIP
Address: 18975 BUTTS CANYON RD
City: MIDDLETOWN
Region: 5
Status: Case Closed
Case Number: 170066
Case Type: Drinking Water Aquifer affected
Substance: GASOLINE
Staff Initials: GTM
Lead Agency: Regional
Program: LUST
MTBE Code: N/A

HIST CORTESE:
edr_fname: MIDDLETOWN AIR STRIP
edr_fadd1: 18975 BUTTS CNYN
City,State,Zip: MIDDLETOWN, CA 95461
Region: CORTESE
Facility County Code: 17
Reg By: LTNKA
Reg Id: 170066

CERS:
Name: MIDDLETOWN AIR STRIP
Address: 18975 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
Site ID: 203591
CERS ID: T0603300046

MIDDLETOWN AIR STRIP (Continued) **S105024958**

CERS Description: Leaking Underground Storage Tank Cleanup Site

Affiliation:

Affiliation Type Desc:	Regional Board Caseworker
Entity Name:	GLENN T. MEEKS - CENTRAL VALLEY RWQCB (REGION 5S)
Entity Title:	Not reported
Affiliation Address:	11020 SUN CENTER DRIVE #200
Affiliation City:	RANCHO CORDOVA
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

Affiliation Type Desc:	Local Agency Caseworker
Entity Name:	MANUEL RAMIREZ - LAKE COUNTY
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	r5 UNKNOWN
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

E21 **GEOTHERMAL, INC** **ENVIROSTOR** **S109422438**
WSW **19020 BUTTS CANYON ROAD (BOX 480)** **N/A**
1/4-1/2 **MIDDLETOWN, CA 95461**
0.480 mi.
2532 ft. **Site 1 of 7 in cluster E**

Actual:
1155 ft.

Focus Map:
18

ENVIROSTOR:

Name:	GEOTHERMAL, INC
Address:	19020 BUTTS CANYON ROAD (BOX 480)
City,State,Zip:	MIDDLETOWN, CA 95461
Facility ID:	17490002
Status:	Refer: RWQCB
Status Date:	02/20/1996
Site Code:	100066
Site Type:	Evaluation
Site Type Detailed:	Evaluation
Acres:	1
NPL:	NO
Regulatory Agencies:	NONE SPECIFIED
Lead Agency:	NONE SPECIFIED
Program Manager:	Not reported
Supervisor:	Referred - Not Assigned
Division Branch:	Cleanup Sacramento
Assembly:	04
Senate:	02
Special Program:	* Rural County Survey Program
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	Not reported
Latitude:	38.73987
Longitude:	-122.5563
APN:	NONE SPECIFIED
Past Use:	NONE SPECIFIED
Potential COC:	NONE SPECIFIED

GEOTHERMAL, INC (Continued) **S109422438**

Confirmed COC: NONE SPECIFIED
Potential Description: NONE SPECIFIED
Alias Name: Butts Canyon Rd Facility
Alias Type: Alternate Name
Alias Name: CAD098080484
Alias Type: EPA Identification Number
Alias Name: L10005342355
Alias Type: GeoTracker Global ID
Alias Name: 100066
Alias Type: Project Code (Site Code)
Alias Name: 17490002
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Discovery
Completed Date: 04/12/1988
Comments: SITE SCREENING DONE. RP LEAD SITE.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 02/20/1996
Comments: Site Screening Completed. The Regional Water Quality Control Board is overseeing a Remedial Investigation at the Site and the monitoring of the ponds. Refer to RWQCB.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 04/12/1988
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

E22 **BUTTS CANYON RD. FACILITY** **WMUDS/SWAT** **S101175220**
WSW **19020 BUTTS CANYON RD** **HAZNET** **N/A**
1/4-1/2 **MIDDLETOWN CA, CA 95461** **NPDES**
0.480 mi. **WDS**
2532 ft. **Site 2 of 7 in cluster E** **CIWQS**

Actual:
1155 ft.

Focus Map:
18

WMUDS/SWAT:
Edit Date: Not reported
Complexity: Category A - Any major NPDES facility, any non-NPDES facility (particularly those with toxic wastes) that would be a major if discharge was made to surface or ground waters, or any Class I disposal site. Includes any small-volume complex facility (particularly those with toxicwastes) with numerous discharge points, leak detection systems or ground water monitoring wells.

BUTTS CANYON RD. FACILITY (Continued) **S101175220**

Primary Waste:	DRILLS
Primary Waste Type:	Designated/Influent or Solid Wastes that pose a significant threat to water quality because of their high concentrations (E.G., BOD, Hardness, TRF, Chloride). 'Manageable' hazardous wastes (E.G., inorganic salts and heavy metals) are included in this category.
Secondary Waste:	Erosion Wastes
Secondary Waste Type:	I
Base Meridian:	Not reported
NPID:	Not reported
Tonnage:	0
Regional Board ID:	Not reported
Municipal Solid Waste:	False
Superorder:	False
Open To Public:	False
Waste List:	False
Agency Type:	Private
Agency Name:	GEOTHERMAL INC.
Agency Department:	GEOTHERMAL INC
Agency Address:	PO BOX 480
Agency City,St,Zip:	MIDDLETOWN CA 95461
Agency Contact:	JAMES A. LEHRMAN
Agency Telephone:	9254606300
Land Owner Name:	Not reported
Land Owner Address:	Not reported
Land Owner City,St,Zip:	CA
Land Owner Contact:	Not reported
Land Owner Phone:	Not reported
Region:	5S
Facility Type:	Industrial - Facility that treats and/or disposes of liquid or semisolid wastes from any servicing, producing, manufacturing or processing operation of whatever nature, including mining, gravel washing, geothermal operations, air conditioning, ship building and repairing, oil production, storage and disposal operations, water pumping.
Facility Description:	Not reported
Facility Telephone:	Not reported
SWAT Facility Name:	GEOTHERMAL INCORPORATED
Primary SIC:	4961
Secondary SIC:	Not reported
Comments:	Not reported
Last Facility Editors:	Not reported
Waste Discharge System:	True
Solid Waste Assessment Test Program:	True
Toxic Pits Cleanup Act Program:	True
Resource Conservation Recovery Act:	False
Department of Defence:	False
Solid Waste Assessment Test Program:	W.T. KRITIKOS
Threat to Water Quality:	Major Threat to Water Quality. A violation could render unusable a ground water or surface water resource used as a significant drink water supply, require closure of an area used for contact recreation, result in long-term deleterious effects on shell fish spawning or growth areas of aquatic resources, or directly expose the public to toxic substances.
Sub Chapter 15:	True
Regional Board Project Officer:	WLB
Number of WMUDS at Facility:	2
Section Range:	Not reported

BUTTS CANYON RD. FACILITY (Continued) **S101175220**

RCRA Facility: No
Waste Discharge Requirements: A
Self-Monitoring Rept. Frequency: Quarterly Submittal
Waste Discharge System ID: 5A170304001
Solid Waste Information ID: Not reported

HAZNET:
Name: PG&E GEOTHERMAL INC LANDFILL
Address: 19020 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
Year: 2017
GEPAID: CAL000383937
Contact: LEAH UPCHURCH
Telephone: 2093239617
Mailing Name: Not reported
Mailing Address: PO BOX 7640
Mailing City,St,Zip: SAN FRANCISCO, CA 941207640
Gen County: Lakes
TSD EPA ID: CAD059494310
TSD County: Santa Clara
Tons: 0.125
CA Waste Code: 352-Other organic solids
Method: H141-Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Facility County: Lakes

Name: PG&E GEOTHERMAL INC LANDFILL
Address: 19020 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
Year: 2017
GEPAID: CAL000383937
Contact: LEAH UPCHURCH
Telephone: 2093239617
Mailing Name: Not reported
Mailing Address: PO BOX 7640
Mailing City,St,Zip: SAN FRANCISCO, CA 941207640
Gen County: Lakes
TSD EPA ID: CAT000646117
TSD County: Kings
Tons: 28.2
CA Waste Code: 611-Contaminated soil from site clean-up
Method: H132-Landfill Or Surface Impoundment That Will Be Closed As Landfill(To Include On-Site Treatment And/Or Stabilization)
Facility County: Lakes

Name: PG&E GEOTHERMAL INC LANDFILL
Address: 19020 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
Year: 2016
GEPAID: CAL000383937
Contact: LEAH UPCHURCH
Telephone: 2093239617
Mailing Name: Not reported
Mailing Address: PO BOX 7640
Mailing City,St,Zip: SAN FRANCISCO, CA 941200000
Gen County: Lakes
TSD EPA ID: CAT000646117

BUTTS CANYON RD. FACILITY (Continued) **S101175220**

TSD County: Kings
Tons: 23.97
CA Waste Code: 611-Contaminated soil from site clean-up
Method: H132-Landfill Or Surface Impoundment That Will Be Closed As Landfill(To Include On-Site Treatment And/Or Stabilization)
Facility County: Lakes

Name: PG&E GEOTHERMAL INC LANDFILL
Address: 19020 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
Year: 2015
GEPAID: CAL000383937
Contact: LEAH UPCHURCH
Telephone: 2093239617
Mailing Name: Not reported
Mailing Address: PO BOX 7640
Mailing City,St,Zip: SAN FRANCISCO, CA 941200000
Gen County: Lakes
TSD EPA ID: CAD980884183
TSD County: Sacramento
Tons: 0.0375
CA Waste Code: 151-Asbestos containing waste
Method: H141-Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Facility County: Lakes

NPDES:
Name: GEOTHERMAL INC LANDFILL DRAINAGE IMPROVEMENTS
Address: 19020 BUTTS CANYON ROAD
City,State,Zip: MIDDLETOWN, CA 95461
Facility Status: Not reported
NPDES Number: Not reported
Region: Not reported
Agency Number: Not reported
Regulatory Measure ID: Not reported
Place ID: Not reported
Order Number: Not reported
WDID: 5S17C374559
Regulatory Measure Type: Construction
Program Type: Not reported
Adoption Date Of Regulatory Measure: Not reported
Effective Date Of Regulatory Measure: Not reported
Termination Date Of Regulatory Measure: Not reported
Expiration Date Of Regulatory Measure: Not reported
Discharge Address: Not reported
Discharge Name: Not reported
Discharge City: Not reported
Discharge State: Not reported
Discharge Zip: Not reported
Status: Terminated
Status Date: 03/11/2016
Operator Name: Pacific Gas and Electric Company
Operator Address: 3401 Crow Canyon Road
Operator City: San Ramon
Operator State: California
Operator Zip: 94583

BUTTS CANYON RD. FACILITY (Continued) **S101175220**

NPDES as of 03/2018:

NPDES Number:	Not reported
Status:	Not reported
Agency Number:	Not reported
Region:	5S
Regulatory Measure ID:	465923
Order Number:	Not reported
Regulatory Measure Type:	Construction
Place ID:	Not reported
WDID:	5S17C374559
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	03/11/2016
Discharge Name:	Not reported
Discharge Address:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
Received Date:	11/06/2015
Processed Date:	11/10/2015
Status:	Terminated
Status Date:	03/11/2016
Place Size:	460
Place Size Unit:	Acres
Contact:	Rob Saur
Contact Title:	PG&E Project Manager
Contact Phone:	925-415-6371
Contact Phone Ext:	Not reported
Contact Email:	R4Sw@pge.com
Operator Name:	Pacific Gas and Electric Company
Operator Address:	3401 Crow Canyon Road
Operator City:	San Ramon
Operator State:	California
Operator Zip:	94583
Operator Contact:	Daniel Sanchez
Operator Contact Title:	Not reported
Operator Contact Phone:	925-244-3628
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	d2sy@pge.com
Operator Type:	Private Business
Developer:	PG&E Project Manager
Developer Address:	3401 Crow Canyon Road
Developer City:	San Ramon
Developer State:	California
Developer Zip:	94583
Developer Contact:	Rob Saur
Developer Contact Title:	PG&E Project Manager
Constype Linear Utility Ind:	N
Emergency Phone:	Not reported
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	N
Constype Below Ground Ind:	N
Constype Cable Line Ind:	N
Constype Comm Line Ind:	N
Constype Commertial Ind:	N

BUTTS CANYON RD. FACILITY (Continued) **S101175220**

Constype Electrical Line Ind:	N
Constype Gas Line Ind:	N
Constype Industrial Ind:	N
Constype Other Description:	Not reported
Constype Other Ind:	N
Constype Recons Ind:	N
Constype Residential Ind:	N
Constype Transport Ind:	N
Constype Utility Description:	Storm Drain Improvements
Constype Utility Ind:	Y
Constype Water Sewer Ind:	N
Dir Discharge Uswater Ind:	N
Receiving Water Name:	Detert Reservoir
Certifier:	Daniel Sanchez
Certifier Title:	HazMat and Water Quality Manager
Certification Date:	06-NOV-15
Primary Sic:	Not reported
Secondary Sic:	Not reported
Tertiary Sic:	Not reported
NPDES Number:	CAS000002
Status:	Terminated
Agency Number:	0
Region:	5S
Regulatory Measure ID:	465923
Order Number:	2009-0009-DWQ
Regulatory Measure Type:	Enrollee
Place ID:	Not reported
WDID:	5S17C374559
Program Type:	Construction
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	11/10/2015
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	03/11/2016
Discharge Name:	Pacific Gas and Electric Company
Discharge Address:	3401 Crow Canyon Road
Discharge City:	San Ramon
Discharge State:	California
Discharge Zip:	94583
Received Date:	Not reported
Processed Date:	Not reported
Status:	Not reported
Status Date:	Not reported
Place Size:	Not reported
Place Size Unit:	Not reported
Contact:	Not reported
Contact Title:	Not reported
Contact Phone:	Not reported
Contact Phone Ext:	Not reported
Contact Email:	Not reported
Operator Name:	Not reported
Operator Address:	Not reported
Operator City:	Not reported
Operator State:	Not reported
Operator Zip:	Not reported
Operator Contact:	Not reported
Operator Contact Title:	Not reported

BUTTS CANYON RD. FACILITY (Continued) **S101175220**

Operator Contact Phone:	Not reported
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	Not reported
Operator Type:	Not reported
Developer:	Not reported
Developer Address:	Not reported
Developer City:	Not reported
Developer State:	Not reported
Developer Zip:	Not reported
Developer Contact:	Not reported
Developer Contact Title:	Not reported
Constype Linear Utility Ind:	Not reported
Emergency Phone:	Not reported
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	Not reported
Constype Below Ground Ind:	Not reported
Constype Cable Line Ind:	Not reported
Constype Comm Line Ind:	Not reported
Constype Commertial Ind:	Not reported
Constype Electrical Line Ind:	Not reported
Constype Gas Line Ind:	Not reported
Constype Industrial Ind:	Not reported
Constype Other Description:	Not reported
Constype Other Ind:	Not reported
Constype Recons Ind:	Not reported
Constype Residential Ind:	Not reported
Constype Transport Ind:	Not reported
Constype Utility Description:	Not reported
Constype Utility Ind:	Not reported
Constype Water Sewer Ind:	Not reported
Dir Discharge Uswater Ind:	Not reported
Receiving Water Name:	Not reported
Certifier:	Not reported
Certifier Title:	Not reported
Certification Date:	Not reported
Primary Sic:	Not reported
Secondary Sic:	Not reported
Tertiary Sic:	Not reported

WDS:

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON RD
City:	MIDDLETOWN
Facility ID:	Sacramento River 170304001
Facility Type:	Industrial - Facility that treats and/or disposes of liquid or semisolid wastes from any servicing, producing, manufacturing or processing operation of whatever nature, including mining, gravel washing, geothermal operations, air conditioning, ship building and repairing, oil production, storage and disposal operations, water pumping.
Facility Status:	Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements.
NPDES Number:	Not reported
Subregion:	0
Facility Telephone:	Not reported
Facility Contact:	WILLIAM KRITIKOS

BUTTS CANYON RD. FACILITY (Continued) **S101175220**

Agency Name:	GEOTHERMAL INC.
Agency Address:	PO BOX 480
Agency City,St,Zip:	MIDDLETOWN 95461
Agency Contact:	JAMES A. LEHRMAN
Agency Telephone:	Not reported
Agency Type:	Private
SIC Code:	4961
SIC Code 2:	Not reported
Primary Waste Type:	Designated/Influent or Solid Wastes that pose a significant threat to water quality because of their high concentrations (E.G., BOD, Hardness, TRF, Chloride). 'Manageable' hazardous wastes (E.G., inorganic salts and heavy metals) are included in this category.
Primary Waste:	DRILLS
Waste Type2:	I
Waste2:	Drilling Muds
Primary Waste Type:	Designated/Influent or Solid Wastes that pose a significant threat to water quality because of their high concentrations (E.G., BOD, Hardness, TRF, Chloride). 'Manageable' hazardous wastes (E.G., inorganic salts and heavy metals) are included in this category.
Secondary Waste:	Erosion Wastes
Secondary Waste Type:	Inert/Influent or Solid Wastes that do not contain soluble pollutants or organic wastes and have little adverse impact on water quality. Such wastes could cause turbidity and siltation. Uncontaminated soils, rubble and concrete are examples of this category.
Design Flow:	0
Baseline Flow:	0
Reclamation:	No reclamation requirements associated with this facility.
POTW:	The POTW Does not have an approved pretreatment program. Some POTWs may have local pretreatment programs that have not been approved by the regional board and/or EPA.
Treat To Water:	0
Complexity:	Not reported
Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON RD
City:	MIDDLETOWN
Facility ID:	Sacramento River 170304001
Facility Type:	Industrial - Facility that treats and/or disposes of liquid or semisolid wastes from any servicing, producing, manufacturing or processing operation of whatever nature, including mining, gravel washing, geothermal operations, air conditioning, ship building and repairing, oil production, storage and disposal operations, water pumping.
Facility Status:	Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements.
NPDES Number:	Not reported
Subregion:	0
Facility Telephone:	Not reported
Facility Contact:	WILLIAM KRITIKOS
Agency Name:	GEOTHERMAL INC.
Agency Address:	PO BOX 480
Agency City,St,Zip:	MIDDLETOWN 95461
Agency Contact:	JAMES A. LEHRMAN
Agency Telephone:	Not reported
Agency Type:	Private
SIC Code:	4961
SIC Code 2:	Not reported

BUTTS CANYON RD. FACILITY (Continued) **S101175220**

Primary Waste Type:	Designated/Influent or Solid Wastes that pose a significant threat to water quality because of their high concentrations (E.G., BOD, Hardness, TRF, Chloride). 'Manageable' hazardous wastes (E.G., inorganic salts and heavy metals) are included in this category.
Primary Waste:	DRILLS
Waste Type2:	I
Waste2:	Drilling Muds
Primary Waste Type:	Designated/Influent or Solid Wastes that pose a significant threat to water quality because of their high concentrations (E.G., BOD, Hardness, TRF, Chloride). 'Manageable' hazardous wastes (E.G., inorganic salts and heavy metals) are included in this category.
Secondary Waste:	Erosion Wastes
Secondary Waste Type:	Inert/Influent or Solid Wastes that do not contain soluble pollutants or organic wastes and have little adverse impact on water quality. Such wastes could cause turbidity and siltation. Uncontaminated soils, rubble and concrete are examples of this category.
Design Flow:	0
Baseline Flow:	0
Reclamation:	No reclamation requirements associated with this facility.
POTW:	The POTW Does not have an approved pretreatment program. Some POTWs may have local pretreatment programs that have not been approved by the regional board and/or EPA.
Treat To Water:	Major Threat to Water Quality. A violation could render unusable a ground water or surface water resource used as a significant drink water supply, require closure of an area used for contact recreation, result in long-term deleterious effects on shell fish spawning or growth areas of aquatic resources, or directly expose the public to toxic substances.
Complexity:	Category A - Any major NPDES facility, any non-NPDES facility (particularly those with toxic wastes) that would be a major if discharge was made to surface or ground waters, or any Class I disposal site. Includes any small-volume complex facility (particularly those with toxicwastes) with numerous discharge points, leak detection systems or ground water monitoring wells.

CIWQS:

Name:	GEOTHERMAL INC LANDFILL DRAINAGE IMPROVEMENTS
Address:	19020 BUTTS CANYON ROAD
City,State,Zip:	MIDDLETOWN, CA 95461
Agency:	Pacific Gas and Electric Company
Agency Address:	3401 Crow Canyon Road, San Ramon, CA 94583
Place/Project Type:	Construction - Utility: Storm Drain Improvements
SIC/NAICS:	Not reported
Region:	5S
Program:	CONSTW
Regulatory Measure Status:	Terminated
Regulatory Measure Type:	Storm water construction
Order Number:	2009-0009-DWQ
WDID:	5S17C374559
NPDES Number:	CAS000002
Adoption Date:	Not reported
Effective Date:	11/10/2015
Termination Date:	03/11/2016
Expiration/Review Date:	Not reported
Design Flow:	Not reported
Major/Minor:	Not reported
Complexity:	Not reported

BUTTS CANYON RD. FACILITY (Continued) **S101175220**

TTWQ: Not reported
Enforcement Actions within 5 years: 0
Violations within 5 years: 0
Latitude: 38.7361
Longitude: -122.5555

E23 **GEOTHERMAL, BUTTS CANYON FAC.** **Toxic Pits** **S100676322**
WSW **19020 BUTTS CANYON ROAD** **N/A**
1/4-1/2 **MIDDLETOWN, CA 95461**
0.480 mi.
2532 ft. **Site 3 of 7 in cluster E**

Actual: **1155 ft.**
Focus Map: **18**

TOXIC PITS:
Region: 05S
Task #: 85017
Owner: GEOTHERMAL INC.
1/2 Mi Limit: Y
Num. of Pits: 7
Cease Discharge Due: / /
Cease Discharge Complete: / /
Closure Due: / /
Closure Completed: 06/30/93
Status: CLOSED
Hydro Geological Assessment Report Due: / /
Final Hydro Geological Assessment Review Completed: / /

E24 **BUTTS CANYON RD. FACILITY** **HIST CORTESE** **S105024959**
WSW **19020 BUTTS CNYN** **N/A**
1/4-1/2 **MIDDLETOWN, CA 95461**
0.480 mi.
2532 ft. **Site 4 of 7 in cluster E**

Actual: **1155 ft.**
Focus Map: **18**

HIST CORTESE:
edr_fname: BUTTS CANYON RD. FACILITY
edr_fadd1: 19020 BUTTS CNYN
City,State,Zip: MIDDLETOWN, CA 95461
Region: CORTESE
Facility County Code: 17
Reg By: WBC&D
Reg Id: 5A170304001

E25 **GEOTHERMAL INDUSTRIES INC** **SEMS-ARCHIVE** **1000409170**
WSW **BUTTS CANYON RD** **CORRACTS** **CAD098080484**
1/4-1/2 **MIDDLETOWN, CA 95461** **RCRA-TSDF**
0.480 mi. **RCRA NonGen / NLR**
2532 ft. **Site 5 of 7 in cluster E** **2020 COR ACTION**

Actual: **1155 ft.**
Focus Map: **18**

SEMS Archive:
Site ID: 0901692
EPA ID: CAD098080484
Cong District: 02
FIPS Code: 06033
FF: N
NPL: Not on the NPL
Non NPL Status: Deferred to RCRA (Subtitle C)

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

SEMS Archive Detail:

Region:	09
Site ID:	0901692
EPA ID:	CAD098080484
Site Name:	GEOTHERMAL INC BUTTS CYN RD FACIL
NPL:	N
FF:	N
OU:	00
Action Code:	SI
Action Name:	SI
SEQ:	1
Start Date:	Not reported
Finish Date:	1986-04-01 05:00:00
Qual:	D
Current Action Lead:	EPA Perf

Region:	09
Site ID:	0901692
EPA ID:	CAD098080484
Site Name:	GEOTHERMAL INC BUTTS CYN RD FACIL
NPL:	N
FF:	N
OU:	00
Action Code:	VS
Action Name:	ARCH SITE
SEQ:	1
Start Date:	Not reported
Finish Date:	1996-01-23 05:00:00
Qual:	Not reported
Current Action Lead:	EPA Perf In-Hse

Region:	09
Site ID:	0901692
EPA ID:	CAD098080484
Site Name:	GEOTHERMAL INC BUTTS CYN RD FACIL
NPL:	N
FF:	N
OU:	00
Action Code:	PA
Action Name:	PA
SEQ:	1
Start Date:	1986-01-01 05:00:00
Finish Date:	1986-01-01 05:00:00
Qual:	H
Current Action Lead:	EPA Perf

Region:	09
Site ID:	0901692
EPA ID:	CAD098080484
Site Name:	GEOTHERMAL INC BUTTS CYN RD FACIL
NPL:	N
FF:	N
OU:	00
Action Code:	DS
Action Name:	DISCVRY
SEQ:	1
Start Date:	1984-12-01 06:00:00

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

Finish Date: 1984-12-01 06:00:00
Qual: Not reported
Current Action Lead: EPA Perf

CORRACTS:

EPA ID: CAD098080484
EPA Region: 09
Area Name: ENTIRE FACILITY
Actual Date: 20090326
Action: CA550RC
NAICS Code(s): Not reported
Original schedule date: 20090326
Schedule end date: Not reported

EPA ID: CAD098080484
EPA Region: 09
Area Name: ENTIRE FACILITY
Actual Date: 20090326
Action: CA725YE - Current Human Exposures Under Control, Yes, Current Human Exposures Under Control has been verified
NAICS Code(s): Not reported
Original schedule date: 20090326
Schedule end date: Not reported

EPA ID: CAD098080484
EPA Region: 09
Area Name: ENTIRE FACILITY
Actual Date: 20090326
Action: CA750YE - Migration of Contaminated Groundwater under Control, Yes, Migration of Contaminated Groundwater Under Control has been verified
NAICS Code(s): Not reported
Original schedule date: 20090326
Schedule end date: Not reported

EPA ID: CAD098080484
EPA Region: 09
Area Name: ENTIRE FACILITY
Actual Date: 19971007
Action: CA750NO - Migration of Contaminated Groundwater under Control, Unacceptable migration of contaminated groundwater is observed or expected
NAICS Code(s): Not reported
Original schedule date: 19971007
Schedule end date: Not reported

EPA ID: CAD098080484
EPA Region: 09
Area Name: ENTIRE FACILITY
Actual Date: 19971007
Action: CA725NO - Current Human Exposures Under Control, Current human exposures are NOT under control
NAICS Code(s): Not reported
Original schedule date: 19971007
Schedule end date: Not reported

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

RCRA-TSDF:
Date form received by agency: 12/31/2000
Facility name: GEOTHERMAL INDUSTRIES INC
Facility address: BUTTS CANYON RD
MIDDLETOWN, CA 95461
EPA ID: CAD098080484
Contact: Not reported
Contact address: Not reported
Not reported
Contact country: US
Contact telephone: Not reported
Contact email: Not reported
EPA Region: 09
Land type: Other land type
Classification: TSDF
Description: Handler is engaged in the treatment, storage or disposal of hazardous waste
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: NOT REQUIRED
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: 415-555-1212
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Owner/operator name: NOT REQUIRED
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: 415-555-1212
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 09/01/1996
Site name: GEOTHERMAL INDUSTRIES INC
Classification: Small Quantity Generator

Corrective Action Summary:
Event date: 01/01/1990
Event: LEAD AGENCY DETERMINATION

Event date: 09/06/1991
Event: INVESTIGATION WORKPLAN APPROVED

Event date: 09/06/1991
Event: INVESTIGATION IMPOSITION

Event date: 02/01/1995
Event: INVESTIGATION COMPLETE

Event date: 12/05/1995
Event: CA PRIORITIZATION-MEDIUM CA PRIORITY

Event date: 12/05/1995
Event: STABILIZATION MEASURES EVALUATION-FACILITY NOT AMENABLE TO STABILIZATION

Event date: 10/07/1997
Event: CA PRIORITIZATION-MEDIUM CA PRIORITY

Event date: 10/07/1997
Event: RELEASE TO GW CONTROLLED DETERMINATION-FACILITY DOES NOT MEET DEFINITION

Event date: 10/07/1997
Event: HUMAN EXPOSURES CONTROLLED DETERMINATION-FACILITY DOES NOT MEET DEFINITION

Event date: 10/07/1997
Event: RELEASE TO GW CONTROLLED DETERMINATION-FACILITY DOES NOT MEET DEFINITION

Event date: 10/07/1997
Event: HUMAN EXPOSURES CONTROLLED DETERMINATION-FACILITY DOES NOT MEET DEFINITION

Event date: 10/07/1997
Event: STABILIZATION MEASURES EVALUATION-FACILITY IS AMENABLE TO STABILIZATION

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

Event date: 10/07/1997
Event: STABILIZATION MEASURES EVALUATION-FACILITY IS AMENABLE TO STABILIZATION

Event date: 10/07/1997
Event: REFERRED TO A NON-RCRA AUTHORITY

Event date: 01/01/2009
Event: REMEDY CONSTRUCTION-REMEDY CONSTRUCTED

Event date: 03/26/2009
Event: REMEDY CONSTRUCTION-REMEDY CONSTRUCTED

Event date: 03/26/2009
Event: HUMAN EXPOSURES CONTROLLED DETERMINATION-YES, APPLICABLE AS OF THIS DATE

Event date: 03/26/2009
Event: RELEASE TO GW CONTROLLED DETERMINATION-YES, APPLICABLE AS OF THIS DATE

Event date: 03/26/2009
Event: HUMAN EXPOSURES CONTROLLED DETERMINATION-YES, APPLICABLE AS OF THIS DATE

Event date: 03/26/2009
Event: RELEASE TO GW CONTROLLED DETERMINATION-YES, APPLICABLE AS OF THIS DATE

Event date: 09/24/2009
Event: READY FOR ANTICIPATED USE DETERMINATION - READY FOR ANTICIPATED USE

Facility Has Received Notices of Violations:
Regulation violated: Not reported
Area of violation: TSD - Financial Requirements
Date violation determined: 12/08/1987
Date achieved compliance: 07/27/1988
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 07/27/1988
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD IS-Ground-Water Monitoring
Date violation determined: 12/02/1987
Date achieved compliance: 07/27/1988
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD IS-Ground-Water Monitoring
Date violation determined: 10/16/1987
Date achieved compliance: 11/30/1987
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - Closure/Post-Closure
Date violation determined: 10/16/1987
Date achieved compliance: 11/30/1987
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 10/16/1987
Date achieved compliance: 11/30/1987
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - Financial Requirements
Date violation determined: 05/18/1987
Date achieved compliance: 07/27/1988
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 05/18/1987
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

Regulation violated: Not reported
Area of violation: Permits - Application
Date violation determined: 03/19/1987
Date achieved compliance: 11/30/1987
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 11/30/1987
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 03/19/1987
Date achieved compliance: 11/30/1987
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 11/30/1987
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Evaluation Action Summary:
Evaluation date: 12/08/1987
Evaluation: FINANCIAL RECORD REVIEW
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 12/02/1987
Evaluation: GROUNDWATER MONITORING EVALUATION
Area of violation: TSD - Financial Requirements
Date achieved compliance: 07/27/1988
Evaluation lead agency: State

Evaluation date: 12/02/1987
Evaluation: GROUNDWATER MONITORING EVALUATION
Area of violation: TSD IS-Ground-Water Monitoring
Date achieved compliance: 07/27/1988
Evaluation lead agency: State

Evaluation date: 10/16/1987
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD IS-Ground-Water Monitoring
Date achieved compliance: 11/30/1987
Evaluation lead agency: State

Evaluation date: 10/16/1987
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - Closure/Post-Closure
Date achieved compliance: 11/30/1987

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

Evaluation lead agency: State

Evaluation date: 10/16/1987
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 11/30/1987
Evaluation lead agency: State

Evaluation date: 05/18/1987
Evaluation: FINANCIAL RECORD REVIEW
Area of violation: TSD - Financial Requirements
Date achieved compliance: 07/27/1988
Evaluation lead agency: State

Evaluation date: 03/19/1987
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 11/30/1987
Evaluation lead agency: State

Evaluation date: 03/19/1987
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Permits - Application
Date achieved compliance: 11/30/1987
Evaluation lead agency: State

RCRA NonGen / NLR:
Date form received by agency: 12/31/2000
Facility name: GEOTHERMAL INDUSTRIES INC
Facility address: BUTTS CANYON RD
MIDDLETOWN, CA 95461
EPA ID: CAD098080484
Contact: Not reported
Contact address: Not reported
Not reported
Contact country: US
Contact telephone: Not reported
Contact email: Not reported
EPA Region: 09
Land type: Other land type
Classification: TSDF
Description: Handler is engaged in the treatment, storage or disposal of hazardous waste
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: NOT REQUIRED
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: 415-555-1212
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Owner

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

Owner/Op start date: Not reported
Owner/Op end date: Not reported

Owner/operator name: NOT REQUIRED
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: 415-555-1212
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 09/01/1996
Site name: GEOTHERMAL INDUSTRIES INC
Classification: Small Quantity Generator

Corrective Action Summary:
Event date: 01/01/1990
Event: LEAD AGENCY DETERMINATION

Event date: 09/06/1991
Event: INVESTIGATION WORKPLAN APPROVED

Event date: 09/06/1991
Event: INVESTIGATION IMPOSITION

Event date: 02/01/1995
Event: INVESTIGATION COMPLETE

Event date: 12/05/1995
Event: CA PRIORITIZATION-MEDIUM CA PRIORITY

Event date: 12/05/1995
Event: STABILIZATION MEASURES EVALUATION-FACILITY NOT AMENABLE TO

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

STABILIZATION

Event date: 10/07/1997
Event: CA PRIORITIZATION-MEDIUM CA PRIORITY

Event date: 10/07/1997
Event: RELEASE TO GW CONTROLLED DETERMINATION-FACILITY DOES NOT MEET DEFINITION

Event date: 10/07/1997
Event: HUMAN EXPOSURES CONTROLLED DETERMINATION-FACILITY DOES NOT MEET DEFINITION

Event date: 10/07/1997
Event: RELEASE TO GW CONTROLLED DETERMINATION-FACILITY DOES NOT MEET DEFINITION

Event date: 10/07/1997
Event: HUMAN EXPOSURES CONTROLLED DETERMINATION-FACILITY DOES NOT MEET DEFINITION

Event date: 10/07/1997
Event: STABILIZATION MEASURES EVALUATION-FACILITY IS AMENABLE TO STABILIZATION

Event date: 10/07/1997
Event: STABILIZATION MEASURES EVALUATION-FACILITY IS AMENABLE TO STABILIZATION

Event date: 10/07/1997
Event: REFERRED TO A NON-RCRA AUTHORITY

Event date: 01/01/2009
Event: REMEDY CONSTRUCTION-REMEDY CONSTRUCTED

Event date: 03/26/2009
Event: REMEDY CONSTRUCTION-REMEDY CONSTRUCTED

Event date: 03/26/2009
Event: HUMAN EXPOSURES CONTROLLED DETERMINATION-YES, APPLICABLE AS OF THIS DATE

Event date: 03/26/2009
Event: RELEASE TO GW CONTROLLED DETERMINATION-YES, APPLICABLE AS OF THIS DATE

Event date: 03/26/2009
Event: HUMAN EXPOSURES CONTROLLED DETERMINATION-YES, APPLICABLE AS OF THIS DATE

Event date: 03/26/2009
Event: RELEASE TO GW CONTROLLED DETERMINATION-YES, APPLICABLE AS OF THIS DATE

Event date: 09/24/2009
Event: READY FOR ANTICIPATED USE DETERMINATION - READY FOR ANTICIPATED USE

Facility Has Received Notices of Violations:
Regulation violated: Not reported

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

Area of violation: TSD - Financial Requirements
Date violation determined: 12/08/1987
Date achieved compliance: 07/27/1988
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 07/27/1988
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD IS-Ground-Water Monitoring
Date violation determined: 12/02/1987
Date achieved compliance: 07/27/1988
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD IS-Ground-Water Monitoring
Date violation determined: 10/16/1987
Date achieved compliance: 11/30/1987
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - Closure/Post-Closure
Date violation determined: 10/16/1987
Date achieved compliance: 11/30/1987
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

Date violation determined: 10/16/1987
Date achieved compliance: 11/30/1987
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - Financial Requirements
Date violation determined: 05/18/1987
Date achieved compliance: 07/27/1988
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 05/18/1987
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Permits - Application
Date violation determined: 03/19/1987
Date achieved compliance: 11/30/1987
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 11/30/1987
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 03/19/1987
Date achieved compliance: 11/30/1987
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 11/30/1987
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Evaluation Action Summary:
Evaluation date: 12/08/1987
Evaluation: FINANCIAL RECORD REVIEW

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 12/02/1987
Evaluation: GROUNDWATER MONITORING EVALUATION
Area of violation: TSD - Financial Requirements
Date achieved compliance: 07/27/1988
Evaluation lead agency: State

Evaluation date: 12/02/1987
Evaluation: GROUNDWATER MONITORING EVALUATION
Area of violation: TSD IS-Ground-Water Monitoring
Date achieved compliance: 07/27/1988
Evaluation lead agency: State

Evaluation date: 10/16/1987
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD IS-Ground-Water Monitoring
Date achieved compliance: 11/30/1987
Evaluation lead agency: State

Evaluation date: 10/16/1987
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - Closure/Post-Closure
Date achieved compliance: 11/30/1987
Evaluation lead agency: State

Evaluation date: 10/16/1987
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 11/30/1987
Evaluation lead agency: State

Evaluation date: 05/18/1987
Evaluation: FINANCIAL RECORD REVIEW
Area of violation: TSD - Financial Requirements
Date achieved compliance: 07/27/1988
Evaluation lead agency: State

Evaluation date: 03/19/1987
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 11/30/1987
Evaluation lead agency: State

Evaluation date: 03/19/1987
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Permits - Application
Date achieved compliance: 11/30/1987
Evaluation lead agency: State

2020 COR ACTION:
EPA ID: CAD098080484
Region: 9
Action: Remedy Construction

E26 **BUTTS CANYON RD FACILITY** **LDS** **S109287554**
WSW **19020 BUTTS CANYON** **Cortese** **N/A**
1/4-1/2 **MIDDLETOWN, CA 95461** **ENF**
0.480 mi. **CIWQS**
2532 ft. **Site 6 of 7 in cluster E** **CERS**

Actual:
1155 ft.

Focus Map:
18

LDS:

Name:	GEOTHERMAL INC. LANDFILL (FORMERLY BUTTS CANYON RD FACILITY)
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Global Id:	L10005342355
Latitude:	38.73256
Longitude:	-122.5587
Case Type:	Land Disposal Site
Status:	Open - Closed/with Monitoring
Status Date:	12/30/2014
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Caseworker:	KWC
Local Agency:	Not reported
RB Case Number:	5A170304001
LOC Case Number:	Not reported
File Location:	Regional Board
Potential Media Affect:	Not reported
EDR Link ID:	L10005342355
Potential Contaminants of Concern:	Not reported
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

CORTESE:

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	CORTESE
Envirostor Id:	Not reported
Global ID:	Not reported
Site/Facility Type:	Not reported
Cleanup Status:	Not reported
Status Date:	Not reported
Site Code:	Not reported
Latitude:	Not reported
Longitude:	Not reported
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	CORTESE
Order No:	86-087
Waste Discharge System No:	Not reported
Effective Date:	03/28/1986
Region 2:	5S
WID Id:	5A170304001
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported
File Name:	Cease Desist Orders & Cleanup Abatement Orders
Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON

BUTTS CANYON RD FACILITY (Continued) **S109287554**

City,State,Zip:	MIDDLETOWN, CA 95461
Region:	CORTESE
Envirostor Id:	Not reported
Global ID:	Not reported
Site/Facility Type:	Not reported
Cleanup Status:	Not reported
Status Date:	Not reported
Site Code:	Not reported
Latitude:	Not reported
Longitude:	Not reported
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	CORTESE
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported
File Name:	Cease Desist Orders & Cleanup Abatement Orders

ENF:

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	210951
Agency Name:	Geothermal Inc
Place Type:	Utility
Place Subtype:	Power Plant
Facility Type:	Industrial
Agency Type:	Privately-Owned Business
# Of Agencies:	1
Place Latitude:	38.731995
Place Longitude:	-122.557956
SIC Code 1:	4961
SIC Desc 1:	Steam and Air-Conditioning Supply
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	0.075
Threat To Water Quality:	1
Complexity:	A
Pretreatment:	N - POTW does not have EPA approved pretreatment prog.
Facility Waste Type:	Drilling muds
Facility Waste Type 2:	Erosion wastes

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	LNDISP
Program Category1:	LNDISP
Program Category2:	LNDISP
# Of Programs:	1
WDID:	5A170304001
Reg Measure Id:	140127
Reg Measure Type:	WDR
Region:	Not reported
Order #:	86-087
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Historical
Status Date:	09/15/2017
Effective Date:	03/28/1986
Expiration/Review Date:	11/01/2004
Termination Date:	12/05/2007
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	12/6/2007
WDR Review - No Action Required:	3/15/2002
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	14 - Court order
Direction/Voice:	Passive
Enforcement Id(EID):	224114
Region:	Not reported
Order / Resolution Number:	R5-1987-0198
Enforcement Action Type:	Formal Refer to Attorney Gen
Effective Date:	10/23/1987
Adoption/Issuance Date:	Not reported
Achieve Date:	Not reported
Termination Date:	Not reported
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Active
Title:	RAG R5-1987-0198 for Geothermal Inc, Butts Canyon Rd Facility
Description:	VIOL OF TPCA, WATER CODE 13267 & C&D ORDER 85-092
Program:	LNDISP
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	210951
Agency Name:	Geothermal Inc
Place Type:	Utility
Place Subtype:	Power Plant
Facility Type:	Industrial
Agency Type:	Privately-Owned Business
# Of Agencies:	1
Place Latitude:	38.731995
Place Longitude:	-122.557956
SIC Code 1:	4961
SIC Desc 1:	Steam and Air-Conditioning Supply
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	0.075
Threat To Water Quality:	1
Complexity:	A
Pretreatment:	N - POTW does not have EPA approved pretreatment prog.
Facility Waste Type:	Drilling muds
Facility Waste Type 2:	Erosion wastes
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	LNDISP
Program Category1:	LNDISP
Program Category2:	LNDISP
# Of Programs:	1
WDID:	5A170304001
Reg Measure Id:	140127
Reg Measure Type:	WDR
Region:	Not reported
Order #:	86-087
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Historical
Status Date:	09/15/2017
Effective Date:	03/28/1986
Expiration/Review Date:	11/01/2004
Termination Date:	12/05/2007
WDR Review - Amend:	Not reported

BUTTS CANYON RD FACILITY (Continued) **S109287554**

WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	12/6/2007
WDR Review - No Action Required:	3/15/2002
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	14 - Court order
Direction/Voice:	Passive
Enforcement Id(EID):	224113
Region:	Not reported
Order / Resolution Number:	R5-1987-0199
Enforcement Action Type:	Admin Civil Liability
Effective Date:	10/23/1987
Adoption/Issuance Date:	Not reported
Achieve Date:	Not reported
Termination Date:	Not reported
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Withdrawn
Title:	ACLO R5-1987-0199 for Geothermal Inc, Butts Canyon Rd
Description:	$10,000 FINE- FAILURE TO SUBMIT SWAT REPORT (WC 13273) (BANKRUPT - UNCOLLECTABLE) Referred to AG; bankrupt; uncollectable.
Program:	LNDISP
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	210951
Agency Name:	Geothermal Inc
Place Type:	Utility
Place Subtype:	Power Plant
Facility Type:	Industrial
Agency Type:	Privately-Owned Business
# Of Agencies:	1
Place Latitude:	38.731995
Place Longitude:	-122.557956
SIC Code 1:	4961
SIC Desc 1:	Steam and Air-Conditioning Supply
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported

BUTTS CANYON RD FACILITY (Continued) **S109287554**

NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	0.075
Threat To Water Quality:	1
Complexity:	A
Pretreatment:	N - POTW does not have EPA approved pretreatment prog.
Facility Waste Type:	Drilling muds
Facility Waste Type 2:	Erosion wastes
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	LNDISP
Program Category1:	LNDISP
Program Category2:	LNDISP
# Of Programs:	1
WDID:	5A170304001
Reg Measure Id:	140127
Reg Measure Type:	WDR
Region:	Not reported
Order #:	86-087
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Historical
Status Date:	09/15/2017
Effective Date:	03/28/1986
Expiration/Review Date:	11/01/2004
Termination Date:	12/05/2007
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	12/6/2007
WDR Review - No Action Required:	3/15/2002
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	14 - Court order
Direction/Voice:	Passive
Enforcement Id(EID):	224015
Region:	Not reported
Order / Resolution Number:	R5-1984-0076
Enforcement Action Type:	Cease and Desist Order
Effective Date:	06/22/1984
Adoption/Issuance Date:	Not reported
Achieve Date:	Not reported
Termination Date:	04/26/1985
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Historical
Title:	CDO R5-1984-0076 for Geothermal Inc, Butts Canyon Rd Facility
Description:	Amended by CDO 85-092

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Program:	LNDISP
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	210951
Agency Name:	Geothermal Inc
Place Type:	Utility
Place Subtype:	Power Plant
Facility Type:	Industrial
Agency Type:	Privately-Owned Business
# Of Agencies:	1
Place Latitude:	38.731995
Place Longitude:	-122.557956
SIC Code 1:	4961
SIC Desc 1:	Steam and Air-Conditioning Supply
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	0.075
Threat To Water Quality:	1
Complexity:	A
Pretreatment:	N - POTW does not have EPA approved pretreatment prog.
Facility Waste Type:	Drilling muds
Facility Waste Type 2:	Erosion wastes
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	LNDISP
Program Category1:	LNDISP
Program Category2:	LNDISP
# Of Programs:	1
WDID:	5A170304001
Reg Measure Id:	140127
Reg Measure Type:	WDR
Region:	Not reported
Order #:	86-087
Npdes# CA#:	Not reported
Major-Minor:	Not reported

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Historical
Status Date:	09/15/2017
Effective Date:	03/28/1986
Expiration/Review Date:	11/01/2004
Termination Date:	12/05/2007
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	12/6/2007
WDR Review - No Action Required:	3/15/2002
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	14 - Court order
Direction/Voice:	Passive
Enforcement Id(EID):	224012
Region:	Not reported
Order / Resolution Number:	R5-1987-0500
Enforcement Action Type:	Admin Civil Liability
Effective Date:	01/23/1987
Adoption/Issuance Date:	Not reported
Achieve Date:	4/3/1987
Termination Date:	04/03/1987
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Historical
Title:	ACLC R5-1987-0500 for Geothermal Inc, Butts Canyon Rd Facility
Description:	FAILURE TO COMPLY WITH C&A DATED 1 JANUARY 1987.
Program:	LNDISP
Latest Milestone Completion Date:	4/3/1987
# Of Programs1:	1
Total Assessment Amount:	15000
Initial Assessed Amount:	0
Liability $ Amount:	15000
Project $ Amount:	0
Liability $ Paid:	15000
Project $ Completed:	0
Total $ Paid/Completed Amount:	15000

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	210951
Agency Name:	Geothermal Inc
Place Type:	Utility
Place Subtype:	Power Plant
Facility Type:	Industrial
Agency Type:	Privately-Owned Business
# Of Agencies:	1
Place Latitude:	38.731995
Place Longitude:	-122.557956

BUTTS CANYON RD FACILITY (Continued) **S109287554**

SIC Code 1:	4961
SIC Desc 1:	Steam and Air-Conditioning Supply
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	0.075
Threat To Water Quality:	1
Complexity:	A
Pretreatment:	N - POTW does not have EPA approved pretreatment prog.
Facility Waste Type:	Drilling muds
Facility Waste Type 2:	Erosion wastes
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	LNDISP
Program Category1:	LNDISP
Program Category2:	LNDISP
# Of Programs:	1
WDID:	5A170304001
Reg Measure Id:	140127
Reg Measure Type:	WDR
Region:	Not reported
Order #:	86-087
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Historical
Status Date:	09/15/2017
Effective Date:	03/28/1986
Expiration/Review Date:	11/01/2004
Termination Date:	12/05/2007
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	12/6/2007
WDR Review - No Action Required:	3/15/2002
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	14 - Court order
Direction/Voice:	Passive
Enforcement Id(EID):	224011
Region:	Not reported
Order / Resolution Number:	LT870106
Enforcement Action Type:	Clean-up and Abatement Order

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Effective Date:	01/06/1987
Adoption/Issuance Date:	Not reported
Achieve Date:	Not reported
Termination Date:	Not reported
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Active
Title:	CAO LT870106 for Geothermal Inc, Butts Canyon Rd Facility
Description:	C&A FOR CLEANUP OF DISCH TO UNNAMED TRIBUTARY, MAINTAIN POND 4 IN DEWATERED CONDITION.
Program:	LNDISP
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	210951
Agency Name:	Geothermal Inc
Place Type:	Utility
Place Subtype:	Power Plant
Facility Type:	Industrial
Agency Type:	Privately-Owned Business
# Of Agencies:	1
Place Latitude:	38.731995
Place Longitude:	-122.557956
SIC Code 1:	4961
SIC Desc 1:	Steam and Air-Conditioning Supply
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	0.075
Threat To Water Quality:	1
Complexity:	A
Pretreatment:	N - POTW does not have EPA approved pretreatment prog.
Facility Waste Type:	Drilling muds
Facility Waste Type 2:	Erosion wastes
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	LNDISP

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Program Category1:	LNDISP
Program Category2:	LNDISP
# Of Programs:	1
WDID:	5A170304001
Reg Measure Id:	140127
Reg Measure Type:	WDR
Region:	Not reported
Order #:	86-087
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Historical
Status Date:	09/15/2017
Effective Date:	03/28/1986
Expiration/Review Date:	11/01/2004
Termination Date:	12/05/2007
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	12/6/2007
WDR Review - No Action Required:	3/15/2002
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	14 - Court order
Direction/Voice:	Passive
Enforcement Id(EID):	224010
Region:	Not reported
Order / Resolution Number:	R5-1985-0092
Enforcement Action Type:	Cease and Desist Order
Effective Date:	04/26/1985
Adoption/Issuance Date:	Not reported
Achieve Date:	Not reported
Termination Date:	Not reported
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Active
Title:	CDO R5-1985-0092 for Geothermal Inc, Butts Canyon Rd Facility
Description:	AMENDED C&D ORDER 84-076 TO PROVIDE LONGER RETROFIT TIME SCHEDULE. DISCHARGER HAS YET TO COMPLY.
Program:	LNDISP
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0
Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON

BUTTS CANYON RD FACILITY (Continued) **S109287554**

City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	210951
Agency Name:	Geothermal Inc
Place Type:	Utility
Place Subtype:	Power Plant
Facility Type:	Industrial
Agency Type:	Privately-Owned Business
# Of Agencies:	1
Place Latitude:	38.731995
Place Longitude:	-122.557956
SIC Code 1:	4961
SIC Desc 1:	Steam and Air-Conditioning Supply
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	0.075
Threat To Water Quality:	1
Complexity:	A
Pretreatment:	N - POTW does not have EPA approved pretreatment prog.
Facility Waste Type:	Drilling muds
Facility Waste Type 2:	Erosion wastes
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	LNDISP
Program Category1:	LNDISP
Program Category2:	LNDISP
# Of Programs:	1
WDID:	5A170304001
Reg Measure Id:	140127
Reg Measure Type:	WDR
Region:	Not reported
Order #:	86-087
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Historical
Status Date:	09/15/2017
Effective Date:	03/28/1986
Expiration/Review Date:	11/01/2004
Termination Date:	12/05/2007
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	12/6/2007

BUTTS CANYON RD FACILITY (Continued) **S109287554**

WDR Review - No Action Required:	3/15/2002
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	14 - Court order
Direction/Voice:	Passive
Enforcement Id(EID):	223899
Region:	Not reported
Order / Resolution Number:	R5-1987-0507
Enforcement Action Type:	Admin Civil Liability
Effective Date:	08/24/1987
Adoption/Issuance Date:	Not reported
Achieve Date:	Not reported
Termination Date:	Not reported
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Withdrawn
Title:	ACLC R5-1987-0507 for Geothermal Inc, Butts Canyon Rd Facility
Description:	WC 13273(A) & 13267(B), LEAKING WASTE MANAGEMENT UNITS, UNACCEPTABLE SWAT REPORT. Per ACL Logbook: Board reaffirmed ACL and referred to AG; bankrupt; uncollectable; closed
Program:	LNDISP
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	210951
Agency Name:	Geothermal Inc
Place Type:	Utility
Place Subtype:	Power Plant
Facility Type:	Industrial
Agency Type:	Privately-Owned Business
# Of Agencies:	1
Place Latitude:	38.731995
Place Longitude:	-122.557956
SIC Code 1:	4961
SIC Desc 1:	Steam and Air-Conditioning Supply
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported

BUTTS CANYON RD FACILITY (Continued) **S109287554**

NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	0.075
Threat To Water Quality:	1
Complexity:	A
Pretreatment:	N - POTW does not have EPA approved pretreatment prog.
Facility Waste Type:	Drilling muds
Facility Waste Type 2:	Erosion wastes
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	LNDISP
Program Category1:	LNDISP
Program Category2:	LNDISP
# Of Programs:	1
WDID:	5A170304001
Reg Measure Id:	140127
Reg Measure Type:	WDR
Region:	Not reported
Order #:	86-087
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Historical
Status Date:	09/15/2017
Effective Date:	03/28/1986
Expiration/Review Date:	11/01/2004
Termination Date:	12/05/2007
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	12/6/2007
WDR Review - No Action Required:	3/15/2002
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	14 - Court order
Direction/Voice:	Passive
Enforcement Id(EID):	223895
Region:	Not reported
Order / Resolution Number:	LT870824
Enforcement Action Type:	Formal Refer to Attorney Gen
Effective Date:	08/24/1987
Adoption/Issuance Date:	Not reported
Achieve Date:	Not reported
Termination Date:	Not reported
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Historical
Title:	Formal Refer to AG 08/24/1987 for Geothermal Inc, Butts Canyon Rd Facility
Description:	1/6/87 C&A, WDR 86-087, WC 13261, 13268 - CLEANUP OF SURFACE AND GROUND WATER.

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Program:	LNDISP
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	210951
Agency Name:	Not reported
Place Type:	Utility
Place Subtype:	Power Plant
Facility Type:	Industrial
Agency Type:	Not reported
# Of Agencies:	Not reported
Place Latitude:	38.731995
Place Longitude:	-122.557956
SIC Code 1:	4961
SIC Desc 1:	Steam and Air-Conditioning Supply
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Enf Action
Design Flow:	Not reported
Threat To Water Quality:	Not reported
Complexity:	Not reported
Pretreatment:	Not reported
Facility Waste Type:	Not reported
Facility Waste Type 2:	Not reported
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	Not reported
Program Category1:	Not reported
Program Category2:	UNREGS
# Of Programs:	Not reported
WDID:	Not reported
Reg Measure Id:	Not reported
Reg Measure Type:	Not reported
Region:	Not reported
Order #:	Not reported
Npdes# CA#:	Not reported
Major-Minor:	Not reported

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Npdes Type:	Not reported
Reclamation:	Not reported
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Not reported
Status Date:	Not reported
Effective Date:	Not reported
Expiration/Review Date:	Not reported
Termination Date:	Not reported
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	Not reported
WDR Review - No Action Required:	Not reported
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	Not reported
Individual/General:	Not reported
Fee Code:	Not reported
Direction/Voice:	Not reported
Enforcement Id(EID):	381940
Region:	Not reported
Order / Resolution Number:	Not reported
Enforcement Action Type:	13267 Letter
Effective Date:	08/19/2011
Adoption/Issuance Date:	08/19/2011
Achieve Date:	Not reported
Termination Date:	Not reported
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Active
Title:	13267 Letter 08/19/2011 for Geothermal Inc
Description:	The Discharger+s method of presenting adjusted data in monitoring reports prevents staff from determining compliance with the CAO and from identifying a preliminary indication of a release.
Program:	ENFCAO
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	210951
Agency Name:	Not reported
Place Type:	Utility
Place Subtype:	Power Plant
Facility Type:	Industrial
Agency Type:	Not reported

BUTTS CANYON RD FACILITY (Continued) **S109287554**

# Of Agencies:	Not reported
Place Latitude:	38.731995
Place Longitude:	-122.557956
SIC Code 1:	4961
SIC Desc 1:	Steam and Air-Conditioning Supply
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Enf Action
Design Flow:	Not reported
Threat To Water Quality:	Not reported
Complexity:	Not reported
Pretreatment:	Not reported
Facility Waste Type:	Not reported
Facility Waste Type 2:	Not reported
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	Not reported
Program Category1:	Not reported
Program Category2:	UNREGS
# Of Programs:	Not reported
WDID:	Not reported
Reg Measure Id:	Not reported
Reg Measure Type:	Not reported
Region:	Not reported
Order #:	Not reported
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	Not reported
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Not reported
Status Date:	Not reported
Effective Date:	Not reported
Expiration/Review Date:	Not reported
Termination Date:	Not reported
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	Not reported
WDR Review - No Action Required:	Not reported
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	Not reported
Individual/General:	Not reported
Fee Code:	Not reported
Direction/Voice:	Not reported
Enforcement Id(EID):	246051

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Region:	Not reported
Order / Resolution Number:	R5-2002-0204
Enforcement Action Type:	Clean-up and Abatement Order
Effective Date:	12/06/2002
Adoption/Issuance Date:	Not reported
Achieve Date:	Not reported
Termination Date:	Not reported
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Active
Title:	CAO R5-2002-0204 for Geothermal Inc, Butts Canyon Rd Facility
Description:	Order to close facility (surface impoundments and disposal trenches). Order includes closure, post-closure and groundwater cleanup requirements.
Program:	ENFCAO
Latest Milestone Completion Date:	11/1/2003
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

CIWQS:

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Agency:	Geothermal Inc
Agency Address:	3401 Crow Canyon Road, San Ramon, CA 94583
Place/Project Type:	Power Plant
SIC/NAICS:	4961
Region:	5S
Program:	LNDISP
Regulatory Measure Status:	Historical
Regulatory Measure Type:	WDR
Order Number:	86-087
WDID:	5A170304001
NPDES Number:	Not reported
Adoption Date:	03/28/1986
Effective Date:	03/28/1986
Termination Date:	12/05/2007
Expiration/Review Date:	11/01/2004
Design Flow:	0.075
Major/Minor:	Not reported
Complexity:	A
TTWQ:	1
Enforcement Actions within 5 years:	0
Violations within 5 years:	0
Latitude:	38.731995
Longitude:	-122.557956

CERS:

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON

BUTTS CANYON RD FACILITY (Continued) **S109287554**

City,State,Zip: MIDDLETOWN, CA 95461
Site ID: 345852
CERS ID: 210951
CERS Description: Land Disposal

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-08-2007
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-10-2006
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-16-2000
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Sampling Inspection
Eval Date: 02-24-1993
Violations Found: No
Eval Type: RWQCB Type A compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 03-10-2004
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 03-30-1999
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-18-2001
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-13-2011
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-17-2016
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 06-16-2004
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 06-20-2002
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-05-2004
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Eval Date:	08-29-2002
Violations Found:	No
Eval Type:	RWQCB Type B compliance inspection
Eval Notes:	Not reported
Eval Division:	Water Boards
Eval Program:	LNDISPOTH
Eval Source:	CIWQS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	09-14-2005
Violations Found:	No
Eval Type:	RWQCB Type B compliance inspection
Eval Notes:	Not reported
Eval Division:	Water Boards
Eval Program:	LNDISPOTH
Eval Source:	CIWQS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	09-25-2003
Violations Found:	No
Eval Type:	RWQCB Type B compliance inspection
Eval Notes:	Not reported
Eval Division:	Water Boards
Eval Program:	LNDISPOTH
Eval Source:	CIWQS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	09-27-2006
Violations Found:	No
Eval Type:	RWQCB Type B compliance inspection
Eval Notes:	Not reported
Eval Division:	Water Boards
Eval Program:	LNDISPOTH
Eval Source:	CIWQS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	10-23-2007
Violations Found:	No
Eval Type:	RWQCB Type B compliance inspection
Eval Notes:	Not reported
Eval Division:	Water Boards
Eval Program:	LNDISPOTH
Eval Source:	CIWQS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	10-28-2008
Violations Found:	No
Eval Type:	RWQCB Type B compliance inspection
Eval Notes:	Not reported
Eval Division:	Water Boards
Eval Program:	LNDISPOTH
Eval Source:	CIWQS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	11-17-2009
Violations Found:	No
Eval Type:	RWQCB Type B compliance inspection

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-18-1993
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-18-2004
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-04-2018
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-11-2017
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-22-1992
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Enforcement Action:
Site ID: 345852
Site Name: Butts Canyon Rd Facility
Site Address: 19020 BUTTS CANYON
Site City: MIDDLETOWN
Site Zip: 95461
Enf Action Date: 01-06-1987

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Enf Action Type:	Clean-up and Abatement Order
Enf Action Description:	Clean-up and Abatement Order
Enf Action Notes:	Not reported
Enf Action Division:	Water Boards
Enf Action Program:	LNDISPOTH
Enf Action Source:	CIWQS
Site ID:	345852
Site Name:	Butts Canyon Rd Facility
Site Address:	19020 BUTTS CANYON
Site City:	MIDDLETOWN
Site Zip:	95461
Enf Action Date:	01-23-1987
Enf Action Type:	Administrative Enforcement with Penality
Enf Action Description:	Administrative Enforcement with Civil Liability (Penality)
Enf Action Notes:	Not reported
Enf Action Division:	Water Boards
Enf Action Program:	LNDISPOTH
Enf Action Source:	CIWQS
Site ID:	345852
Site Name:	Butts Canyon Rd Facility
Site Address:	19020 BUTTS CANYON
Site City:	MIDDLETOWN
Site Zip:	95461
Enf Action Date:	04-26-1985
Enf Action Type:	Cease and Desist Order
Enf Action Description:	Cease and Desist Order
Enf Action Notes:	Not reported
Enf Action Division:	Water Boards
Enf Action Program:	LNDISPOTH
Enf Action Source:	CIWQS
Site ID:	345852
Site Name:	Butts Canyon Rd Facility
Site Address:	19020 BUTTS CANYON
Site City:	MIDDLETOWN
Site Zip:	95461
Enf Action Date:	06-22-1984
Enf Action Type:	Cease and Desist Order
Enf Action Description:	Cease and Desist Order
Enf Action Notes:	Not reported
Enf Action Division:	Water Boards
Enf Action Program:	LNDISPOTH
Enf Action Source:	CIWQS
Site ID:	345852
Site Name:	Butts Canyon Rd Facility
Site Address:	19020 BUTTS CANYON
Site City:	MIDDLETOWN
Site Zip:	95461
Enf Action Date:	08-19-2011
Enf Action Type:	Enforcement Letter (Formal)
Enf Action Description:	Enforcement Letter Citing Violations and with Required Actions (Formal)
Enf Action Notes:	Not reported
Enf Action Division:	Water Boards

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Enf Action Program:	LNDISPOTH
Enf Action Source:	CIWQS
Site ID:	345852
Site Name:	Butts Canyon Rd Facility
Site Address:	19020 BUTTS CANYON
Site City:	MIDDLETOWN
Site Zip:	95461
Enf Action Date:	08-24-1987
Enf Action Type:	Administrative Enforcement with Penality
Enf Action Description:	Administrative Enforcement with Civil Liability (Penality)
Enf Action Notes:	Not reported
Enf Action Division:	Water Boards
Enf Action Program:	LNDISPOTH
Enf Action Source:	CIWQS
Site ID:	345852
Site Name:	Butts Canyon Rd Facility
Site Address:	19020 BUTTS CANYON
Site City:	MIDDLETOWN
Site Zip:	95461
Enf Action Date:	08-24-1987
Enf Action Type:	Formal Refer to Attorney Gen
Enf Action Description:	Formal Refer to Attorney Gen
Enf Action Notes:	Not reported
Enf Action Division:	Water Boards
Enf Action Program:	LNDISPOTH
Enf Action Source:	CIWQS
Site ID:	345852
Site Name:	Butts Canyon Rd Facility
Site Address:	19020 BUTTS CANYON
Site City:	MIDDLETOWN
Site Zip:	95461
Enf Action Date:	10-23-1987
Enf Action Type:	Administrative Enforcement with Penality
Enf Action Description:	Administrative Enforcement with Civil Liability (Penality)
Enf Action Notes:	Not reported
Enf Action Division:	Water Boards
Enf Action Program:	LNDISPOTH
Enf Action Source:	CIWQS
Site ID:	345852
Site Name:	Butts Canyon Rd Facility
Site Address:	19020 BUTTS CANYON
Site City:	MIDDLETOWN
Site Zip:	95461
Enf Action Date:	10-23-1987
Enf Action Type:	Formal Refer to Attorney Gen
Enf Action Description:	Formal Refer to Attorney Gen
Enf Action Notes:	Not reported
Enf Action Division:	Water Boards
Enf Action Program:	LNDISPOTH
Enf Action Source:	CIWQS
Site ID:	345852
Site Name:	Butts Canyon Rd Facility

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Site Address:	19020 BUTTS CANYON
Site City:	MIDDLETOWN
Site Zip:	95461
Enf Action Date:	12-06-2002
Enf Action Type:	Clean-up and Abatement Order
Enf Action Description:	Clean-up and Abatement Order
Enf Action Notes:	Not reported
Enf Action Division:	Water Boards
Enf Action Program:	LNDISPOTH
Enf Action Source:	CIWQS

Name:	GEOTHERMAL INC. LANDFILL (FORMERLY BUTTS CANYON RD FACILITY)
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Site ID:	239744
CERS ID:	L10005342355
CERS Description:	Land Disposal Site

Affiliation:

Affiliation Type Desc:	Regional Board Caseworker
Entity Name:	KENNY W CROYLE - CENTRAL VALLEY RWQCB (REGION 5S)
Entity Title:	Not reported
Affiliation Address:	11020 SUN CENTER DRIVE #200
Affiliation City:	RANCHO CORDOVA
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

E27 **GEOTHERMAL INC** **ENVIROSTOR** **S109467202**
WSW **19020 BUTTS CANYON RD** **HWP** **N/A**
1/4-1/2 **MIDDLETOWN, CA 95461** **CERS**
0.480 mi.
2532 ft. **Site 7 of 7 in cluster E**

Actual:
1155 ft.

Focus Map:
18

ENVIROSTOR:

Name:	GEOTHERMAL INC
Address:	19020 BOTTS CANYON ROAD
City,State,Zip:	MIDDLETOWN, CA 933080000
Facility ID:	80001735
Status:	Refer: RWQCB
Status Date:	01/01/2008
Site Code:	Not reported
Site Type:	Corrective Action
Site Type Detailed:	Corrective Action
Acres:	0
NPL:	NO
Regulatory Agencies:	RWQCB 5S - Central Valley
Lead Agency:	RWQCB 5S - Central Valley
Program Manager:	Not reported
Supervisor:	* Unknown
Division Branch:	Cleanup Sacramento
Assembly:	11, 04
Senate:	07, 02
Special Program:	Not reported
Restricted Use:	NO

GEOTHERMAL INC (Continued) **S109467202**

Site Mgmt Req: NONE SPECIFIED
Funding: Not reported
Latitude: 38.73526
Longitude: -122.5626
APN: NONE SPECIFIED
Past Use: NONE SPECIFIED
Potential COC: NONE SPECIFIED
Confirmed COC: NONE SPECIFIED
Potential Description: NONE SPECIFIED
Alias Name: CAD098080484
Alias Type: EPA Identification Number
Alias Name: 17490002
Alias Type: Envirostor ID Number
Alias Name: 80001735
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedy Construction Complete
Completed Date: 03/26/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Groundwater Migration Controlled
Completed Date: 10/07/1997
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Human Exposure Controlled
Completed Date: 10/07/1997
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Groundwater Migration Controlled
Completed Date: 03/26/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Human Exposure Controlled
Completed Date: 03/26/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: RFI Report
Completed Date: 02/01/1995
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Interim Measures Questionnaire
Completed Date: 10/07/1997
Comments: BCOFER 20010611.11:16E

GEOTHERMAL INC (Continued) **S109467202**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * RFI Imposition
Completed Date: 09/06/1991
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Interim Measures Questionnaire
Completed Date: 10/07/1997
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Interim Measures Questionnaire
Completed Date: 12/05/1995
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Other Instrument
Completed Date: 09/06/1991
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: RFI Workplan
Completed Date: 09/06/1991
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

HWP:
Name: GEOTHERMAL INC
Address: 19020 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
EPA Id: CAD098080484
Cleanup Status: CLOSED
Latitude: 38.73526
Longitude: -122.5626
Facility Type: Historical - Non-Operating
Facility Size: Not reported
Team: Not reported
Supervisor: Not reported
Site Code: Not reported
Assembly District: 11, 04
Senate District: 07, 02
Public Information Officer: Not reported
Public Information Officer: Not reported

GEOTHERMAL INC (Continued) **S109467202**

Closure:
EPA Id: CAD098080484
Facility Type: Historical - Non-Operating
Unit Names: PONDS1, TRENCHES1
Event Description: Closure - 1ST NOTICE OF DEFICIENCY ISSUED
Actual Date: 09/21/1987

EPA Id: CAD098080484
Facility Type: Historical - Non-Operating
Unit Names: PONDS1, TRENCHES1
Event Description: Closure - ISSUE CLOSURE VERIFICATION
Actual Date: 03/26/2009

EPA Id: CAD098080484
Facility Type: Historical - Non-Operating
Unit Names: PONDS1, TRENCHES1
Event Description: Closure - CLOSURE PLAN RECEIVED
Actual Date: 06/11/1986

Alias:
EPA Id: CAD098080484
Facility Type: Historical - Non-Operating
Alias Type: Envirostor ID Number
Alias: 17490002

CERS:
Name: GEOTHERMAL INC
Address: 19020 BOTTS CANYON ROAD
City,State,Zip: MIDDLETOWN, CA 933080000
Site ID: 337830
CERS ID: 80001735
CERS Description: Corrective Action

Affiliation:
Affiliation Type Desc: Supervisor
Entity Name: * Unknown
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

Count: 6 records

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
MIDDLETOWN	S106933317	U S COAST GUARD	END OF GRANGE RD	95461	SWEEPS UST
MIDDLETOWN	S123298129		BUTTS CANYON RD, MILE MARKER 266		CHMIRS
MIDDLETOWN	S124450545		BUTTS CANYON ROAD // MM 9.38		CHMIRS
MIDDLETOWN	1023222421	MIDDLETOWN SCHOOL DISTRICT	11710 BUTTS CANYON RD	95461	FINDS
MIDDLETOWN	S121650251	LANGTRY GOLF COURSE LANGTRY ESTATE & VIN	21423 BUTTS CANYON RD & 23000 OAT HILL RD	95461	CIWQS
POPE VALLEY	S124450549		BUTTS CANYON RD X GUENOC RD		CHMIRS

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: N/A
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 5
Telephone 312-886-6686

EPA Region 10
Telephone 206-553-8665

EPA Region 6
Telephone: 214-655-6659

EPA Region 7
Telephone: 913-551-7247

EPA Region 8
Telephone: 303-312-6774

EPA Region 9
Telephone: 415-947-4246

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: N/A
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: N/A
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Quarterly

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 04/03/2019
Date Data Arrived at EDR: 04/05/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 10/04/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Quarterly

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Quarterly

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 08/13/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 08/26/2019
Number of Days to Update: 6

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 08/07/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 08/19/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 08/26/2019
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 08/19/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 08/26/2019
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/09/2019
Date Data Arrived at EDR: 09/09/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 14

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

STANDARD ENVIRONMENTAL RECORDS

State- and tribal - equivalent NPL

CA RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 07/29/2019
Date Data Arrived at EDR: 07/31/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 69

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

CA ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 07/29/2019
Date Data Arrived at EDR: 07/31/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 69

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

CA SWF/LF (SWIS): Solid Waste Information System
Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 05/13/2019
Date Data Arrived at EDR: 05/14/2019
Date Made Active in Reports: 07/17/2019
Number of Days to Update: 64

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 08/13/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

CA LUST REG 9: Leaking Underground Storage Tank Report
Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

CA LUST REG 8: Leaking Underground Storage Tanks
California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

CA LUST REG 7: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

CA LUST REG 5: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

CA LUST REG 4: Underground Storage Tank Leak List

Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

CA LUST REG 3: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

CA LUST REG 2: Fuel Leak List

Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

CA LUST REG 1: Active Toxic Site Investigation

Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

CA LUST REG 6V: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

CA LUST REG 6L: Leaking Underground Storage Tank Case Listing

For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

CA LUST: Leaking Underground Fuel Tank Report (GEOTRACKER)

Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 55
Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/13/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/13/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/13/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/13/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/13/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/13/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/13/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/13/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

CA CPS-SLIC: Statewide SLIC Cases (GEOTRACKER)
Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 55

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

CA SLIC REG 1: Active Toxic Site Investigations
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

CA SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

CA SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

CA SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

CA SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

CA SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

CA SLIC REG 6L: SLIC Sites

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

CA SLIC REG 7: SLIC List

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

CA SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

CA SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17
Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: No Update Planned

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 05/15/2017
Date Data Arrived at EDR: 05/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 136
Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 08/26/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Varies

State and tribal registered storage tank lists

CA MILITARY UST SITES: Military UST Sites (GEOTRACKER)
Military ust sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

CA UST CLOSURE: Proposed Closure of Underground Storage Tank (UST) Cases
UST cases that are being considered for closure by either the State Water Resources Control Board or the Executive Director have been posted for a 60-day public comment period. UST Case Closures being proposed for consideration by the State Water Resources Control Board. These are primarily UST cases that meet closure criteria under the decisional framework in State Water Board Resolution No. 92-49 and other Board orders. UST Case Closures proposed for consideration by the Executive Director pursuant to State Water Board Resolution No. 2012-0061. These are cases that meet the criteria of the Low-Threat UST Case Closure Policy. UST Case Closure Review Denials and Approved Orders.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 41
Source: State Water Resources Control Board
Telephone: 916-327-7844
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

CA UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 42
Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Semi-Annually

CA AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 07/06/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 09/19/2016
Number of Days to Update: 69
Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 09/12/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

INDIAN UST R1: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27
Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

CA VCP: Voluntary Cleanup Program Properties
Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 07/29/2019
Date Data Arrived at EDR: 07/31/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 69
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Quarterly

INDIAN VCP R1: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27
Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

State and tribal Brownfields sites

CA BROWNFIELDS: Considered Brownfieds Sites Listing
A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 57
Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 06/03/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/26/2019
Number of Days to Update: 83
Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Semi-Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Landfill / Solid Waste Disposal Sites

CA WMUDS/SWAT: Waste Management Unit Database

Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 07/25/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: No Update Planned

CA SWRCY: Recycler Database

A listing of recycling facilities in California.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 64

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

CA HAULERS: Registered Waste Tire Haulers Listing

A listing of registered waste tire haulers.

Date of Government Version: 03/26/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/30/2019
Number of Days to Update: 34

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 08/07/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 07/25/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land

A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 08/02/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/13/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 82

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: No Update Planned

Local Lists of Hazardous waste / Contaminated Sites

CA HIST CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

CA SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 07/29/2019
Date Data Arrived at EDR: 07/31/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 69

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Quarterly

CA CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/16/2019
Date Made Active in Reports: 09/24/2019
Number of Days to Update: 70

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Varies

CA CERS HAZ WASTE: CERS HAZ WASTE

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, and RCRA LQ HW Generator programs.

Date of Government Version: 08/14/2019
Date Data Arrived at EDR: 08/14/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 7

Source: CalEPA
Telephone: 916-323-2514
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Quarterly

CA TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/13/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 82

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Quarterly

CA PFAS: PFAS Contamination Site Location Listing

A listing of PFAS contaminated sites included in the GeoTracker database.

Date of Government Version: 06/28/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 26

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

Local Lists of Registered Storage Tanks

CA SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CA UST MENDOCINO: Mendocino County UST Database

A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 12/04/2018
Date Data Arrived at EDR: 12/06/2018
Date Made Active in Reports: 12/14/2018
Number of Days to Update: 8

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Annually

CA HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CA SAN FRANCISCO AST: Aboveground Storage Tank Site Listing

Aboveground storage tank sites

Date of Government Version: 09/11/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/11/2018
Number of Days to Update: 29

Source: San Francisco County Department of Public Health
Telephone: 415-252-3896
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CA CERS TANKS: California Environmental Reporting System (CERS) Tanks

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Aboveground Petroleum Storage and Underground Storage Tank regulatory programs.

Date of Government Version: 08/14/2019
Date Data Arrived at EDR: 08/14/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 7

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Quarterly

Local Land Records

CA LIENS: Environmental Liens Listing

A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 06/05/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 08/09/2019
Number of Days to Update: 64

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 07/30/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Semi-Annually

CA DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 65

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Semi-Annually

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/26/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 89

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

Records of Emergency Release Reports

CA CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 05/15/2019
Date Data Arrived at EDR: 06/24/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 58

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 07/26/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Semi-Annually

CA LDS: Land Disposal Sites Listing (GEOTRACKER)

Land Disposal sites (Landfills) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 55

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

CA MCS: Military Cleanup Sites Listing (GEOTRACKER)

Military sites (consisting of: Military UST sites; Military Privatized sites; and Military Cleanup sites [formerly known as DoD non UST]) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

CA SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 05/15/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 79

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 08/23/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 07/09/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 10/07/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 08/16/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/26/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 89

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 08/09/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/21/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 198

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 01/10/2018
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 2

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 08/23/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 09/30/2018
Date Data Arrived at EDR: 04/24/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 106

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 07/26/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 04/25/2019
Date Data Arrived at EDR: 05/02/2019
Date Made Active in Reports: 05/23/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 08/20/2019
Date Data Arrived at EDR: 09/05/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 18

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

PADS: PCB Activity Database System
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 03/20/2019
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 34

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 07/12/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 10/07/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 06/20/2019
Date Data Arrived at EDR: 06/20/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 49

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76
Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 09/06/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 09/03/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 05/24/2017
Date Data Arrived at EDR: 11/30/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 15
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 08/09/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/01/2019
Date Data Arrived at EDR: 07/01/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 84
Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 10/01/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 04/01/2019
Date Data Arrived at EDR: 04/30/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 100

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 06/30/2019
Date Data Arrived at EDR: 07/16/2019
Date Made Active in Reports: 10/02/2019
Number of Days to Update: 78

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 09/28/2017
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 10/06/2019
Next Scheduled EDR Contact: 01/19/2020
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 08/08/2017
Date Data Arrived at EDR: 09/11/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 3

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 07/30/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 06/23/2017
Date Data Arrived at EDR: 10/11/2017
Date Made Active in Reports: 11/03/2017
Number of Days to Update: 23

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites
A listing of former lead smelter site locations.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites
A listing of former lead smelter site locations.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Varies

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem

Date of Government Version: 10/27/2009
Date Data Arrived at EDR: 11/10/2009
Date Made Active in Reports: 12/08/2009
Number of Days to Update: 28

Source: N/A
Telephone: N/A
Last EDR Contact: 11/12/1996
Next Scheduled EDR Contact: N/A
Data Release Frequency: Annually

US AIRS MINOR: Aerometric Information Retrieval System Facility Subsystem

Date of Government Version: 10/27/2009
Date Data Arrived at EDR: 11/10/2009
Date Made Active in Reports: 12/08/2009
Number of Days to Update: 28

Source: N/A
Telephone: N/A
Last EDR Contact: 11/12/1996
Next Scheduled EDR Contact: N/A
Data Release Frequency: Annually

US MINES: Active Mines & Mineral Plants Database Listing
Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 08/30/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

US MINES 2: Active Mines & Mineral Plants Database Listing
Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 08/30/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 08/30/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 03/27/2019
Date Data Arrived at EDR: 03/28/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 34

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 09/10/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 05/03/2019
Date Data Arrived at EDR: 06/05/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 90

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 01/17/2019
Date Made Active in Reports: 04/01/2019
Number of Days to Update: 74

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 07/15/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Varies

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 07/26/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 71

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 07/06/2019
Date Data Arrived at EDR: 07/09/2019
Date Made Active in Reports: 10/02/2019
Number of Days to Update: 85

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 10/08/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Quarterly

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 05/20/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 79

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Quarterly

Other Ascertainable Records

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CA CORTESE: "Cortese" Hazardous Waste & Substances Sites List

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 57

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

CA CUPA SAN FRANCISCO CO: CUPA Facility Listing

Cupa facilities

Date of Government Version: 04/18/2019
Date Data Arrived at EDR: 04/19/2019
Date Made Active in Reports: 04/30/2019
Number of Days to Update: 11

Source: San Francisco County Department of Environmental Health
Telephone: 415-252-3896
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

CA CUPA LIVERMORE-PLEASANTON: CUPA Facility Listing

list of facilities associated with the various CUPA programs in Livermore-Pleasanton

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 05/14/2019
Date Made Active in Reports: 07/17/2019
Number of Days to Update: 64

Source: Livermore-Pleasanton Fire Department
Telephone: 925-454-2361
Last EDR Contact: 08/15/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Varies

CA DRYCLEAN SOUTH COAST: South Coast Air Quality Management District Drycleaner Listing

A listing of dry cleaners in the South Coast Air Quality Management District

Date of Government Version: 03/19/2019
Date Data Arrived at EDR: 03/22/2019
Date Made Active in Reports: 04/09/2019
Number of Days to Update: 18

Source: South Coast Air Quality Management District
Telephone: 909-396-3211
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

CA DRYCLEAN AVAQMD: Antelope Valley Air Quality Management District Drycleaner Listing

A listing of dry cleaners in the Antelope Valley Air Quality Management District.

Date of Government Version: 06/03/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 65

Source: Antelope Valley Air Quality Management District
Telephone: 661-723-8070
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

CA DRYCLEANERS: Cleaner Facilities

A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 55

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Annually

CA EMI: Emissions Inventory Data

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 06/24/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 59

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 09/18/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Varies

CA ENF: Enforcement Action Listing

A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/22/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 66

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 07/18/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

CA Financial Assurance 1: Financial Assurance Information Listing

Financial Assurance information

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/23/2019
Date Made Active in Reports: 09/30/2019
Number of Days to Update: 69

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

CA Financial Assurance 2: Financial Assurance Information Listing

A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 05/15/2019
Date Data Arrived at EDR: 05/16/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 63

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 08/07/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Varies

CA HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 05/29/2019
Date Made Active in Reports: 07/22/2019
Number of Days to Update: 54

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 07/12/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Annually

CA ICE: ICE

Contains data pertaining to the Permitted Facilities with Inspections / Enforcements sites tracked in Envirostor.

Date of Government Version: 05/20/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 58

Source: Department of Toxic Subsances Control
Telephone: 877-786-9427
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Quarterly

CA HIST CORTESE: Hazardous Waste & Substance Site List

The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CA HWP: EnviroStor Permitted Facilities Listing

Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 05/20/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 58

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Quarterly

CA HWT: Registered Hazardous Waste Transporter Database

A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 07/08/2019
Date Data Arrived at EDR: 07/09/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 73

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 10/08/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Quarterly

CA MINES: Mines Site Location Listing
A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 65
Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

CA MWMP: Medical Waste Management Program Listing
The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 05/17/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/09/2019
Number of Days to Update: 66
Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

CA NPDES: NPDES Permits Listing
A listing of NPDES permits, including stormwater.

Date of Government Version: 05/13/2019
Date Data Arrived at EDR: 05/14/2019
Date Made Active in Reports: 07/17/2019
Number of Days to Update: 64
Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 08/13/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Quarterly

CA PEST LIC: Pesticide Regulation Licenses Listing
A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/09/2019
Number of Days to Update: 66
Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

CA PROC: Certified Processors Database
A listing of certified processors.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 64
Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

CA NOTIFY 65: Proposition 65 Records
Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 06/17/2019
Date Data Arrived at EDR: 06/18/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 65
Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: No Update Planned

CA UIC: UIC Listing
A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 04/27/2018
Date Data Arrived at EDR: 06/13/2018
Date Made Active in Reports: 07/17/2018
Number of Days to Update: 34
Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

CA UIC GEO: Underground Injection Control Sites (GEOTRACKER)
Underground control injection sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43
Source: State Water Resource Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

CA WASTEWATER PITS: Oil Wastewater Pits Listing
Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water boards review found that more than one-third of the region's active disposal pits are operating without permission.

Date of Government Version: 05/08/2018
Date Data Arrived at EDR: 07/11/2018
Date Made Active in Reports: 09/13/2018
Number of Days to Update: 64
Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 07/12/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Varies

CA WDS: Waste Discharge System
Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9
Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: No Update Planned

CA WIP: Well Investigation Program Case List
Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13
Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: No Update Planned

CA MILITARY PRIV SITES: Military Privatized Sites (GEOTRACKER)
Military privatized sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

CA PROJECT: Project Sites (GEOTRACKER)
Projects sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

CA WDR: Waste Discharge Requirements Listing

In general, the Waste Discharge Requirements (WDRs) Program (sometimes also referred to as the "Non Chapter 15 (Non 15) Program") regulates point discharges that are exempt pursuant to Subsection 20090 of Title 27 and not subject to the Federal Water Pollution Control Act. Exemptions from Title 27 may be granted for nine categories of discharges (e.g., sewage, wastewater, etc.) that meet, and continue to meet, the preconditions listed for each specific exemption. The scope of the WDRs Program also includes the discharge of wastes classified as inert, pursuant to section 20230 of Title 27.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 64

Source: State Water Resources Control Board
Telephone: 916-341-5810
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

CA CIWQS: California Integrated Water Quality System

The California Integrated Water Quality System (CIWQS) is a computer system used by the State and Regional Water Quality Control Boards to track information about places of environmental interest, manage permits and other orders, track inspections, and manage violations and enforcement activities.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 65

Source: State Water Resources Control Board
Telephone: 866-794-4977
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

CA CERS: CalEPA Regulated Site Portal Data

The CalEPA Regulated Site Portal database combines data about environmentally regulated sites and facilities in California into a single database. It combines data from a variety of state and federal databases, and provides an overview of regulated activities across the spectrum of environmental programs for any given location in California. These activities include hazardous materials and waste, state and federal cleanups, impacted ground and surface waters, and toxic materials

Date of Government Version: 08/14/2019
Date Data Arrived at EDR: 08/14/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 7

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

CA NON-CASE INFO: Non-Case Information Sites (GEOTRACKER)

Non-Case Information sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

CA OTHER OIL GAS: Other Oil & Gas Projects Sites (GEOTRACKER)

Other Oil & Gas Projects sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CA PROD WATER PONDS: Produced Water Ponds Sites (GEOTRACKER)
Produced water ponds sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

CA SAMPLING POINT: Sampling Point ? Public Sites (GEOTRACKER)
Sampling point - public sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

CA WELL STIM PROJ: Well Stimulation Project (GEOTRACKER)
Includes areas of groundwater monitoring plans, a depiction of the monitoring network, and the facilities, boundaries, and subsurface characteristics of the oilfield and the features (oil and gas wells, produced water ponds, UIC wells, water supply wells, etc?) being monitored

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

EDR MGP: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations
EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

CA RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

CA RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 01/09/2019
Date Data Arrived at EDR: 01/11/2019
Date Made Active in Reports: 03/05/2019
Number of Days to Update: 53

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Semi-Annually

Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 04/10/2019
Date Data Arrived at EDR: 04/11/2019
Date Made Active in Reports: 06/20/2019
Number of Days to Update: 70

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 04/24/2047
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA Facility List
Cupa Facility List

Date of Government Version: 06/27/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 26

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA Facility Listing
Cupa facility list.

Date of Government Version: 04/21/2017
Date Data Arrived at EDR: 04/25/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 106

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 05/02/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 27

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 09/23/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 05/17/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 58

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 05/22/2019
Date Data Arrived at EDR: 05/23/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 56

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 07/26/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA Facility List
Cupa Facility list

Date of Government Version: 02/20/2019
Date Data Arrived at EDR: 05/01/2019
Date Made Active in Reports: 05/30/2019
Number of Days to Update: 29

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 07/25/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 06/05/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 47

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 09/05/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA Resources List
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 07/11/2019
Date Data Arrived at EDR: 07/11/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 71

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 09/25/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Semi-Annually

GLENN COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 49

Source: Glenn County Air Pollution Control District
Telephone: 830-934-6500
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: No Update Planned

HUMBOLDT COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 07/08/2019
Date Data Arrived at EDR: 07/10/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 72

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 08/19/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Semi-Annually

IMPERIAL COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/23/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 65

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INYO COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/03/2018
Date Made Active in Reports: 06/14/2018
Number of Days to Update: 72

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 08/01/2019
Date Data Arrived at EDR: 08/06/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 63

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 05/16/2019
Date Data Arrived at EDR: 05/17/2019
Date Made Active in Reports: 05/30/2019
Number of Days to Update: 13

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

LAKE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 05/30/2019
Date Data Arrived at EDR: 05/31/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 53

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 07/15/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Varies

LASSEN COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 07/22/2019
Date Data Arrived at EDR: 07/23/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 65

Source: Lassen County Environmental Health
Telephone: 530-251-8528
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

LOS ANGELES COUNTY:

Key Areas of Concerns in Los Angeles County
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office. Date of Government Version: 3/30/2009 Exide Site area is a cleanup plan of lead-impacted soil surrounding the former Exide Facility as designated by the DTSC. Date of Government Version: 7/17/2017

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: N/A
Telephone: N/A
Last EDR Contact: 09/12/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: No Update Planned

HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 07/09/2019
Date Data Arrived at EDR: 07/11/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 71

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 07/15/2019
Date Data Arrived at EDR: 07/17/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 71

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 07/17/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Varies

City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 01/01/2019
Date Data Arrived at EDR: 01/15/2019
Date Made Active in Reports: 03/07/2019
Number of Days to Update: 51

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 07/12/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Varies

Active & Inactive AST Inventory
A listing of active & inactive above ground petroleum storage tank site locations, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 09/27/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Varies

Methane Producing Landfills

This data was created on April 30, 2012 to represent known disposal sites in Los Angeles County that may produce and emanate methane gas. The shapefile contains disposal sites within Los Angeles County that once accepted degradable refuse material. Information used to create this data was extracted from a landfill survey performed by County Engineers (Major Waste System Map, 1973) as well as historical records from CalRecycle, Regional Water Quality Control Board, and Los Angeles County Department of Public Health

Date of Government Version: 04/30/2012
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 42

Source: Los Angeles County Department of Public Works
Telephone: 626-458-6973
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: No Update Planned

Active & Inactive Hazardous Materials Inventory

A listing of active & inactive hazardous materials facility locations, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 09/27/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Varies

Active & Inactive UST Inventory

A listing of active & inactive underground storage tank site locations and underground storage tank historical sites, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 06/25/2019
Next Scheduled EDR Contact: 10/07/2019
Data Release Frequency: Varies

Site Mitigation List

Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 07/15/2019
Date Data Arrived at EDR: 07/17/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 19

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 07/17/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Annually

City of El Segundo Underground Storage Tank

Underground storage tank sites located in El Segundo city.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 04/19/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 21

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 07/12/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: No Update Planned

City of Long Beach Underground Storage Tank

Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 04/22/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/27/2019
Number of Days to Update: 65

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 06/27/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 10/02/2019
Number of Days to Update: 64

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 05/28/2019
Date Data Arrived at EDR: 05/30/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 67

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

MARIN COUNTY:

Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 09/26/2018
Date Data Arrived at EDR: 10/04/2018
Date Made Active in Reports: 11/02/2018
Number of Days to Update: 29

Source: Public Works Department Waste Management
Telephone: 415-473-6647
Last EDR Contact: 09/25/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 05/29/2019
Date Data Arrived at EDR: 05/30/2019
Date Made Active in Reports: 07/22/2019
Number of Days to Update: 53

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

MONO COUNTY:

CUPA Facility List
CUPA Facility List

Date of Government Version: 05/23/2019
Date Data Arrived at EDR: 05/30/2019
Date Made Active in Reports: 07/22/2019
Number of Days to Update: 53

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

MONTEREY COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 07/25/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/30/2019
Number of Days to Update: 62

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 09/30/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Varies

NAPA COUNTY:

Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 01/09/2017
Date Data Arrived at EDR: 01/11/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 50

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: No Update Planned

Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 02/21/2019
Date Data Arrived at EDR: 02/22/2019
Date Made Active in Reports: 03/08/2019
Number of Days to Update: 14

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 09/05/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 07/23/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 10/02/2019
Number of Days to Update: 64

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 07/25/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

ORANGE COUNTY:

List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 05/09/2019
Date Made Active in Reports: 05/30/2019
Number of Days to Update: 21

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 05/09/2019
Date Made Active in Reports: 05/30/2019
Number of Days to Update: 21

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 04/02/2019
Date Data Arrived at EDR: 05/07/2019
Date Made Active in Reports: 07/16/2019
Number of Days to Update: 70

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

PLACER COUNTY:

Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 06/03/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/12/2019
Number of Days to Update: 69

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Semi-Annually

PLUMAS COUNTY:

CUPA Facility List
Plumas County CUPA Program facilities.

Date of Government Version: 03/31/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/26/2019
Number of Days to Update: 64

Source: Plumas County Environmental Health
Telephone: 530-283-6355
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 07/10/2019
Date Data Arrived at EDR: 07/11/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 71

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Quarterly

Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 07/10/2019
Date Data Arrived at EDR: 07/11/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 74

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 05/06/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 55

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 10/01/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Quarterly

Master Hazardous Materials Facility List

Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 05/06/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 09/13/2019
Number of Days to Update: 77

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 10/01/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Quarterly

SAN BENITO COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 07/16/2019
Date Data Arrived at EDR: 07/16/2019
Date Made Active in Reports: 09/24/2019
Number of Days to Update: 70

Source: San Benito County Environmental Health
Telephone: N/A
Last EDR Contact: 07/16/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

SAN BERNARDINO COUNTY:

Hazardous Material Permits

This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 05/31/2019
Date Data Arrived at EDR: 05/31/2019
Date Made Active in Reports: 07/22/2019
Number of Days to Update: 52

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 65

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

Solid Waste Facilities
San Diego County Solid Waste Facilities.

Date of Government Version: 04/18/2018
Date Data Arrived at EDR: 04/24/2018
Date Made Active in Reports: 06/19/2018
Number of Days to Update: 56
Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

Local Oversight Program Listing
A listing of all LOP release sites that are or were under the County of San Diego's jurisdiction. Included are closed or transferred cases, open cases, and cases that did not have a case type indicated. The cases without a case type are mostly complaints; however, some of them could be LOP cases.

Date of Government Version: 07/16/2019
Date Data Arrived at EDR: 07/23/2019
Date Made Active in Reports: 09/30/2019
Number of Days to Update: 69
Source: Department of Environmental Health
Telephone: 858-505-6874
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

Environmental Case Listing
The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24
Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

Local Oversite Facilities
A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10
Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: No Update Planned

Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 08/01/2019
Date Data Arrived at EDR: 08/02/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 67
Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 06/22/2018
Date Data Arrived at EDR: 06/26/2018
Date Made Active in Reports: 07/11/2018
Number of Days to Update: 15
Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 09/11/2019
Next Scheduled EDR Contact: 12/29/2019
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 05/20/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 58

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

SAN MATEO COUNTY:

Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 08/06/2019
Date Data Arrived at EDR: 08/14/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 1

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Annually

Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 03/29/2019
Date Data Arrived at EDR: 03/29/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 61

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 09/05/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: No Update Planned

SANTA CLARA COUNTY:

Cupa Facility List
Cupa facility list

Date of Government Version: 05/16/2019
Date Data Arrived at EDR: 05/23/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 56

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

HIST LUST - Fuel Leak Site Activity Report
A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LOP Listing
A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13
Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: No Update Planned

Hazardous Material Facilities
Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 07/30/2019
Date Data Arrived at EDR: 08/02/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 67
Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA Facility List
CUPA facility listing.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 90
Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 06/15/2017
Date Data Arrived at EDR: 06/19/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 51
Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

SOLANO COUNTY:

Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 08/13/2019
Number of Days to Update: 68
Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 47
Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

SONOMA COUNTY:

Cupa Facility List
Cupa Facility list

Date of Government Version: 06/18/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 29

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Varies

Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 07/02/2019
Date Data Arrived at EDR: 07/02/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 80

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

STANISLAUS COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 07/18/2019
Date Data Arrived at EDR: 07/18/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 70

Source: Stanislaus County Department of Ennvironmental Protection
Telephone: 209-525-6751
Last EDR Contact: 07/15/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Varies

SUTTER COUNTY:

Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 06/03/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 49

Source: Sutter County Environmental Health Services
Telephone: 530-822-7500
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Semi-Annually

TEHAMA COUNTY:

CUPA Facility List
Cupa facilities

Date of Government Version: 05/20/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 58

Source: Tehama County Department of Environmental Health
Telephone: 530-527-8020
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

TRINITY COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/23/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 65

Source: Department of Toxic Substances Control
Telephone: 760-352-0381
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

TULARE COUNTY:

CUPA Facility List
Cupa program facilities

Date of Government Version: 05/09/2019
Date Data Arrived at EDR: 05/10/2019
Date Made Active in Reports: 07/17/2019
Number of Days to Update: 68

Source: Tulare County Environmental Health Services Division
Telephone: 559-624-7400
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

TUOLUMNE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 04/23/2018
Date Data Arrived at EDR: 04/25/2018
Date Made Active in Reports: 06/25/2018
Number of Days to Update: 61

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 05/29/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 09/30/2019
Number of Days to Update: 63

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 09/25/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: No Update Planned

Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 08/07/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: No Update Planned

Medical Waste Program List

To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 05/29/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 09/30/2019
Number of Days to Update: 63

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Quarterly

Underground Tank Closed Sites List

Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 42

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report

Underground storage tank sites located in Yolo county.

Date of Government Version: 06/26/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 07/31/2019
Number of Days to Update: 33

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 09/25/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Annually

YUBA COUNTY:

CUPA Facility List

CUPA facility listing for Yuba County.

Date of Government Version: 07/26/2019
Date Data Arrived at EDR: 07/31/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 69

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 07/25/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

Oil/Gas Pipelines

Source: PennWell Corporation

Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Electric Power Transmission Line Data

Source: PennWell Corporation

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GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish & Game
Telephone: 916-445-0411

STREET AND ADDRESS INFORMATION

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Middletown Housing Site
21000 Santa Clara
Middletown, CA 95461

Inquiry Number: 5804415.2s
September 26, 2019

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

21000 SANTA CLARA
MIDDLETOWN, CA 95461

COORDINATES

Latitude (North):	38.7559140 - 38° 45' 21.29''
Longitude (West):	122.6207570 - 122° 37' 14.72''
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	532952.8
UTM Y (Meters):	4289551.5
Elevation:	1102 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5602144 MIDDLETOWN, CA
Version Date:	2012
Southeast Map:	5602108 DETERT RESERVOIR, CA
Version Date:	2012
Southwest Map:	5602150 MOUNT SAINT HELENA, CA
Version Date:	2012
Northwest Map:	5602180 WHISPERING PINES, CA
Version Date:	2012

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140604
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
21000 SANTA CLARA
MIDDLETOWN, CA 95461

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
A1	SOUTH LAKE COUNTY FI	21095 STATE HIGHWAY	RCRA NonGen / NLR	Higher	585, 0.111, SSW
A2	SO LAKE CO FIRE MIDD	21095 STATE HIGHWAY	CERS HAZ WASTE, CUPA Listings, CERS	Higher	585, 0.111, SSW
A3	CA DEPT OF TRANSP	21121 175	LUST, HIST CORTESE, CERS	Higher	588, 0.111, SSW
A4	SOUTHLAKE CO FIRE PR	21121 HIGHWAY 175	AST	Higher	588, 0.111, SSW
5	MIDDLETOWN AUTOMOTIV	21071 BARNES ST	CUPA Listings	Higher	590, 0.112, ESE
6	PACIFIC BELL	MAIN & STEWARD STREE	RCRA NonGen / NLR	Higher	718, 0.136, SSE
B7	NEW MINNIE CANNON EL	20771 & 20931 BIG CA	ENVIROSTOR, SCH	Lower	768, 0.145, East
B8	MIDDLETOWN USD - MAI	20882 BIG CANYON ROA	CERS HAZ WASTE, CERS	Lower	926, 0.175, East
B9	MIDDLETOWN USD-MHS-M	20932 BIG CANYON ROA	AST	Lower	939, 0.178, East
B10	MIDDLETOWN UNIFIED S	20932 BIG CANYON RD	CUPA Listings	Lower	939, 0.178, East
B11	MIDDLETOWN USD-MHS-M	20932 BIG CANYON ROA	CERS HAZ WASTE, CERS TANKS, CERS	Lower	939, 0.178, East
12	AT&T CORP-TD061-MIDD	21347 HWY 175	CUPA Listings	Higher	1029, 0.195, SE
C13	GEORGE'S UNION 76	21137 CALISTOGA RD	SWEEPS UST, HIST UST	Higher	1309, 0.248, ESE
C14	GEORGE'S UNION 76 (F	21137 CALISTOGA	LUST, HIST CORTESE	Higher	1309, 0.248, ESE
C15	GEORGES UNION 76	21137 CALLISTOGA RD	SWEEPS UST, HIST UST	Higher	1309, 0.248, ESE
C16	GEORGES UNION SERVIC	21137 CALISTOGA RD	HIST UST	Higher	1309, 0.248, ESE
C17	JOHN KENNY ANTIQUES	21157 CALISTOGA STRE	LUST, CERS	Higher	1343, 0.254, SE
18	JOLLY KONE RESTAURAN	21010 HIGHWAY 29	LUST, CERS	Higher	1411, 0.267, ESE
19	AREA #1 ROAD YARD	15784 DOUGLAS ST	LUST, HIST CORTESE, CERS	Higher	1846, 0.350, SE
20	FIRE STATION #60	21218 CALISTOGA RD	LUST, CUPA Listings, HIST CORTESE, CERS	Higher	2007, 0.380, SSE
21	REDBUD COMMUNITY HOS	21268 CALISTOGA STRE	ENVIROSTOR	Higher	2222, 0.421, SSE

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ---------- Federal Facility Site Information listing
SEMS ---------- Superfund Enterprise Management System

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE ---------- Superfund Enterprise Management System Archive

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-SQG ---------- RCRA - Small Quantity Generators
RCRA-VSQG ---------- RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

Federal institutional controls / engineering controls registries

LUCIS ---------- Land Use Control Information System

US ENG CONTROLS..... Engineering Controls Sites List
US INST CONTROL..... Sites with Institutional Controls

Federal ERNS list

ERNS..... Emergency Response Notification System

State- and tribal - equivalent NPL

RESPONSE..... State Response Sites

State and tribal landfill and/or solid waste disposal site lists

SWF/LF..... Solid Waste Information System

State and tribal leaking storage tank lists

INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land
CPS-SLIC..... Statewide SLIC Cases

State and tribal registered storage tank lists

FEMA UST..... Underground Storage Tank Listing
UST..... Active UST Facilities
INDIAN UST..... Underground Storage Tanks on Indian Land

State and tribal voluntary cleanup sites

VCP..... Voluntary Cleanup Program Properties
INDIAN VCP..... Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

BROWNFIELDS..... Considered Brownfieds Sites Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT..... Waste Management Unit Database
SWRCY..... Recycler Database
HAULERS..... Registered Waste Tire Haulers Listing
INDIAN ODI..... Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9..... Torres Martinez Reservation Illegal Dump Site Locations
ODI..... Open Dump Inventory
IHS OPEN DUMPS..... Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL..... Delisted National Clandestine Laboratory Register

HIST Cal-Sites	Historical Calsites Database
CDL	Clandestine Drug Labs
Toxic Pits	Toxic Pits Cleanup Act Sites
US CDL	National Clandestine Laboratory Register
PFAS	PFAS Contamination Site Location Listing

Local Lists of Registered Storage Tanks

CA FID UST	Facility Inventory Database

Local Land Records

LIENS	Environmental Liens Listing
LIENS 2	CERCLA Lien Information
DEED	Deed Restriction Listing

Records of Emergency Release Reports

HMIRS	Hazardous Materials Information Reporting System
CHMIRS	California Hazardous Material Incident Report System
LDS	Land Disposal Sites Listing
MCS	Military Cleanup Sites Listing
SPILLS 90	SPILLS 90 data from FirstSearch

Other Ascertainable Records

FUDS	Formerly Used Defense Sites
DOD	Department of Defense Sites
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR	Financial Assurance Information
EPA WATCH LIST	EPA WATCH LIST
2020 COR ACTION	2020 Corrective Action Program List
TSCA	Toxic Substances Control Act
TRIS	Toxic Chemical Release Inventory System
SSTS	Section 7 Tracking Systems
ROD	Records Of Decision
RMP	Risk Management Plans
RAATS	RCRA Administrative Action Tracking System
PRP	Potentially Responsible Parties
PADS	PCB Activity Database System
ICIS	Integrated Compliance Information System
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS	Material Licensing Tracking System
COAL ASH DOE	Steam-Electric Plant Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER	PCB Transformer Registration Database
RADINFO	Radiation Information Database
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS	Incident and Accident Data
CONSENT	Superfund (CERCLA) Consent Decrees
INDIAN RESERV	Indian Reservations
FUSRAP	Formerly Utilized Sites Remedial Action Program
UMTRA	Uranium Mill Tailings Sites
LEAD SMELTERS	Lead Smelter Sites

EXECUTIVE SUMMARY

US AIRS ---- Aerometric Information Retrieval System Facility Subsystem
US MINES ---- Mines Master Index File
ABANDONED MINES ---- Abandoned Mines
FINDS ---- Facility Index System/Facility Registry System
DOCKET HWC ---- Hazardous Waste Compliance Docket Listing
UXO ---- Unexploded Ordnance Sites
ECHO ---- Enforcement & Compliance History Information
FUELS PROGRAM ---- EPA Fuels Program Registered Listing
CA BOND EXP. PLAN ---- Bond Expenditure Plan
Cortese ---- "Cortese" Hazardous Waste & Substances Sites List
DRYCLEANERS ---- Cleaner Facilities
EMI ---- Emissions Inventory Data
ENF ---- Enforcement Action Listing
Financial Assurance ---- Financial Assurance Information Listing
HAZNET ---- Facility and Manifest Data
ICE ---- ICE
HWP ---- EnviroStor Permitted Facilities Listing
HWT ---- Registered Hazardous Waste Transporter Database
MINES ---- Mines Site Location Listing
MWMP ---- Medical Waste Management Program Listing
NPDES ---- NPDES Permits Listing
PEST LIC ---- Pesticide Regulation Licenses Listing
PROC ---- Certified Processors Database
Notify 65 ---- Proposition 65 Records
UIC ---- UIC Listing
UIC GEO ---- UIC GEO (GEOTRACKER)
WASTEWATER PITS ---- Oil Wastewater Pits Listing
WDS ---- Waste Discharge System
WIP ---- Well Investigation Program Case List
MILITARY PRIV SITES ---- MILITARY PRIV SITES (GEOTRACKER)
PROJECT ---- PROJECT (GEOTRACKER)
WDR ---- Waste Discharge Requirements Listing
CIWQS ---- California Integrated Water Quality System
CERS ---- CERS
NON-CASE INFO ---- NON-CASE INFO (GEOTRACKER)
OTHER OIL GAS ---- OTHER OIL & GAS (GEOTRACKER)
PROD WATER PONDS ---- PROD WATER PONDS (GEOTRACKER)
SAMPLING POINT ---- SAMPLING POINT (GEOTRACKER)
WELL STIM PROJ ---- Well Stimulation Project (GEOTRACKER)

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP ---- EDR Proprietary Manufactured Gas Plants
EDR Hist Auto ---- EDR Exclusive Historical Auto Stations
EDR Hist Cleaner ---- EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF ---- Recovered Government Archive Solid Waste Facilities List

EXECUTIVE SUMMARY

RGA LUST ---------- Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

State- and tribal - equivalent CERCLIS

ENVIROSTOR: The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

A review of the ENVIROSTOR list, as provided by EDR, and dated 04/29/2019 has revealed that there are 2 ENVIROSTOR sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
REDBUD COMMUNITY HOS Facility Id: 17800001 Status: No Action Required	21268 CALISTOGA STRE	SSE 1/4 - 1/2 (0.421 mi.)	21	52

Lower Elevation	Address	Direction / Distance	Map ID	Page
NEW MINNIE CANNON EL Facility Id: 60001113 Status: No Further Action	***20771 & 20931 BIG CA***	***E 1/8 - 1/4 (0.145 mi.)***	***B7***	***19***

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

A review of the LUST list, as provided by EDR, has revealed that there are 6 LUST sites within

approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CA DEPT OF TRANSP	***21121 175***	***SSW 0 - 1/8 (0.111 mi.)***	***A3***	***14***
Database: LUST REG 5, Date of Government Version: 07/01/2008				
Database: LUST, Date of Government Version: 06/10/2019				
Status: Completed - Case Closed				
Status: Case Closed				
Global Id: T0603300035				
GEORGE'S UNION 76 (F	***21137 CALISTOGA***	***ESE 1/8 - 1/4 (0.248 mi.)***	***C14***	***32***
Database: LUST REG 5, Date of Government Version: 07/01/2008				
Database: LUST, Date of Government Version: 06/10/2019				
Status: Completed - Case Closed				
Status: Case Closed				
Global Id: T0603300041				
JOHN KENNY ANTIQUES	***21157 CALISTOGA STRE***	***SE 1/4 - 1/2 (0.254 mi.)***	***C17***	***37***
Database: LUST REG 5, Date of Government Version: 07/01/2008				
Database: LUST, Date of Government Version: 06/10/2019				
Status: Completed - Case Closed				
Status: Pollution Characterization				
Global Id: T0603374792				
JOLLY KONE RESTAURAN	***21010 HIGHWAY 29***	***ESE 1/4 - 1/2 (0.267 mi.)***	***18***	***45***
Database: LUST, Date of Government Version: 06/10/2019				
Status: Completed - Case Closed				
Global Id: T10000008192				
AREA #1 ROAD YARD	***15784 DOUGLAS ST***	***SE 1/4 - 1/2 (0.350 mi.)***	***19***	***46***
Database: LUST REG 5, Date of Government Version: 07/01/2008				
Database: LUST, Date of Government Version: 06/10/2019				
Status: Completed - Case Closed				
Status: Case Closed				
Global Id: T0603300060				
FIRE STATION #60	***21218 CALISTOGA RD***	***SSE 1/4 - 1/2 (0.380 mi.)***	***20***	***49***
Database: LUST REG 5, Date of Government Version: 07/01/2008				
Database: LUST, Date of Government Version: 06/10/2019				
Status: Completed - Case Closed				
Status: Case Closed				
Global Id: T0603300039				

State and tribal registered storage tank lists

AST: A listing of aboveground storage tank petroleum storage tank locations.

A review of the AST list, as provided by EDR, has revealed that there are 2 AST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SOUTHLAKE CO FIRE PR	21121 HIGHWAY 175	SSW 0 - 1/8 (0.111 mi.)	A4	17
Database: AST, Date of Government Version: 07/06/2016				

Lower Elevation	Address	Direction / Distance	Map ID	Page
MIDDLETOWN USD-MHS-M	20932 BIG CANYON ROA	E 1/8 - 1/4 (0.178 mi.)	B9	25
Database: AST, Date of Government Version: 07/06/2016				

EXECUTIVE SUMMARY

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Hazardous waste / Contaminated Sites

SCH: This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category. depending on the level of threat to public health and safety or the. environment they pose.

A review of the SCH list, as provided by EDR, and dated 04/29/2019 has revealed that there is 1 SCH site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
NEW MINNIE CANNON EL	***20771 & 20931 BIG CA***	***E 1/8 - 1/4 (0.145 mi.)***	***B7***	***19***
Facility Id: 60001113				
Status: No Further Action				

CERS HAZ WASTE: List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, and RCRA LQ HW Generator programs.

A review of the CERS HAZ WASTE list, as provided by EDR, and dated 08/14/2019 has revealed that there are 3 CERS HAZ WASTE sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SO LAKE CO FIRE MIDD	***21095 STATE HIGHWAY***	***SSW 0 - 1/8 (0.111 mi.)***	***A2***	***9***

Lower Elevation	Address	Direction / Distance	Map ID	Page
MIDDLETOWN USD - MAI	***20882 BIG CANYON ROA***	***E 1/8 - 1/4 (0.175 mi.)***	***B8***	***23***
MIDDLETOWN USD-MHS-M	***20932 BIG CANYON ROA***	***E 1/8 - 1/4 (0.178 mi.)***	***B11***	***26***

Local Lists of Registered Storage Tanks

SWEEPS UST: Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

A review of the SWEEPS UST list, as provided by EDR, and dated 06/01/1994 has revealed that there are 2 SWEEPS UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
GEORGE'S UNION 76	***21137 CALISTOGA RD***	***ESE 1/8 - 1/4 (0.248 mi.)***	***C13***	***31***
Status: A				
Tank Status: A				
Comp Number: 35485				
GEORGES UNION 76	***21137 CALLISTOGA RD***	***ESE 1/8 - 1/4 (0.248 mi.)***	***C15***	***35***
Status: A				

Tank Status: A
Comp Number: 65121

HIST UST: Historical UST Registered Database.

A review of the HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there are 3 HIST UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
GEORGE'S UNION 76	***21137 CALISTOGA RD***	***ESE 1/8 - 1/4 (0.248 mi.)***	***C13***	***31***
Facility Id: 00000065121				
GEORGES UNION 76	***21137 CALLISTOGA RD***	***ESE 1/8 - 1/4 (0.248 mi.)***	***C15***	***35***
GEORGES UNION SERVIC	21137 CALISTOGA RD	ESE 1/8 - 1/4 (0.248 mi.)	C16	36
Facility Id: 00000035485				

CERS TANKS: List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Aboveground Petroleum Storage and Underground Storage Tank regulatory programs.

A review of the CERS TANKS list, as provided by EDR, and dated 08/14/2019 has revealed that there is 1 CERS TANKS site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
MIDDLETOWN USD-MHS-M	***20932 BIG CANYON ROA***	***E 1/8 - 1/4 (0.178 mi.)***	***B11***	***26***

Other Ascertainable Records

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 03/25/2019 has revealed that there are 2 RCRA NonGen / NLR sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SOUTH LAKE COUNTY FI	21095 STATE HIGHWAY	SSW 0 - 1/8 (0.111 mi.)	A1	8
EPA ID:: CAH111000378				
PACIFIC BELL	MAIN & STEWARD STREE	SSE 1/8 - 1/4 (0.136 mi.)	6	18
EPA ID:: CAT080014665				

EXECUTIVE SUMMARY

CUPA Listings: A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

A review of the CUPA Listings list, as provided by EDR, has revealed that there are 4 CUPA Listings sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SO LAKE CO FIRE MIDD	***21095 STATE HIGHWAY***	***SSW 0 - 1/8 (0.111 mi.)***	***A2***	***9***
Database: CUPA LAKE, Date of Government Version: 05/30/2019 Facility: FA0000224				
MIDDLETOWN AUTOMOTIV	21071 BARNES ST	ESE 0 - 1/8 (0.112 mi.)	5	17
Database: CUPA LAKE, Date of Government Version: 05/30/2019 Facility: FA0000184				
AT&T CORP-TD061-MIDD	21347 HWY 175	SE 1/8 - 1/4 (0.195 mi.)	12	30
Database: CUPA LAKE, Date of Government Version: 05/30/2019 Facility: FA0000593				

Lower Elevation	Address	Direction / Distance	Map ID	Page
MIDDLETOWN UNIFIED S	20932 BIG CANYON RD	E 1/8 - 1/4 (0.178 mi.)	B10	25
Database: CUPA LAKE, Date of Government Version: 05/30/2019 Facility: FA0000438				

HIST CORTESE: The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

A review of the HIST CORTESE list, as provided by EDR, and dated 04/01/2001 has revealed that there are 4 HIST CORTESE sites within approximately 0.5 miles of the target property.

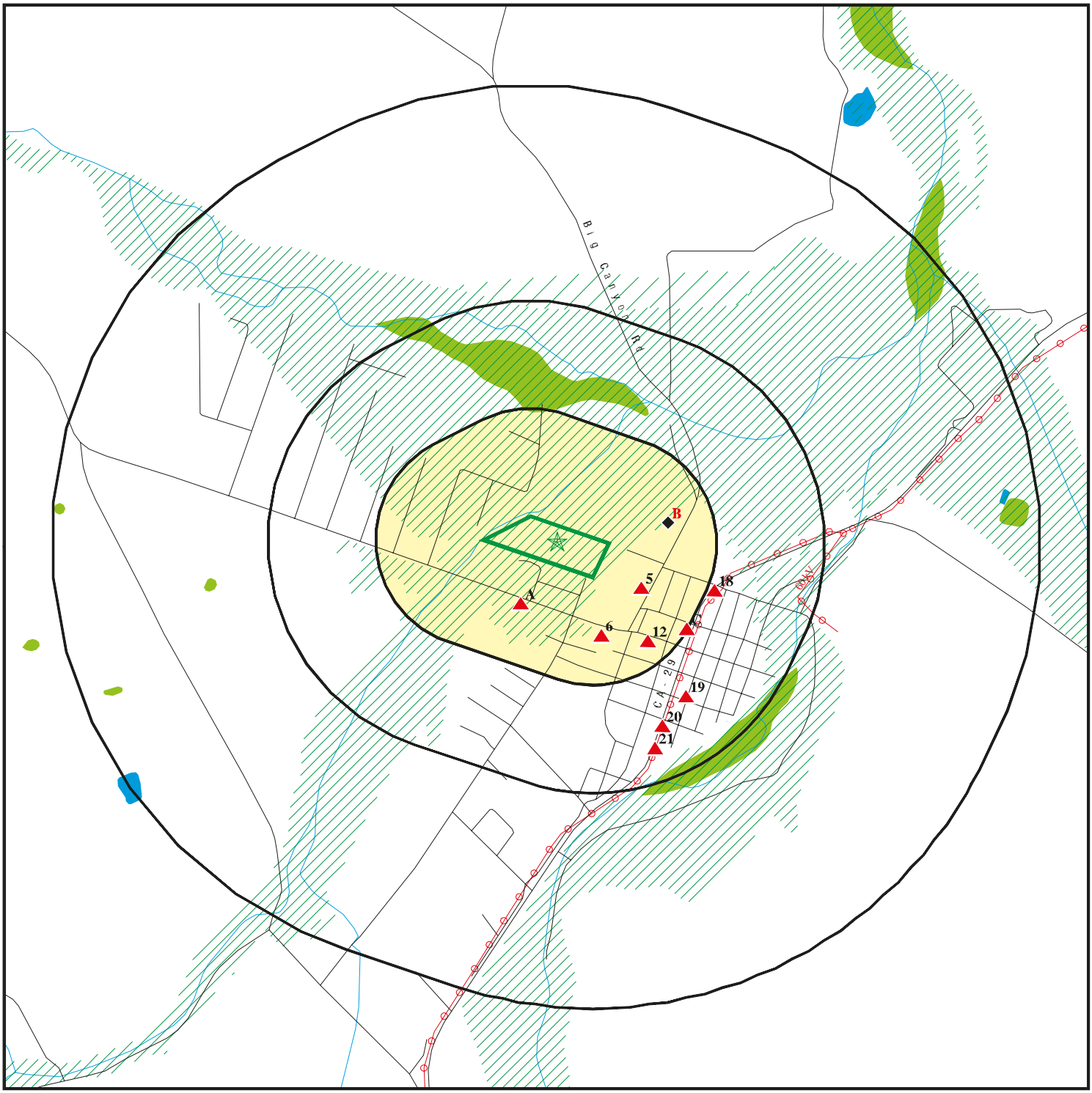
Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CA DEPT OF TRANSP	***21121 175***	***SSW 0 - 1/8 (0.111 mi.)***	***A3***	***14***
Reg Id: 170055				
GEORGE'S UNION 76 (F	***21137 CALISTOGA***	***ESE 1/8 - 1/4 (0.248 mi.)***	***C14***	***32***
Reg Id: 170061				
AREA #1 ROAD YARD	***15784 DOUGLAS ST***	***SE 1/4 - 1/2 (0.350 mi.)***	***19***	***46***
Reg Id: 170080				
FIRE STATION #60	***21218 CALISTOGA RD***	***SSE 1/4 - 1/2 (0.380 mi.)***	***20***	***49***
Reg Id: 170059				

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 1 records.

Site Name	Database(s)
MIDDLETOWN VALLEY FIRE RESPONSE 20	SEMS

OVERVIEW MAP - 5804415.2S



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

0 1/4 1/2 1 Miles

Indian Reservations BIA

Power transmission lines

Special Flood Hazard Area (1%)

0.2% Annual Chance Flood Hazard

National Wetland Inventory

State Wetlands

Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Middletown Housing Site	CLIENT:	ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS:	21000 Santa Clara Middletown CA 95461	CONTACT:	Kristen Miner
		INQUIRY #:	5804415.2s
LAT/LONG:	38.755914 / 122.620757	DATE:	September 26, 2019 3:44 pm

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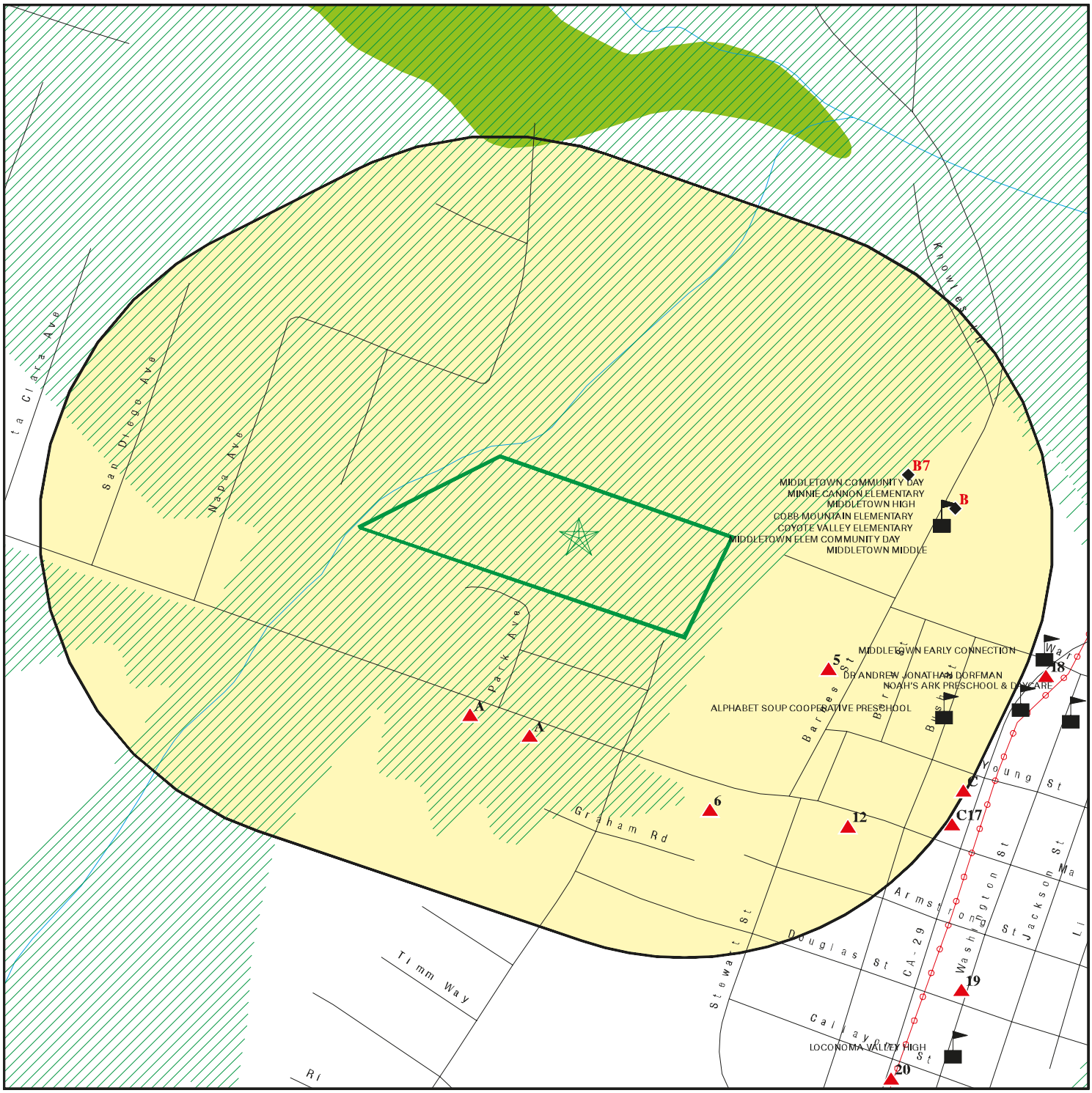
DETAIL MAP - 5804415.2S



0 1/16 1/8 1/4 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- National Wetland Inventory
- State Wetlands
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Middletown Housing Site	CLIENT:	ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS:	21000 Santa Clara Middletown CA 95461	CONTACT:	Kristen Miner
LAT/LONG:	38.755914 / 122.620757	INQUIRY #:	5804415.2s
		DATE:	September 26, 2019 3:50 pm

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-VSQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	0.001		0	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
RESPONSE	1.000		0	0	0	0	NR	0
State- and tribal - equivalent CERCLIS								
ENVIROSTOR	1.000		0	1	1	0	NR	2
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		1	1	4	NR	NR	6

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN LUST	0.500		0	0	0	NR	NR	0
CPS-SLIC	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		1	1	NR	NR	NR	2
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal voluntary cleanup sites								
VCP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
WMUDS/SWAT	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
HAULERS	0.001		0	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.001		0	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	1	NR	NR	NR	1
CDL	0.001		0	NR	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	0	NR	0
CERS HAZ WASTE	0.250		1	2	NR	NR	NR	3
US CDL	0.001		0	NR	NR	NR	NR	0
PFAS	0.500		0	0	0	NR	NR	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.250		0	2	NR	NR	NR	2
HIST UST	0.250		0	3	NR	NR	NR	3
CERS TANKS	0.250		0	1	NR	NR	NR	1
CA FID UST	0.250		0	0	NR	NR	NR	0
Local Land Records								
LIENS	0.001		0	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
LIENS 2	0.001		0	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	0.001		0	NR	NR	NR	NR	0
CHMIRS	0.001		0	NR	NR	NR	NR	0
LDS	0.001		0	NR	NR	NR	NR	0
MCS	0.001		0	NR	NR	NR	NR	0
SPILLS 90	0.001		0	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		1	1	NR	NR	NR	2
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	0.001		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.001		0	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	0.001		0	NR	NR	NR	NR	0
TRIS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	0.001		0	NR	NR	NR	NR	0
RAATS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		0	NR	NR	NR	NR	0
PADS	0.001		0	NR	NR	NR	NR	0
ICIS	0.001		0	NR	NR	NR	NR	0
FTTS	0.001		0	NR	NR	NR	NR	0
MLTS	0.001		0	NR	NR	NR	NR	0
COAL ASH DOE	0.001		0	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	0.001		0	NR	NR	NR	NR	0
RADINFO	0.001		0	NR	NR	NR	NR	0
HIST FTTS	0.001		0	NR	NR	NR	NR	0
DOT OPS	0.001		0	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	0.001		0	NR	NR	NR	NR	0
US AIRS	0.001		0	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	0.001		0	NR	NR	NR	NR	0
DOCKET HWC	0.001		0	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
ECHO	0.001		0	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	0	NR	0
Cortese	0.500		0	0	0	NR	NR	0
CUPA Listings	0.250		2	2	NR	NR	NR	4

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
EMI	0.001		0	NR	NR	NR	NR	0
ENF	0.001		0	NR	NR	NR	NR	0
Financial Assurance	0.001		0	NR	NR	NR	NR	0
HAZNET	0.001		0	NR	NR	NR	NR	0
ICE	0.001		0	NR	NR	NR	NR	0
HIST CORTESE	0.500		1	1	2	NR	NR	4
HWP	1.000		0	0	0	0	NR	0
HWT	0.250		0	0	NR	NR	NR	0
MINES	0.250		0	0	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
NPDES	0.001		0	NR	NR	NR	NR	0
PEST LIC	0.001		0	NR	NR	NR	NR	0
PROC	0.500		0	0	0	NR	NR	0
Notify 65	1.000		0	0	0	0	NR	0
UIC	0.001		0	NR	NR	NR	NR	0
UIC GEO	0.001		0	NR	NR	NR	NR	0
WASTEWATER PITS	0.500		0	0	0	NR	NR	0
WDS	0.001		0	NR	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
MILITARY PRIV SITES	0.001		0	NR	NR	NR	NR	0
PROJECT	0.001		0	NR	NR	NR	NR	0
WDR	0.001		0	NR	NR	NR	NR	0
CIWQS	0.001		0	NR	NR	NR	NR	0
CERS	0.001		0	NR	NR	NR	NR	0
NON-CASE INFO	0.001		0	NR	NR	NR	NR	0
OTHER OIL GAS	0.001		0	NR	NR	NR	NR	0
PROD WATER PONDS	0.001		0	NR	NR	NR	NR	0
SAMPLING POINT	0.001		0	NR	NR	NR	NR	0
WELL STIM PROJ	0.001		0	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	0.001		0	NR	NR	NR	NR	0
RGA LUST	0.001		0	NR	NR	NR	NR	0
- Totals --		0	7	16	7	0	0	30

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

A1
SSW
< 1/8
0.111 mi.
585 ft.

SOUTH LAKE COUNTY FIRE PROTECTION DIST
21095 STATE HIGHWAY 175
MIDDLETOWN, CA 95461

Site 1 of 4 in cluster A

RCRA NonGen / NLR | **1024784404** | **CAH111000378**

Relative:
Higher

Actual:
1105 ft.

RCRA NonGen / NLR:

Date form received by agency:	04/04/1995
Facility name:	SOUTH LAKE COUNTY FIRE PROTECTION DIST
Facility address:	21095 STATE HIGHWAY 175 MIDDLETOWN, CA 95461-0000
EPA ID:	CAH111000378
Mailing address:	PO BOX 1360 MIDDLETOWN, CA 95461-0000
Contact:	GILBERT HORST/FIRE CHIEF
Contact address:	21095 STATE HIGHWAY 175 MIDDLETOWN, CA 95461-0000
Contact country:	Not reported
Contact telephone:	707-987-3089
Contact email:	Not reported
EPA Region:	09
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	SOUTH LAKE CTY FIRE DISTRICT
Owner/operator address:	21095 STATE HIGHWAY 175 MIDDLETOWN, CA 95461
Owner/operator country:	Not reported
Owner/operator telephone:	000-000-0000
Owner/operator email:	Not reported
Owner/operator fax:	Not reported
Owner/operator extension:	Not reported
Legal status:	Other
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Owner/operator name:	GILBERT HORST/FIRE CHIEF
Owner/operator address:	21095 STATE HIGHWAY 175 MIDDLETOWN, CA 95461
Owner/operator country:	Not reported
Owner/operator telephone:	707-987-3089
Owner/operator email:	Not reported
Owner/operator fax:	Not reported
Owner/operator extension:	Not reported
Legal status:	Other
Owner/Operator Type:	Operator
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	Yes
Treater, storer or disposer of HW:	No
Underground injection activity:	No

SOUTH LAKE COUNTY FIRE PROTECTION DIST (Continued) **1024784404**

On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Violation Status: No violations found

A2 **SO LAKE CO FIRE MIDDLETOWN STATION 60** **CERS HAZ WASTE** **S104575097**
SSW **21095 STATE HIGHWAY 175** **CUPA Listings** **N/A**
< 1/8 **MIDDLETOWN, CA 95461** **CERS**
0.111 mi.
585 ft. **Site 2 of 4 in cluster A**

Relative:
Higher

Actual:
1105 ft.

CERS HAZ WASTE:

Name:	SO LAKE CO FIRE MIDDLETOWN STATION 60
Address:	21095 STATE HIGHWAY 175
City,State,Zip:	MIDDLETOWN, CA 95461
Site ID:	68726
CERS ID:	10136176
CERS Description:	Hazardous Waste Generator

CUPA LAKE:

Name:	SO LAKE CO FIRE MIDDLETOWN STATION 60
Address:	21095 STATE HIGHWAY 175
City,State,Zip:	MIDDLETOWN, CA 95461
Facility:	FA0000224
Business Type:	1 - CUPA
Program Element:	2018 - EXEMPT - HMRRP Category 2
Mailing Address:	PO Box 1360 c/o Scott Upton Middletown, CA 95461
Mailing Telephone:	7079873089
Entered Date:	11/21/2012
Program Identifier:	CUPA-21095 HWY 175, MIDDLETOWN
Record ID:	PR0000826
Billing Status:	01 - ACTIVE, BILLABLE
Total Fee Amount:	0.00
Current Inspection Date:	05/16/2019
Contact Name:	Scott Upton
Mailing Address:	Middletown, CA 95461
APN:	Not reported
Program/Element Code:	2018

Name:	SO LAKE CO FIRE MIDDLETOWN STATION 60
Address:	21095 STATE HIGHWAY 175
City,State,Zip:	MIDDLETOWN, CA 95461
Facility:	FA0000224
Business Type:	1 - CUPA
Program Element:	2800 - CUPA Hazardous Waste Generator Program
Mailing Address:	PO Box 1360 c/o Scott Upton Middletown, CA 95461
Mailing Telephone:	7079873089
Entered Date:	11/21/2012
Program Identifier:	CUPA-21095 HWY 175, MIDDLETOWN
Record ID:	PR0000827
Billing Status:	01 - ACTIVE, BILLABLE

SO LAKE CO FIRE MIDDLETOWN STATION 60 (Continued) **S104575097**

Total Fee Amount: 0.00
Current Inspection Date: 05/16/2019
Contact Name: Scott Upton
Mailing Address: Middletown, CA 95461
APN: Not reported
Program/Element Code: 2800

Name: SO LAKE CO FIRE MIDDLETOWN STATION 60
Address: 21095 STATE HIGHWAY 175
City,State,Zip: MIDDLETOWN, CA 95461
Facility: FA0000224
Business Type: 1 - CUPA
Program Element: 2500 - APSA 1320 GALS OR ABOVE PROGRAM
Mailing Address: PO Box 1360 c/o Scott Upton Middletown, CA 95461
Mailing Telephone: 7079873089
Entered Date: 11/21/2012
Program Identifier: CUPA-21095 HWY 175, MIDDLETOWN
Record ID: PR0000828
Billing Status: 02 - INACTIVE, NON-BILLABLE
Total Fee Amount: 0.00
Current Inspection Date: 01/25/2016
Contact Name: Scott Upton
Mailing Address: Middletown, CA 95461
APN: Not reported
Program/Element Code: 2500

Name: SO LAKE CO FIRE MIDDLETOWN STATION 60
Address: 21095 STATE HIGHWAY 175
City,State,Zip: MIDDLETOWN, CA 95461
Facility: FA0000224
Business Type: 1 - CUPA
Program Element: 2300 - CUPA Oversight State Surcharge Program
Mailing Address: PO Box 1360 c/o Scott Upton Middletown, CA 95461
Mailing Telephone: 7079873089
Entered Date: 11/21/2012
Program Identifier: CUPA-21095 HWY 175, MIDDLETOWN
Record ID: PR0000830
Billing Status: 01 - ACTIVE, BILLABLE
Total Fee Amount: 49.00
Current Inspection Date: 01/01/2020
Contact Name: Scott Upton
Mailing Address: Middletown, CA 95461
APN: Not reported
Program/Element Code: 2300

CERS:
Name: SO LAKE CO FIRE MIDDLETOWN STATION 60
Address: 21095 STATE HIGHWAY 175
City,State,Zip: MIDDLETOWN, CA 95461
Site ID: 68726
CERS ID: 10136176
CERS Description: Chemical Storage Facilities

Violations:
Site ID: 68726
Site Name: So Lake Co Fire Middletown Station 60
Violation Date: 05-16-2016

SO LAKE CO FIRE MIDDLETOWN STATION 60 (Continued) **S104575097**

Citation:	HSC 6.95 Multiple - California Health and Safety Code, Chapter 6.95, Section(s) Multiple
Violation Description:	Business Plan Program - Administration/Documentation - General
Violation Notes:	Returned to compliance on 06/15/2016. There were approximately 7 tanks x approx 200 cubic feet/tank=1400 cubic feet of oxygen onsite during inspection that were not reported on CERS inventory. Please add oxygen to inventory. Onsite personnel indicated anywhere from 7 to 11 of the larger cylinders onsite at any given time.
Violation Division:	Lake County Environmental Health
Violation Program:	HMRRP
Violation Source:	CERS
Site ID:	68726
Site Name:	So Lake Co Fire Middletown Station 60
Violation Date:	05-16-2016
Citation:	HSC 6.5 Multiple Sections - California Health and Safety Code, Chapter 6.5, Section(s) Multiple Sections
Violation Description:	Haz Waste Generator Program - Operations/Maintenance - General
Violation Notes:	Returned to compliance on 06/15/2016. Waste oil tank onsite that is owned and operated by Lake County Public Services as a service to the community. Numerous oil filters that appeared to have been emptied and left in various places around oil tank instead of being placed in waste oil filters drum after draining. Small amount of soil also impacted by relaxed enforcement of dumping protocol (Fire Department cannot always be around to supervise). Clean up oil filters and place in 55 gallon drum onsite for their disposal. Remove and properly dispose of soil impacted by spills.
Violation Division:	Lake County Environmental Health
Violation Program:	HW
Violation Source:	CERS
Site ID:	68726
Site Name:	So Lake Co Fire Middletown Station 60
Violation Date:	03-01-2018
Citation:	HSC 6.95 25508.2 - California Health and Safety Code, Chapter 6.95, Section(s) 25508.2
Violation Description:	Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date.
Violation Notes:	OBSERVATION: Owner/Operator failed to submit inventory reports by March 1 to CERS. (Activities, Inventory, Map, Emergency Response and Contingency) CORRECTIVE ACTION: Owner/Operator shall submit inventory reports in CERS within 30 Days of this notice.
Violation Division:	Lake County Environmental Health
Violation Program:	HMRRP
Violation Source:	CERS

Evaluation:

Eval General Type:	Other/Unknown
Eval Date:	04-16-2018
Violations Found:	Yes
Eval Type:	Other, not routine, done by local agency
Eval Notes:	NOV
Eval Division:	Lake County Environmental Health
Eval Program:	HMRRP
Eval Source:	CERS

SO LAKE CO FIRE MIDDLETOWN STATION 60 (Continued) **S104575097**

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-16-2016
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: Lake County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-16-2016
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: Lake County Environmental Health
Eval Program: HW
Eval Source: CERS

Enforcement Action:
Site ID: 68726
Site Name: So Lake Co Fire Middletown Station 60
Site Address: 21095 STATE HIGHWAY 175
Site City: MIDDLETOWN
Site Zip: 95461
Enf Action Date: 04-16-2018
Enf Action Type: Notice of Violation (Unified Program)
Enf Action Description: Notice of Violation Issued by the Inspector at the Time of Inspection
Enf Action Notes: Not reported
Enf Action Division: Lake County Environmental Health
Enf Action Program: HMRRP
Enf Action Source: CERS

Site ID: 68726
Site Name: So Lake Co Fire Middletown Station 60
Site Address: 21095 STATE HIGHWAY 175
Site City: MIDDLETOWN
Site Zip: 95461
Enf Action Date: 05-16-2016
Enf Action Type: Notice of Violation (Unified Program)
Enf Action Description: Notice of Violation Issued by the Inspector at the Time of Inspection
Enf Action Notes: Not reported
Enf Action Division: Lake County Environmental Health
Enf Action Program: HMRRP
Enf Action Source: CERS

Site ID: 68726
Site Name: So Lake Co Fire Middletown Station 60
Site Address: 21095 STATE HIGHWAY 175
Site City: MIDDLETOWN
Site Zip: 95461
Enf Action Date: 05-16-2016
Enf Action Type: Notice of Violation (Unified Program)
Enf Action Description: Notice of Violation Issued by the Inspector at the Time of Inspection
Enf Action Notes: Not reported
Enf Action Division: Lake County Environmental Health
Enf Action Program: HW
Enf Action Source: CERS

SO LAKE CO FIRE MIDDLETOWN STATION 60 (Continued) **S104575097**

Affiliation:

Affiliation Type Desc:	CUPA District
Entity Name:	Lake County Environmental Health
Entity Title:	Not reported
Affiliation Address:	922 Bevins Court
Affiliation City:	Lakeport
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	95453
Affiliation Phone:	(707) 263-1164

Affiliation Type Desc:	Document Preparer
Entity Name:	Mandi Huff
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

Affiliation Type Desc:	Facility Mailing Address
Entity Name:	Mailing Address
Entity Title:	Not reported
Affiliation Address:	PO Box 1360
Affiliation City:	Middletown
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	95461
Affiliation Phone:	Not reported

Affiliation Type Desc:	Legal Owner
Entity Name:	South Lake County Fire Protection District
Entity Title:	Not reported
Affiliation Address:	P.O. Box 1360
Affiliation City:	Middletown
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	95461
Affiliation Phone:	(707) 987-3089

Affiliation Type Desc:	Parent Corporation
Entity Name:	So Lake Co Fire Middletown Station 60
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

Affiliation Type Desc:	Property Owner
Entity Name:	South Lake County Fire Protection District
Entity Title:	Not reported
Affiliation Address:	P.O. Box 1360
Affiliation City:	Middletown
Affiliation State:	CA

SO LAKE CO FIRE MIDDLETOWN STATION 60 (Continued) **S104575097**

Affiliation Country:	United States
Affiliation Zip:	95461
Affiliation Phone:	(707) 987-3089
Affiliation Type Desc:	Environmental Contact
Entity Name:	Mike Wink
Entity Title:	Not reported
Affiliation Address:	PO Box 1360
Affiliation City:	Middletown
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	95461
Affiliation Phone:	Not reported
Affiliation Type Desc:	Identification Signer
Entity Name:	Mike Wink
Entity Title:	Battalion Chief
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported
Affiliation Type Desc:	Operator
Entity Name:	Mike Wink
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	(707) 987-3089

A3 **CA DEPT OF TRANSP** **LUST** **S105024961**
SSW **21121 175** **HIST CORTESE** **N/A**
< 1/8 **MIDDLETOWN, CA 95461** **CERS**
0.111 mi.
588 ft. **Site 3 of 4 in cluster A**

Relative: LUST:
Higher

Actual:
1105 ft.

Name:	CA DEPT OF TRANSP
Address:	21121 HWY 175
City,State,Zip:	MIDDLETOWN, CA 95461
Lead Agency:	LAKE COUNTY
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0603300035
Global Id:	T0603300035
Latitude:	38.753556
Longitude:	-122.621513
Status:	Completed - Case Closed
Status Date:	02/24/1995
Case Worker:	MAN
RB Case Number:	170055
Local Agency:	LAKE COUNTY
File Location:	Not reported
Local Case Number:	Not reported

CA DEPT OF TRANSP (Continued) **S105024961**

Potential Media Affect: Soil
Potential Contaminants of Concern: Gasoline
Site History: Not reported

LUST:
Global Id: T0603300035
Contact Type: Regional Board Caseworker
Contact Name: GLENN T. MEEKS
Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: gmeeks@waterboards.ca.gov
Phone Number: Not reported

Global Id: T0603300035
Contact Type: Local Agency Caseworker
Contact Name: MANUEL RAMIREZ
Organization Name: LAKE COUNTY
Address: Not reported
City: r5 UNKNOWN
Email: Not reported
Phone Number: Not reported

LUST:
Global Id: T0603300035
Action Type: Other
Date: 06/18/1992
Action: Leak Discovery

Global Id: T0603300035
Action Type: Other
Date: 06/18/1992
Action: Leak Stopped

Global Id: T0603300035
Action Type: ENFORCEMENT
Date: 02/24/1995
Action: Closure/No Further Action Letter

Global Id: T0603300035
Action Type: Other
Date: 10/26/1992
Action: Leak Reported

LUST:
Global Id: T0603300035
Status: Open - Case Begin Date
Status Date: 06/18/1992

Global Id: T0603300035
Status: Open - Site Assessment
Status Date: 06/18/1992

Global Id: T0603300035
Status: Open - Remediation
Status Date: 04/05/1994

CA DEPT OF TRANSP (Continued) **S105024961**

Global Id: T0603300035
Status: Completed - Case Closed
Status Date: 02/24/1995

LUST REG 5:
Name: CA DEPT OF TRANSP
Address: 21121 HWY 175
City: MIDDLETOWN
Region: 5
Status: Case Closed
Case Number: 170055
Case Type: Soil only
Substance: GASOLINE
Staff Initials: GTM
Lead Agency: Local
Program: LUST
MTBE Code: N/A

HIST CORTESE:
edr_fname: CA DEPT OF TRANSP
edr_fadd1: 21121 175
City,State,Zip: MIDDLETOWN, CA 95461
Region: CORTESE
Facility County Code: 17
Reg By: LTNKA
Reg Id: 170055

CERS:
Name: CA DEPT OF TRANSP
Address: 21121 HWY 175
City,State,Zip: MIDDLETOWN, CA 95461
Site ID: 237761
CERS ID: T0603300035
CERS Description: Leaking Underground Storage Tank Cleanup Site

Affiliation:
Affiliation Type Desc: Local Agency Caseworker
Entity Name: MANUEL RAMIREZ - LAKE COUNTY
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: r5 UNKNOWN
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

Affiliation Type Desc: Regional Board Caseworker
Entity Name: GLENN T. MEEKS - CENTRAL VALLEY RWQCB (REGION 5S)
Entity Title: Not reported
Affiliation Address: 11020 SUN CENTER DRIVE #200
Affiliation City: RANCHO CORDOVA
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

A4
SSW
< 1/8
0.111 mi.
588 ft.

SOUTHLAKE CO FIRE PROTECTION DISTRICT MIDDLETOWN
21121 HIGHWAY 175
MIDDLETOWN, CA

Site 4 of 4 in cluster A

AST **A100337662**
N/A

Relative:
Higher

Actual:
1105 ft.

AST:

Name:	SOUTHLAKE CO FIRE PROTECTION DISTRICT MIDDLETOWN
Address:	21121 HIGHWAY 175
City/Zip:	MIDDLETOWN,
Certified Unified Program Agencies:	Lake
Owner:	SOUTHLAKE CO FIRE PROTECTION DISTRICT
Total Gallons:	2,000
CERSID:	Not reported
Facility ID:	Not reported
Business Name:	Not reported
Phone:	Not reported
Fax:	Not reported
Mailing Address:	Not reported
Mailing Address City:	Not reported
Mailing Address State:	Not reported
Mailing Address Zip Code:	Not reported
Operator Name:	Not reported
Operator Phone:	Not reported
Owner Phone:	Not reported
Owner Mail Address:	Not reported
Owner State:	Not reported
Owner Zip Code:	Not reported
Owner Country:	Not reported
Property Owner Name:	Not reported
Property Owner Phone:	Not reported
Property Owner Mailing Address:	Not reported
Property Owner City:	Not reported
Property Owner Stat :	Not reported
Property Owner Zip Code:	Not reported
Property Owner Country:	Not reported
EPAID:	Not reported

5
ESE
< 1/8
0.112 mi.
590 ft.

MIDDLETOWN AUTOMOTIVE REPAIR
21071 BARNES ST
MIDDLETOWN, CA 95461

CUPA Listings **S112444437**
N/A

Relative:
Higher

Actual:
1102 ft.

CUPA LAKE:

Name:	MIDDLETOWN AUTOMOTIVE REPAIR
Address:	21071 BARNES ST
City,State,Zip:	MIDDLETOWN, CA 95461
Facility:	FA0000184
Business Type:	1 - CUPA
Program Element:	2002 - HMRRP Category 2 (111-500 gal, 1,001-5,000 lb
Mailing Address:	P. O. Box 1207 c/o Ronald Kelly Middletown, CA 95461
Mailing Telephone:	7079878807
Entered Date:	11/19/2012
Program Identifier:	CUPA-21071 BARNES ST., MIDDLETOWN
Record ID:	PR0000584
Billing Status:	02 - INACTIVE, NON-BILLABLE
Total Fee Amount:	391.00
Current Inspection Date:	12/18/2016
Contact Name:	Ronald Kelly

MIDDLETOWN AUTOMOTIVE REPAIR (Continued) **S112444437**

Mailing Address: Middletown, CA 95461
APN: Not reported
Program/Element Code: 2002

Name: MIDDLETOWN AUTOMOTIVE REPAIR
Address: 21071 BARNES ST
City,State,Zip: MIDDLETOWN, CA 95461
Facility: FA0000184
Business Type: 1 - CUPA
Program Element: 2800 - CUPA Hazardous Waste Generator Program
Mailing Address: P. O. Box 1207 c/o Ronald Kelly Middletown, CA 95461
Mailing Telephone: 7079878807
Entered Date: 11/19/2012
Program Identifier: CUPA
Record ID: PR0000585
Billing Status: 02 - INACTIVE, NON-BILLABLE
Total Fee Amount: 0.00
Current Inspection Date: 12/20/2016
Contact Name: Ronald Kelly
Mailing Address: Middletown, CA 95461
APN: Not reported
Program/Element Code: 2800

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6 **PACIFIC BELL** **RCRA NonGen / NLR** **1000250776**
SSE **MAIN & STEWARD STREETS** **CAT080014665**
1/8-1/4 **MIDDLETOWN, CA 95461**
0.136 mi.
718 ft.

Relative:
Higher

Actual:
1108 ft.

RCRA NonGen / NLR:
Date form received by agency: 01/02/1981
Facility name: PACIFIC BELL
Facility address: MAIN & STEWARD STREETS
MIDDLETOWN, CA 95461
EPA ID: CAT080014665
Mailing address: 3707 KINGS WAY SEC A-6
SACRAMENTO, CA 95821
Contact: ENVIRONMENTAL MANAGER
Contact address: MAIN & STEWARD STREETS
MIDDLETOWN, CA 95461
Contact country: US
Contact telephone: 916-485-0997
Contact email: Not reported
EPA Region: 09
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: THE PACIFIC TELEPHONE AND TELEGRAPH CO
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: 415-555-1212
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private

PACIFIC BELL (Continued) **1000250776**

Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Owner/operator name: NOT REQUIRED
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: 415-555-1212
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Violation Status: No violations found

B7 **NEW MINNIE CANNON ELEMENTARY SCHOOL** **ENVIROSTOR** **S109548299**
East **20771 & 20931 BIG CANYON ROAD** **SCH** **N/A**
1/8-1/4 **MIDDLETOWN, CA 95461**
0.145 mi.
768 ft. **Site 1 of 5 in cluster B**

Relative: **Lower**
Actual: **1092 ft.**

ENVIROSTOR:
Name: NEW MINNIE CANNON ELEMENTARY SCHOOL
Address: 20771 & 20931 BIG CANYON ROAD
City,State,Zip: MIDDLETOWN, CA 95461
Facility ID: 60001113
Status: No Further Action
Status Date: 11/15/2010
Site Code: 104668
Site Type: School Investigation
Site Type Detailed: School
Acres: 9.84
NPL: NO
Regulatory Agencies: SMBRP
Lead Agency: SMBRP
Program Manager: Harold (Bud) Duke
Supervisor: Juan Koponen

NEW MINNIE CANNON ELEMENTARY SCHOOL (Continued) **S109548299**

Division Branch: Northern California Schools & Santa Susana
Assembly: 04
Senate: 02
Special Program: Not reported
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: School District
Latitude: 38.7566
Longitude: -122.616
APN: 014-490-13, 014-490-15, 01449013, 01449015
Past Use: AGRICULTURAL - LIVESTOCK
Potential COC: Arsenic Mercury (elemental Naturally Occurring Asbestos (NOA Nickel
Confirmed COC: 30001-NO 30014-NO 31000-NO 30407-NO 40002-NO
Potential Description: SOIL
Alias Name: 014-490-13
Alias Type: APN
Alias Name: 014-490-15
Alias Type: APN
Alias Name: 01449013
Alias Type: APN
Alias Name: 01449015
Alias Type: APN
Alias Name: 104668
Alias Type: Project Code (Site Code)
Alias Name: 60001113
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 09/14/2009
Comments: Project manager change notification from Mike Hall to Bud Duke

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Cost Recovery Closeout Memo
Completed Date: 11/16/2010
Comments: Issued Cost Recovery Letter and closed project.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Environmental Oversight Agreement
Completed Date: 09/14/2009
Comments: DTSC issued a fully executed environmental oversight agreement

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Phase 1
Completed Date: 06/03/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Workplan
Completed Date: 01/14/2010
Comments: DTSC issued conditional approval of PEA Work Plan.

NEW MINNIE CANNON ELEMENTARY SCHOOL (Continued) **S109548299**

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Environmental Oversight Agreement Application
Completed Date:	09/14/2009
Comments:	EOA Application

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Preliminary Endangerment Assessment Report
Completed Date:	07/13/2010
Comments:	DTSC approved the PEA with a no further action determination

Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

SCH:

Name:	NEW MINNIE CANNON ELEMENTARY SCHOOL
Address:	20771 & 20931 BIG CANYON ROAD
City,State,Zip:	MIDDLETOWN, CA 95461
Facility ID:	60001113
Site Type:	School Investigation
Site Type Detail:	School
Site Mgmt. Req.:	NONE SPECIFIED
Acres:	9.84
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP
Lead Agency:	SMBRP
Lead Agency Description:	DTSC - Site Cleanup Program
Project Manager:	Harold (Bud) Duke
Supervisor:	Juan Koponen
Division Branch:	Northern California Schools & Santa Susana
Site Code:	104668
Assembly:	04
Senate:	02
Special Program Status:	Not reported
Status:	No Further Action
Status Date:	11/15/2010
Restricted Use:	NO
Funding:	School District
Latitude:	38.7566
Longitude:	-122.616
APN:	014-490-13, 014-490-15, 01449013, 01449015
Past Use:	AGRICULTURAL - LIVESTOCK
Potential COC:	Arsenic, Arsenic, Mercury (elemental, Naturally Occurring Asbestos (NOA, Nickel
Confirmed COC:	30001-NO, 30014-NO, 31000-NO, 30407-NO, 40002-NO
Potential Description:	SOIL
Alias Name:	014-490-13
Alias Type:	APN

NEW MINNIE CANNON ELEMENTARY SCHOOL (Continued) **S109548299**

Alias Name: 014-490-15
Alias Type: APN
Alias Name: 01449013
Alias Type: APN
Alias Name: 01449015
Alias Type: APN
Alias Name: 104668
Alias Type: Project Code (Site Code)
Alias Name: 60001113
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 09/14/2009
Comments: Project manager change notification from Mike Hall to Bud Duke

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Cost Recovery Closeout Memo
Completed Date: 11/16/2010
Comments: Issued Cost Recovery Letter and closed project.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Environmental Oversight Agreement
Completed Date: 09/14/2009
Comments: DTSC issued a fully executed environmental oversight agreement

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Phase 1
Completed Date: 06/03/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Workplan
Completed Date: 01/14/2010
Comments: DTSC issued conditional approval of PEA Work Plan.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Environmental Oversight Agreement Application
Completed Date: 09/14/2009
Comments: EOA Application

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 07/13/2010
Comments: DTSC approved the PEA with a no further action determination

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported

NEW MINNIE CANNON ELEMENTARY SCHOOL (Continued) **S109548299**

Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

B8 **MIDDLETOWN USD - MAINTENANCE-GROUNDS** **CERS HAZ WASTE** **S121786704**
East **20882 BIG CANYON ROAD** **CERS** **N/A**
1/8-1/4 **MIDDLETOWN, CA 95461**
0.175 mi.
926 ft. **Site 2 of 5 in cluster B**

Relative:
Lower

Actual:
1095 ft.

CERS HAZ WASTE:
Name: MIDDLETOWN USD - MAINTENANCE-GROUNDS
Address: 20882 BIG CANYON ROAD
City,State,Zip: MIDDLETOWN, CA 95461
Site ID: 48931
CERS ID: 10029436
CERS Description: Hazardous Waste Generator

CERS:
Name: MIDDLETOWN USD - MAINTENANCE-GROUNDS
Address: 20882 BIG CANYON ROAD
City,State,Zip: MIDDLETOWN, CA 95461
Site ID: 48931
CERS ID: 10029436
CERS Description: Chemical Storage Facilities

Affiliation:
Affiliation Type Desc: CUPA District
Entity Name: Lake County Environmental Health
Entity Title: Not reported
Affiliation Address: 922 Bevins Court
Affiliation City: Lakeport
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 95453
Affiliation Phone: (707) 263-1164

Affiliation Type Desc: Document Preparer
Entity Name: Mike Morris
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

Affiliation Type Desc: Environmental Contact
Entity Name: Mike Morris
Entity Title: Not reported
Affiliation Address: 20932 Big Canyon rd
Affiliation City: Middletown
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 95461
Affiliation Phone: Not reported

MIDDLETOWN USD - MAINTENANCE-GROUNDS (Continued) **S121786704**

Affiliation Type Desc:	Facility Mailing Address
Entity Name:	Mailing Address
Entity Title:	Not reported
Affiliation Address:	20932 Big Canyon Road
Affiliation City:	Middletown
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	95461
Affiliation Phone:	Not reported

Affiliation Type Desc:	Identification Signer
Entity Name:	Catherine Stone
Entity Title:	Superintendent
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

Affiliation Type Desc:	Operator
Entity Name:	Catherine Stone - Superintendent
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	(707) 987-4100

Affiliation Type Desc:	Legal Owner
Entity Name:	Middletown USD
Entity Title:	Not reported
Affiliation Address:	20932 Big Canyon rd.
Affiliation City:	Middletown
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	95461
Affiliation Phone:	(707) 987-4100

Affiliation Type Desc:	Parent Corporation
Entity Name:	Middletown USD - Maintenance-Grounds
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

B9 **MIDDLETOWN USD-MHS-MMS-MCES** **AST** **A100422381**
East **20932 BIG CANYON ROAD** **N/A**
1/8-1/4 **MIDDLETOWN, CA 95461**
0.178 mi.
939 ft. **Site 3 of 5 in cluster B**

Relative: **Lower**
Actual: **1095 ft.**

AST:

Name:	MIDDLETOWN USD-MHS-MMS-MCES
Address:	20932 BIG CANYON ROAD
City/Zip:	MIDDLETOWN,95461
Certified Unified Program Agencies:	Not reported
Owner:	Middletown USD
Total Gallons:	Not reported
CERSID:	10029427
Facility ID:	17-000-TMP005
Business Name:	Middletown USD-MHS-MMS-MCES
Phone:	707-987-4100
Fax:	Not reported
Mailing Address:	20932 Big Canyon Road
Mailing Address City:	Middletown
Mailing Address State:	CA
Mailing Address Zip Code:	95461
Operator Name:	Korby Olson - Superintendent
Operator Phone:	707-987-4100
Owner Phone:	(707) 987-4100
Owner Mail Address:	Not reported
Owner State:	CA
Owner Zip Code:	95461
Owner Country:	United States
Property Owner Name:	Not reported
Property Owner Phone:	Not reported
Property Owner Mailing Address:	Not reported
Property Owner City:	Not reported
Property Owner Stat :	Not reported
Property Owner Zip Code:	Not reported
Property Owner Country:	Not reported
EPAID:	CAL000283599

B10 **MIDDLETOWN UNIFIED SCHOOL DISTRICT** **CUPA Listings** **S108214504**
East **20932 BIG CANYON RD** **N/A**
1/8-1/4 **MIDDLETOWN, CA 95461**
0.178 mi.
939 ft. **Site 4 of 5 in cluster B**

Relative: **Lower**
Actual: **1095 ft.**

CUPA LAKE:

Name:	MIDDLETOWN UNIFIED SCHOOL DISTRICT
Address:	20932 BIG CANYON RD
City,State,Zip:	MIDDLETOWN, CA 95461
Facility:	FA0000438
Business Type:	1 - CUPA
Program Element:	2001 - HMRRP Category 1 (55-110 gal, 500-1,000 lbs)
Mailing Address:	20932 BIG CANYON ROAD c/o MIDDLETOWN UNIFIED SCHOOL DISTRICT Middletown, CA 95461 USA
Mailing Telephone:	7079874100
Entered Date:	11/26/2012
Program Identifier:	CUPA--20932 BIG CANYON RD., MIDDLETOWN
Record ID:	PR0000900
Billing Status:	02 - INACTIVE, NON-BILLABLE
Total Fee Amount:	0.00
Current Inspection Date:	10/20/2019
Contact Name:	KORBY OLSON-MIDDLETOWN UNIFIED SCHOOL DIST.

MIDDLETOWN UNIFIED SCHOOL DISTRICT (Continued) **S108214504**

Mailing Address: Middletown, CA 95461
APN: Not reported
Program/Element Code: 2001

Name: MIDDLETOWN UNIFIED SCHOOL DISTRICT
Address: 20932 BIG CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
Facility: FA0000438
Business Type: 1 - CUPA
Program Element: 2800 - CUPA Hazardous Waste Generator Program
Mailing Address: 20932 BIG CANYON ROAD c/o MIDDLETOWN UNIFIED SCHOOL DISTRICT Middletown, CA 95461 USA
Mailing Telephone: 7079874100
Entered Date: 11/26/2012
Program Identifier: CUPA-BUS YARD-20932 BIG CANYON RD
Record ID: PR0000901
Billing Status: 02 - INACTIVE, NON-BILLABLE
Total Fee Amount: 0.00
Current Inspection Date: 11/06/2016
Contact Name: KORBY OLSON
Mailing Address: Middletown, CA 95461
APN: Not reported
Program/Element Code: 2800

B11 **MIDDLETOWN USD-MHS-MMS-MCES** **CERS HAZ WASTE** **S121786705**
East **20932 BIG CANYON ROAD** **CERS TANKS** **N/A**
1/8-1/4 **MIDDLETOWN, CA 95461** **CERS**
0.178 mi.
939 ft. **Site 5 of 5 in cluster B**

Relative:
Lower

Actual:
1095 ft.

CERS HAZ WASTE:
Name: MIDDLETOWN USD-MHS-MMS-MCES
Address: 20932 BIG CANYON ROAD
City,State,Zip: MIDDLETOWN, CA 95461
Site ID: 48932
CERS ID: 10029427
CERS Description: Hazardous Waste Generator

CERS TANKS:
Name: MIDDLETOWN USD-MHS-MMS-MCES
Address: 20932 BIG CANYON ROAD
City,State,Zip: MIDDLETOWN, CA 95461
Site ID: 48932
CERS ID: 10029427
CERS Description: Aboveground Petroleum Storage

CERS:
Name: MIDDLETOWN USD-MHS-MMS-MCES
Address: 20932 BIG CANYON ROAD
City,State,Zip: MIDDLETOWN, CA 95461
Site ID: 48932
CERS ID: 10029427
CERS Description: Chemical Storage Facilities

Violations:
Site ID: 48932
Site Name: Middletown USD-MHS-MMS-MCES
Violation Date: 11-06-2013

MIDDLETOWN USD-MHS-MMS-MCES (Continued) **S121786705**

Citation:	40 CFR 1 265.31 - U.S. Code of Federal Regulations, Title 40, Chapter 1, Section(s) 265.31
Violation Description:	Failure to maintain and operate the facility to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to the air, soil, or surface water which could threaten human health or the environment..
Violation Notes:	Returned to compliance on 10/20/2016. Maintenance yard - north perimetre: fluorescent bulbs pile; next to that were numerous plastic bottles, containers with various "old" products stored in weeds. Welding/Wood Shop: 2 - 281 cu ft O2 cylinders standing, not contained by belt or chain, which would prevent them from being knocked over. OLD Science lab - now an Art classroom: Science storeroom has a wall of lockers - unlocked. When opened, Mike found old chemicals stored inside. Meanwhile, there are at least 10-12 guitars leaning up against the wall of lockers as well as across the narrow aisle against cabinets where the counter top is littered with old chemical glass containers, egg carton w/ 6 eggs, various school paraphanalia
Violation Division:	Lake County Environmental Health
Violation Program:	HW
Violation Source:	CERS
Site ID:	48932
Site Name:	Middletown USD-MHS-MMS-MCES
Violation Date:	11-06-2013
Citation:	22 CCR 23 66273.5 - California Code of Regulations, Title 22, Chapter 23, Section(s) 66273.5
Violation Description:	Failure to properly manage mercury containing lamp bulbs which are destined for reclamation or recycling from the date the bulbs were first discarded or broken.
Violation Notes:	Returned to compliance on 10/20/2016. Large pile of fluorescent bulbs stored outside on pallet - broken glass evidence of vulnerbility. Mike, Maintenance, stated company replaced ALL the school's bulbs several months ago, took many old bulbs except this pile. Lynn will contact that company to come pick up, or Mike/Lynn will contact Haz Mobile to see how to arrange appropriate disposal. They were given Haz Mobile schedule and the Ukiah phone #.
Violation Division:	Lake County Environmental Health
Violation Program:	HW
Violation Source:	CERS
Site ID:	48932
Site Name:	Middletown USD-MHS-MMS-MCES
Violation Date:	11-06-2013
Citation:	40 CFR 1 262.34(d)(5)(iii) - U.S. Code of Federal Regulations, Title 40, Chapter 1, Section(s) 262.34(d)(5)(iii)
Violation Description:	Failure to ensure employees are familiar with the handling and compliance of hazardous waste regulations and emergency response.
Violation Notes:	Returned to compliance on 10/20/2016.
Violation Division:	Lake County Environmental Health
Violation Program:	HW
Violation Source:	CERS
Site ID:	48932
Site Name:	Middletown USD-MHS-MMS-MCES
Violation Date:	11-06-2013
Citation:	22 CCR 23 66273.34 - California Code of Regulations, Title 22, Chapter

MIDDLETOWN USD-MHS-MMS-MCES (Continued) **S121786705**

	23, Section(s) 66273.34
Violation Description:	Failure to properly label the following categories of universal waste as: 1) Each batteries or the container in which the batteries are contained as "Universal Waste-Battery(ies)". 2) Each mercury-containing equipment or the container in which the mercury-containing equipment is contained as "Universal Waste -Mercury-Containing Equipment". 3) Each Florescent lamp or the container or package in which the lamps are contained as "Universal Waste-Lamp(s)". 4) Each electronic devices or the container or pallet in or on which the electronic devices are contained as "Universal Waste-Electronic Device(s)". 5) Each CRTs or the container or pallet in or on which the CRTs are contained as "Universal Waste-CRT(s)". 6) A container of CRT glass shall be labeled or marked clearly with the following phrase: "Universal Waste-CRT glass". 7) In lieu of labeling individual electronic devices, CRTs, and/or containers of CRT glass pursuant to subsections d) through f) of this section, a universal waste handler may combine, package, and accumulate those universal wastes in appropriate containers or within a designated area demarcated by boundaries that are clearly labeled with the applicable portion(s) of the following phrase: "Universal Waste-Electronic Device(s)/Universal Waste - CRT(s)/Universal Waste-CRT Glass".
Violation Notes:	Returned to compliance on 10/20/2016.
Violation Division:	Lake County Environmental Health
Violation Program:	HW
Violation Source:	CERS
Site ID:	48932
Site Name:	Middletown USD-MHS-MMS-MCES
Violation Date:	11-06-2013
Citation:	HSC 6.5 25189.5(a) - California Health and Safety Code, Chapter 6.5, Section(s) 25189.5(a)
Violation Description:	Failure to properly dispose of hazardous waste at an authorized location.
Violation Notes:	Returned to compliance on 10/20/2016. Since chemicals left in OLD Science Room/Art classroom, we must assume they are considered "waste". Discussed with Lynn & Mike - contact Haz Mobile and share what chemicals/amounts MUSD wants to dispose of. They will then find out if Haz Mobile can take all the chemicals and the price. Also stated that Clearlake High's science teacher, Ken Hook, has a disposal chemical company pick up his chemistry "waste."
Violation Division:	Lake County Environmental Health
Violation Program:	HW
Violation Source:	CERS

Evaluation:

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	10-20-2016
Violations Found:	No
Eval Type:	Routine done by local agency
Eval Notes:	Walked site with Craig Wetherbee and Mike Morris-Director Maintenance Operations/Grounds. Valley Fire destroyed the hazmat storage building in September 2015. The school has just finished rebuilding it, but waiting for building final. No hazmat currently onsite. Mr. Morris advised it may be some time before reportable quantities are onsite (if ever). Any waste generated (such as minor waste oil) is taken to Bus Yard on Butts Canyon. We advised we would inactivate the site until reportable quantities are again onsite since waste taken to Bus

MIDDLETOWN USD-MHS-MMS-MCES (Continued) **S121786705**

Yard.
Eval Division: Lake County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-06-2013
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: Lake County Environmental Health
Eval Program: HW
Eval Source: CERS

Affiliation:
Affiliation Type Desc: Facility Mailing Address
Entity Name: Mailing Address
Entity Title: Not reported
Affiliation Address: 20932 Big Canyon Road
Affiliation City: Middletown
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 95461
Affiliation Phone: Not reported

Affiliation Type Desc: Identification Signer
Entity Name: Catherine Stone
Entity Title: Superintendent
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

Affiliation Type Desc: Legal Owner
Entity Name: Middletown USD
Entity Title: Not reported
Affiliation Address: 20932 Big Canyon Road
Affiliation City: Middletown
Affiliation State: CA
Affiliation Country: United States
Affiliation Zip: 95461
Affiliation Phone: (707) 987-4100

Affiliation Type Desc: CUPA District
Entity Name: Lake County Environmental Health
Entity Title: Not reported
Affiliation Address: 922 Bevins Court
Affiliation City: Lakeport
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 95453
Affiliation Phone: (707) 263-1164

Affiliation Type Desc: Document Preparer
Entity Name: Mike Morris

MIDDLETOWN USD-MHS-MMS-MCES (Continued) **S121786705**

Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported
Affiliation Type Desc:	Environmental Contact
Entity Name:	Mike Morris
Entity Title:	Not reported
Affiliation Address:	20932 Big Canyon Road
Affiliation City:	Middletown
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	95461
Affiliation Phone:	Not reported
Affiliation Type Desc:	Operator
Entity Name:	Catherine Stone - Superintendent
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	(707) 987-4100
Affiliation Type Desc:	Parent Corporation
Entity Name:	Middletown USD-MHS-MMS-MCES
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

12
SE
1/8-1/4
0.195 mi.
1029 ft.

AT&T CORP-TD061-MIDDLETOWN **CUPA Listings** **S112444440**
21347 HWY 175 **N/A**
MIDDLETOWN, CA 95461

Relative:
Higher

Actual:
1107 ft.

CUPA LAKE:

Name:	AT&T CORP-TD061-MIDDLETOWN
Address:	21347 HWY 175
City,State,Zip:	MIDDLETOWN, CA 95461
Facility:	FA0000593
Business Type:	1 - CUPA
Program Element:	2004 - HMRRP Category 4 (1,001-5,000 gal, 10,001-100
Mailing Address:	P. O. BOX 5095, ROOM 4W2001 c/o MATTHEW LAWS SAN RAMON, CA 94583 USA
Mailing Telephone:	7075752115
Entered Date:	12/04/2012
Program Identifier:	CUPA-TD061-21347 HWY 175 MIDDLETOWN
Record ID:	PR0001184
Billing Status:	01 - ACTIVE, BILLABLE

AT&T CORP-TD061-MIDDLETOWN (Continued) **S112444440**

Total Fee Amount:	852.00
Current Inspection Date:	11/19/2021
Contact Name:	MATTHEW LAWS
Mailing Address:	SAN RAMON, CA 94583
APN:	024-452-07
Program/Element Code:	2004

C13 **GEORGE'S UNION 76** **SWEEPS UST U001610506**
ESE **21137 CALISTOGA RD** **HIST UST N/A**
1/8-1/4 **MIDDLETOWN, CA 95461**
0.248 mi.
1309 ft. **Site 1 of 5 in cluster C**

Relative:
Higher

Actual:
1105 ft.

SWEEPS UST:

Name:	GEORGE'S UNION 76
Address:	21137 CALISTOGA RD
City:	MIDDLETOWN
Status:	Active
Comp Number:	35485
Number:	9
Board Of Equalization:	44-006842
Referral Date:	Not reported
Action Date:	11-08-88
Created Date:	02-29-88
Owner Tank Id:	2
SWRCB Tank Id:	17-000-035485-000001
Tank Status:	A
Capacity:	2000
Active Date:	11-08-88
Tank Use:	M.V. FUEL
STG:	P
Content:	LEADED
Number Of Tanks:	2

Name:	GEORGE'S UNION 76
Address:	21137 CALISTOGA RD
City:	MIDDLETOWN
Status:	Active
Comp Number:	35485
Number:	9
Board Of Equalization:	44-006842
Referral Date:	Not reported
Action Date:	11-08-88
Created Date:	02-29-88
Owner Tank Id:	2
SWRCB Tank Id:	17-000-035485-000002
Tank Status:	A
Capacity:	10000
Active Date:	11-08-88
Tank Use:	M.V. FUEL
STG:	P
Content:	REG UNLEADED
Number Of Tanks:	Not reported

Name:	GEORGE'S UNION 76
Address:	21137 CALISTOGA RD
City:	MIDDLETOWN
Status:	Not reported

GEORGE'S UNION 76 (Continued) **U001610506**

Comp Number: 35485
Number: Not reported
Board Of Equalization: 44-006842
Referral Date: Not reported
Action Date: Not reported
Created Date: Not reported
Owner Tank Id: Not reported
SWRCB Tank Id: 17-000-035485-000003
Tank Status: Not reported
Capacity: 550
Active Date: Not reported
Tank Use: M.V. FUEL
STG: PRODUCT
Content: LEADED
Number Of Tanks: 1

HIST UST:
Name: GEORGE'S UNION 76
Address: 21137 CALISTOGA RD
City,State,Zip: MIDDLETOWN, CA 95461
File Number: Not reported
URL: Not reported
Region: STATE
Facility ID: 00000065121
Facility Type: Gas Station
Other Type: 1
Contact Name: GEO. SWEAT
Telephone: 7079873328
Owner Name: JOSEPH J. PHILLIPS
Owner Address: 3136 GEARY BLVD.
Owner City,St,Zip: SAN FRANCISCO, CA 94118
Total Tanks: 0001

Tank Num: 001
Container Num: 5
Year Installed: Not reported
Tank Capacity: 00001500
Tank Used for: PRODUCT
Type of Fuel: DIESEL
Container Construction Thickness: Not reported
Leak Detection: Visual, Stock Inventor

C14 **GEORGE'S UNION 76 (FORMER** **LUST** **S104163289**
ESE **21137 CALISTOGA** **HIST CORTESE** **N/A**
1/8-1/4 **MIDDLETOWN, CA 95461**
0.248 mi.
1309 ft. **Site 2 of 5 in cluster C**

Relative:
Higher

Actual:
1105 ft.

LUST:
Name: GEORGE'S UNION 76 (FORMER)
Address: 21137 CALISTOGA RD
City,State,Zip: MIDDLETOWN, CA 95461
Lead Agency: CENTRAL VALLEY RWQCB (REGION 5S)
Case Type: LUST Cleanup Site
Geo Track: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0603300041
Global Id: T0603300041
Latitude: 38.75307

GEORGE'S UNION 76 (FORMER (Continued) **S104163289**

Longitude:	-122.615347
Status:	Completed - Case Closed
Status Date:	09/24/2002
Case Worker:	GTM
RB Case Number:	170061
Local Agency:	LAKE COUNTY
File Location:	Not reported
Local Case Number:	Not reported
Potential Media Affect:	Aquifer used for drinking water supply
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

LUST:

Global Id:	T0603300041
Contact Type:	Regional Board Caseworker
Contact Name:	GLENN T. MEEKS
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	gmeeks@waterboards.ca.gov
Phone Number:	Not reported

Global Id:	T0603300041
Contact Type:	Local Agency Caseworker
Contact Name:	MANUEL RAMIREZ
Organization Name:	LAKE COUNTY
Address:	Not reported
City:	r5 UNKNOWN
Email:	Not reported
Phone Number:	Not reported

LUST:

Global Id:	T0603300041
Action Type:	ENFORCEMENT
Date:	07/09/2002
Action:	Staff Letter

Global Id:	T0603300041
Action Type:	ENFORCEMENT
Date:	09/24/2002
Action:	Closure/No Further Action Letter

Global Id:	T0603300041
Action Type:	Other
Date:	07/09/1993
Action:	Leak Discovery

Global Id:	T0603300041
Action Type:	ENFORCEMENT
Date:	08/07/2001
Action:	Staff Letter

Global Id:	T0603300041
Action Type:	ENFORCEMENT
Date:	10/05/2000
Action:	Staff Letter

GEORGE'S UNION 76 (FORMER (Continued) **S104163289**

Global Id: T0603300041
Action Type: Other
Date: 08/02/1993
Action: Leak Reported

Global Id: T0603300041
Action Type: ENFORCEMENT
Date: 07/31/2000
Action: Staff Letter

LUST:
Global Id: T0603300041
Status: Open - Case Begin Date
Status Date: 07/09/1993

Global Id: T0603300041
Status: Open - Site Assessment
Status Date: 07/09/1993

Global Id: T0603300041
Status: Open - Site Assessment
Status Date: 04/21/1994

Global Id: T0603300041
Status: Open - Verification Monitoring
Status Date: 10/02/2000

Global Id: T0603300041
Status: Completed - Case Closed
Status Date: 09/24/2002

LUST REG 5:
Name: GEORGE'S UNION 76 (FORMER)
Address: 21137 CALISTOGA RD
City: MIDDLETOWN
Region: 5
Status: Case Closed
Case Number: 170061
Case Type: Drinking Water Aquifer affected
Substance: GASOLINE
Staff Initials: GTM
Lead Agency: Regional
Program: LUST
MTBE Code: 0

HIST CORTESE:
edr_fname: GEORGE'S UNION 76 (FORMER
edr_fadd1: 21137 CALISTOGA
City,State,Zip: MIDDLETOWN, CA 95461
Region: CORTESE
Facility County Code: 17
Reg By: LTNKA
Reg Id: 170061

C15
ESE
1/8-1/4
0.248 mi.
1309 ft.

GEORGES UNION 76
21137 CALLISTOGA RD
HIDDLETOWN, CA 95461

Site 3 of 5 in cluster C

SWEEPS UST **S106926681**
HIST UST **N/A**

Relative:
Higher

Actual:
1105 ft.

SWEEPS UST:

Name:	GEORGE'S UNION 76
Address:	21137 CALLISTOGA RD
City:	MIDDLETOWN
Status:	Active
Comp Number:	65121
Number:	9
Board Of Equalization:	Not reported
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	5
SWRCB Tank Id:	17-000-065121-000001
Tank Status:	A
Capacity:	1500
Active Date:	07-01-85
Tank Use:	M.V. FUEL
STG:	P
Content:	DIESEL
Number Of Tanks:	1

HIST UST:

Name:	GEORGES UNION 76
Address:	21137 CALLISTOGA RD
City,State,Zip:	HIDDLETOWN, CA 95461
File Number:	0002595D
URL:	http://geotracker.waterboards.ca.gov/ustpdfs/pdf/0002595D.pdf
Region:	Not reported
Facility ID:	Not reported
Facility Type:	Not reported
Other Type:	Not reported
Contact Name:	Not reported
Telephone:	Not reported
Owner Name:	Not reported
Owner Address:	Not reported
Owner City,St,Zip:	Not reported
Total Tanks:	Not reported
Tank Num:	Not reported
Container Num:	Not reported
Year Installed:	Not reported
Tank Capacity:	Not reported
Tank Used for:	Not reported
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported
Leak Detection:	Not reported

Click here for Geo Tracker PDF:

C16 **GEORGES UNION SERVICE** **HIST UST** **U001610507**
ESE **21137 CALISTOGA RD** **N/A**
1/8-1/4 **MIDDLETOWN, CA 95461**
0.248 mi.
1309 ft. **Site 4 of 5 in cluster C**

Relative:
Higher

Actual:
1105 ft.

HIST UST:

Name:	GEORGES UNION SERVICE
Address:	21137 CALISTOGA RD
City,State,Zip:	MIDDLETOWN, CA 95461
File Number:	0002593E
URL:	http://geotracker.waterboards.ca.gov/ustpdfs/pdf/0002593E.pdf
Region:	STATE
Facility ID:	00000035485
Facility Type:	Gas Station
Other Type:	Not reported
Contact Name:	GEORGE & MERRIL SWEAT
Telephone:	7079873328
Owner Name:	JANE E. PHILLIPS
Owner Address:	180 SO. SPRUCE #250
Owner City,St,Zip:	SOUTH SAN FRANCISCO, CA 94080
Total Tanks:	0004
Tank Num:	001
Container Num:	1
Year Installed:	1974
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	1/4
Leak Detection:	Stock Inventor
Tank Num:	002
Container Num:	2
Year Installed:	Not reported
Tank Capacity:	00002000
Tank Used for:	PRODUCT
Type of Fuel:	PREMIUM
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor
Tank Num:	003
Container Num:	3
Year Installed:	Not reported
Tank Capacity:	00000550
Tank Used for:	PRODUCT
Type of Fuel:	PREMIUM
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor
Tank Num:	004
Container Num:	4
Year Installed:	Not reported
Tank Capacity:	00001000
Tank Used for:	Not reported
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor

GEORGES UNION SERVICE (Continued) **U001610507**

Click here for Geo Tracker PDF:

C17 **JOHN KENNY ANTIQUES** **LUST S106567598**
SE **21157 CALISTOGA STREET** **CERS N/A**
1/4-1/2 **MIDDLETOWN, CA 95453**
0.254 mi.
1343 ft. **Site 5 of 5 in cluster C**

Relative:
Higher

Actual:
1105 ft.

LUST:

Name:	JOHN KENNY ANTIQUES
Address:	21157 CALISTOGA STREET
City,State,Zip:	MIDDLETOWN, CA 95453
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0603374792
Global Id:	T0603374792
Latitude:	38.7526630017484
Longitude:	-122.615379989147
Status:	Completed - Case Closed
Status Date:	09/14/2011
Case Worker:	GTM
RB Case Number:	170109
Local Agency:	LAKE COUNTY
File Location:	Not reported
Local Case Number:	Not reported
Potential Media Affect:	Aquifer used for drinking water supply
Potential Contaminants of Concern:	Waste Oil / Motor / Hydraulic / Lubricating
Site History:	The case was opened following an unauthorized release from an underground storage tank system at the subject site. Corrective action is underway as directed by the CVRWQCB. Corrective action may consist of preliminary site investigation, planning and implementation of remedial action, verification monitoring, or a combination thereof. A summary of the site history is available by clicking on either the

LUST:

Global Id:	T0603374792
Contact Type:	Local Agency Caseworker
Contact Name:	KEN WILLIAMS
Organization Name:	LAKE COUNTY
Address:	922 BEVINS COURT
City:	LAKEPORT
Email:	Not reported
Phone Number:	Not reported

Global Id:	T0603374792
Contact Type:	Regional Board Caseworker
Contact Name:	GLENN T. MEEKS
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	gmeeks@waterboards.ca.gov
Phone Number:	Not reported

LUST:

Global Id:	T0603374792
Action Type:	ENFORCEMENT
Date:	07/14/2009

JOHN KENNY ANTIQUES (Continued) **S106567598**

Action: Staff Letter

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 07/26/2007
Action: Email Correspondence

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 06/24/2011
Action: Staff Letter

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 01/30/2007
Action: Staff Letter

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 09/19/2006
Action: Staff Letter

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 04/22/2005
Action: Staff Letter

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 06/07/2005
Action: Staff Letter

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 06/12/2008
Action: Email Correspondence

Global Id: T0603374792
Action Type: RESPONSE
Date: 01/11/2006
Action: Correspondence

Global Id: T0603374792
Action Type: RESPONSE
Date: 01/06/2005
Action: Correspondence

Global Id: T0603374792
Action Type: RESPONSE
Date: 05/27/2004
Action: Correspondence

Global Id: T0603374792
Action Type: RESPONSE
Date: 09/02/2011
Action: Well Destruction Report

JOHN KENNY ANTIQUES (Continued) **S106567598**

Global Id: T0603374792
Action Type: RESPONSE
Date: 08/07/2007
Action: Correspondence

Global Id: T0603374792
Action Type: RESPONSE
Date: 09/13/2004
Action: Correspondence

Global Id: T0603374792
Action Type: RESPONSE
Date: 08/10/2004
Action: Correspondence

Global Id: T0603374792
Action Type: RESPONSE
Date: 05/21/2004
Action: Other Report / Document

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 10/28/2009
Action: Verbal Enforcement

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 09/30/2004
Action: Staff Letter

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 08/22/2008
Action: Email Correspondence

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 06/23/2004
Action: Staff Letter

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 06/23/2004
Action: Staff Letter

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 11/15/2007
Action: Other Report

Global Id: T0603374792
Action Type: RESPONSE
Date: 04/21/2005
Action: Other Report / Document

Global Id: T0603374792
Action Type: RESPONSE

JOHN KENNY ANTIQUES (Continued) **S106567598**

Date: 12/04/2003
Action: Correspondence

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 07/23/2004
Action: Staff Letter

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 02/10/2010
Action: Verbal Enforcement

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 07/13/2011
Action: Staff Letter

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 09/17/2004
Action: Staff Letter

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 12/11/2007
Action: Email Correspondence

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 12/21/2005
Action: Staff Letter

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 07/16/2009
Action: Email Correspondence

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 04/29/2008
Action: Email Correspondence

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 09/17/2004
Action: Staff Letter

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 08/23/2010
Action: Verbal Enforcement

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 09/07/2011
Action: Closure/No Further Action Letter

JOHN KENNY ANTIQUES (Continued) **S106567598**

Global Id: T0603374792
Action Type: RESPONSE
Date: 01/10/2005
Action: Preliminary Site Assessment Workplan

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 06/07/2005
Action: Staff Letter

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 09/19/2006
Action: Staff Letter

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 07/26/2007
Action: Technical Correspondence / Assistance / Other

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 07/11/2011
Action: Notification - Public Notice of Case Closure

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 03/17/2011
Action: Technical Correspondence / Assistance / Other

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 03/24/2011
Action: Technical Correspondence / Assistance / Other

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 03/07/2011
Action: Technical Correspondence / Assistance / Other

Global Id: T0603374792
Action Type: Other
Date: 06/30/2003
Action: Leak Discovery

Global Id: T0603374792
Action Type: RESPONSE
Date: 08/30/2007
Action: Soil and Water Investigation Workplan

Global Id: T0603374792
Action Type: RESPONSE
Date: 10/31/2011
Action: Well Destruction Report

Global Id: T0603374792
Action Type: ENFORCEMENT

JOHN KENNY ANTIQUES (Continued) **S106567598**

Date: 01/30/2007
Action: Staff Letter

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 04/28/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 03/24/2011
Action: Verbal Enforcement

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 05/23/2011
Action: Notification - Public Notice of Case Closure

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 04/13/2011
Action: Technical Correspondence / Assistance / Other

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 04/13/2011
Action: Verbal Enforcement

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 03/23/2011
Action: Verbal Enforcement

Global Id: T0603374792
Action Type: REMEDIATION
Date: 05/21/2004
Action: Excavation

Global Id: T0603374792
Action Type: Other
Date: 05/21/2004
Action: Leak Reported

Global Id: T0603374792
Action Type: RESPONSE
Date: 08/01/2005
Action: Preliminary Site Assessment Report

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 06/11/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 04/09/2008
Action: Staff Letter

JOHN KENNY ANTIQUES (Continued) **S106567598**

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 09/26/2007
Action: Staff Letter

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 04/29/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 08/22/2008
Action: Verbal Enforcement

Global Id: T0603374792
Action Type: RESPONSE
Date: 12/30/2007
Action: Unknown

Global Id: T0603374792
Action Type: RESPONSE
Date: 04/30/2008
Action: Other Report / Document

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 10/15/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0603374792
Action Type: ENFORCEMENT
Date: 02/19/2009
Action: Technical Correspondence / Assistance / Other

LUST:
Global Id: T0603374792
Status: Open - Case Begin Date
Status Date: 06/30/2003

Global Id: T0603374792
Status: Open - Site Assessment
Status Date: 05/21/2004

Global Id: T0603374792
Status: Open - Site Assessment
Status Date: 04/22/2005

Global Id: T0603374792
Status: Open - Site Assessment
Status Date: 09/01/2006

Global Id: T0603374792
Status: Open - Site Assessment
Status Date: 09/26/2007

Global Id: T0603374792

JOHN KENNY ANTIQUES (Continued) **S106567598**

Status: Open - Verification Monitoring
Status Date: 03/02/2011

Global Id: T0603374792
Status: Completed - Case Closed
Status Date: 09/14/2011

LUST REG 5:
Name: JOHN KENNY ANTIQUES
Address: 21157 CALISTOGA STREET
City: MIDDLETOWN
Region: 5
Status: Pollution Characterization
Case Number: 170109
Case Type: Drinking Water Aquifer affected
Substance: WASTE OIL
Staff Initials: GTM
Lead Agency: Regional
Program: LUST
MTBE Code: N/A

CERS:
Name: JOHN KENNY ANTIQUES
Address: 21157 CALISTOGA STREET
City,State,Zip: MIDDLETOWN, CA 95453
Site ID: 226772
CERS ID: T0603374792
CERS Description: Leaking Underground Storage Tank Cleanup Site

Affiliation:
Affiliation Type Desc: Regional Board Caseworker
Entity Name: GLENN T. MEEKS - CENTRAL VALLEY RWQCB (REGION 5S)
Entity Title: Not reported
Affiliation Address: 11020 SUN CENTER DRIVE #200
Affiliation City: RANCHO CORDOVA
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

Affiliation Type Desc: Local Agency Caseworker
Entity Name: KEN WILLIAMS - LAKE COUNTY
Entity Title: Not reported
Affiliation Address: 922 BEVINS COURT
Affiliation City: LAKEPORT
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

18
ESE
1/4-1/2
0.267 mi.
1411 ft.

JOLLY KONE RESTAURANT
21010 HIGHWAY 29
MIDDLETOWN, CA 95461

LUST **S118502928**
CERS **N/A**

Relative:
Higher

Actual:
1102 ft.

LUST:

Name:	JOLLY KONE RESTAURANT
Address:	21010 HIGHWAY 29
City,State,Zip:	MIDDLETOWN, CA 95461
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T10000008192
Global Id:	T10000008192
Latitude:	38.75497
Longitude:	-122.61136
Status:	Completed - Case Closed
Status Date:	12/21/2015
Case Worker:	EMC
RB Case Number:	170116
Local Agency:	Not reported
File Location:	Not reported
Local Case Number:	Not reported
Potential Media Affect:	Not reported
Potential Contaminants of Concern:	Not reported
Site History:	Not reported

LUST:

Global Id:	T10000008192
Contact Type:	Regional Board Caseworker
Contact Name:	EMILY CUSHMAN
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 Sun Center Drive #200
City:	RANCHO CORDOVA
Email:	emily.cushman@waterboards.ca.gov
Phone Number:	9164644696

LUST:

Global Id:	T10000008192
Action Type:	Other
Date:	11/25/2015
Action:	Leak Began
Global Id:	T10000008192
Action Type:	Other
Date:	11/25/2015
Action:	Leak Discovery
Global Id:	T10000008192
Action Type:	ENFORCEMENT
Date:	12/10/2015
Action:	Referral to Regional Board
Global Id:	T10000008192
Action Type:	ENFORCEMENT
Date:	12/21/2015
Action:	Closure/No Further Action Letter
Global Id:	T10000008192

JOLLY KONE RESTAURANT (Continued) **S118502928**

Action Type: Other
Date: 12/08/2015
Action: Leak Stopped

Global Id: T10000008192
Action Type: Other
Date: 12/08/2015
Action: Leak Reported

LUST:
Global Id: T10000008192
Status: Open - Case Begin Date
Status Date: 11/25/2015

Global Id: T10000008192
Status: Open - Site Assessment
Status Date: 12/18/2015

Global Id: T10000008192
Status: Completed - Case Closed
Status Date: 12/21/2015

CERS:
Name: JOLLY KONE RESTAURANT
Address: 21010 HIGHWAY 29
City,State,Zip: MIDDLETOWN, CA 95461
Site ID: 362167
CERS ID: T10000008192
CERS Description: Leaking Underground Storage Tank Cleanup Site

Affiliation:
Affiliation Type Desc: Regional Board Caseworker
Entity Name: EMILY CUSHMAN - CENTRAL VALLEY RWQCB (REGION 5S)
Entity Title: Not reported
Affiliation Address: 11020 Sun Center Drive #200
Affiliation City: RANCHO CORDOVA
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: 9164644696

19
SE
1/4-1/2
0.350 mi.
1846 ft.

AREA #1 ROAD YARD **LUST** **S102424501**
15784 DOUGLAS ST **HIST CORTESE** **N/A**
MIDDLETOWN, CA 95461 **CERS**

Relative:
Higher

Actual:
1111 ft.

LUST:
Name: AREA #1 ROAD YARD
Address: 15784 DOUGLAS ST
City,State,Zip: MIDDLETOWN, CA 95461
Lead Agency: CENTRAL VALLEY RWQCB (REGION 5S)
Case Type: LUST Cleanup Site
Geo Track: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0603300060
Global Id: T0603300060

AREA #1 ROAD YARD (Continued) **S102424501**

Latitude:	38.750774
Longitude:	-122.615235
Status:	Completed - Case Closed
Status Date:	08/20/1996
Case Worker:	GTM
RB Case Number:	170080
Local Agency:	LAKE COUNTY
File Location:	Not reported
Local Case Number:	Not reported
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Diesel
Site History:	Not reported

LUST:

Global Id:	T0603300060
Contact Type:	Regional Board Caseworker
Contact Name:	GLENN T. MEEKS
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	gmeeks@waterboards.ca.gov
Phone Number:	Not reported

Global Id:	T0603300060
Contact Type:	Local Agency Caseworker
Contact Name:	MANUEL RAMIREZ
Organization Name:	LAKE COUNTY
Address:	Not reported
City:	r5 UNKNOWN
Email:	Not reported
Phone Number:	Not reported

LUST:

Global Id:	T0603300060
Action Type:	Other
Date:	06/09/1995
Action:	Leak Discovery

Global Id:	T0603300060
Action Type:	Other
Date:	06/09/1995
Action:	Leak Stopped

Global Id:	T0603300060
Action Type:	Other
Date:	06/09/1995
Action:	Leak Reported

LUST:

Global Id:	T0603300060
Status:	Open - Case Begin Date
Status Date:	06/09/1995

Global Id:	T0603300060
Status:	Open - Site Assessment
Status Date:	06/09/1995

AREA #1 ROAD YARD (Continued) **S102424501**

Global Id: T0603300060
Status: Completed - Case Closed
Status Date: 08/20/1996

LUST REG 5:
Name: AREA #1 ROAD YARD
Address: 15784 DOUGLAS ST
City: MIDDLETOWN
Region: 5
Status: Case Closed
Case Number: 170080
Case Type: Soil only
Substance: DIESEL
Staff Initials: GTM
Lead Agency: Regional
Program: LUST
MTBE Code: N/A

HIST CORTESE:
edr_fname: AREA #1 ROAD YARD
edr_fadd1: 15784 DOUGLAS
City,State,Zip: MIDDLETOWN, CA 95461
Region: CORTESE
Facility County Code: 17
Reg By: LTNKA
Reg Id: 170080

CERS:
Name: AREA #1 ROAD YARD
Address: 15784 DOUGLAS ST
City,State,Zip: MIDDLETOWN, CA 95461
Site ID: 255831
CERS ID: T0603300060
CERS Description: Leaking Underground Storage Tank Cleanup Site

Affiliation:
Affiliation Type Desc: Local Agency Caseworker
Entity Name: MANUEL RAMIREZ - LAKE COUNTY
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: r5 UNKNOWN
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

Affiliation Type Desc: Regional Board Caseworker
Entity Name: GLENN T. MEEKS - CENTRAL VALLEY RWQCB (REGION 5S)
Entity Title: Not reported
Affiliation Address: 11020 SUN CENTER DRIVE #200
Affiliation City: RANCHO CORDOVA
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

20
SSE
1/4-1/2
0.380 mi.
2007 ft.

FIRE STATION #60
21218 CALISTOGA RD
MIDDLETOWN, CA 95461

LUST
CUPA Listings
HIST CORTESE
CERS

S102429963
N/A

Relative:
Higher

Actual:
1117 ft.

LUST:

Name:	FIRE STATION #60
Address:	21218 CALISTOGA RD
City,State,Zip:	MIDDLETOWN, CA 95461
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0603300039
Global Id:	T0603300039
Latitude:	38.750851
Longitude:	-122.615523
Status:	Completed - Case Closed
Status Date:	08/20/1996
Case Worker:	GTM
RB Case Number:	170059
Local Agency:	LAKE COUNTY
File Location:	Not reported
Local Case Number:	Not reported
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

LUST:

Global Id:	T0603300039
Contact Type:	Regional Board Caseworker
Contact Name:	GLENN T. MEEKS
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	gmeeks@waterboards.ca.gov
Phone Number:	Not reported

Global Id:	T0603300039
Contact Type:	Local Agency Caseworker
Contact Name:	MANUEL RAMIREZ
Organization Name:	LAKE COUNTY
Address:	Not reported
City:	r5 UNKNOWN
Email:	Not reported
Phone Number:	Not reported

LUST:

Global Id:	T0603300039
Action Type:	Other
Date:	07/14/1993
Action:	Leak Discovery

Global Id:	T0603300039
Action Type:	Other
Date:	07/14/1993
Action:	Leak Stopped

Global Id:	T0603300039
Action Type:	Other

FIRE STATION #60 (Continued) **S102429963**

Date: 08/17/1993
Action: Leak Reported

LUST:
Global Id: T0603300039
Status: Open - Case Begin Date
Status Date: 07/14/1993

Global Id: T0603300039
Status: Open - Site Assessment
Status Date: 08/17/1993

Global Id: T0603300039
Status: Completed - Case Closed
Status Date: 08/20/1996

LUST REG 5:
Name: FIRE STATION #60
Address: 21218 CALISTOGA RD
City: MIDDLETOWN
Region: 5
Status: Case Closed
Case Number: 170059
Case Type: Soil only
Substance: GASOLINE
Staff Initials: GTM
Lead Agency: Regional
Program: LUST
MTBE Code: N/A

CUPA LAKE:
Name: B & G TIRES OF MIDDLETOWN
Address: 21218 CALISTOGA ST
City,State,Zip: MIDDLETOWN, CA 95461
Facility: FA0000014
Business Type: 1 - CUPA
Program Element: 2002 - HMRRP Category 2 (111-500 gal, 1,001-5,000 lb
Mailing Address: P O Box 961 c/o Gemy D'Adamo Middletown, CA 95461
Mailing Telephone: 7079872291
Entered Date: 11/13/2012
Program Identifier: CUPA-21218 CALISTOGA ST, MIDDLETOWN
Record ID: PR0000064
Billing Status: 01 - ACTIVE, BILLABLE
Total Fee Amount: 473.00
Current Inspection Date: 03/16/2020
Contact Name: Gemy D'Adamo
Mailing Address: Middletown, CA 95461
APN: Not reported
Program/Element Code: 2002

Name: B & G TIRES OF MIDDLETOWN
Address: 21218 CALISTOGA ST
City,State,Zip: MIDDLETOWN, CA 95461
Facility: FA0000014
Business Type: 1 - CUPA

FIRE STATION #60 (Continued) **S102429963**

Program Element:	2800 - CUPA Hazardous Waste Generator Program
Mailing Address:	P O Box 961 c/o Gemy D'Adamo Middletown, CA 95461
Mailing Telephone:	7079872291
Entered Date:	11/13/2012
Program Identifier:	CUPA
Record ID:	PR0000065
Billing Status:	01 - ACTIVE, BILLABLE
Total Fee Amount:	0.00
Current Inspection Date:	03/16/2020
Contact Name:	Gemy D'Adamo
Mailing Address:	Middletown, CA 95461
APN:	Not reported
Program/Element Code:	2800

HIST CORTESE:

edr_fname:	FIRE STATION #60
edr_fadd1:	21218 CALISTOGA
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	CORTESE
Facility County Code:	17
Reg By:	LTNKA
Reg Id:	170059

CERS:

Name:	FIRE STATION #60
Address:	21218 CALISTOGA RD
City,State,Zip:	MIDDLETOWN, CA 95461
Site ID:	238273
CERS ID:	T0603300039
CERS Description:	Leaking Underground Storage Tank Cleanup Site

Affiliation:

Affiliation Type Desc:	Local Agency Caseworker
Entity Name:	MANUEL RAMIREZ - LAKE COUNTY
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	r5 UNKNOWN
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

Affiliation Type Desc:	Regional Board Caseworker
Entity Name:	GLENN T. MEEKS - CENTRAL VALLEY RWQCB (REGION 5S)
Entity Title:	Not reported
Affiliation Address:	11020 SUN CENTER DRIVE #200
Affiliation City:	RANCHO CORDOVA
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

21
SSE
1/4-1/2
0.421 mi.
2222 ft.

REDBUD COMMUNITY HOSP-MIDDLETOWN CLINIC
21268 CALISTOGA STREET
MIDDLETOWN, CA 95461

ENVIROSTOR **S118756493**
N/A

Relative:
Higher

Actual:
1113 ft.

ENVIROSTOR:

Name:	REDBUD COMMUNITY HOSP-MIDDLETOWN CLINIC
Address:	21268 CALISTOGA STREET
City,State,Zip:	MIDDLETOWN, CA 95461
Facility ID:	17800001
Status:	No Action Required
Status Date:	11/28/1994
Site Code:	100522
Site Type:	Calmortgage
Site Type Detailed:	Calmortgage
Acres:	0.25
NPL:	NO
Regulatory Agencies:	SMBRP
Lead Agency:	SMBRP
Program Manager:	Sandra Karinen
Supervisor:	William Beckman
Division Branch:	Cleanup Sacramento
Assembly:	04
Senate:	02
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	CalMortgage
Latitude:	38.75012
Longitude:	-122.6157
APN:	NONE SPECIFIED
Past Use:	NONE
Potential COC:	NONE SPECIFIED No Contaminants found
Confirmed COC:	No Contaminants found
Potential Description:	NMA
Alias Name:	100522
Alias Type:	Project Code (Site Code)
Alias Name:	17800001
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Phase 1
Completed Date:	11/28/1994
Comments:	Pursuant to the MOU, DTSC has prepared a Phase I Environmental Assessment for the Redbud Community Hospital Middletown Clinic. The property, currently a vacant lot, is owned by Redbud Community Hospital and is intended for the relocation of their Middletown Medical Clinic. A Phase I Report was prepared by DTSC and concluded that no action was needed for this property; there is no contamination on the property.
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported

REDBUD COMMUNITY HOSP-MIDDLETOWN CLINIC (Continued) **S118756493**

Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

Count: 1 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
MIDDLETOWN	1018148647	MIDDLETOWN VALLEY FIRE RESPONSE 20	1234 MAIN STREET - FAKE ADDRES	95461	SEMS

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: N/A
Last EDR Contact: 09/05/2019
Next Scheduled EDR Contact: 10/14/2019
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 5
Telephone 312-886-6686

EPA Region 10
Telephone 206-553-8665

EPA Region 6
Telephone: 214-655-6659

EPA Region 7
Telephone: 913-551-7247

EPA Region 8
Telephone: 303-312-6774

EPA Region 9
Telephone: 415-947-4246

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: N/A
Last EDR Contact: 09/05/2019
Next Scheduled EDR Contact: 10/14/2019
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: N/A
Last EDR Contact: 09/05/2019
Next Scheduled EDR Contact: 10/14/2019
Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 04/03/2019
Date Data Arrived at EDR: 04/05/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 07/03/2019
Next Scheduled EDR Contact: 10/14/2019
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 09/05/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 09/05/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 08/13/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 08/26/2019
Number of Days to Update: 6

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 08/07/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 08/19/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 08/26/2019
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 08/19/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 08/26/2019
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/09/2019
Date Data Arrived at EDR: 09/09/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 14

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

State- and tribal - equivalent NPL

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 04/29/2019
Date Data Arrived at EDR: 04/30/2019
Date Made Active in Reports: 06/27/2019
Number of Days to Update: 58

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 04/29/2019
Date Data Arrived at EDR: 04/30/2019
Date Made Active in Reports: 06/27/2019
Number of Days to Update: 58

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 05/13/2019
Date Data Arrived at EDR: 05/14/2019
Date Made Active in Reports: 07/17/2019
Number of Days to Update: 64

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 08/13/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 7: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks
California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 4: Underground Storage Tank Leak List
Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG 3: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST: Leaking Underground Fuel Tank Report (GEOTRACKER)
Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 55

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

LUST REG 6V: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 1: Active Toxic Site Investigation
Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List
Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

LUST REG 9: Leaking Underground Storage Tank Report
Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 10/17/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 10/10/2018
Date Data Arrived at EDR: 03/08/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 10/16/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 02/19/2019
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 11/01/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 09/24/2018
Date Data Arrived at EDR: 03/12/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 50
Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 07/23/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/13/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 10/12/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

CPS-SLIC: Statewide SLIC Cases (GEOTRACKER)
Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 55
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35
Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36
Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11
Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17
Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: No Update Planned

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 05/15/2017
Date Data Arrived at EDR: 05/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 136
Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 08/26/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Varies

MILITARY UST SITES: Military UST Sites (GEOTRACKER)
Military ust sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

UST: Active UST Facilities

Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 42

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Semi-Annually

UST CLOSURE: Proposed Closure of Underground Storage Tank (UST) Cases

UST cases that are being considered for closure by either the State Water Resources Control Board or the Executive Director have been posted for a 60-day public comment period. UST Case Closures being proposed for consideration by the State Water Resources Control Board. These are primarily UST cases that meet closure criteria under the decisional framework in State Water Board Resolution No. 92-49 and other Board orders. UST Case Closures proposed for consideration by the Executive Director pursuant to State Water Board Resolution No. 2012-0061. These are cases that meet the criteria of the Low-Threat UST Case Closure Policy. UST Case Closure Review Denials and Approved Orders.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 41

Source: State Water Resources Control Board
Telephone: 916-327-7844
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

AST: Aboveground Petroleum Storage Tank Facilities

A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 07/06/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 09/19/2016
Number of Days to Update: 69

Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 09/12/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 10/03/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 10/17/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 10/10/2018
Date Data Arrived at EDR: 03/08/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 54

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 09/24/2018
Date Data Arrived at EDR: 03/12/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 50

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 07/23/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 10/12/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/05/2019
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 11/01/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 11/07/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 10/16/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

VCP: Voluntary Cleanup Program Properties

Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 04/29/2019
Date Data Arrived at EDR: 04/30/2019
Date Made Active in Reports: 06/27/2019
Number of Days to Update: 58

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Quarterly

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Varies

State and tribal Brownfields sites

BROWNFIELDS: Considered Brownfieds Sites Listing
A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 57

Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 06/03/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/26/2019
Number of Days to Update: 83

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT: Waste Management Unit Database
Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 07/25/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: No Update Planned

SWRCY: Recycler Database
A listing of recycling facilities in California.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 64

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing
A listing of registered waste tire haulers.

Date of Government Version: 03/26/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/30/2019
Number of Days to Update: 34

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 08/07/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 07/25/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 08/02/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/13/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 82

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: No Update Planned

HIST CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 04/29/2019
Date Data Arrived at EDR: 04/30/2019
Date Made Active in Reports: 06/27/2019
Number of Days to Update: 58

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Quarterly

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/16/2019
Date Made Active in Reports: 09/24/2019
Number of Days to Update: 70

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 07/08/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Varies

CERS HAZ WASTE: CERS HAZ WASTE

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, and RCRA LQ HW Generator programs.

Date of Government Version: 08/14/2019
Date Data Arrived at EDR: 08/14/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 7

Source: CalEPA
Telephone: 916-323-2514
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Quarterly

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/13/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 82

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Quarterly

PFAS: PFAS Contamination Site Location Listing

A listing of PFAS contaminated sites included in the GeoTracker database.

Date of Government Version: 06/28/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 26

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

Local Lists of Registered Storage Tanks

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UST MENDOCINO: Mendocino County UST Database

A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 12/04/2018
Date Data Arrived at EDR: 12/06/2018
Date Made Active in Reports: 12/14/2018
Number of Days to Update: 8

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Annually

HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SAN FRANCISCO AST: Aboveground Storage Tank Site Listing
Aboveground storage tank sites

Date of Government Version: 09/11/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/11/2018
Number of Days to Update: 29

Source: San Francisco County Department of Public Health
Telephone: 415-252-3896
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

CA FID UST: Facility Inventory Database
The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CERS TANKS: California Environmental Reporting System (CERS) Tanks
List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Aboveground Petroleum Storage and Underground Storage Tank regulatory programs.

Date of Government Version: 08/14/2019
Date Data Arrived at EDR: 08/14/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 7

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Quarterly

Local Land Records

LIENS: Environmental Liens Listing
A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 06/05/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 08/09/2019
Number of Days to Update: 64

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

LIENS 2: CERCLA Lien Information
A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 07/30/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 09/05/2019
Next Scheduled EDR Contact: 10/14/2019
Data Release Frequency: Semi-Annually

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 65

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/26/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 89

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 05/15/2019
Date Data Arrived at EDR: 06/24/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 58

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 07/26/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Semi-Annually

LDS: Land Disposal Sites Listing (GEOTRACKER)

Land Disposal sites (Landfills) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 55

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing (GEOTRACKER)

Military sites (consisting of: Military UST sites; Military Privatized sites; and Military Cleanup sites [formerly known as DoD non UST]) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 05/15/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 79

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 08/23/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 07/09/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 07/10/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 08/16/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/26/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 89

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 08/09/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/21/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 198

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 01/10/2018
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 2

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 08/23/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 09/30/2018
Date Data Arrived at EDR: 04/24/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 106

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 07/26/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 09/05/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 04/25/2019
Date Data Arrived at EDR: 05/02/2019
Date Made Active in Reports: 05/23/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 08/20/2019
Date Data Arrived at EDR: 09/05/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 18

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 09/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

PADS: PCB Activity Database System
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 03/20/2019
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 34

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 07/12/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 07/03/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 06/20/2019
Date Data Arrived at EDR: 06/20/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 49

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76
Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 09/06/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 09/03/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 05/24/2017
Date Data Arrived at EDR: 11/30/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 15
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 08/09/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/01/2019
Date Data Arrived at EDR: 07/01/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 84
Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 07/01/2019
Next Scheduled EDR Contact: 10/14/2019
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 04/01/2019
Date Data Arrived at EDR: 04/30/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 100

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 03/31/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 05/23/2019
Number of Days to Update: 30

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 07/08/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 09/28/2017
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 07/10/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 08/08/2017
Date Data Arrived at EDR: 09/11/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 3

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 07/30/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 06/23/2017
Date Data Arrived at EDR: 10/11/2017
Date Made Active in Reports: 11/03/2017
Number of Days to Update: 23

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 09/05/2019
Next Scheduled EDR Contact: 10/14/2019
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 05/03/2019
Date Data Arrived at EDR: 05/29/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 71

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 08/27/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 04/18/2008
Number of Days to Update: 49

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 08/30/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 08/30/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 03/27/2019
Date Data Arrived at EDR: 03/28/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 34

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 09/10/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 05/03/2019
Date Data Arrived at EDR: 06/05/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 90

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 04/07/2019
Date Data Arrived at EDR: 04/09/2019
Date Made Active in Reports: 05/23/2019
Number of Days to Update: 44

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 07/09/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 07/26/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 71

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

UXO: Unexploded Ordnance Sites
A listing of unexploded ordnance site locations

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 01/17/2019
Date Made Active in Reports: 04/01/2019
Number of Days to Update: 74
Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 07/15/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Varies

FUELS PROGRAM: EPA Fuels Program Registered Listing
This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 05/20/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 79
Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Quarterly

CA BOND EXP. PLAN: Bond Expenditure Plan
Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6
Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CORTESE: "Cortese" Hazardous Waste & Substances Sites List
The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 57
Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

CUPA SAN FRANCISCO CO: CUPA Facility Listing
Cupa facilities

Date of Government Version: 04/18/2019
Date Data Arrived at EDR: 04/19/2019
Date Made Active in Reports: 04/30/2019
Number of Days to Update: 11
Source: San Francisco County Department of Environmental Health
Telephone: 415-252-3896
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

CUPA LIVERMORE-PLEASANTON: CUPA Facility Listing
list of facilities associated with the various CUPA programs in Livermore-Pleasanton

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 05/14/2019
Date Made Active in Reports: 07/17/2019
Number of Days to Update: 64
Source: Livermore-Pleasanton Fire Department
Telephone: 925-454-2361
Last EDR Contact: 08/15/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Varies

DRYCLEANERS: Cleaner Facilities
A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 55
Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Annually

DRYCLEAN SOUTH COAST: South Coast Air Quality Management District Drycleaner Listing
A listing of dry cleaners in the South Coast Air Quality Management District

Date of Government Version: 03/19/2019
Date Data Arrived at EDR: 03/22/2019
Date Made Active in Reports: 04/09/2019
Number of Days to Update: 18
Source: South Coast Air Quality Management District
Telephone: 909-396-3211
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

DRYCLEAN AVAQMD: Antelope Valley Air Quality Management District Drycleaner Listing
A listing of dry cleaners in the Antelope Valley Air Quality Management District.

Date of Government Version: 06/03/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 65
Source: Antelope Valley Air Quality Management District
Telephone: 661-723-8070
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

EMI: Emissions Inventory Data
Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 06/24/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 59
Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 09/18/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Varies

ENF: Enforcement Action Listing
A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 11/01/2018
Date Data Arrived at EDR: 11/02/2018
Date Made Active in Reports: 12/13/2018
Number of Days to Update: 41
Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 07/18/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing
Financial Assurance information

Date of Government Version: 04/22/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/26/2019
Number of Days to Update: 64
Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing
A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 05/15/2019
Date Data Arrived at EDR: 05/16/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 63
Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 08/07/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 05/29/2019
Date Made Active in Reports: 07/22/2019
Number of Days to Update: 54

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 07/12/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Annually

ICE: ICE

Contains data pertaining to the Permitted Facilities with Inspections / Enforcements sites tracked in Envirostor.

Date of Government Version: 05/20/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 58

Source: Department of Toxic Subsances Control
Telephone: 877-786-9427
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List

The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HWP: EnviroStor Permitted Facilities Listing

Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 05/20/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 58

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Quarterly

HWT: Registered Hazardous Waste Transporter Database

A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 07/08/2019
Date Data Arrived at EDR: 07/09/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 73

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 07/09/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Quarterly

MINES: Mines Site Location Listing

A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 65

Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

MWMP: Medical Waste Management Program Listing

The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 05/17/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/09/2019
Number of Days to Update: 66

Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

NPDES: NPDES Permits Listing

A listing of NPDES permits, including stormwater.

Date of Government Version: 05/13/2019
Date Data Arrived at EDR: 05/14/2019
Date Made Active in Reports: 07/17/2019
Number of Days to Update: 64

Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 08/13/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Quarterly

PEST LIC: Pesticide Regulation Licenses Listing

A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/09/2019
Number of Days to Update: 66

Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

PROC: Certified Processors Database

A listing of certified processors.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 64

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

NOTIFY 65: Proposition 65 Records

Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 06/17/2019
Date Data Arrived at EDR: 06/18/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 65

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: No Update Planned

UIC: UIC Listing

A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 04/27/2018
Date Data Arrived at EDR: 06/13/2018
Date Made Active in Reports: 07/17/2018
Number of Days to Update: 34

Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

UIC GEO: Underground Injection Control Sites (GEOTRACKER)
Underground control injection sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resource Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

WASTEWATER PITS: Oil Wastewater Pits Listing
Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water boards review found that more than one-third of the region's active disposal pits are operating without permission.

Date of Government Version: 05/08/2018
Date Data Arrived at EDR: 07/11/2018
Date Made Active in Reports: 09/13/2018
Number of Days to Update: 64

Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 07/12/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Varies

WDS: Waste Discharge System
Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: No Update Planned

WIP: Well Investigation Program Case List
Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: No Update Planned

MILITARY PRIV SITES: Military Privatized Sites (GEOTRACKER)
Military privatized sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

PROJECT: Project Sites (GEOTRACKER)
Projects sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

WDR: Waste Discharge Requirements Listing
In general, the Waste Discharge Requirements (WDRs) Program (sometimes also referred to as the "Non Chapter 15 (Non 15) Program") regulates point discharges that are exempt pursuant to Subsection 20090 of Title 27 and not subject to the Federal Water Pollution Control Act. Exemptions from Title 27 may be granted for nine categories of discharges (e.g., sewage, wastewater, etc.) that meet, and continue to meet, the preconditions listed for each specific exemption. The scope of the WDRs Program also includes the discharge of wastes classified as inert, pursuant to section 20230 of Title 27.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 64

Source: State Water Resources Control Board
Telephone: 916-341-5810
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

CIWQS: California Integrated Water Quality System

The California Integrated Water Quality System (CIWQS) is a computer system used by the State and Regional Water Quality Control Boards to track information about places of environmental interest, manage permits and other orders, track inspections, and manage violations and enforcement activities.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 65

Source: State Water Resources Control Board
Telephone: 866-794-4977
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

CERS: CalEPA Regulated Site Portal Data

The CalEPA Regulated Site Portal database combines data about environmentally regulated sites and facilities in California into a single database. It combines data from a variety of state and federal databases, and provides an overview of regulated activities across the spectrum of environmental programs for any given location in California. These activities include hazardous materials and waste, state and federal cleanups, impacted ground and surface waters, and toxic materials

Date of Government Version: 08/14/2019
Date Data Arrived at EDR: 08/14/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 7

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

NON-CASE INFO: Non-Case Information Sites (GEOTRACKER)

Non-Case Information sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

OTHER OIL GAS: Other Oil & Gas Projects Sites (GEOTRACKER)

Other Oil & Gas Projects sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

PROD WATER PONDS: Produced Water Ponds Sites (GEOTRACKER)

Produced water ponds sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

SAMPLING POINT: Sampling Point ? Public Sites (GEOTRACKER)

Sampling point - public sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

WELL STIM PROJ: Well Stimulation Project (GEOTRACKER)

Includes areas of groundwater monitoring plans, a depiction of the monitoring network, and the facilities, boundaries, and subsurface characteristics of the oilfield and the features (oil and gas wells, produced water ponds, UIC wells, water supply wells, etc?) being monitored

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

CS ALAMEDA: Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 01/09/2019
Date Data Arrived at EDR: 01/11/2019
Date Made Active in Reports: 03/05/2019
Number of Days to Update: 53

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 07/08/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Semi-Annually

UST ALAMEDA: Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 04/10/2019
Date Data Arrived at EDR: 04/11/2019
Date Made Active in Reports: 06/20/2019
Number of Days to Update: 70

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 04/24/2047
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA AMADOR: CUPA Facility List
Cupa Facility List

Date of Government Version: 06/27/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 26

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA BUTTE: CUPA Facility Listing
Cupa facility list.

Date of Government Version: 04/21/2017
Date Data Arrived at EDR: 04/25/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 106

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 07/08/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA CALVERAS: CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 05/02/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 27

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 09/23/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA COLUSA: CUPA Facility List
Cupa facility list.

Date of Government Version: 05/17/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 58

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

SL CONTRA COSTA: Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 05/22/2019
Date Data Arrived at EDR: 05/23/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 56

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 07/26/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA DEL NORTE: CUPA Facility List
Cupa Facility list

Date of Government Version: 02/20/2019
Date Data Arrived at EDR: 05/01/2019
Date Made Active in Reports: 05/30/2019
Number of Days to Update: 29

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 07/25/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA EL DORADO: CUPA Facility List
CUPA facility list.

Date of Government Version: 06/05/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 47

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 09/05/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA FRESNO: CUPA Resources List
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 07/11/2019
Date Data Arrived at EDR: 07/11/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 71

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 09/25/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Semi-Annually

GLENN COUNTY:

CUPA GLENN: CUPA Facility List
Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 49

Source: Glenn County Air Pollution Control District
Telephone: 830-934-6500
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: No Update Planned

HUMBOLDT COUNTY:

CUPA HUMBOLDT: CUPA Facility List
CUPA facility list.

Date of Government Version: 07/08/2019
Date Data Arrived at EDR: 07/10/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 72

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 08/19/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Semi-Annually

IMPERIAL COUNTY:

CUPA IMPERIAL: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/24/2019
Date Data Arrived at EDR: 04/25/2019
Date Made Active in Reports: 06/27/2019
Number of Days to Update: 63

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INYO COUNTY:

CUPA INYO: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/03/2018
Date Made Active in Reports: 06/14/2018
Number of Days to Update: 72

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

KERN COUNTY:

UST KERN: Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 05/06/2019
Date Data Arrived at EDR: 05/07/2019
Date Made Active in Reports: 07/16/2019
Number of Days to Update: 70

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA KINGS: CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 05/16/2019
Date Data Arrived at EDR: 05/17/2019
Date Made Active in Reports: 05/30/2019
Number of Days to Update: 13

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

LAKE COUNTY:

CUPA LAKE: CUPA Facility List
Cupa facility list

Date of Government Version: 05/30/2019
Date Data Arrived at EDR: 05/31/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 53

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 07/15/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Varies

LASSEN COUNTY:

CUPA LASSEN: CUPA Facility List
Cupa facility list

Date of Government Version: 01/17/2019
Date Data Arrived at EDR: 01/18/2019
Date Made Active in Reports: 03/05/2019
Number of Days to Update: 46

Source: Lassen County Environmental Health
Telephone: 530-251-8528
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

LOS ANGELES COUNTY:

AOCONCERN: Key Areas of Concerns in Los Angeles County
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office. Date of Government Version: 3/30/2009 Exide Site area is a cleanup plan of lead-impacted soil surrounding the former Exide Facility as designated by the DTSC. Date of Government Version: 7/17/2017

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: N/A
Telephone: N/A
Last EDR Contact: 09/12/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: No Update Planned

HMS LOS ANGELES: HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 07/09/2019
Date Data Arrived at EDR: 07/11/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 71

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 07/08/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Semi-Annually

LF LOS ANGELES: List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 04/15/2019
Date Data Arrived at EDR: 04/16/2019
Date Made Active in Reports: 06/21/2019
Number of Days to Update: 66

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 07/17/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Varies

LF LOS ANGELES CITY: City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 01/01/2019
Date Data Arrived at EDR: 01/15/2019
Date Made Active in Reports: 03/07/2019
Number of Days to Update: 51

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 07/12/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Varies

LOS ANGELES AST: Active & Inactive AST Inventory
A listing of active & inactive above ground petroleum storage tank site locations, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 06/25/2019
Next Scheduled EDR Contact: 10/07/2019
Data Release Frequency: Varies

LOS ANGELES CO LF METHANE: Methane Producing Landfills

This data was created on April 30, 2012 to represent known disposal sites in Los Angeles County that may produce and emanate methane gas. The shapefile contains disposal sites within Los Angeles County that once accepted degradable refuse material. Information used to create this data was extracted from a landfill survey performed by County Engineers (Major Waste System Map, 1973) as well as historical records from CalRecycle, Regional Water Quality Control Board, and Los Angeles County Department of Public Health

Date of Government Version: 04/30/2012
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 42

Source: Los Angeles County Department of Public Works
Telephone: 626-458-6973
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: No Update Planned

LOS ANGELES HM: Active & Inactive Hazardous Materials Inventory

A listing of active & inactive hazardous materials facility locations, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 06/25/2019
Next Scheduled EDR Contact: 10/07/2019
Data Release Frequency: Varies

LOS ANGELES UST: Active & Inactive UST Inventory

A listing of active & inactive underground storage tank site locations and underground storage tank historical sites, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 06/25/2019
Next Scheduled EDR Contact: 10/07/2019
Data Release Frequency: Varies

SITE MIT LOS ANGELES: Site Mitigation List

Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 07/15/2019
Date Data Arrived at EDR: 07/17/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 19

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 07/17/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Annually

UST EL SEGUNDO: City of El Segundo Underground Storage Tank

Underground storage tank sites located in El Segundo city.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 04/19/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 21

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 07/12/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: No Update Planned

UST LONG BEACH: City of Long Beach Underground Storage Tank

Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 04/22/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/27/2019
Number of Days to Update: 65

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

UST TORRANCE: City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 04/04/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/27/2019
Number of Days to Update: 65

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA MADERA: CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 05/28/2019
Date Data Arrived at EDR: 05/30/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 67

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

MARIN COUNTY:

UST MARIN: Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 09/26/2018
Date Data Arrived at EDR: 10/04/2018
Date Made Active in Reports: 11/02/2018
Number of Days to Update: 29

Source: Public Works Department Waste Management
Telephone: 415-473-6647
Last EDR Contact: 09/25/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA MERCED: CUPA Facility List
CUPA facility list.

Date of Government Version: 05/29/2019
Date Data Arrived at EDR: 05/30/2019
Date Made Active in Reports: 07/22/2019
Number of Days to Update: 53

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

MONO COUNTY:

CUPA MONO: CUPA Facility List
CUPA Facility List

Date of Government Version: 05/23/2019
Date Data Arrived at EDR: 05/30/2019
Date Made Active in Reports: 07/22/2019
Number of Days to Update: 53

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 09/09/2019
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA MONTEREY: CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 02/05/2019
Date Data Arrived at EDR: 02/07/2019
Date Made Active in Reports: 03/05/2019
Number of Days to Update: 26

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 06/28/2019
Next Scheduled EDR Contact: 10/14/2019
Data Release Frequency: Varies

NAPA COUNTY:

LUST NAPA: Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 01/09/2017
Date Data Arrived at EDR: 01/11/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 50

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: No Update Planned

UST NAPA: Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 02/21/2019
Date Data Arrived at EDR: 02/22/2019
Date Made Active in Reports: 03/08/2019
Number of Days to Update: 14

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 09/05/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA NEVADA: CUPA Facility List
CUPA facility list.

Date of Government Version: 05/20/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 05/30/2019
Number of Days to Update: 9

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 07/25/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

ORANGE COUNTY:

IND_SITE ORANGE: List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 05/09/2019
Date Made Active in Reports: 05/30/2019
Number of Days to Update: 21

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Annually

LUST ORANGE: List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 05/09/2019
Date Made Active in Reports: 05/30/2019
Number of Days to Update: 21

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

UST ORANGE: List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 04/02/2019
Date Data Arrived at EDR: 05/07/2019
Date Made Active in Reports: 07/16/2019
Number of Days to Update: 70

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

PLACER COUNTY:

MS PLACER: Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 06/03/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/12/2019
Number of Days to Update: 69

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Semi-Annually

PLUMAS COUNTY:

CUPA PLUMAS: CUPA Facility List
Plumas County CUPA Program facilities.

Date of Government Version: 03/31/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/26/2019
Number of Days to Update: 64

Source: Plumas County Environmental Health
Telephone: 530-283-6355
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

RIVERSIDE COUNTY:

LUST RIVERSIDE: Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 07/10/2019
Date Data Arrived at EDR: 07/11/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 71

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Quarterly

UST RIVERSIDE: Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 07/10/2019
Date Data Arrived at EDR: 07/11/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 74

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

CS SACRAMENTO: Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 05/06/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 55

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 06/28/2019
Next Scheduled EDR Contact: 10/14/2019
Data Release Frequency: Quarterly

ML SACRAMENTO: Master Hazardous Materials Facility List

Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 05/06/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 09/13/2019
Number of Days to Update: 77

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 06/28/2019
Next Scheduled EDR Contact: 10/14/2019
Data Release Frequency: Quarterly

SAN BENITO COUNTY:

CUPA SAN BENITO: CUPA Facility List

Cupa facility list

Date of Government Version: 07/16/2019
Date Data Arrived at EDR: 07/16/2019
Date Made Active in Reports: 09/24/2019
Number of Days to Update: 70

Source: San Benito County Environmental Health
Telephone: N/A
Last EDR Contact: 07/16/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

SAN BERNARDINO COUNTY:

PERMITS SAN BERNARDINO: Hazardous Material Permits

This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 05/31/2019
Date Data Arrived at EDR: 05/31/2019
Date Made Active in Reports: 07/22/2019
Number of Days to Update: 52

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

HMMD SAN DIEGO: Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 65

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

LF SAN DIEGO: Solid Waste Facilities
San Diego County Solid Waste Facilities.

Date of Government Version: 04/18/2018
Date Data Arrived at EDR: 04/24/2018
Date Made Active in Reports: 06/19/2018
Number of Days to Update: 56
Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

SAN DIEGO CO LOP: Local Oversight Program Listing
A listing of all LOP release sites that are or were under the County of San Diego's jurisdiction. Included are closed or transferred cases, open cases, and cases that did not have a case type indicated. The cases without a case type are mostly complaints; however, some of them could be LOP cases.

Date of Government Version: 04/24/2019
Date Data Arrived at EDR: 04/25/2019
Date Made Active in Reports: 06/27/2019
Number of Days to Update: 63
Source: Department of Environmental Health
Telephone: 858-505-6874
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

SAN DIEGO CO SAM: Environmental Case Listing
The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24
Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

LUST SAN FRANCISCO: Local Oversite Facilities
A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10
Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: No Update Planned

UST SAN FRANCISCO: Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 11/05/2018
Date Data Arrived at EDR: 11/06/2018
Date Made Active in Reports: 12/14/2018
Number of Days to Update: 38
Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

UST SAN JOAQUIN: San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 06/22/2018
Date Data Arrived at EDR: 06/26/2018
Date Made Active in Reports: 07/11/2018
Number of Days to Update: 15
Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 09/11/2019
Next Scheduled EDR Contact: 12/29/2019
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA SAN LUIS OBISPO: CUPA Facility List
Cupa Facility List.

Date of Government Version: 05/20/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 58

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

SAN MATEO COUNTY:

BI SAN MATEO: Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 08/06/2019
Date Data Arrived at EDR: 08/14/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 1

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Annually

LUST SAN MATEO: Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 03/29/2019
Date Data Arrived at EDR: 03/29/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 61

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 09/05/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA SANTA BARBARA: CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: No Update Planned

SANTA CLARA COUNTY:

CUPA SANTA CLARA: Cupa Facility List
Cupa facility list

Date of Government Version: 05/16/2019
Date Data Arrived at EDR: 05/23/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 56

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

HIST LUST SANTA CLARA: HIST LUST - Fuel Leak Site Activity Report
A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LUST SANTA CLARA: LOP Listing
A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: No Update Planned

SAN JOSE HAZMAT: Hazardous Material Facilities
Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 05/19/2019
Date Data Arrived at EDR: 05/23/2019
Date Made Active in Reports: 07/22/2019
Number of Days to Update: 60

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA SANTA CRUZ: CUPA Facility List
CUPA facility listing.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 90

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA SHASTA: CUPA Facility List
Cupa Facility List.

Date of Government Version: 06/15/2017
Date Data Arrived at EDR: 06/19/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 51

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

SOLANO COUNTY:

LUST SOLANO: Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 08/13/2019
Number of Days to Update: 68

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

UST SOLANO: Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 47

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

SONOMA COUNTY:

CUPA SONOMA: Cupa Facility List
Cupa Facility list

Date of Government Version: 06/18/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 29

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Varies

LUST SONOMA: Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 07/02/2019
Date Data Arrived at EDR: 07/02/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 80

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

STANISLAUS COUNTY:

CUPA STANISLAUS: CUPA Facility List
Cupa facility list

Date of Government Version: 12/11/2018
Date Data Arrived at EDR: 12/13/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 33

Source: Stanislaus County Department of Ennvironmental Protection
Telephone: 209-525-6751
Last EDR Contact: 07/15/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Varies

SUTTER COUNTY:

UST SUTTER: Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 06/03/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 49

Source: Sutter County Environmental Health Services
Telephone: 530-822-7500
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Semi-Annually

TEHAMA COUNTY:

CUPA TEHAMA: CUPA Facility List
Cupa facilities

Date of Government Version: 05/20/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 58

Source: Tehama County Department of Environmental Health
Telephone: 530-527-8020
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

TRINITY COUNTY:

CUPA TRINITY: CUPA Facility List
Cupa facility list

Date of Government Version: 04/24/2019
Date Data Arrived at EDR: 04/25/2019
Date Made Active in Reports: 06/28/2019
Number of Days to Update: 64

Source: Department of Toxic Substances Control
Telephone: 760-352-0381
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

TULARE COUNTY:

CUPA TULARE: CUPA Facility List
Cupa program facilities

Date of Government Version: 05/09/2019
Date Data Arrived at EDR: 05/10/2019
Date Made Active in Reports: 07/17/2019
Number of Days to Update: 68

Source: Tulare County Environmental Health Services Division
Telephone: 559-624-7400
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

TUOLUMNE COUNTY:

CUPA TUOLUMNE: CUPA Facility List
Cupa facility list

Date of Government Version: 04/23/2018
Date Data Arrived at EDR: 04/25/2018
Date Made Active in Reports: 06/25/2018
Number of Days to Update: 61

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

VENTURA COUNTY:

BWT VENTURA: Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 03/26/2019
Date Data Arrived at EDR: 04/25/2019
Date Made Active in Reports: 06/27/2019
Number of Days to Update: 63

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Quarterly

LF VENTURA: Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 09/25/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: No Update Planned

LUST VENTURA: Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 08/07/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: No Update Planned

MED WASTE VENTURA: Medical Waste Program List
To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 03/26/2019
Date Data Arrived at EDR: 04/25/2019
Date Made Active in Reports: 05/30/2019
Number of Days to Update: 35
Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Quarterly

UST VENTURA: Underground Tank Closed Sites List
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 42
Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

YOLO COUNTY:

UST YOLO: Underground Storage Tank Comprehensive Facility Report
Underground storage tank sites located in Yolo county.

Date of Government Version: 06/26/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 07/31/2019
Number of Days to Update: 33
Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 09/25/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Annually

YUBA COUNTY:

CUPA YUBA: CUPA Facility List
CUPA facility listing for Yuba County.

Date of Government Version: 05/03/2019
Date Data Arrived at EDR: 05/07/2019
Date Made Active in Reports: 07/16/2019
Number of Days to Update: 70
Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 07/25/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 05/14/2019
Date Data Arrived at EDR: 05/14/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 83
Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 08/07/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/16/2019
Number of Days to Update: 36

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 07/09/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 01/01/2019
Date Data Arrived at EDR: 05/01/2019
Date Made Active in Reports: 06/21/2019
Number of Days to Update: 51

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/19/2019
Date Made Active in Reports: 09/10/2019
Number of Days to Update: 53

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 07/15/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 02/23/2018
Date Made Active in Reports: 04/09/2018
Number of Days to Update: 45

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 08/16/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 76

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 09/06/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: Endeavor Business Media
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Electric Power Transmission Line Data
Source: Endeavor Business Media
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

MIDDLETOWN HOUSING SITE
21000 SANTA CLARA
MIDDLETOWN, CA 95461

TARGET PROPERTY COORDINATES

Latitude (North):	38.755914 - 38° 45' 21.29''
Longitude (West):	122.620757 - 122° 37' 14.73''
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	532952.8
UTM Y (Meters):	4289551.5
Elevation:	1102 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5602144 MIDDLETOWN, CA
Version Date:	2012
Southeast Map:	5602108 DETERT RESERVOIR, CA
Version Date:	2012
Southwest Map:	5602150 MOUNT SAINT HELENA, CA
Version Date:	2012
Northwest Map:	5602180 WHISPERING PINES, CA
Version Date:	2012

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

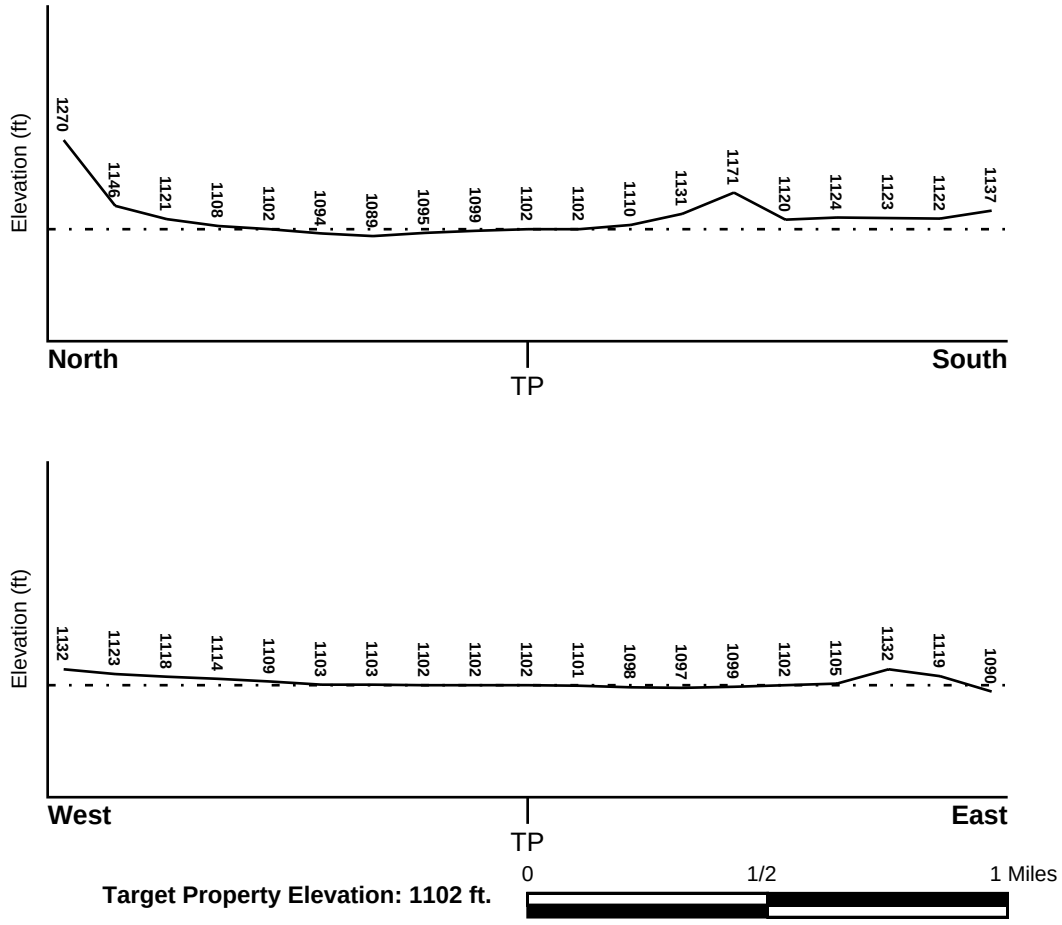
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General NNE

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
06033C0863D	FEMA FIRM Flood data

Additional Panels in search area:	FEMA Source Type
06033C0844D	FEMA FIRM Flood data
06097C0200E	FEMA FIRM Flood data
06033C0951D	FEMA FIRM Flood data
06097C0400E	FEMA FIRM Flood data
06097C0425E	FEMA FIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
NOT AVAILABLE	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Status:	Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

* ©1996 Site−specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

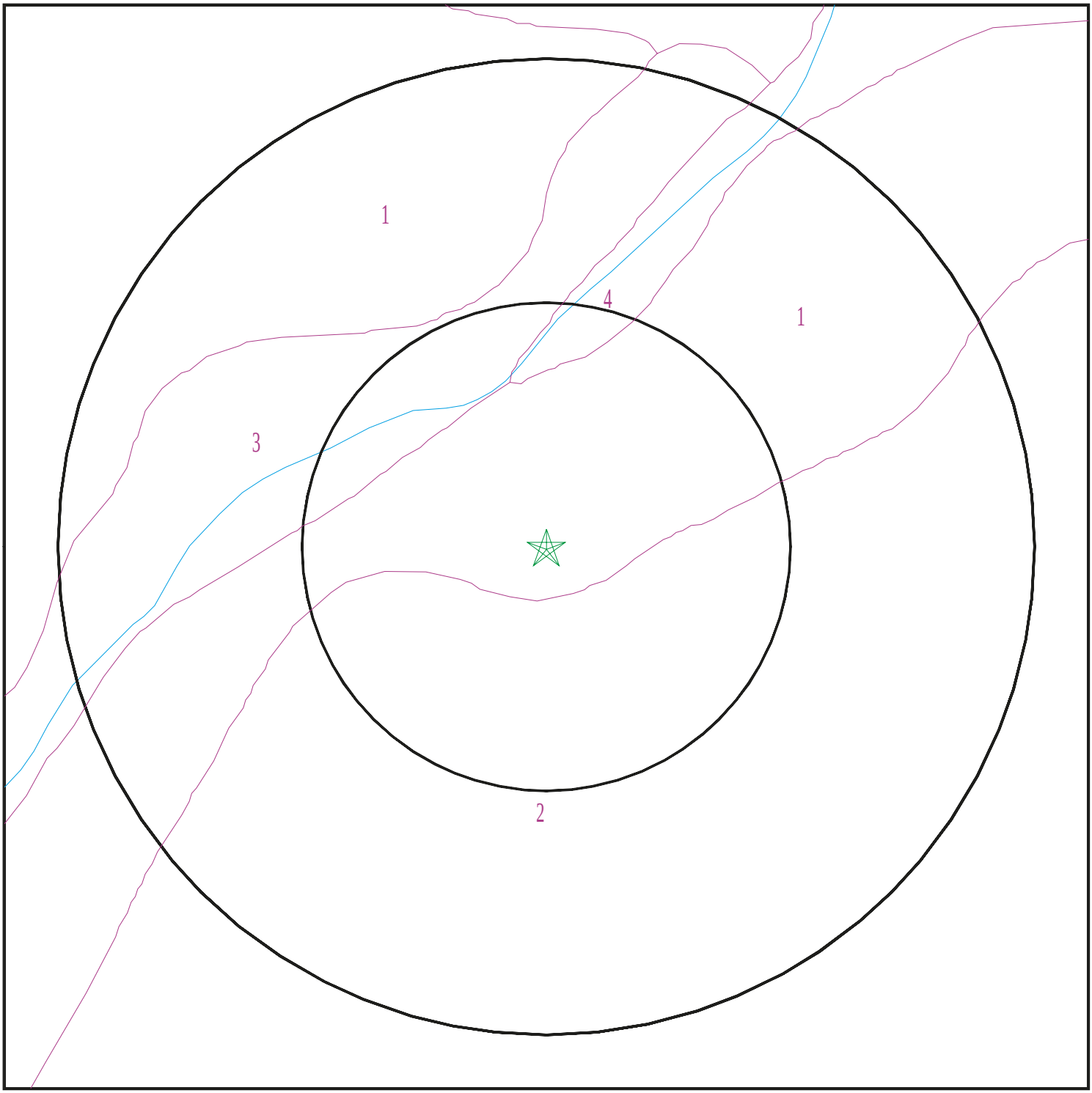
Era:	Paleozoic
System:	Permian
Series:	Ultramafic rocks
Code:	uM *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Plutonic and Intrusive Rocks

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 5804415.2s



SITE NAME:	Middletown Housing Site	CLIENT:	ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS:	21000 Santa Clara Middletown CA 95461	CONTACT:	Kristen Miner
		INQUIRY #:	5804415.2s
LAT/LONG:	38.755914 / 122.620757	DATE:	September 26, 2019 3:51 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: KELSEY

Soil Surface Texture:
Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	11 inches		Not reported	Not reported	Max: 42 Min: 14	Max: 7.8 Min: 6.1
2	11 inches	59 inches		Not reported	Not reported	Max: 42 Min: 14	Max: 7.8 Min: 6.1

Soil Map ID: 2

Soil Component Name: TALMAGE

Soil Surface Texture:
Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Somewhat excessively drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	33 inches		Not reported	Not reported	Max: 42 Min: 14	Max: 7.8 Min: 6.1
2	33 inches	70 inches		Not reported	Not reported	Max: 42 Min: 14	Max: 7.8 Min: 6.1

Soil Map ID: 3

Soil Component Name: XEROFLUVENTS

Soil Surface Texture:

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Excessively drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

No Layer Information available.

Soil Map ID: 4

Soil Component Name: RIVERWASH

Soil Surface Texture:

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Excessively drained

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

No Layer Information available.

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
7	USGS40000190127	1/2 - 1 Mile ENE

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
2	CA1700679	1/4 - 1/2 Mile SE

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

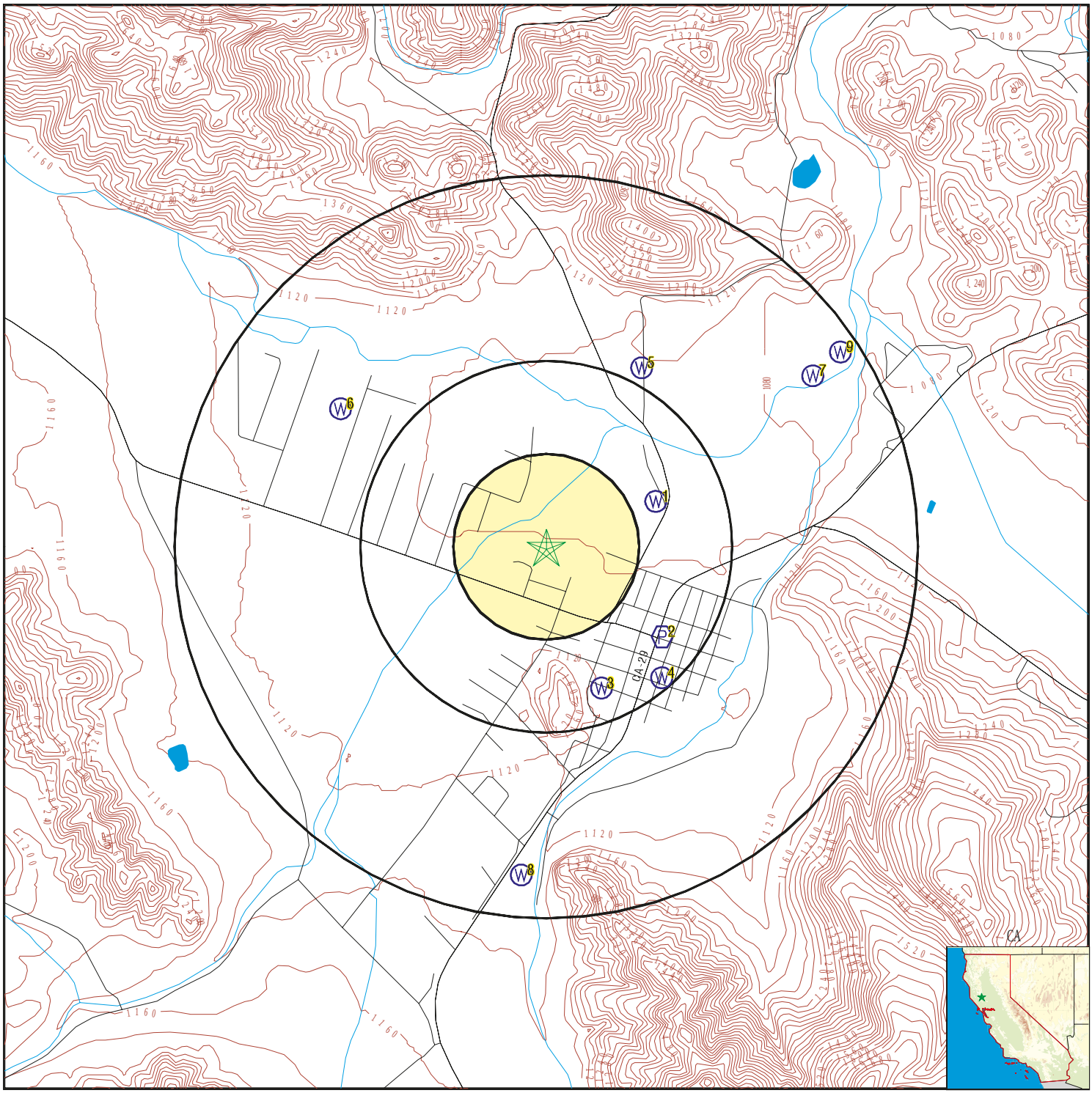
MAP ID	WELL ID	LOCATION FROM TP
1	10385	1/4 - 1/2 Mile ENE
3	CADWR8000039022	1/4 - 1/2 Mile SSE
4	CADWR8000039027	1/4 - 1/2 Mile SE
5	CADWR8000039073	1/2 - 1 Mile NNE
6	CADWR8000039064	1/2 - 1 Mile NW

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
8	CADWR8000039004	1/2 - 1 Mile South
9	51	1/2 - 1 Mile ENE

PHYSICAL SETTING SOURCE MAP - 5804415.2s



- County Boundary
- Major Roads
- Contour Lines
- Earthquake Fault Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data
- Oil, gas or related wells

SITE NAME:	Middletown Housing Site	CLIENT:	ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS:	21000 Santa Clara Middletown CA 95461	CONTACT:	Kristen Miner
		INQUIRY #:	5804415.2s
LAT/LONG:	38.755914 / 122.620757	DATE:	September 26, 2019 3:51 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

1
ENE
1/4 - 1/2 Mile
Lower

CA WELLS **10385**

Seq:	10385	Prim sta c:	11N/07W-34R02 M
Frds no:	1710013002	County:	17
District:	03	User id:	RXR
System no:	1710013	Water type:	G
Source nam:	WELL 01 (BIG CANYON) - STANDBY	Station ty:	WELL/AMBNT/MUN/INTAKE
Latitude:	384528.0	Longitude:	1223651.0
Precision:	3	Status:	SR
Comment 1:	HWY 29 TO HWY 175 WEST. GO 3 BLOCKS TO BIG CANYON RD. TURN RIGHT ON		
Comment 2:	BIG CANYON RD. GO 1/4 MI TO JUST BEFORE BRIDGE THAT CROSSES PUTAH		
Comment 3:	CREEK. DIRT DRIVEWAY IS ON THE LEFT ACROSS FROM HIGH SCHOOL. WELL IS		
Comment 4:	AT END OF DRIVEWAY.	Comment 5:	Not Reported
Comment 6:	Not Reported	Comment 7:	REVISED 01/13/89

System no:	1710013	System nam:	Callayomi County Water District
Hqname:	Not Reported	Address:	P.O. BOX 623
City:	Middletown	State:	CA
Zip:	95461	Zip ext:	Not Reported
Pop serv:	750	Connection:	294
Area serve:	Not Reported		

Sample date:	16-OCT-12	Finding:	3.
Chemical:	COLOR	Report units:	UNITS
Dlr:	0.		

Sample date:	16-OCT-12	Finding:	1.94
Chemical:	GROSS ALPHA COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		

Sample date:	16-OCT-12	Finding:	1.2
Chemical:	ODOR THRESHOLD @ 60 C	Report units:	TON
Dlr:	1.		

Sample date:	16-OCT-12	Finding:	430.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		

Sample date:	16-OCT-12	Finding:	7.9
Chemical:	PH, LABORATORY	Report units:	Not Reported
Dlr:	0.		

Sample date:	16-OCT-12	Finding:	220.
Chemical:	ALKALINITY (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		

Sample date:	16-OCT-12	Finding:	270.
Chemical:	BICARBONATE ALKALINITY	Report units:	MG/L
Dlr:	0.		

Sample date:	16-OCT-12	Finding:	150.
Chemical:	HARDNESS (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		

Sample date:	16-OCT-12	Finding:	8.9
Chemical:	CALCIUM	Report units:	MG/L
Dlr:	0.		

Sample date:	16-OCT-12	Finding:	32.
Chemical:	MAGNESIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	16-OCT-12	Finding:	35.
Chemical:	SODIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	16-OCT-12	Finding:	7.4
Chemical:	CHLORIDE	Report units:	MG/L
Dlr:	0.		
Sample date:	16-OCT-12	Finding:	0.19
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)	Report units:	MG/L
Dlr:	0.1		
Sample date:	16-OCT-12	Finding:	240.
Chemical:	BARIUM	Report units:	UG/L
Dlr:	100.		
Sample date:	16-OCT-12	Finding:	2.6
Chemical:	CHROMIUM (TOTAL)	Report units:	UG/L
Dlr:	10.		
Sample date:	16-OCT-12	Finding:	3200.
Chemical:	IRON	Report units:	UG/L
Dlr:	100.		
Sample date:	16-OCT-12	Finding:	73.
Chemical:	MANGANESE	Report units:	UG/L
Dlr:	20.		
Sample date:	16-OCT-12	Finding:	32.
Chemical:	NICKEL	Report units:	UG/L
Dlr:	10.		
Sample date:	16-OCT-12	Finding:	570.
Chemical:	ALUMINUM	Report units:	UG/L
Dlr:	50.		
Sample date:	16-OCT-12	Finding:	270.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	16-OCT-12	Finding:	6.2
Chemical:	TURBIDITY, LABORATORY	Report units:	NTU
Dlr:	0.1		
Sample date:	16-OCT-12	Finding:	11.6
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)	Report units:	Not Reported
Dlr:	0.		
Sample date:	28-JUN-12	Finding:	2.39
Chemical:	GROSS ALPHA COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

2
SE
1/4 - 1/2 Mile
Higher

FRDS PWS **CA1700679**

Epa region:	09	State:	CA
Pwsid:	CA1700679	Pwsname:	FRITZ'S PLACE
Cityserved:	Not Reported	Stateserved:	CA
Zipserved:	Not Reported	Fipscounty:	06033
Status:	Closed	Retpopsrvd:	100
Pwssvcconn:	1	Psource longname:	Groundwater
Pwstype:	TNCWS	Owner:	Private
Contact:	FRITZ'S PLACE	Contactorgname:	Not Reported
Contactphone:	Not Reported	Contactaddress1:	FRITZ'S PLACE
Contactaddress2:	20763 ST HELENA AVE	Contactcity:	MIDDLETOWN
Contactstate:	CA	Contactzip:	95461
Pwsactivitycode:	N		

PWS ID:	CA1700679	PWS type:	System Owner/Responsible Party
PWS name:	FRITZ'S PLACE	PWS address:	Not Reported
PWS city:	MIDDLETOWN	PWS state:	CA
PWS zip:	95461	PWS ID:	CA1700679
Activity status:	Active	Date system activated:	8703
Date system deactivated:	Not Reported	Retail population:	00000100
System name:	FRITZ'S PLACE	System address:	FRITZ'S PLACE
System address:	20763 ST HELENA AVE	System city:	MIDDLETOWN
System state:	CA	System zip:	95461
Population served:	Under 101 Persons	Treatment:	Untreated
Latitude:	384509	Longitude:	1223650

3
SSE
1/4 - 1/2 Mile
Higher

CA WELLS **CADWR8000039022**

State Well #:	10N07W03B002M	Station ID:	13806
Well Name:	Not Reported	Well Use:	Residential
Well Type:	Unknown	Well Depth:	0
Basin Name:	Collayomi Valley	Well Completion Rpt #:	Not Reported

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4
SE
1/4 - 1/2 Mile
Higher

CA WELLS **CADWR8000039027**

State Well #:	10N07W03A002M	Station ID:	48705
Well Name:	10N07W03A002M	Well Use:	Other
Well Type:	Single Well	Well Depth:	108
Basin Name:	Collayomi Valley	Well Completion Rpt #:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

5
NNE
1/2 - 1 Mile
Lower

CA WELLS **CADWR8000039073**

State Well #:	11N07W34K001M	Station ID:	29741
Well Name:	Not Reported	Well Use:	Residential
Well Type:	Unknown	Well Depth:	0
Basin Name:	Collayomi Valley	Well Completion Rpt #:	NONE

6
NW
1/2 - 1 Mile
Higher

CA WELLS **CADWR8000039064**

State Well #:	11N07W33J002M	Station ID:	12085
Well Name:	11N-07W-33J2	Well Use:	Residential
Well Type:	Unknown	Well Depth:	0
Basin Name:	Collayomi Valley	Well Completion Rpt #:	NONE

7
ENE
1/2 - 1 Mile
Lower

FED USGS **USGS40000190127**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	011N007W35M001M	Type:	Well
Description:	Not Reported	HUC:	18020117
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19760830	Well Depth:	283
Well Depth Units:	ft	Well Hole Depth:	283
Well Hole Depth Units:	ft		

8
South
1/2 - 1 Mile
Higher

CA WELLS **CADWR8000039004**

State Well #:	10N07W03L004M	Station ID:	13807
Well Name:	10N-07W-03L4	Well Use:	Irrigation
Well Type:	Unknown	Well Depth:	0
Basin Name:	Collayomi Valley	Well Completion Rpt #:	NONE

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

9
ENE
1/2 - 1 Mile
Lower | **CA WELLS** | **51**

Seq:	51	Prim sta c:	017/013-001
Frds no:	1710013001	County:	17
District:	03	User id:	RXR
System no:	1710013	Water type:	G
Source nam:	DIAMOND WELL	Station ty:	WELL/AMBNT/MUN/INTAKE
Latitude:	384549.4	Longitude:	1223618.2
Precision:	3	Status:	AR
Comment 1:	WELL ON THE DIAMOND D RANCH, ON BIG CANYON RD., CONNECTED TO THE CALLA		
Comment 2:	YOMI CWD SYSTEM.	Comment 3:	Not Reported
Comment 4:	Not Reported	Comment 5:	Not Reported
Comment 6:	Not Reported	Comment 7:	Not Reported
System no:	1710013	System nam:	Callayomi County Water District
Hqname:	Not Reported	Address:	P.O. BOX 623
City:	Middletown	State:	CA
Zip:	95461	Zip ext:	Not Reported
Pop serv:	750	Connection:	294
Area serve:	Not Reported		
Sample date:	25-JAN-18	Finding:	0.96
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	21-FEB-17	Finding:	0.54
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	16-FEB-16	Finding:	5.
Chemical:	COLOR	Report units:	UNITS
Dlr:	0.		
Sample date:	16-FEB-16	Finding:	440.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	16-FEB-16	Finding:	7.5
Chemical:	PH, LABORATORY	Report units:	Not Reported
Dlr:	0.		
Sample date:	16-FEB-16	Finding:	210.
Chemical:	ALKALINITY (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	16-FEB-16	Finding:	260.
Chemical:	BICARBONATE ALKALINITY	Report units:	MG/L
Dlr:	0.		
Sample date:	16-FEB-16	Finding:	130.
Chemical:	HARDNESS (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	16-FEB-16	Finding:	8.9
Chemical:	CALCIUM	Report units:	MG/L
Dlr:	0.		

Sample date:	16-FEB-16	Finding:	27.
Chemical:	MAGNESIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	16-FEB-16	Finding:	44.
Chemical:	SODIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	16-FEB-16	Finding:	12.
Chemical:	CHLORIDE	Report units:	MG/L
Dlr:	0.		
Sample date:	16-FEB-16	Finding:	3.
Chemical:	SULFATE	Report units:	MG/L
Dlr:	0.5		
Sample date:	16-FEB-16	Finding:	0.19
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)	Report units:	MG/L
Dlr:	0.1		
Sample date:	16-FEB-16	Finding:	490.
Chemical:	BARIUM	Report units:	UG/L
Dlr:	100.		
Sample date:	16-FEB-16	Finding:	280.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	16-FEB-16	Finding:	0.2
Chemical:	TURBIDITY, LABORATORY	Report units:	NTU
Dlr:	0.1		
Sample date:	16-FEB-16	Finding:	11.2
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)	Report units:	Not Reported
Dlr:	0.		
Sample date:	16-FEB-16	Finding:	5.6e-002
Chemical:	GROSS ALPHA	Report units:	PCI/L
Dlr:	3.		
Sample date:	16-FEB-16	Finding:	0.926
Chemical:	GROSS ALPHA COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		
Sample date:	16-FEB-16	Finding:	1.52
Chemical:	GROSS ALPHA MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	16-FEB-16	Finding:	1.2
Chemical:	CHLOROFORM (THM)	Report units:	UG/L
Dlr:	1.		
Sample date:	16-FEB-16	Finding:	5.2
Chemical:	CHLOROMETHANE	Report units:	UG/L
Dlr:	0.5		
Sample date:	16-FEB-16	Finding:	3.72
Chemical:	TOTAL TRIHALOMETHANES	Report units:	UG/L
Dlr:	0.		
Sample date:	04-FEB-16	Finding:	1.4
Chemical:	NITRATE (AS N)	Report units:	MG/L

Dlr:	0.4		
Sample date:	22-JAN-15	Finding:	3.2
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	12-FEB-13	Finding:	210.
Chemical:	ALKALINITY (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	12-FEB-13	Finding:	260.
Chemical:	BICARBONATE ALKALINITY	Report units:	MG/L
Dlr:	0.		
Sample date:	12-FEB-13	Finding:	130.
Chemical:	HARDNESS (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	12-FEB-13	Finding:	8.4
Chemical:	CALCIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	12-FEB-13	Finding:	27.
Chemical:	MAGNESIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	12-FEB-13	Finding:	36.
Chemical:	SODIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	12-FEB-13	Finding:	3.4
Chemical:	SULFATE	Report units:	MG/L
Dlr:	0.5		
Sample date:	12-FEB-13	Finding:	0.18
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)	Report units:	MG/L
Dlr:	0.1		
Sample date:	12-FEB-13	Finding:	190.
Chemical:	BARIUM	Report units:	UG/L
Dlr:	100.		
Sample date:	12-FEB-13	Finding:	15.
Chemical:	NICKEL	Report units:	UG/L
Dlr:	10.		
Sample date:	12-FEB-13	Finding:	270.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	12-FEB-13	Finding:	4.7
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	12-FEB-13	Finding:	0.25
Chemical:	TURBIDITY, LABORATORY	Report units:	NTU
Dlr:	0.1		
Sample date:	12-FEB-13	Finding:	11.3
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)	Report units:	Not Reported
Dlr:	0.		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Sample date:	12-FEB-13	Finding:	0.82
Chemical:	GROSS ALPHA COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		
Sample date:	12-FEB-13	Finding:	7.7
Chemical:	PH, LABORATORY	Report units:	Not Reported
Dlr:	0.		
Sample date:	12-FEB-13	Finding:	410.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	12-FEB-13	Finding:	1.2
Chemical:	ODOR THRESHOLD @ 60 C	Report units:	TON
Dlr:	1.		
Sample date:	12-FEB-13	Finding:	5.
Chemical:	COLOR	Report units:	UNITS
Dlr:	0.		
Sample date:	12-FEB-13	Finding:	6.1
Chemical:	CHLORIDE	Report units:	MG/L
Dlr:	0.		
Sample date:	20-SEP-12	Finding:	170.
Chemical:	IRON	Report units:	UG/L
Dlr:	100.		
Sample date:	07-FEB-12	Finding:	5.5
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zipcode	Num Tests	> 4 pCi/L
95461	4	0

Federal EPA Radon Zone for LAKE County: 3

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 95461

Number of sites tested: 2

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.700 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Public Health
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

OTHER STATE DATABASE INFORMATION

California Oil and Gas Well Locations
Source: Department of Conservation
Telephone: 916-323-1779
Oil and Gas well locations in the state.

California Earthquake Fault Lines
Source: California Division of Mines and Geology
The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

RADON

State Database: CA Radon
Source: Department of Public Health
Telephone: 916-210-8558
Radon Database for California

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

STREET AND ADDRESS INFORMATION

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Off-Site Infrastructure Improvement Areas
APN 014-430-07
Middletown, CA 95461

Inquiry Number: 5820451.1s
October 09, 2019

EDR Area / Corridor Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

SUBJECT PROPERTY INFORMATION

ADDRESS

APN 014-430-07
MIDDLETOWN, CA 95461

TARGET PROPERTY SEARCH RESULTS

The Target Property was identified in the following databases.

Page Numbers and Map Identifcations refer to the EDR Area/Corridor Report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

ADDITIONAL ENVIRONMENTAL RECORDS

Records of Emergency Release Reports

CHMIRS: California Hazardous Material Incident Report System

A review of the CHMIRS list, as provided by EDR, and dated 05/15/2019 has revealed that there is 1 CHMIRS site within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
Not reported OES Incident Number: 8-3293	19020 BUTTS CANYON R	2 / 6	26

Other Ascertainable Records

HIST CORTESE: Hazardous Waste & Substance Site List

A review of the HIST CORTESE list, as provided by EDR, and dated 04/01/2001 has revealed that there is 1 HIST CORTESE site within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
MIDDLETOWN SCHOOL DI Reg Id: 170065	11710 BUTTS CNYN	1 / 1	26

EXECUTIVE SUMMARY

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Page Numbers and Map Identifcations refer to the EDR Area/Corridor Report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

A review of the SEMS-ARCHIVE list, as provided by EDR, and dated 07/19/2019 has revealed that there is 1 SEMS-ARCHIVE site within approximately 0.5 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
GEOTHERMAL INDUSTRIE Site ID: 0901692 EPA Id: CAD098080484	***BUTTS CANYON RD***	***NE 1/4 - 1/2 (0.473 mi.)***	***D16 / 6***	***51***

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

A review of the CORRACTS list, as provided by EDR, and dated 03/25/2019 has revealed that there is 1 CORRACTS site within approximately1 mile of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
GEOTHERMAL INDUSTRIE EPA ID:: CAD098080484	***BUTTS CANYON RD***	***NE 1/4 - 1/2 (0.473 mi.)***	***D16 / 6***	***51***

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

A review of the RCRA-TSDF list, as provided by EDR, and dated 03/25/2019 has revealed that there is 1 RCRA-TSDF site within approximately 0.5 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
GEOTHERMAL INDUSTRIE EPA ID:: CAD098080484	***BUTTS CANYON RD***	***NE 1/4 - 1/2 (0.473 mi.)***	***D16 / 6***	***51***

EXECUTIVE SUMMARY

State- and tribal - equivalent CERCLIS

ENVIROSTOR: EnviroStor Database

A review of the ENVIROSTOR list, as provided by EDR, and dated 07/29/2019 has revealed that there are 4 ENVIROSTOR sites within approximately1 mile of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
GEOTHERMAL, INC Status: Refer: RWQCB Facility Id: 17490002	19020 BUTTS CANYON R	NE 1/4 - 1/2 (0.473 mi.)	D19 / 6	97
GEOTHERMAL INC Status: Refer: RWQCB Facility Id: 80001735	***19020 BUTTS CANYON R***	***NE 1/4 - 1/2 (0.473 mi.)***	***D21 / 6***	***99***
NEW MINNIE CANNON EL Status: No Further Action Facility Id: 60001113	***20771 & 20931 BIG CA***	***W 1/2 - 1 (0.509 mi.)***	***22 / 1***	***102***
REDBUD COMMUNITY HOS Status: No Action Required Facility Id: 17800001	21268 CALISTOGA STRE	SW 1/2 - 1 (0.750 mi.)	23 / 4	105

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: Solid Waste Information System

A review of the SWF/LF list, as provided by EDR, has revealed that there is 1 SWF/LF site within approximately 0.5 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
MIDDLETOWN DUMP SITE Database: SWF/LF (SWIS), Date of Government Version: 05/13/2019 Facility ID: 17-CR-0004 Operational Status: Closed Regulation Status: Unpermitted	***19355 STATE HWY 29 @***	***NNE 0 - 1/8 (0.057 mi.)***	***C13 / 1***	***47***

State and tribal leaking storage tank lists

LUST: Geotracker's Leaking Underground Fuel Tank Report

A review of the LUST list, as provided by EDR, has revealed that there are 4 LUST sites within approximately 0.5 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
MIDDLETOWN SCHOOL DI Database: LUST REG 5, Date of Government Version: 07/01/2008 Database: LUST, Date of Government Version: 06/10/2019 Status: Completed - Case Closed Status: Case Closed	***11710 BUTTS CANYON R***	***0 - 1/8 (0.001 mi.)***	***3 / 5***	***27***

Global Id: T0603300045

MIDDLETOWN ENTERPRIS ***18975 BUTTS CANYON R*** ***SW 0 - 1/8 (0.007 mi.)*** ***A4 / 9*** ***29***
Database: LUST, Date of Government Version: 06/10/2019
Status: Completed - Case Closed
Global Id: T0603300046

MIDDLETOWN AIR STRIP ***18975 BUTTS CNYN*** ***SW 0 - 1/8 (0.007 mi.)*** ***A5 / 9*** ***33***
Database: LUST REG 5, Date of Government Version: 07/01/2008
Status: Case Closed

JOLLY KONE RESTAURAN ***21010 HIGHWAY 29*** ***WSW 1/4 - 1/2 (0.432 mi.)*** ***14 / 1*** ***49***
Database: LUST, Date of Government Version: 06/10/2019
Status: Completed - Case Closed
Global Id: T10000008192

State and tribal registered storage tank lists

AST: Aboveground Petroleum Storage Tank Facilities

A review of the AST list, as provided by EDR, has revealed that there are 2 AST sites within approximately 0.25 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
MIDDLETOWN USD BUS Y	17110 BUTTS CANYON R	NE 0 - 1/8 (0.013 mi.)	B7 / 5	35
Database: AST, Date of Government Version: 07/06/2016				
MIDDLETOWN USD - BUS	17110 BUTTS CANYON R	NE 0 - 1/8 (0.013 mi.)	B9 / 5	39
Database: AST, Date of Government Version: 07/06/2016				

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT: Waste Management Unit Database

A review of the WMUDS/SWAT list, as provided by EDR, and dated 04/01/2000 has revealed that there is 1 WMUDS/SWAT site within approximately 0.5 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
BUTTS CANYON RD. FAC	***19020 BUTTS CANYON R***	***NE 1/4 - 1/2 (0.473 mi.)***	***D18 / 6***	***89***

Local Lists of Hazardous waste / Contaminated Sites

Toxic Pits: Toxic Pits Cleanup Act Sites

A review of the Toxic Pits list, as provided by EDR, and dated 07/01/1995 has revealed that there is 1 Toxic Pits site within approximately1 mile of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
GEOTHERMAL, BUTTS CA Closure Date: 06/30/93 Task #: 85017 Status: CLOSED	19020 BUTTS CANYON R	NE 1/4 - 1/2 (0.473 mi.)	D15 / 6	51

CERS HAZ WASTE: CERS HAZ WASTE

A review of the CERS HAZ WASTE list, as provided by EDR, and dated 08/14/2019 has revealed that there are 2 CERS HAZ WASTE sites within approximately 0.25 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
MIDDLETOWN USD - BUS	***17110 BUTTS CANYON R***	***NE 0 - 1/8 (0.013 mi.)***	***B8 / 5***	***36***
BURNS ENTERPRISES	***19355 S. STATE HWY 2***	***NNE 0 - 1/8 (0.057 mi.)***	***C12 / 1***	***43***

Local Lists of Registered Storage Tanks

SWEEPS UST: SWEEPS UST Listing

A review of the SWEEPS UST list, as provided by EDR, and dated 06/01/1994 has revealed that there are 3 SWEEPS UST sites within approximately 0.25 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
MIDDLETOWN ENTERPRIS Status: A Tank Status: A Comp Number: 51664	***18975 BUTTS CANYON R***	***SW 0 - 1/8 (0.007 mi.)***	***A4 / 9***	***29***
UP RANCH Status: A Tank Status: A Comp Number: 44562	***17525 BUTTS CANYON R***	***SSE 0 - 1/8 (0.011 mi.)***	***6 / 5***	***34***
MIDDLTOWN UNIFIED SC Status: A Comp Number: 115	***17110 BUTTS CANYON R***	***NE 0 - 1/8 (0.013 mi.)***	***B10 / 5***	***39***

HIST UST: Hazardous Substance Storage Container Database

A review of the HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there are 2 HIST UST sites within approximately 0.25 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
MIDDLETOWN ENTERPRIS Facility Id: 00000051664	***18975 BUTTS CANYON R***	***SW 0 - 1/8 (0.007 mi.)***	***A4 / 9***	***29***
UP RANCH Facility Id: 00000044562	***17525 BUTTS CANYON R***	***SSE 0 - 1/8 (0.011 mi.)***	***6 / 5***	***34***

CERS TANKS: California Environmental Reporting System (CERS) Tanks

A review of the CERS TANKS list, as provided by EDR, and dated 08/14/2019 has revealed that there is 1 CERS TANKS site within approximately 0.25 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
MIDDLETOWN USD - BUS	***17110 BUTTS CANYON R***	***NE 0 - 1/8 (0.013 mi.)***	***B8 / 5***	***36***

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 03/25/2019 has revealed that there is 1 RCRA NonGen / NLR site within approximately 0.25 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
BURNS ENTERPRISES EPA ID:: CAL000324716	19355 S HWY 29	NNE 0 - 1/8 (0.057 mi.)	C11 / 1	41

Cortese: "Cortese" Hazardous Waste & Substances Sites List

A review of the Cortese list, as provided by EDR, and dated 06/24/2019 has revealed that there is 1 Cortese site within approximately 0.5 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
BUTTS CANYON RD FACI	***19020 BUTTS CANYON***	***NE 1/4 - 1/2 (0.473 mi.)***	***D17 / 6***	***64***

CUPA Listings: CUPA Resources List

A review of the CUPA Listings list, as provided by EDR, has revealed that there are 2 CUPA Listings sites within approximately 0.25 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
MIDDLTOWN UNIFIED SC Database: CUPA LAKE, Date of Government Version: 05/30/2019 Facility: FA0000437	***17110 BUTTS CANYON R***	***NE 0 - 1/8 (0.013 mi.)***	***B10 / 5***	***39***
BURNS ENTERPRISES Database: CUPA LAKE, Date of Government Version: 05/30/2019 Facility: FA0000027	***19355 S. STATE HWY 2***	***NNE 0 - 1/8 (0.057 mi.)***	***C12 / 1***	***43***

HIST CORTESE: Hazardous Waste & Substance Site List

A review of the HIST CORTESE list, as provided by EDR, and dated 04/01/2001 has revealed that there are 2 HIST CORTESE sites within approximately 0.5 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
MIDDLETOWN AIR STRIP Reg Id: 170066	***18975 BUTTS CNYN***	***SW 0 - 1/8 (0.007 mi.)***	***A5 / 9***	***33***
BUTTS CANYON RD. FAC	19020 BUTTS CNYN	NE 1/4 - 1/2 (0.473 mi.)	D20 / 6	98

EXECUTIVE SUMMARY

Reg Id: 5A170304001

HWP: EnviroStor Permitted Facilities Listing

A review of the HWP list, as provided by EDR, and dated 05/20/2019 has revealed that there is 1 HWP site within approximately1 mile of the requested target property.

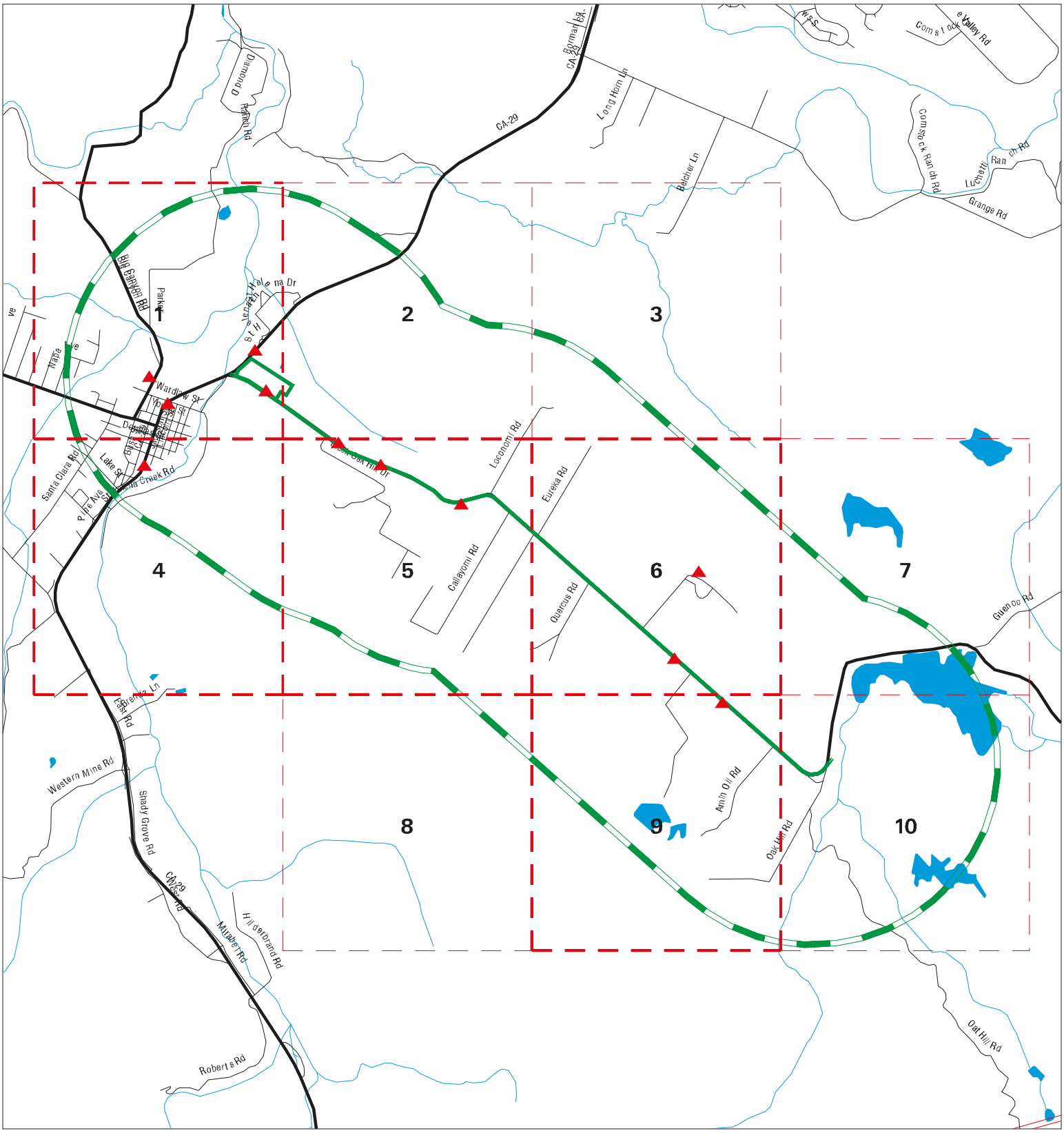
Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
GEOTHERMAL INC EPA Id: CAD098080484 Cleanup Status: CLOSED	***19020 BUTTS CANYON R***	***NE 1/4 - 1/2 (0.473 mi.)***	***D21 / 6***	***99***

MAPPED SITES SUMMARY

Target Property:
APN 014-430-07
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
1 / 1	MIDDLETOWN SCHOOL DI	11710 BUTTS CNYN	HIST CORTESE	TP
2 / 6		19020 BUTTS CANYON R	CHMIRS	TP
3 / 5	MIDDLETOWN SCHOOL DI	11710 BUTTS CANYON R	LUST, CERS	4 0.001
A4 / 9	MIDDLETOWN ENTERPRIS	18975 BUTTS CANYON R	LUST, SWEEPS UST, HIST UST	39 0.007 SW
A5 / 9	MIDDLETOWN AIR STRIP	18975 BUTTS CNYN	LUST, HIST CORTESE, CERS	39 0.007 SW
6 / 5	UP RANCH	17525 BUTTS CANYON R	SWEEPS UST, HIST UST	59 0.011 SSE
B7 / 5	MIDDLETOWN USD BUS Y	17110 BUTTS CANYON R	AST	67 0.013 NE
B8 / 5	MIDDLETOWN USD - BUS	17110 BUTTS CANYON R	CERS HAZ WASTE, CERS TANKS, CERS	67 0.013 NE
B9 / 5	MIDDLETOWN USD - BUS	17110 BUTTS CANYON R	AST	67 0.013 NE
B10 / 5	MIDDLTOWN UNIFIED SC	17110 BUTTS CANYON R	SWEEPS UST, CUPA Listings	67 0.013 NE
C11 / 1	BURNS ENTERPRISES	19355 S HWY 29	RCRA NonGen / NLR	303 0.057 NNE
C12 / 1	BURNS ENTERPRISES	19355 S. STATE HWY 2	CERS HAZ WASTE, CUPA Listings, CERS	303 0.057 NNE
C13 / 1	MIDDLETOWN DUMP SITE	19355 STATE HWY 29 @	SWF/LF, CERS	303 0.057 NNE
14 / 1	JOLLY KONE RESTAURAN	21010 HIGHWAY 29	LUST, CERS	2279 0.432 WSW
D15 / 6	GEOTHERMAL, BUTTS CA	19020 BUTTS CANYON R	Toxic Pits	2500 0.473 NE
D16 / 6	GEOTHERMAL INDUSTRIE	BUTTS CANYON RD	SEMS-ARCHIVE, CORRACTS, RCRA-TSDF, RCRA	2500 0.473 NE
D17 / 6	BUTTS CANYON RD FACI	19020 BUTTS CANYON	LDS, Cortese, ENF, CIWQS, CERS	2500 0.473 NE
D18 / 6	BUTTS CANYON RD. FAC	19020 BUTTS CANYON R	WMUDS/SWAT, HAZNET, NPDES, WDS, CIWQS	2500 0.473 NE
D19 / 6	GEOTHERMAL, INC	19020 BUTTS CANYON R	ENVIROSTOR	2500 0.473 NE
D20 / 6	BUTTS CANYON RD. FAC	19020 BUTTS CNYN	HIST CORTESE	2500 0.473 NE
D21 / 6	GEOTHERMAL INC	19020 BUTTS CANYON R	ENVIROSTOR, HWP, CERS	2500 0.473 NE
22 / 1	NEW MINNIE CANNON EL	20771 & 20931 BIG CA	ENVIROSTOR, SCH	2686 0.509 West
23 / 4	REDBUD COMMUNITY HOS	21268 CALISTOGA STRE	ENVIROSTOR	3960 0.750 SW

Key Map - 5820451.1s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/2 1 Miles

SITE NAME: Off-Site Infrastructure Improvement Areas	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: APN 014-430-07	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5820451.1s
ZIP: 95461	DATE: 10/09/19 12:58 PM

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	0	1	NR	NR	1
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	1	0	NR	1
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	1	NR	NR	1
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-VSQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
RESPONSE	1.000		0	0	0	0	NR	0
State- and tribal - equivalent CERCLIS								
ENVIROSTOR	1.000		0	0	2	2	NR	4
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		1	0	0	NR	NR	1
State and tribal leaking storage tank lists								
LUST	0.500		3	0	1	NR	NR	4

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN LUST	0.500		0	0	0	NR	NR	0
CPS-SLIC	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		2	0	NR	NR	NR	2
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal voluntary cleanup sites								
VCP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
WMUDS/SWAT	0.500		0	0	1	NR	NR	1
SWRCY	0.500		0	0	0	NR	NR	0
HAULERS	TP		NR	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	TP		NR	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	0	NR	NR	NR	0
CDL	TP		NR	NR	NR	NR	NR	0
Toxic Pits	1.000		0	0	1	0	NR	1
CERS HAZ WASTE	0.250		2	0	NR	NR	NR	2
US CDL	TP		NR	NR	NR	NR	NR	0
PFAS	0.500		0	0	0	NR	NR	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.250		3	0	NR	NR	NR	3
HIST UST	0.250		2	0	NR	NR	NR	2
CERS TANKS	0.250		1	0	NR	NR	NR	1
CA FID UST	0.250		0	0	NR	NR	NR	0
Local Land Records								
LIENS	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
LIENS 2	TP		NR	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
CHMIRS	TP	1	NR	NR	NR	NR	NR	1
LDS	TP		NR	NR	NR	NR	NR	0
MCS	TP		NR	NR	NR	NR	NR	0
SPILLS 90	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		1	0	NR	NR	NR	1
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
ECHO	TP		NR	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
DOCKET HWC	TP		NR	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	0	NR	0
Cortese	0.500		0	0	1	NR	NR	1
CUPA Listings	0.250		2	0	NR	NR	NR	2

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
EMI	TP		NR	NR	NR	NR	NR	0
ENF	TP		NR	NR	NR	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
HAZNET	TP		NR	NR	NR	NR	NR	0
ICE	TP		NR	NR	NR	NR	NR	0
HIST CORTESE	0.500	1	1	0	1	NR	NR	3
HWP	1.000		0	0	1	0	NR	1
HWT	0.250		0	0	NR	NR	NR	0
MINES	0.250		0	0	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0
PEST LIC	TP		NR	NR	NR	NR	NR	0
PROC	0.500		0	0	0	NR	NR	0
Notify 65	1.000		0	0	0	0	NR	0
UIC	TP		NR	NR	NR	NR	NR	0
UIC GEO	TP		NR	NR	NR	NR	NR	0
WASTEWATER PITS	0.500		0	0	0	NR	NR	0
WDS	TP		NR	NR	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
MILITARY PRIV SITES	TP		NR	NR	NR	NR	NR	0
PROJECT	TP		NR	NR	NR	NR	NR	0
WDR	TP		NR	NR	NR	NR	NR	0
CIWQS	TP		NR	NR	NR	NR	NR	0
CERS	TP		NR	NR	NR	NR	NR	0
NON-CASE INFO	TP		NR	NR	NR	NR	NR	0
OTHER OIL GAS	TP		NR	NR	NR	NR	NR	0
PROD WATER PONDS	TP		NR	NR	NR	NR	NR	0
SAMPLING POINT	TP		NR	NR	NR	NR	NR	0
WELL STIM PROJ	TP		NR	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	TP		NR	NR	NR	NR	NR	0
RGA LUST	TP		NR	NR	NR	NR	NR	0
- Totals --		2	18	0	11	2	0	33

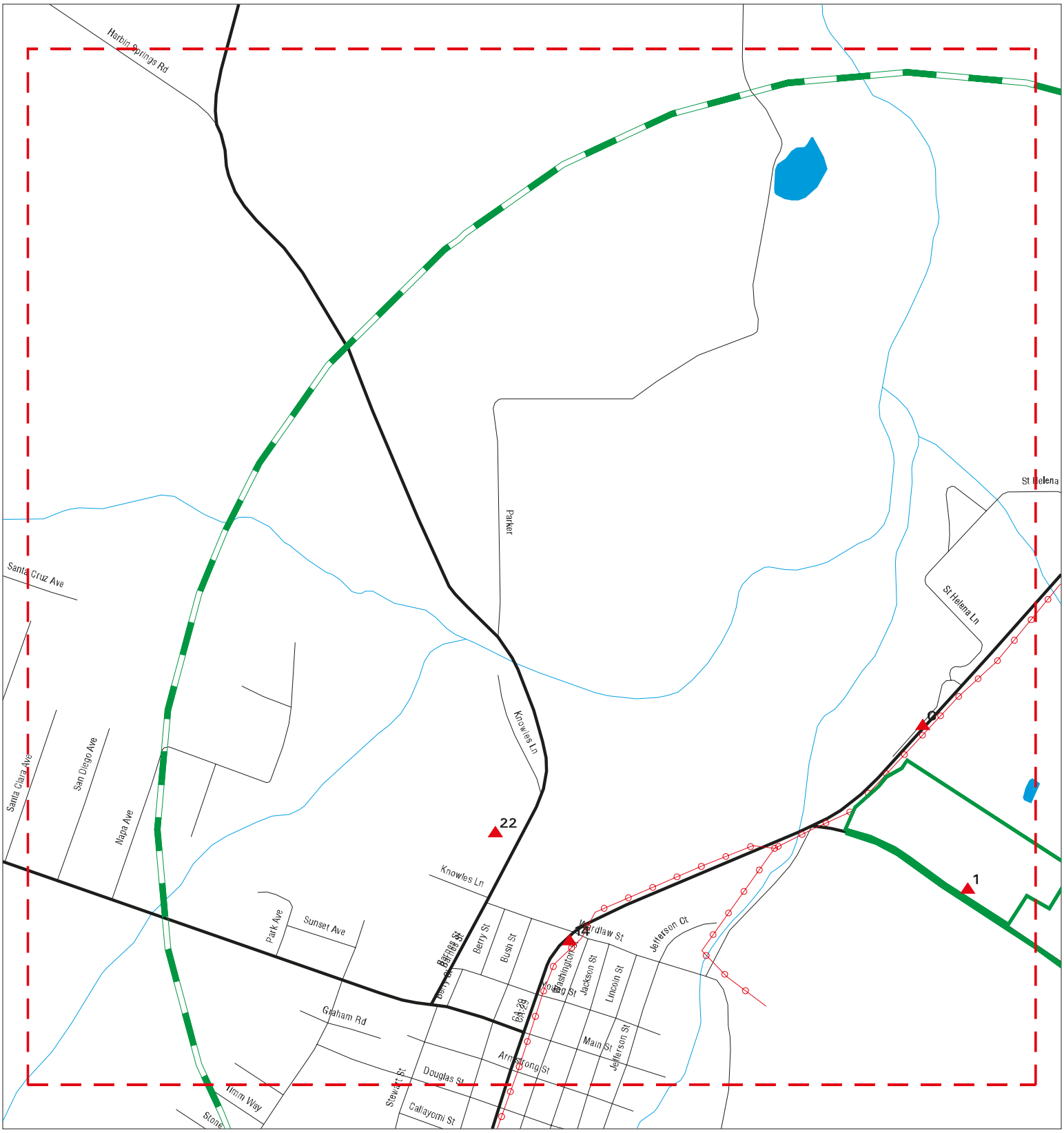
NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

Focus Map - 1 - 5820451.1s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

SITE NAME:	Off-Site Infrastructure Improvement Areas	CLIENT:	ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS:	APN 014-430-07	CONTACT:	Kristin Miner
CITY/STATE:	Middletown CA	INQUIRY #:	5820451.1s
ZIP:	95461	DATE:	10/09/19

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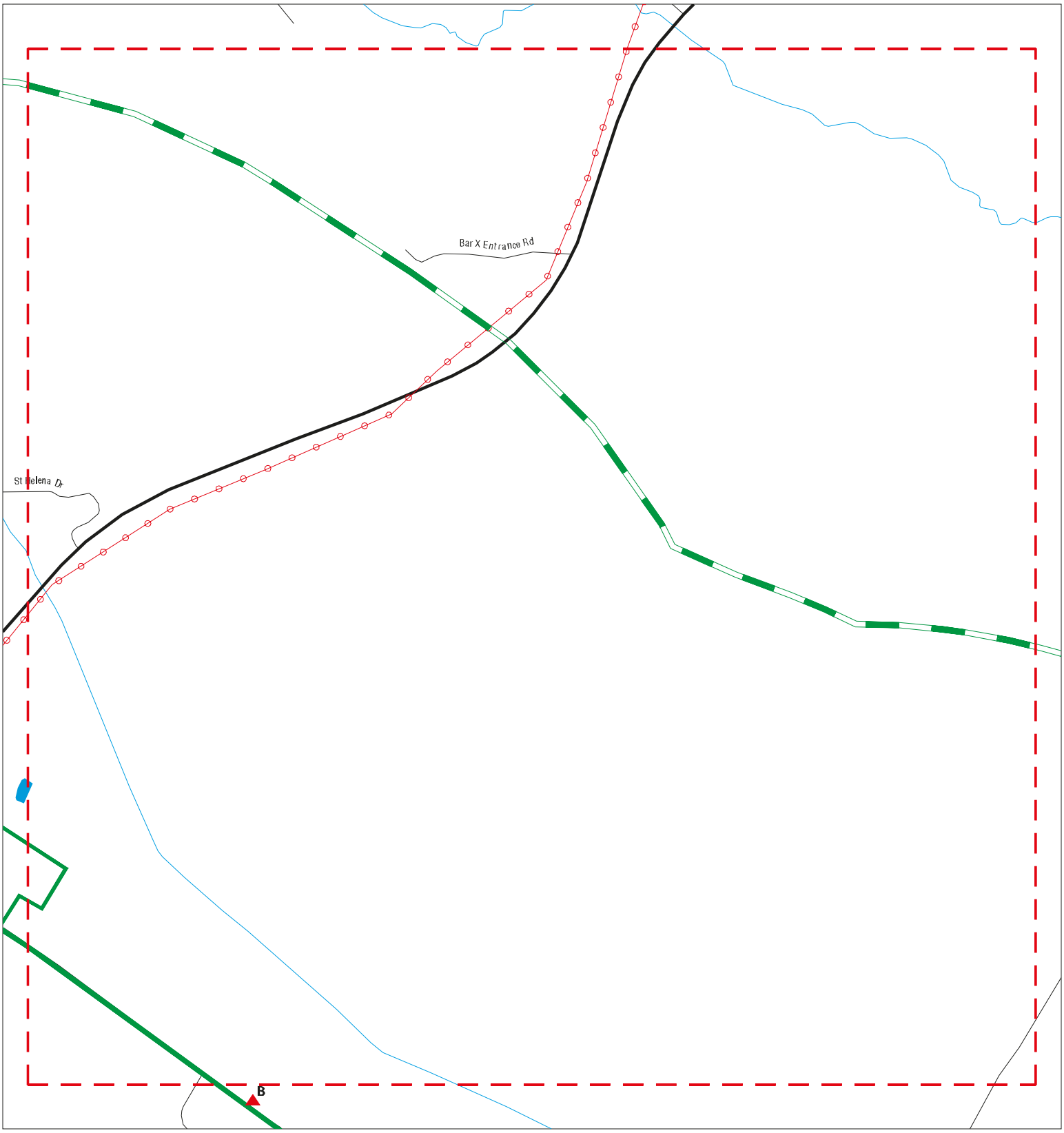
MAPPED SITES SUMMARY - FOCUS MAP 1

Target Property:
APN 014-430-07
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
1 / 1	MIDDLETOWN SCHOOL DI	11710 BUTTS CNYN	HIST CORTESE	TP
C11 / 1	BURNS ENTERPRISES	19355 S HWY 29	RCRA NonGen / NLR	303 0.057 NNE
C12 / 1	BURNS ENTERPRISES	19355 S. STATE HWY 2	CERS HAZ WASTE, CUPA Listings, CERS	303 0.057 NNE
C13 / 1	MIDDLETOWN DUMP SITE	19355 STATE HWY 29 @	SWF/LF, CERS	303 0.057 NNE
14 / 1	JOLLY KONE RESTAURAN	21010 HIGHWAY 29	LUST, CERS	2279 0.432 WSW
22 / 1	NEW MINNIE CANNON EL	20771 & 20931 BIG CA	ENVIROSTOR, SCH	2686 0.509 West

Focus Map - 2 - 5820451.1s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Off-Site Infrastructure Improvement Areas	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: APN 014-430-07	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5820451.1s
ZIP: 95461	DATE: 10/09/19

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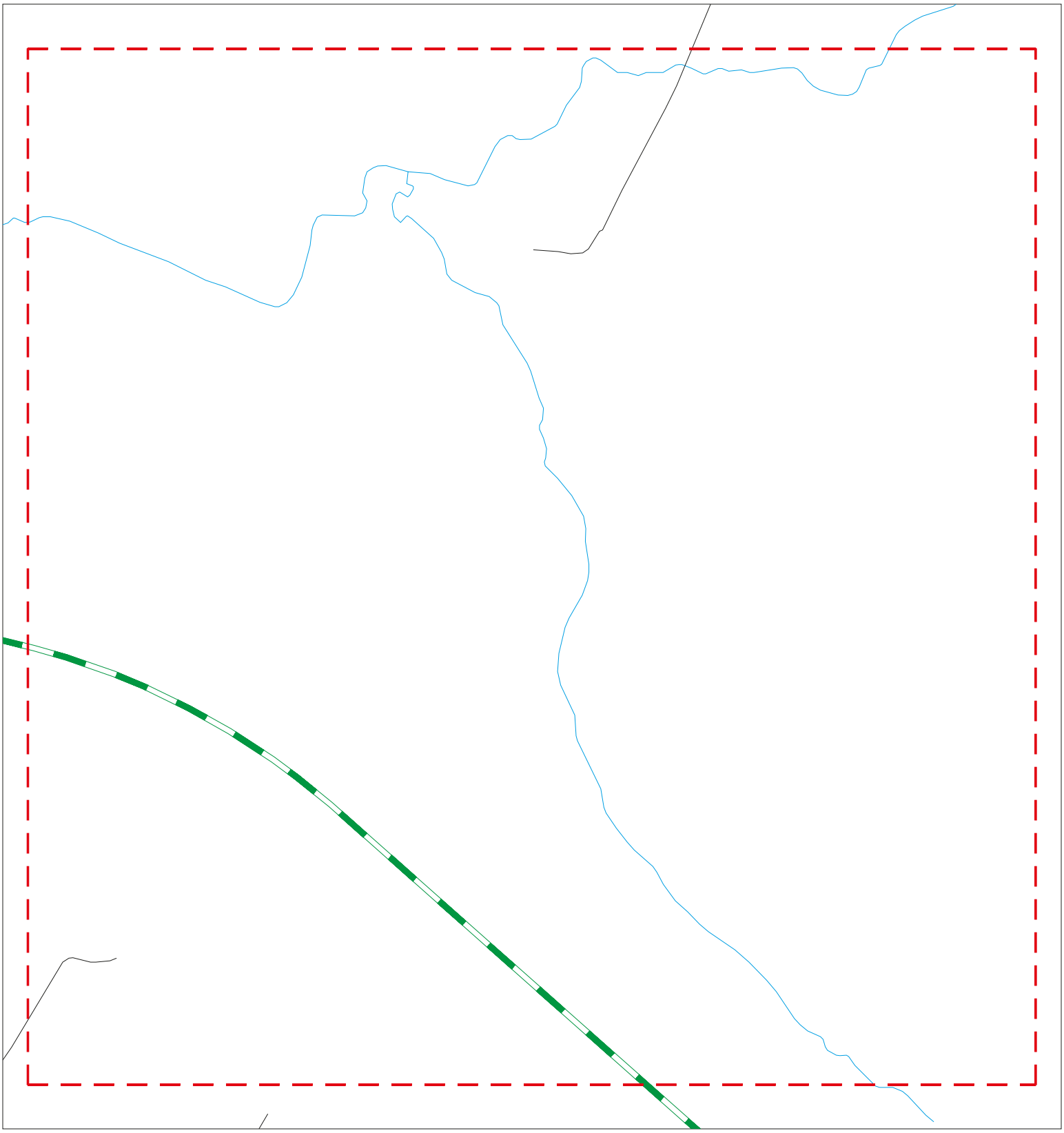
MAPPED SITES SUMMARY - FOCUS MAP 2

Target Property:
APN 014-430-07
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 3 - 5820451.1s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Off-Site Infrastructure Improvement Areas	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: APN 014-430-07	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5820451.1s
ZIP: 95461	DATE: 10/09/19

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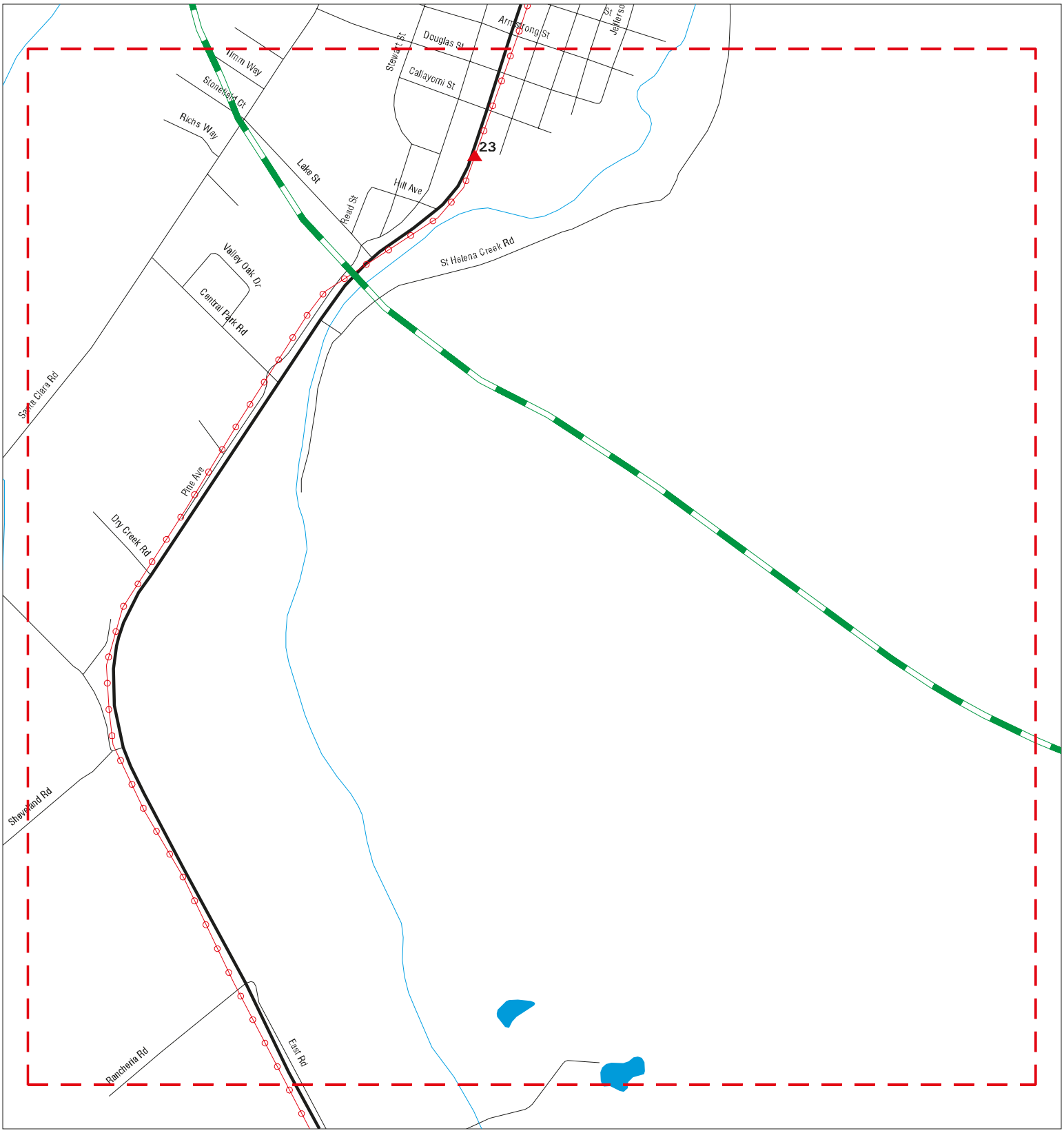
MAPPED SITES SUMMARY - FOCUS MAP 3

Target Property:
APN 014-430-07
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 4 - 5820451.1s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Off-Site Infrastructure Improvement Areas	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: APN 014-430-07	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5820451.1s
ZIP: 95461	DATE: 10/09/19

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MAPPED SITES SUMMARY - FOCUS MAP 4

Target Property:
APN 014-430-07
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
23 / 4	REDBUD COMMUNITY HOS	21268 CALISTOGA STRE	ENVIROSTOR	3960 0.750 SW

Focus Map - 5 - 5820451.1s

Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Off-Site Infrastructure Improvement Areas ADDRESS: APN 014-430-07 CITY/STATE: Middletown CA ZIP: 95461	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES CONTACT: Kristin Miner INQUIRY #: 5820451.1s DATE: 10/09/19

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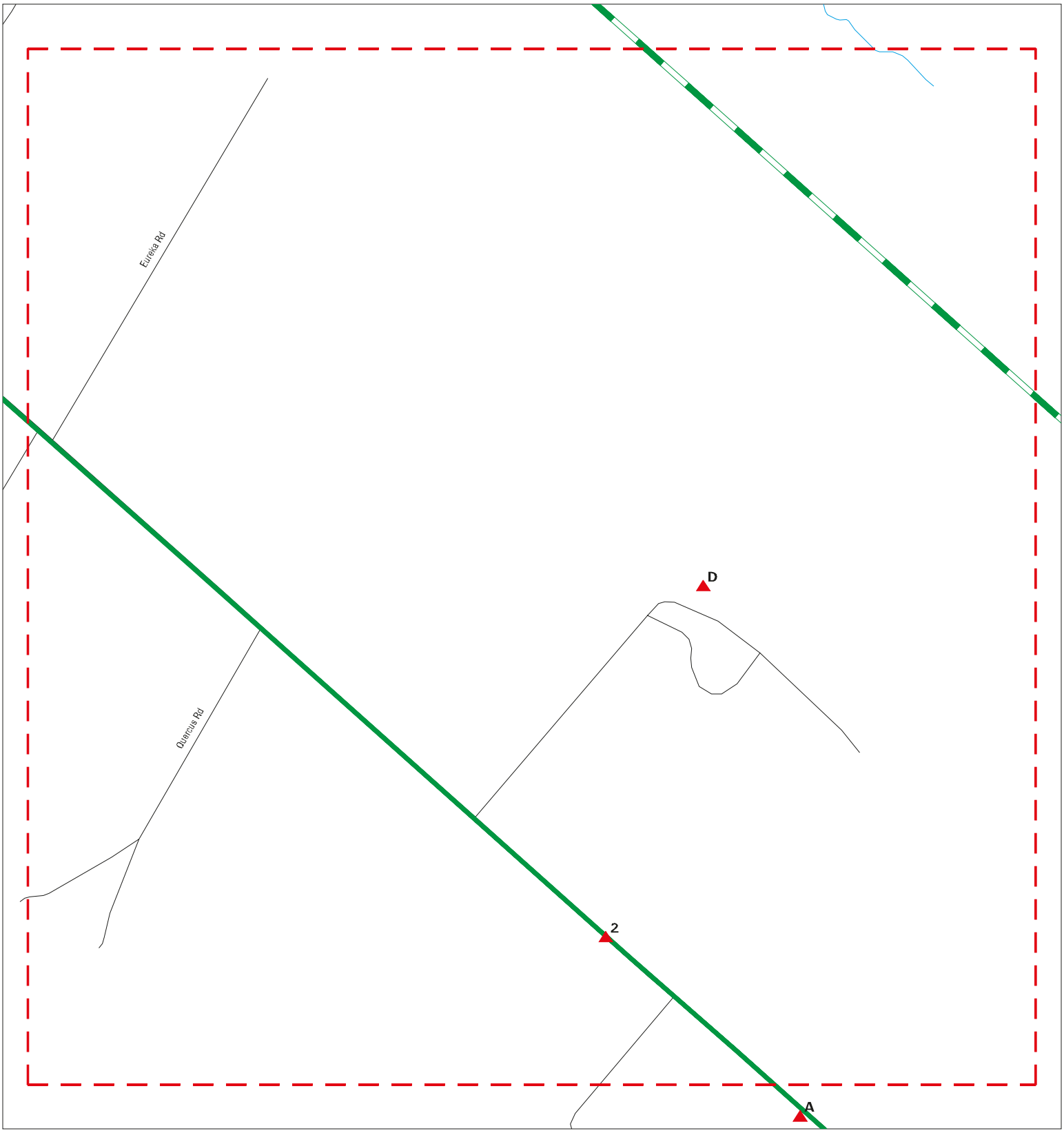
MAPPED SITES SUMMARY - FOCUS MAP 5

Target Property:
APN 014-430-07
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
3 / 5	MIDDLETOWN SCHOOL DI	11710 BUTTS CANYON R	LUST, CERS	4 0.001
6 / 5	UP RANCH	17525 BUTTS CANYON R	SWEEPS UST, HIST UST	59 0.011 SSE
B7 / 5	MIDDLETOWN USD BUS Y	17110 BUTTS CANYON R	AST	67 0.013 NE
B8 / 5	MIDDLETOWN USD - BUS	17110 BUTTS CANYON R	CERS HAZ WASTE, CERS TANKS, CERS	67 0.013 NE
B9 / 5	MIDDLETOWN USD - BUS	17110 BUTTS CANYON R	AST	67 0.013 NE
B10 / 5	MIDDLTOWN UNIFIED SC	17110 BUTTS CANYON R	SWEEPS UST, CUPA Listings	67 0.013 NE

Focus Map - 6 - 5820451.1s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Off-Site Infrastructure Improvement Areas	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: APN 014-430-07	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5820451.1s
ZIP: 95461	DATE: 10/09/19

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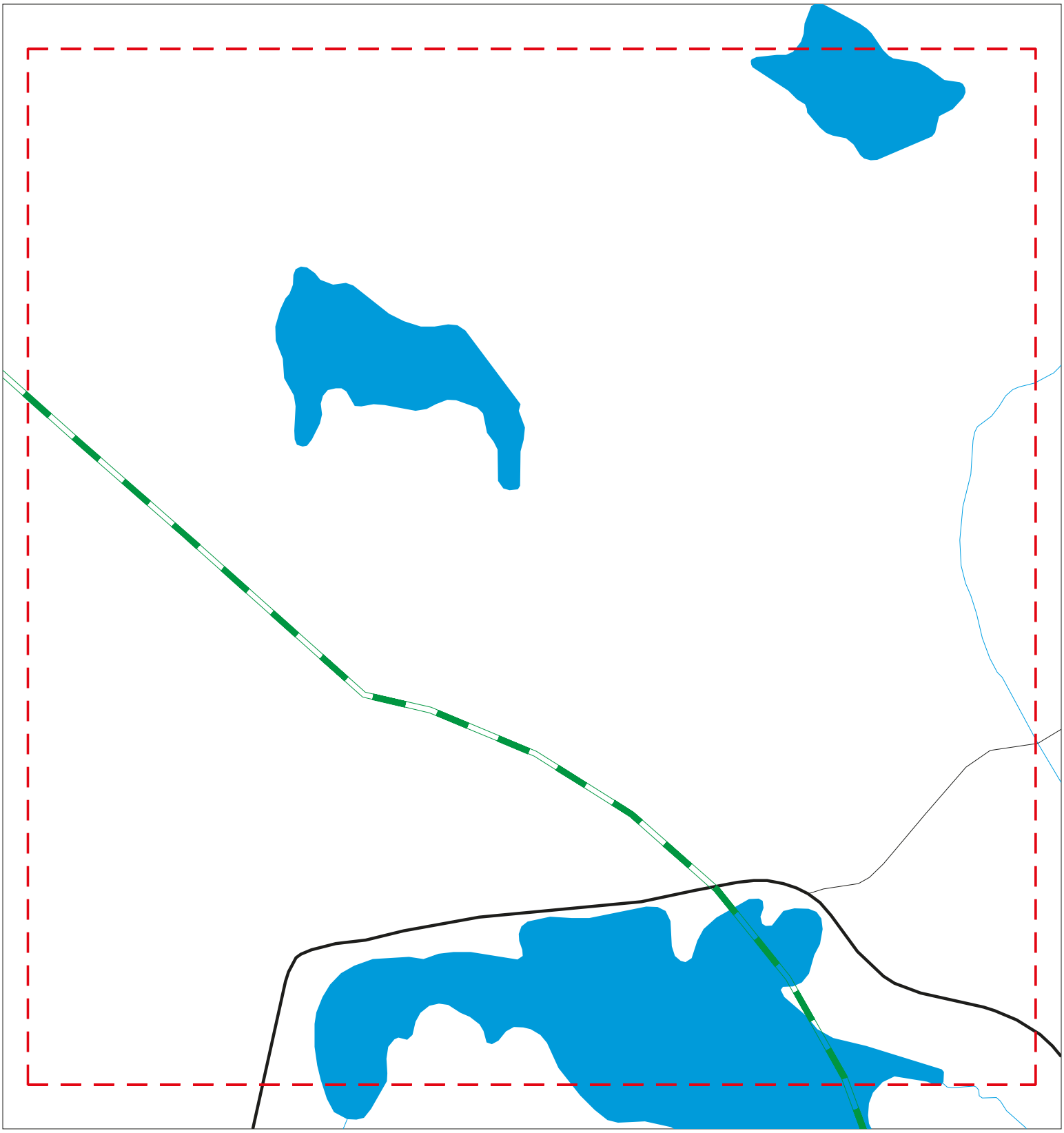
MAPPED SITES SUMMARY - FOCUS MAP 6

Target Property:
APN 014-430-07
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION		
2 / 6		19020 BUTTS CANYON R	CHMIRS	TP		
D15 / 6	GEOTHERMAL, BUTTS CA	19020 BUTTS CANYON R	Toxic Pits	2500	0.473	NE
D16 / 6	GEOTHERMAL INDUSTRIE	BUTTS CANYON RD	SEMS-ARCHIVE, CORRACTS, RCRA-TSDF, RCRA	2500	0.473	NE
D17 / 6	BUTTS CANYON RD FACI	19020 BUTTS CANYON	LDS, Cortese, ENF, CIWQS, CERS	2500	0.473	NE
D18 / 6	BUTTS CANYON RD. FAC	19020 BUTTS CANYON R	WMUDS/SWAT, HAZNET, NPDES, WDS, CIWQS	2500	0.473	NE
D19 / 6	GEOTHERMAL, INC	19020 BUTTS CANYON R	ENVIROSTOR	2500	0.473	NE
D20 / 6	BUTTS CANYON RD. FAC	19020 BUTTS CNYN	HIST CORTESE	2500	0.473	NE
D21 / 6	GEOTHERMAL INC	19020 BUTTS CANYON R	ENVIROSTOR, HWP, CERS	2500	0.473	NE

Focus Map - 7 - 5820451.1s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Off-Site Infrastructure Improvement Areas	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: APN 014-430-07	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5820451.1s
ZIP: 95461	DATE: 10/09/19

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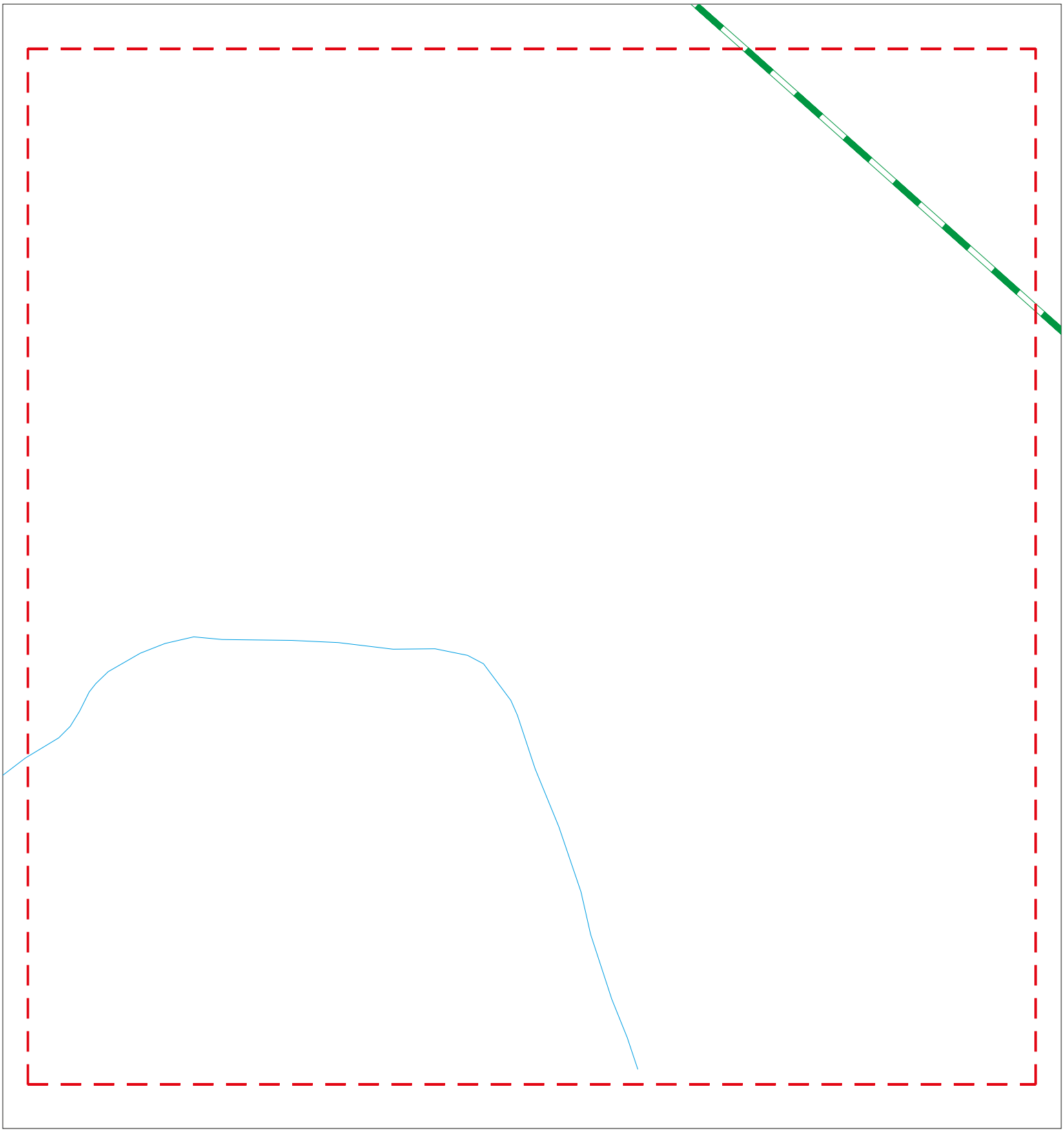
MAPPED SITES SUMMARY - FOCUS MAP 7

Target Property:
APN 014-430-07
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 8 - 5820451.1s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Off-Site Infrastructure Improvement Areas	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES
ADDRESS: APN 014-430-07	CONTACT: Kristin Miner
CITY/STATE: Middletown CA	INQUIRY #: 5820451.1s
ZIP: 95461	DATE: 10/09/19

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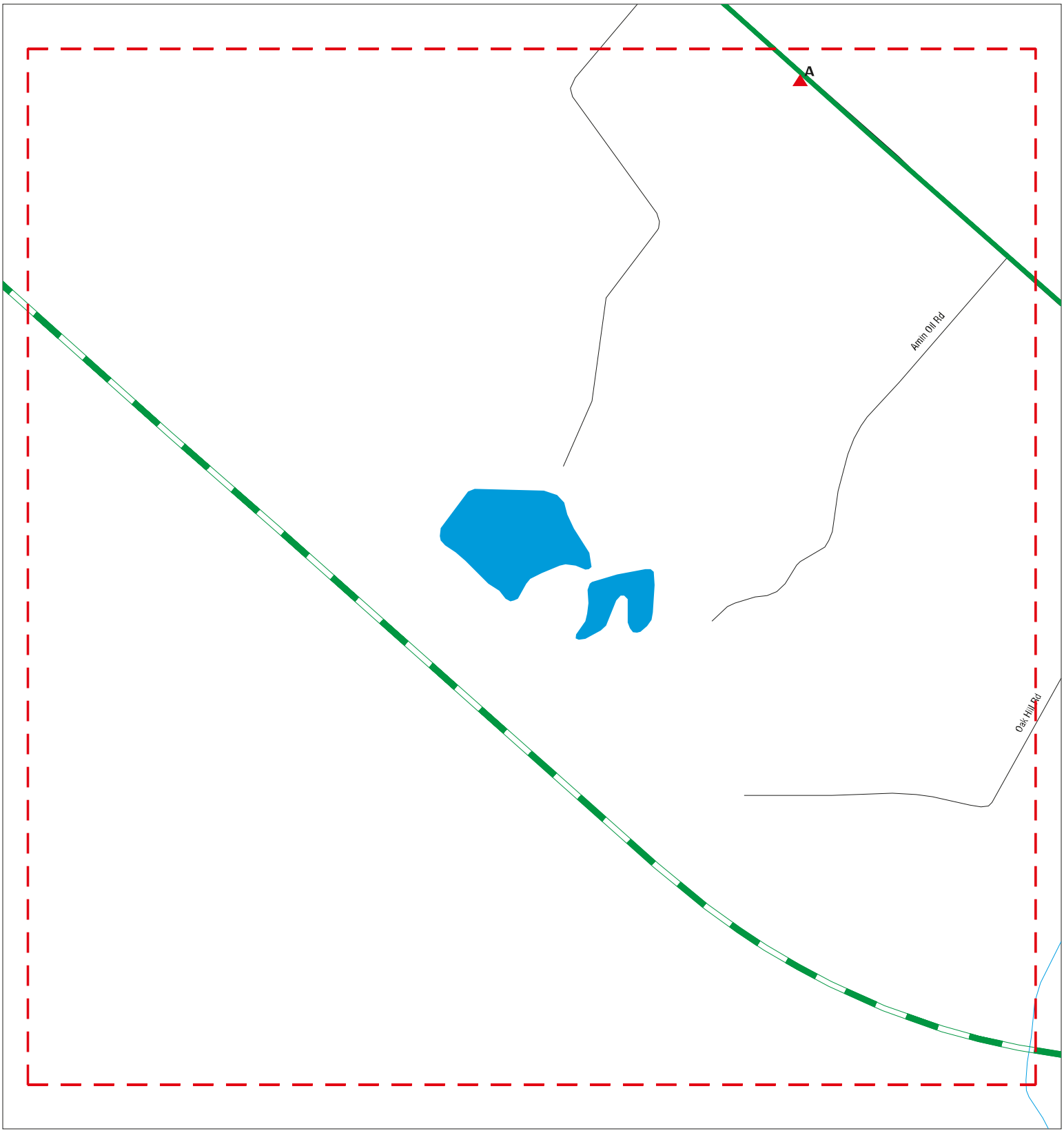
MAPPED SITES SUMMARY - FOCUS MAP 8

Target Property:
APN 014-430-07
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 9 - 5820451.1s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Off-Site Infrastructure Improvement Areas ADDRESS: APN 014-430-07 CITY/STATE: Middletown CA ZIP: 95461	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES CONTACT: Kristin Miner INQUIRY #: 5820451.1s DATE: 10/09/19

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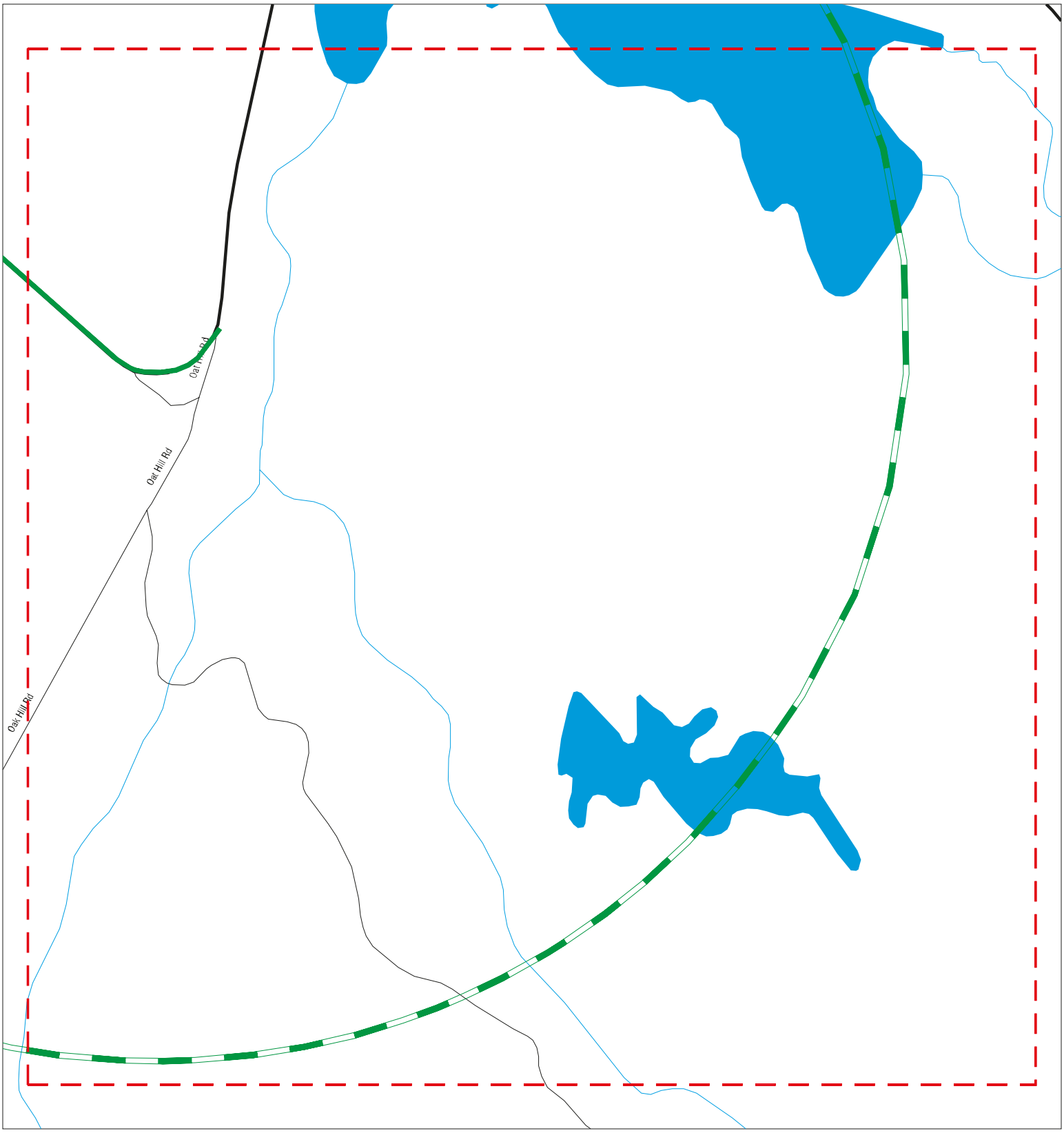
MAPPED SITES SUMMARY - FOCUS MAP 9

Target Property:
APN 014-430-07
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION		
A4 / 9	MIDDLETOWN ENTERPRIS	18975 BUTTS CANYON R	LUST, SWEEPS UST, HIST UST	39	0.007	SW
A5 / 9	MIDDLETOWN AIR STRIP	18975 BUTTS CNYN	LUST, HIST CORTESE, CERS	39	0.007	SW

Focus Map - 10 - 5820451.1s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/8 1/4 Miles

SITE NAME: Off-Site Infrastructure Improvement Areas ADDRESS: APN 014-430-07 CITY/STATE: Middletown CA ZIP: 95461	CLIENT: ANALYTICAL ENVIRONMENTAL SERVICES CONTACT: Kristin Miner INQUIRY #: 5820451.1s DATE: 10/09/19

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MAPPED SITES SUMMARY - FOCUS MAP 10

Target Property:
APN 014-430-07
MIDDLETOWN, CA 95461

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

1 **MIDDLETOWN SCHOOL DISTRIC** **HIST CORTESE** **S105024957**
Target Property **11710 BUTTS CNYN** **N/A**
MIDDLETOWN, CA 95461

Actual: 1110 ft.
Focus Map: 1

HIST CORTESE:

edr_fname:	MIDDLETOWN SCHOOL DISTRIC
edr_fadd1:	11710 BUTTS CNYN
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	CORTESE
Facility County Code:	17
Reg By:	LTNKA
Reg Id:	170065

---

2 **CHMIRS** **S105655257**
Target Property **19020 BUTTS CANYON RD** **N/A**
UNINCORPORATED COUNTY AREA, CA

Actual: 1128 ft.
Focus Map: 6

CHMIRS:

Name:	Not reported
Address:	19020 BUTTS CANYON RD
City,State,Zip:	UNINCORPORATED COUNTY AREA, CA
OES Incident Number:	8-3293
OES notification:	07/20/1998
OES Date:	Not reported
OES Time:	Not reported
Date Completed:	**Not reported**
Property Use:	Not reported
Agency Id Number:	Not reported
Agency Incident Number:	Not reported
Time Notified:	Not reported
Time Completed:	Not reported
Surrounding Area:	Not reported
Estimated Temperature:	Not reported
Property Management:	Not reported
More Than Two Substances Involved?:	Not reported
Resp Agncy Personel # Of Decontaminated:	Not reported
Responding Agency Personel # Of Injuries:	Not reported
Responding Agency Personel # Of Fatalities:	Not reported
Others Number Of Decontaminated:	Not reported
Others Number Of Injuries:	Not reported
Others Number Of Fatalities:	Not reported
Vehicle Make/year:	Not reported
Vehicle License Number:	Not reported
Vehicle State:	Not reported
Vehicle Id Number:	Not reported
CA DOT PUC/ICC Number:	Not reported
Company Name:	Not reported
Reporting Officer Name/ID:	Not reported
Report Date:	Not reported
Facility Telephone:	Not reported
Waterway Involved:	No
Waterway:	Not reported
Spill Site:	Not reported
Cleanup By:	Fire Dept.
Containment:	Not reported
What Happened:	Not reported
Type:	Not reported
Measure:	Not reported
Other:	Not reported
Date/Time:	Not reported

(Continued) **S105655257**

Year:	1998
Agency:	Lake Co SO
Incident Date:	7/19/199812:00:00 AM
Admin Agency:	Lake County Health Department
Amount:	Not reported
Contained:	Yes
Site Type:	Residence
E Date:	Not reported
Substance:	sulfuric acid
Gallons:	4
Unknown:	0
Substance #2:	Not reported
Substance #3:	Not reported
Evacuations:	0
Number of Injuries:	0
Number of Fatalities:	0
#1 Pipeline:	Not reported
#2 Pipeline:	Not reported
#3 Pipeline:	Not reported
#1 Vessel >= 300 Tons:	Not reported
#2 Vessel >= 300 Tons:	Not reported
#3 Vessel >= 300 Tons:	Not reported
Evacs:	Not reported
Injuries:	Not reported
Fatals:	Not reported
Comments:	Not reported
Description:	no release. found by citizen

---

3 **MIDDLETOWN SCHOOL DISTRICT** **LUST S101295444**
11710 BUTTS CANYON RD **CERS N/A**
< 1/8 **MIDDLETOWN, CA 95461**
0.001 mi.
4 ft.

Actual:
1097 ft.

Focus Map:
5

LUST REG 5:

Name:	MIDDLETOWN SCHOOL DISTRICT
Address:	11710 BUTTS CANYON RD
City:	MIDDLETOWN
Region:	5
Status:	Case Closed
Case Number:	170065
Case Type:	Soil only
Substance:	GASOLINE
Staff Initials:	GTM
Lead Agency:	Local
Program:	LUST
MTBE Code:	N/A

LUST:

Name:	MIDDLETOWN SCHOOL DISTRICT
Address:	11710 BUTTS CANYON RD
City,State,Zip:	MIDDLETOWN, CA 95461
Lead Agency:	LAKE COUNTY
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0603300045
Global Id:	T0603300045
Latitude:	38.7490848

MIDDLETOWN SCHOOL DISTRICT (Continued) **S101295444**

Longitude:	-122.5907771
Status:	Completed - Case Closed
Status Date:	07/26/1995
Case Worker:	MAN
RB Case Number:	170065
Local Agency:	LAKE COUNTY
File Location:	Not reported
Local Case Number:	Not reported
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

LUST:

Global Id:	T0603300045
Contact Type:	Regional Board Caseworker
Contact Name:	GLENN T. MEEKS
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	gmeeks@waterboards.ca.gov
Phone Number:	Not reported

Global Id:	T0603300045
Contact Type:	Local Agency Caseworker
Contact Name:	MANUEL RAMIREZ
Organization Name:	LAKE COUNTY
Address:	Not reported
City:	r5 UNKNOWN
Email:	Not reported
Phone Number:	Not reported

LUST:

Global Id:	T0603300045
Action Type:	Other
Date:	07/21/1993
Action:	Leak Discovery

Global Id:	T0603300045
Action Type:	ENFORCEMENT
Date:	07/26/1995
Action:	Closure/No Further Action Letter

Global Id:	T0603300045
Action Type:	Other
Date:	07/21/1993
Action:	Leak Stopped

Global Id:	T0603300045
Action Type:	Other
Date:	09/09/1993
Action:	Leak Reported

LUST:

Global Id:	T0603300045
Status:	Open - Case Begin Date
Status Date:	07/21/1993

MIDDLETOWN SCHOOL DISTRICT (Continued) **S101295444**

Global Id: T0603300045
Status: Open - Site Assessment
Status Date: 12/16/1993

Global Id: T0603300045
Status: Open - Site Assessment
Status Date: 11/07/1994

Global Id: T0603300045
Status: Completed - Case Closed
Status Date: 07/26/1995

CERS:
Name: MIDDLETOWN SCHOOL DISTRICT
Address: 11710 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
Site ID: 224103
CERS ID: T0603300045
CERS Description: Leaking Underground Storage Tank Cleanup Site

Affiliation:
Affiliation Type Desc: Local Agency Caseworker
Entity Name: MANUEL RAMIREZ - LAKE COUNTY
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: r5 UNKNOWN
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

Affiliation Type Desc: Regional Board Caseworker
Entity Name: GLENN T. MEEKS - CENTRAL VALLEY RWQCB (REGION 5S)
Entity Title: Not reported
Affiliation Address: 11020 SUN CENTER DRIVE #200
Affiliation City: RANCHO CORDOVA
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

A4 **MIDDLETOWN ENTERPRISES** **LUST** **U001610520**
SW **18975 BUTTS CANYON RD** **SWEEPS UST** **N/A**
< 1/8 **MIDDLETOWN, CA 95461** **HIST UST**
0.007 mi.
39 ft. **Site 1 of 2 in cluster A**

Actual:
1138 ft.

Focus Map:
9

LUST:
Name: MIDDLETOWN AIR STRIP
Address: 18975 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
Lead Agency: CENTRAL VALLEY RWQCB (REGION 5S)
Case Type: LUST Cleanup Site
Geo Track: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0603300046
Global Id: T0603300046
Latitude: 38.7292948

MIDDLETOWN ENTERPRISES (Continued) **U001610520**

Longitude:	-122.5541162
Status:	Completed - Case Closed
Status Date:	12/12/1994
Case Worker:	GTM
RB Case Number:	170066
Local Agency:	LAKE COUNTY
File Location:	Not reported
Local Case Number:	Not reported
Potential Media Affect:	Aquifer used for drinking water supply
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

LUST:

Global Id:	T0603300046
Contact Type:	Regional Board Caseworker
Contact Name:	GLENN T. MEEKS
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	gmeeks@waterboards.ca.gov
Phone Number:	Not reported

Global Id:	T0603300046
Contact Type:	Local Agency Caseworker
Contact Name:	MANUEL RAMIREZ
Organization Name:	LAKE COUNTY
Address:	Not reported
City:	r5 UNKNOWN
Email:	Not reported
Phone Number:	Not reported

LUST:

Global Id:	T0603300046
Action Type:	Other
Date:	08/13/1993
Action:	Leak Discovery

Global Id:	T0603300046
Action Type:	Other
Date:	08/13/1993
Action:	Leak Stopped

Global Id:	T0603300046
Action Type:	Other
Date:	09/23/1993
Action:	Leak Reported

LUST:

Global Id:	T0603300046
Status:	Open - Case Begin Date
Status Date:	08/13/1993

Global Id:	T0603300046
Status:	Open - Site Assessment
Status Date:	09/23/1993

Global Id: T0603300046

MIDDLETOWN ENTERPRISES (Continued) **U001610520**

Status: Open - Site Assessment
Status Date: 01/18/1994

Global Id: T0603300046
Status: Open - Verification Monitoring
Status Date: 11/07/1994

Global Id: T0603300046
Status: Completed - Case Closed
Status Date: 12/12/1994

SWEEPS UST:
Name: MIDDLETOWN ENTERPRISES
Address: 18975 BUTTS CANYON RD
City: MIDDLETOWN
Status: Active
Comp Number: 51664
Number: 9
Board Of Equalization: 44-006871
Referral Date: Not reported
Action Date: 11-08-88
Created Date: 02-29-88
Owner Tank Id: 404
SWRCB Tank Id: 17-000-051664-000004
Tank Status: A
Capacity: 10000
Active Date: 11-08-88
Tank Use: M.V. FUEL
STG: P
Content: AVIA. GAS
Number Of Tanks: 1

Name: MIDDLETOWN ENTERPRISES
Address: 18975 BUTTS CANYON RD
City: MIDDLETOWN
Status: Not reported
Comp Number: 51664
Number: Not reported
Board Of Equalization: 44-006871
Referral Date: Not reported
Action Date: Not reported
Created Date: Not reported
Owner Tank Id: Not reported
SWRCB Tank Id: 17-000-051664-000001
Tank Status: Not reported
Capacity: 1000
Active Date: Not reported
Tank Use: M.V. FUEL
STG: PRODUCT
Content: REG UNLEADED
Number Of Tanks: 3

Name: MIDDLETOWN ENTERPRISES
Address: 18975 BUTTS CANYON RD
City: MIDDLETOWN
Status: Not reported

MIDDLETOWN ENTERPRISES (Continued) **U001610520**

Comp Number: 51664
Number: Not reported
Board Of Equalization: 44-006871
Referral Date: Not reported
Action Date: Not reported
Created Date: Not reported
Owner Tank Id: Not reported
SWRCB Tank Id: 17-000-051664-000002
Tank Status: Not reported
Capacity: 10000
Active Date: Not reported
Tank Use: M.V. FUEL
STG: PRODUCT
Content: REG UNLEADED
Number Of Tanks: Not reported

Name: MIDDLETOWN ENTERPRISES
Address: 18975 BUTTS CANYON RD
City: MIDDLETOWN
Status: Not reported
Comp Number: 51664
Number: Not reported
Board Of Equalization: 44-006871
Referral Date: Not reported
Action Date: Not reported
Created Date: Not reported
Owner Tank Id: Not reported
SWRCB Tank Id: 17-000-051664-000003
Tank Status: Not reported
Capacity: 10000
Active Date: Not reported
Tank Use: M.V. FUEL
STG: PRODUCT
Content: AVIA. GAS
Number Of Tanks: Not reported

HIST UST:
Name: MIDDLETOWN ENTERPRISES
Address: 18975 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
File Number: 000259CF
URL: http://geotracker.waterboards.ca.gov/ustpdfs/pdf/000259CF.pdf
Region: STATE
Facility ID: 00000051664
Facility Type: Other
Other Type: RANCH
Contact Name: LARRY GABRIELSON
Telephone: 7079873079
Owner Name: MIDDLETOWN ENTERPRISES
Owner Address: 18975 BUTTS CANYON RD.
Owner City,St,Zip: MIDDLETOWN, CA 95461
Total Tanks: 0004

Tank Num: 001
Container Num: 101
Year Installed: 1979
Tank Capacity: 00004000

MIDDLETOWN ENTERPRISES (Continued) **U001610520**

Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	3/16
Leak Detection:	Pressure Test
Tank Num:	002
Container Num:	202
Year Installed:	1980
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	1/4
Leak Detection:	Pressure Test
Tank Num:	003
Container Num:	303
Year Installed:	1980
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	1/4
Leak Detection:	Pressure Test
Tank Num:	004
Container Num:	404
Year Installed:	1980
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	1/4
Leak Detection:	Pressure Test

Click here for Geo Tracker PDF:

A5 **MIDDLETOWN AIR STRIP** **LUST** **S105024958**
SW **18975 BUTTS CNYN** **HIST CORTESE** **N/A**
< 1/8 **MIDDLETOWN, CA 95461** **CERS**
0.007 mi.
39 ft. **Site 2 of 2 in cluster A**

Actual:
1138 ft.

Focus Map:
9

LUST REG 5:

Name:	MIDDLETOWN AIR STRIP
Address:	18975 BUTTS CANYON RD
City:	MIDDLETOWN
Region:	5
Status:	Case Closed
Case Number:	170066
Case Type:	Drinking Water Aquifer affected
Substance:	GASOLINE
Staff Initials:	GTM
Lead Agency:	Regional
Program:	LUST
MTBE Code:	N/A

HIST CORTESE:

edr_fname:	MIDDLETOWN AIR STRIP
edr_fadd1:	18975 BUTTS CNYN

MIDDLETOWN AIR STRIP (Continued) **S105024958**

City,State,Zip: MIDDLETOWN, CA 95461
Region: CORTESE
Facility County Code: 17
Reg By: LTNKA
Reg Id: 170066

CERS:
Name: MIDDLETOWN AIR STRIP
Address: 18975 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
Site ID: 203591
CERS ID: T0603300046
CERS Description: Leaking Underground Storage Tank Cleanup Site

Affiliation:
Affiliation Type Desc: Regional Board Caseworker
Entity Name: GLENN T. MEEKS - CENTRAL VALLEY RWQCB (REGION 5S)
Entity Title: Not reported
Affiliation Address: 11020 SUN CENTER DRIVE #200
Affiliation City: RANCHO CORDOVA
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

Affiliation Type Desc: Local Agency Caseworker
Entity Name: MANUEL RAMIREZ - LAKE COUNTY
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: r5 UNKNOWN
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

---

6 **UP RANCH** **SWEEPS UST** **U001610526**
SSE **17525 BUTTS CANYON RD** **HIST UST** **N/A**
< 1/8 **MIDDLETOWN, CA 95461**
0.011 mi.
59 ft.

Actual:
1086 ft.

Focus Map:
5

SWEEPS UST:
Name: UP RANCH
Address: 17525 BUTTS CANYON RD
City: MIDDLETOWN
Status: Active
Comp Number: 44562
Number: 9
Board Of Equalization: Not reported
Referral Date: 07-01-85
Action Date: Not reported
Created Date: 02-29-88
Owner Tank Id: 1
SWRCB Tank Id: 17-000-044562-000001
Tank Status: A
Capacity: 500
Active Date: 07-01-85

UP RANCH (Continued) **U001610526**

Tank Use: M.V. FUEL
STG: P
Content: REG UNLEADED
Number Of Tanks: 1

HIST UST:
Name: UP RANCH
Address: 17525 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
File Number: 000258AF
URL: http://geotracker.waterboards.ca.gov/ustpdfs/pdf/000258AF.pdf
Region: STATE
Facility ID: 00000044562
Facility Type: Other
Other Type: FARM
Contact Name: EARL HOUSTON
Telephone: 7079873217
Owner Name: EARL HUSTON
Owner Address: 17525 BUTTS CANYON RD.
Owner City,St,Zip: MIDDLETOWN, CA 95461
Total Tanks: 0001

Tank Num: 001
Container Num: 1
Year Installed: Not reported
Tank Capacity: 00000500
Tank Used for: PRODUCT
Type of Fuel: UNLEADED
Container Construction Thickness: 1/4
Leak Detection: None

Click here for Geo Tracker PDF:

B7 **MIDDLETOWN USD BUS YARD** **AST** **A100338562**
NE **17110 BUTTS CANYON RD** **N/A**
< 1/8 **MIDDLETOWN, CA**
0.013 mi.
67 ft. **Site 1 of 4 in cluster B**

Actual:
1114 ft.

Focus Map:
5

AST:
Name: MIDDLETOWN USD BUS YARD
Address: 17110 BUTTS CANYON RD
City/Zip: MIDDLETOWN,
Certified Unified Program Agencies: Lake
Owner: MIDDLETOWN USD
Total Gallons: 3,000
CERSID: Not reported
Facility ID: Not reported
Business Name: Not reported
Phone: Not reported
Fax: Not reported
Mailing Address: Not reported
Mailing Address City: Not reported
Mailing Address State: Not reported
Mailing Address Zip Code: Not reported
Operator Name: Not reported
Operator Phone: Not reported

MIDDLETOWN USD BUS YARD (Continued) **A100338562**

Owner Phone:	Not reported
Owner Mail Address:	Not reported
Owner State:	Not reported
Owner Zip Code:	Not reported
Owner Country:	Not reported
Property Owner Name:	Not reported
Property Owner Phone:	Not reported
Property Owner Mailing Address:	Not reported
Property Owner City:	Not reported
Property Owner Stat :	Not reported
Property Owner Zip Code:	Not reported
Property Owner Country:	Not reported
EPAID:	Not reported

B8 **MIDDLETOWN USD - BUS YARD** **CERS HAZ WASTE** **S121786703**
NE **17110 BUTTS CANYON ROAD** **CERS TANKS** **N/A**
< 1/8 **MIDDLETOWN, CA 95461** **CERS**
0.013 mi.
67 ft. **Site 2 of 4 in cluster B**

Actual:
1114 ft.

Focus Map:
5

CERS HAZ WASTE:

Name:	MIDDLETOWN USD - BUS YARD
Address:	17110 BUTTS CANYON ROAD
City,State,Zip:	MIDDLETOWN, CA 95461
Site ID:	48930
CERS ID:	10029439
CERS Description:	Hazardous Waste Generator

CERS TANKS:

Name:	MIDDLETOWN USD - BUS YARD
Address:	17110 BUTTS CANYON ROAD
City,State,Zip:	MIDDLETOWN, CA 95461
Site ID:	48930
CERS ID:	10029439
CERS Description:	Aboveground Petroleum Storage

CERS:

Name:	MIDDLETOWN USD - BUS YARD
Address:	17110 BUTTS CANYON ROAD
City,State,Zip:	MIDDLETOWN, CA 95461
Site ID:	48930
CERS ID:	10029439
CERS Description:	Chemical Storage Facilities

Evaluation:

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	10-20-2016
Violations Found:	No
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	Lake County Environmental Health
Eval Program:	APSA
Eval Source:	CERS

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	10-20-2016
Violations Found:	No

MIDDLETOWN USD - BUS YARD (Continued) **S121786703**

Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	Lake County Environmental Health
Eval Program:	HMRRP
Eval Source:	CERS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	10-20-2016
Violations Found:	No
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	Lake County Environmental Health
Eval Program:	HW
Eval Source:	CERS
Eval General Type:	Other/Unknown
Eval Date:	12-22-2016
Violations Found:	No
Eval Type:	Other, not routine, done by local agency
Eval Notes:	Inspection follow up and SPCC assistance with Anthony.
Eval Division:	Lake County Environmental Health
Eval Program:	APSA
Eval Source:	CERS

Affiliation:

Affiliation Type Desc:	Document Preparer
Entity Name:	Anthony Raffaelli
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported
Affiliation Type Desc:	Facility Mailing Address
Entity Name:	Mailing Address
Entity Title:	Not reported
Affiliation Address:	20932 Big Canyon Road
Affiliation City:	Middletown
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	95461
Affiliation Phone:	Not reported
Affiliation Type Desc:	Identification Signer
Entity Name:	Catherine Stone
Entity Title:	Superintendent
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported
Affiliation Type Desc:	Legal Owner
Entity Name:	Middletown USD

MIDDLETOWN USD - BUS YARD (Continued) **S121786703**

Entity Title:	Not reported
Affiliation Address:	20932 Big Canyon Road
Affiliation City:	Middletown
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	95461
Affiliation Phone:	(707) 987-4100
Affiliation Type Desc:	Operator
Entity Name:	Catherine Stone - Superintendent
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	(707) 987-4100
Affiliation Type Desc:	CUPA District
Entity Name:	Lake County Environmental Health
Entity Title:	Not reported
Affiliation Address:	922 Bevins Court
Affiliation City:	Lakeport
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	95453
Affiliation Phone:	(707) 263-1164
Affiliation Type Desc:	Parent Corporation
Entity Name:	Middletown USD - Bus Yard
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported
Affiliation Type Desc:	Environmental Contact
Entity Name:	Anthony Raffaelli
Entity Title:	Not reported
Affiliation Address:	20932 Big Canyon Road
Affiliation City:	Middletown
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	95461
Affiliation Phone:	Not reported

B9 **MIDDLETOWN USD - BUS YARD** **AST** **A100422380**
NE **17110 BUTTS CANYON ROAD** **N/A**
< 1/8 **MIDDLETOWN, CA 95461**
0.013 mi.
67 ft. **Site 3 of 4 in cluster B**

Actual:
1114 ft.

Focus Map:
5

AST:

Name:	MIDDLETOWN USD - BUS YARD
Address:	17110 BUTTS CANYON ROAD
City/Zip:	MIDDLETOWN,95461
Certified Unified Program Agencies:	Not reported
Owner:	Middletown USD
Total Gallons:	Not reported
CERSID:	10029439
Facility ID:	17-000-TMP009
Business Name:	Middletown USD - Bus Yard
Phone:	707-987-4100
Fax:	Not reported
Mailing Address:	20932 Big Canyon Road
Mailing Address City:	Middletown
Mailing Address State:	CA
Mailing Address Zip Code:	95461
Operator Name:	Korby Olson - Superintendent
Operator Phone:	707-987-4100
Owner Phone:	(707) 987-4100
Owner Mail Address:	Not reported
Owner State:	CA
Owner Zip Code:	95461
Owner Country:	United States
Property Owner Name:	Not reported
Property Owner Phone:	Not reported
Property Owner Mailing Address:	Not reported
Property Owner City:	Not reported
Property Owner Stat :	Not reported
Property Owner Zip Code:	Not reported
Property Owner Country:	Not reported
EPAID:	CAL000248702

B10 **MIDDLTOWN UNIFIED SCHOOL DIST** **SWEEPS UST** **S106929386**
NE **17110 BUTTS CANYON RD** **CUPA Listings** **N/A**
< 1/8 **MIDDLETOWN, CA 95461**
0.013 mi.
67 ft. **Site 4 of 4 in cluster B**

Actual:
1114 ft.

Focus Map:
5

SWEEPS UST:

Name:	MIDDLTOWN UNIFIED SCHOOL DIST
Address:	17110 BUTTS CANYON RD
City:	MIDDLETOWN
Status:	Active
Comp Number:	115
Number:	4
Board Of Equalization:	44-006704
Referral Date:	Not reported
Action Date:	11-20-88
Created Date:	11-20-88
Owner Tank Id:	Not reported
SWRCB Tank Id:	Not reported
Tank Status:	Not reported
Capacity:	Not reported
Active Date:	Not reported

MIDDLTOWN UNIFIED SCHOOL DIST (Continued) **S106929386**

Tank Use: Not reported
STG: Not reported
Content: Not reported
Number Of Tanks: Not reported

Name: MIDDLTOWN UNIFIED SCHOOL DIST
Address: 17110 BUTTS CANYON RD
City: MIDDLETOWN
Status: Not reported
Comp Number: 115
Number: Not reported
Board Of Equalization: 44-006704
Referral Date: Not reported
Action Date: Not reported
Created Date: Not reported
Owner Tank Id: Not reported
SWRCB Tank Id: 17-000-000115-000001
Tank Status: Not reported
Capacity: 1000
Active Date: Not reported
Tank Use: M.V. FUEL
STG: PRODUCT
Content: REG UNLEADED
Number Of Tanks: 3

Name: MIDDLTOWN UNIFIED SCHOOL DIST
Address: 17110 BUTTS CANYON RD
City: MIDDLETOWN
Status: Not reported
Comp Number: 115
Number: Not reported
Board Of Equalization: 44-006704
Referral Date: Not reported
Action Date: Not reported
Created Date: Not reported
Owner Tank Id: Not reported
SWRCB Tank Id: 17-000-000115-000002
Tank Status: Not reported
Capacity: 1000
Active Date: Not reported
Tank Use: M.V. FUEL
STG: PRODUCT
Content: REG UNLEADED
Number Of Tanks: Not reported

Name: MIDDLTOWN UNIFIED SCHOOL DIST
Address: 17110 BUTTS CANYON RD
City: MIDDLETOWN
Status: Not reported
Comp Number: 115
Number: Not reported
Board Of Equalization: 44-006704
Referral Date: Not reported
Action Date: Not reported
Created Date: Not reported
Owner Tank Id: Not reported
SWRCB Tank Id: 17-000-000115-000003

MIDDLTOWN UNIFIED SCHOOL DIST (Continued) **S106929386**

Tank Status: Not reported
Capacity: 1000
Active Date: Not reported
Tank Use: M.V. FUEL
STG: PRODUCT
Content: REG UNLEADED
Number Of Tanks: Not reported

CUPA LAKE:
Name: MIDDLETOWN UNIFIED SCHOOL DISTRICT BUS YARD
Address: 17110 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
Facility: FA0000437
Business Type: 3 - CUPA APSA
Program Element: 2004 - HMRRP Category 4 (1,001-5,000 gal, 10,001-100
Mailing Address: 20932 BIG CANYON ROAD c/o MIDDLETOWN UNIFIED SCHOOL DISTRICT Middletown, CA 95461 USA
Mailing Telephone: 7079874100
Entered Date: 11/26/2012
Program Identifier: CUPA-17110 BUTTS CANYON ROAD-BUS YARD
Record ID: PR0000896
Billing Status: 01 - ACTIVE, BILLABLE
Total Fee Amount: 852.00
Current Inspection Date: 10/20/2019
Contact Name: MIDDLETOWN UNIFIED SCHOOL DISTRICT
Mailing Address: Middletown, CA 95461
APN: Not reported
Program/Element Code: 2004

Name: MIDDLETOWN UNIFIED SCHOOL DISTRICT BUS YARD
Address: 17110 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
Facility: FA0000437
Business Type: 3 - CUPA APSA
Program Element: 2800 - CUPA Hazardous Waste Generator Program
Mailing Address: 20932 BIG CANYON ROAD c/o MIDDLETOWN UNIFIED SCHOOL DISTRICT Middletown, CA 95461 USA
Mailing Telephone: 7079874100
Entered Date: 11/26/2012
Program Identifier: CUPA-17110 BUTTS CANYON ROAD
Record ID: PR0000897
Billing Status: 01 - ACTIVE, BILLABLE
Total Fee Amount: 0.00
Current Inspection Date: 10/20/2019
Contact Name: MIDDLETOWN UNIFIED SCHOOL DISTRICT
Mailing Address: Middletown, CA 95461
APN: Not reported
Program/Element Code: 2800

C11 **BURNS ENTERPRISES** **RCRA NonGen / NLR** **1024818199**
NNE **19355 S HWY 29** **CAL000324716**
< 1/8 **MIDDLETOWN, CA 95461**
0.057 mi.
303 ft. **Site 1 of 3 in cluster C**

Actual:
1082 ft.

Focus Map:
1

RCRA NonGen / NLR:
Date form received by agency: 09/11/2007
Facility name: BURNS ENTERPRISES
Facility address: 19355 S HWY 29

BURNS ENTERPRISES (Continued) **1024818199**

MIDDLETOWN, CA 95461
EPA ID: CAL000324716
Mailing address: PO BOX 751
19355 S HWY 29
MIDDLETOWN, CA 95461-0000
Contact: MIKE BURNS
Contact address: PO BOX 751
MIDDLETOWN, CA 95461
Contact country: Not reported
Contact telephone: 707-987-9630
Contact email: MRB@PACIFIC.NET
EPA Region: 09
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: MIKE BURNS
Owner/operator address: PO BOX 751
MIDDLETOWN, CA 95461
Owner/operator country: Not reported
Owner/operator telephone: 707-987-9630
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Other
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Owner/operator name: MIKE BURNS
Owner/operator address: PO BOX 751 19355 S HWY 29
MIDDLETOWN, CA 95461
Owner/operator country: Not reported
Owner/operator telephone: 707-987-9630
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Other
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: Yes
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No

BURNS ENTERPRISES (Continued) **1024818199**

Used oil transfer facility: No
Used oil transporter: No

Violation Status: No violations found

C12 **BURNS ENTERPRISES** **CERS HAZ WASTE** **S112444434**
NNE **19355 S. STATE HWY 29** **CUPA Listings** **N/A**
< 1/8 **MIDDLETOWN, CA 95461** **CERS**
0.057 mi.
303 ft. **Site 2 of 3 in cluster C**

Actual:
1082 ft.

Focus Map:
1

CERS HAZ WASTE:
Name: BURNS ENTERPRISES
Address: 19355 S. STATE HWY 29
City,State,Zip: MIDDLETOWN, CA 95461
Site ID: 14127
CERS ID: 10135663
CERS Description: Hazardous Waste Generator

CUPA LAKE:
Name: BURNS ENTERPRISES
Address: 19355 S. STATE HWY 29
City,State,Zip: MIDDLETOWN, CA 95461
Facility: FA0000027
Business Type: 1 - CUPA
Program Element: 2002 - HMRRP Category 2 (111-500 gal, 1,001-5,000 lb
Mailing Address: P O Box 751 c/o Mike Burns Middletown, CA 95461
Mailing Telephone: 7079879630
Entered Date: 11/13/2012
Program Identifier: CUPA-19355 S HWY 29, MIDDLETOWN
Record ID: PR0000028
Billing Status: 01 - ACTIVE, BILLABLE
Total Fee Amount: 473.00
Current Inspection Date: 09/29/2020
Contact Name: Mike Burns
Mailing Address: Middletown, CA 95461
APN: Not reported
Program/Element Code: 2002

Name: BURNS ENTERPRISES
Address: 19355 S. STATE HWY 29
City,State,Zip: MIDDLETOWN, CA 95461
Facility: FA0000027
Business Type: 1 - CUPA
Program Element: 2800 - CUPA Hazardous Waste Generator Program
Mailing Address: P O Box 751 c/o Mike Burns Middletown, CA 95461
Mailing Telephone: 7079879630
Entered Date: 11/13/2012
Program Identifier: CUPA
Record ID: PR0000029
Billing Status: 01 - ACTIVE, BILLABLE
Total Fee Amount: 0.00
Current Inspection Date: 09/27/2020
Contact Name: Mike Burns
Mailing Address: Middletown, CA 95461
APN: Not reported
Program/Element Code: 2800

BURNS ENTERPRISES (Continued) **S112444434**

CERS:
- Name: BURNS ENTERPRISES
- Address: 19355 S. STATE HWY 29
- City,State,Zip: MIDDLETOWN, CA 95461
- Site ID: 14127
- CERS ID: 10135663
- CERS Description: Chemical Storage Facilities

Violations:
- Site ID: 14127
- Site Name: Burns Enterprises
- Violation Date: 09-27-2017
- Citation: 22 CCR 12 66262.34(f) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.34(f)
- Violation Description: Failure to properly label hazardous waste accumulation containers and portable tanks with the following requirements: "Hazardous Waste", name and address of the generator, physical and chemical characteristics of the Hazardous Waste, and starting accumulation date.
- Violation Notes: Returned to compliance on 10/24/2017. OBSERVATION: All hazardous waste containers shall be marked with the following information: 1) the words ?Hazardous Waste?; 2) name and address of generator; 3) hazardous properties; 4) physical state; 5) composition (contents); 6) accumulation start date. CORRECTIVE ACTION: Immediately label these containers and ensure that all hazardous waste containers are marked with all the required information.
- Violation Division: Lake County Environmental Health
- Violation Program: HW
- Violation Source: CERS

Evaluation:
- Eval General Type: Other/Unknown
- Eval Date: 01-06-2016
- Violations Found: No
- Eval Type: Other, not routine, done by local agency
- Eval Notes: Stopped by site and spoke with Mike Burns who had questions about CERS. Gave general assistance as the site does not have internet at this time. Mr. Burns advised he is not sure if he will resume operations at this site after the Valley Fire destroyed the operation and his family.
- Eval Division: Lake County Environmental Health
- Eval Program: HMRRP
- Eval Source: CERS

- Eval General Type: Other/Unknown
- Eval Date: 04-11-2017
- Violations Found: No
- Eval Type: Other, not routine, done by local agency
- Eval Notes: CERS/HMBP Assist. Onsite consultation to help produce new facility map and HMBP.
- Eval Division: Lake County Environmental Health
- Eval Program: HMRRP
- Eval Source: CERS

- Eval General Type: Compliance Evaluation Inspection
- Eval Date: 09-27-2017
- Violations Found: No

BURNS ENTERPRISES (Continued) **S112444434**

Eval Type: Routine done by local agency
Eval Notes: routine inspection
Eval Division: Lake County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-27-2017
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Routine Inspection
Eval Division: Lake County Environmental Health
Eval Program: HW
Eval Source: CERS

Enforcement Action:
Site ID: 14127
Site Name: Burns Enterprises
Site Address: 19355 S. STATE HWY 29
Site City: MIDDLETOWN
Site Zip: 95461
Enf Action Date: 09-27-2017
Enf Action Type: Notice of Violation (Unified Program)
Enf Action Description: Notice of Violation Issued by the Inspector at the Time of Inspection
Enf Action Notes: Not reported
Enf Action Division: Lake County Environmental Health
Enf Action Program: HW
Enf Action Source: CERS

Affiliation:
Affiliation Type Desc: Environmental Contact
Entity Name: Mike Burns
Entity Title: Not reported
Affiliation Address: p.o. box 751
Affiliation City: Middletown
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 95461
Affiliation Phone: Not reported

Affiliation Type Desc: Operator
Entity Name: Mike Burns
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: (707) 484-9328

Affiliation Type Desc: Document Preparer
Entity Name: Mike Burns
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported

BURNS ENTERPRISES (Continued) **S112444434**

Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported
Affiliation Type Desc:	Legal Owner
Entity Name:	Mike Burns
Entity Title:	Not reported
Affiliation Address:	p.o box 751
Affiliation City:	Middletown
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	95461
Affiliation Phone:	(707) 987-9630
Affiliation Type Desc:	CUPA District
Entity Name:	Lake County Environmental Health
Entity Title:	Not reported
Affiliation Address:	922 Bevins Court
Affiliation City:	Lakeport
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	95453
Affiliation Phone:	(707) 263-1164
Affiliation Type Desc:	Parent Corporation
Entity Name:	Burns Enterprises
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported
Affiliation Type Desc:	Facility Mailing Address
Entity Name:	Mailing Address
Entity Title:	Not reported
Affiliation Address:	P O Box 751
Affiliation City:	Middletown
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	95461
Affiliation Phone:	Not reported
Affiliation Type Desc:	Identification Signer
Entity Name:	Mike Burns
Entity Title:	Owner/Operator
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

C13 **MIDDLETOWN DUMP SITE** **SWF/LF** **S102360560**
NNE **19355 STATE HWY 29 @ GRANGE RD** **CERS** **N/A**
< 1/8 **MIDDLETOWN, CA 95461**
0.057 mi.
303 ft. **Site 3 of 3 in cluster C**

Actual:
1082 ft.

Focus Map:
1

SWF/LF (SWIS):

Name:	MIDDLETOWN DUMP SITE
Address:	19355 STATE HWY 29 @ GRANGE RD
City,State,Zip:	MIDDLETOWN, CA
Facility ID:	17-CR-0004
Lat/Long:	38.78236 / -122.57386
Owner Name:	Horne, Winn
Owner Telephone:	Not reported
Owner Address:	Not reported
Owner Address2:	22000 Hwy 29
Owner City,St,Zip:	Middletown, CA 95461
Operational Status:	Closed
Operator:	Not reported
Operator Phone:	Not reported
Operator Address:	Not reported
Operator Address2:	Not reported
Operator City,St,Zip:	Not reported
Permit Date:	Not reported
Permit Status:	Not reported
Permitted Acreage:	Not reported
Activity:	Solid Waste Disposal Site
Regulation Status:	Unpermitted
Landuse Name:	Not reported
GIS Source:	GPS
Category:	Disposal
Unit Number:	01
Inspection Frequency:	Semiannual
Accepted Waste:	Not reported
Closure Date:	12/31/1971
Closure Type:	Estimated
Disposal Acreage:	Not reported
SWIS Num:	17-CR-0004
Waste Discharge Requirement Num:	Not reported
Program Type:	UltraMafic
Permitted Throughput with Units:	Not reported
Actual Throughput with Units:	Not reported
Permitted Capacity with Units:	Not reported
Remaining Capacity:	Not reported
Remaining Capacity with Units:	Not reported
Lat/Long:	38.78236 / -122.57386

Name:	MIDDLETOWN DUMP SITE
Address:	19355 STATE HWY 29 @ GRANGE RD
City,State,Zip:	MIDDLETOWN, CA
Facility ID:	17-CR-0004
Lat/Long:	38.78236 / -122.57386
Owner Name:	Mike Burns
Owner Telephone:	Not reported
Owner Address:	Not reported
Owner Address2:	Not reported
Owner City,St,Zip:	Not reported
Operational Status:	Closed
Operator:	Not reported

MIDDLETOWN DUMP SITE (Continued) **S102360560**

Operator Phone: Not reported
Operator Address: Not reported
Operator Address2: Not reported
Operator City,St,Zip: Not reported
Permit Date: Not reported
Permit Status: Not reported
Permitted Acreage: Not reported
Activity: Solid Waste Disposal Site
Regulation Status: Unpermitted
Landuse Name: Not reported
GIS Source: GPS
Category: Disposal
Unit Number: 01
Inspection Frequency: Semiannual
Accepted Waste: Not reported
Closure Date: 12/31/1971
Closure Type: Estimated
Disposal Acreage: Not reported
SWIS Num: 17-CR-0004
Waste Discharge Requirement Num: Not reported
Program Type: UltraMafic
Permitted Throughput with Units: Not reported
Actual Throughput with Units: Not reported
Permitted Capacity with Units: Not reported
Remaining Capacity: Not reported
Remaining Capacity with Units: Not reported
Lat/Long: 38.78236 / -122.57386

CERS:
Name: MIDDLETOWN DUMP SITE
Address: 19355 STATE HWY 29 @ GRANGE RD
City,State,Zip: MIDDLETOWN, CA 95461
Site ID: 480628
CERS ID: 110013998512
CERS Description: US EPA Air Emission Inventory System (EIS)

Name: MIDDLETOWN DUMP SITE
Address: 19355 STATE HWY 29 @ GRANGE RD
City,State,Zip: MIDDLETOWN, CA
Site ID: 510185
CERS ID: 17-CR-0004
CERS Description: Solid Waste and Recycle Sites

Affiliation:
Affiliation Type Desc: Legal Owner
Entity Name: Horne, Winn
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Middletown
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 95461
Affiliation Phone: Not reported

Affiliation Type Desc: Legal Owner
Entity Name: Mike Burns
Entity Title: Not reported

MIDDLETOWN DUMP SITE (Continued) **S102360560**

Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

14
WSW
1/4-1/2
0.432 mi.
2279 ft.

JOLLY KONE RESTAURANT
21010 HIGHWAY 29
MIDDLETOWN, CA 95461

LUST **S118502928**
CERS **N/A**

Actual:
1102 ft.

Focus Map:
1

LUST:

Name:	JOLLY KONE RESTAURANT
Address:	21010 HIGHWAY 29
City,State,Zip:	MIDDLETOWN, CA 95461
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T10000008192
Global Id:	T10000008192
Latitude:	38.75497
Longitude:	-122.61136
Status:	Completed - Case Closed
Status Date:	12/21/2015
Case Worker:	EMC
RB Case Number:	170116
Local Agency:	Not reported
File Location:	Not reported
Local Case Number:	Not reported
Potential Media Affect:	Not reported
Potential Contaminants of Concern:	Not reported
Site History:	Not reported

LUST:

Global Id:	T10000008192
Contact Type:	Regional Board Caseworker
Contact Name:	EMILY CUSHMAN
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 Sun Center Drive #200
City:	RANCHO CORDOVA
Email:	emily.cushman@waterboards.ca.gov
Phone Number:	9164644696

LUST:

Global Id:	T10000008192
Action Type:	Other
Date:	11/25/2015
Action:	Leak Began

Global Id:	T10000008192
Action Type:	Other
Date:	11/25/2015
Action:	Leak Discovery

Global Id:	T10000008192
Action Type:	ENFORCEMENT

JOLLY KONE RESTAURANT (Continued) **S118502928**

Date: 12/10/2015
Action: Referral to Regional Board

Global Id: T10000008192
Action Type: ENFORCEMENT
Date: 12/21/2015
Action: Closure/No Further Action Letter

Global Id: T10000008192
Action Type: Other
Date: 12/08/2015
Action: Leak Stopped

Global Id: T10000008192
Action Type: Other
Date: 12/08/2015
Action: Leak Reported

LUST:
Global Id: T10000008192
Status: Open - Case Begin Date
Status Date: 11/25/2015

Global Id: T10000008192
Status: Open - Site Assessment
Status Date: 12/18/2015

Global Id: T10000008192
Status: Completed - Case Closed
Status Date: 12/21/2015

CERS:
Name: JOLLY KONE RESTAURANT
Address: 21010 HIGHWAY 29
City,State,Zip: MIDDLETOWN, CA 95461
Site ID: 362167
CERS ID: T10000008192
CERS Description: Leaking Underground Storage Tank Cleanup Site

Affiliation:
Affiliation Type Desc: Regional Board Caseworker
Entity Name: EMILY CUSHMAN - CENTRAL VALLEY RWQCB (REGION 5S)
Entity Title: Not reported
Affiliation Address: 11020 Sun Center Drive #200
Affiliation City: RANCHO CORDOVA
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: 9164644696

D15 **GEOTHERMAL, BUTTS CANYON FAC.** **Toxic Pits** **S100676322**
NE **19020 BUTTS CANYON ROAD** **N/A**
1/4-1/2 **MIDDLETOWN, CA 95461**
0.473 mi.
2500 ft. **Site 1 of 7 in cluster D**

Actual:
1155 ft.

Focus Map:
6

TOXIC PITS:

Region:	05S
Task #:	85017
Owner:	GEOTHERMAL INC.
1/2 Mi Limit:	Y
Num. of Pits:	7
Cease Discharge Due:	/ /
Cease Discharge Complete:	/ /
Closure Due:	/ /
Closure Completed:	**06/30/93**
Status:	CLOSED

Hydro Geological Assessment Report Due: / /
Final Hydro Geological Assessment Review Completed: / /

D16 **GEOTHERMAL INDUSTRIES INC** **SEMS-ARCHIVE** **1000409170**
NE **BUTTS CANYON RD** **CORRACTS** **CAD098080484**
1/4-1/2 **MIDDLETOWN, CA 95461** **RCRA-TSDF**
0.473 mi. **RCRA NonGen / NLR**
2500 ft. **Site 2 of 7 in cluster D** **2020 COR ACTION**

Actual:
1155 ft.

Focus Map:
6

SEMS Archive:

Site ID:	0901692
EPA ID:	CAD098080484
Cong District:	02
FIPS Code:	06033
FF:	N
NPL:	Not on the NPL
Non NPL Status:	Deferred to RCRA (Subtitle C)

SEMS Archive Detail:

Region:	09
Site ID:	0901692
EPA ID:	CAD098080484
Site Name:	GEOTHERMAL INC BUTTS CYN RD FACIL
NPL:	N
FF:	N
OU:	00
Action Code:	SI
Action Name:	SI
SEQ:	1
Start Date:	Not reported
Finish Date:	1986-04-01 05:00:00
Qual:	D
Current Action Lead:	EPA Perf

Region:	09
Site ID:	0901692
EPA ID:	CAD098080484
Site Name:	GEOTHERMAL INC BUTTS CYN RD FACIL
NPL:	N
FF:	N
OU:	00
Action Code:	VS
Action Name:	ARCH SITE

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

SEQ: 1
Start Date: Not reported
Finish Date: 1996-01-23 05:00:00
Qual: Not reported
Current Action Lead: EPA Perf In-Hse

Region: 09
Site ID: 0901692
EPA ID: CAD098080484
Site Name: GEOTHERMAL INC BUTTS CYN RD FACIL
NPL: N
FF: N
OU: 00
Action Code: PA
Action Name: PA
SEQ: 1
Start Date: 1986-01-01 05:00:00
Finish Date: 1986-01-01 05:00:00
Qual: H
Current Action Lead: EPA Perf

Region: 09
Site ID: 0901692
EPA ID: CAD098080484
Site Name: GEOTHERMAL INC BUTTS CYN RD FACIL
NPL: N
FF: N
OU: 00
Action Code: DS
Action Name: DISCVRY
SEQ: 1
Start Date: 1984-12-01 06:00:00
Finish Date: 1984-12-01 06:00:00
Qual: Not reported
Current Action Lead: EPA Perf

CORRACTS:

EPA ID: CAD098080484
EPA Region: 09
Area Name: ENTIRE FACILITY
Actual Date: 20090326
Action: CA550RC
NAICS Code(s): Not reported
Original schedule date: 20090326
Schedule end date: Not reported

EPA ID: CAD098080484
EPA Region: 09
Area Name: ENTIRE FACILITY
Actual Date: 20090326
Action: CA725YE - Current Human Exposures Under Control, Yes, Current Human Exposures Under Control has been verified
NAICS Code(s): Not reported
Original schedule date: 20090326
Schedule end date: Not reported

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

EPA ID: CAD098080484
EPA Region: 09
Area Name: ENTIRE FACILITY
Actual Date: 20090326
Action: CA750YE - Migration of Contaminated Groundwater under Control, Yes, Migration of Contaminated Groundwater Under Control has been verified
NAICS Code(s): Not reported
Original schedule date: 20090326
Schedule end date: Not reported

EPA ID: CAD098080484
EPA Region: 09
Area Name: ENTIRE FACILITY
Actual Date: 19971007
Action: CA750NO - Migration of Contaminated Groundwater under Control, Unacceptable migration of contaminated groundwater is observed or expected
NAICS Code(s): Not reported
Original schedule date: 19971007
Schedule end date: Not reported

EPA ID: CAD098080484
EPA Region: 09
Area Name: ENTIRE FACILITY
Actual Date: 19971007
Action: CA725NO - Current Human Exposures Under Control, Current human exposures are NOT under control
NAICS Code(s): Not reported
Original schedule date: 19971007
Schedule end date: Not reported

RCRA-TSDF:
Date form received by agency: 12/31/2000
Facility name: GEOTHERMAL INDUSTRIES INC
Facility address: BUTTS CANYON RD
MIDDLETOWN, CA 95461
EPA ID: CAD098080484
Contact: Not reported
Contact address: Not reported
Not reported
Contact country: US
Contact telephone: Not reported
Contact email: Not reported
EPA Region: 09
Land type: Other land type
Classification: TSDF
Description: Handler is engaged in the treatment, storage or disposal of hazardous waste
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: NOT REQUIRED
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

Owner/operator telephone: 415-555-1212
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Owner/operator name: NOT REQUIRED
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: 415-555-1212
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 09/01/1996
Site name: GEOTHERMAL INDUSTRIES INC
Classification: Small Quantity Generator

Corrective Action Summary:
Event date: 01/01/1990
Event: LEAD AGENCY DETERMINATION

Event date: 09/06/1991
Event: INVESTIGATION WORKPLAN APPROVED

Event date: 09/06/1991
Event: INVESTIGATION IMPOSITION

Event date: 02/01/1995
Event: INVESTIGATION COMPLETE

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

Event date: 12/05/1995
Event: CA PRIORITIZATION-MEDIUM CA PRIORITY

Event date: 12/05/1995
Event: STABILIZATION MEASURES EVALUATION-FACILITY NOT AMENABLE TO STABILIZATION

Event date: 10/07/1997
Event: CA PRIORITIZATION-MEDIUM CA PRIORITY

Event date: 10/07/1997
Event: RELEASE TO GW CONTROLLED DETERMINATION-FACILITY DOES NOT MEET DEFINITION

Event date: 10/07/1997
Event: HUMAN EXPOSURES CONTROLLED DETERMINATION-FACILITY DOES NOT MEET DEFINITION

Event date: 10/07/1997
Event: RELEASE TO GW CONTROLLED DETERMINATION-FACILITY DOES NOT MEET DEFINITION

Event date: 10/07/1997
Event: HUMAN EXPOSURES CONTROLLED DETERMINATION-FACILITY DOES NOT MEET DEFINITION

Event date: 10/07/1997
Event: STABILIZATION MEASURES EVALUATION-FACILITY IS AMENABLE TO STABILIZATION

Event date: 10/07/1997
Event: STABILIZATION MEASURES EVALUATION-FACILITY IS AMENABLE TO STABILIZATION

Event date: 10/07/1997
Event: REFERRED TO A NON-RCRA AUTHORITY

Event date: 01/01/2009
Event: REMEDY CONSTRUCTION-REMEDY CONSTRUCTED

Event date: 03/26/2009
Event: REMEDY CONSTRUCTION-REMEDY CONSTRUCTED

Event date: 03/26/2009
Event: HUMAN EXPOSURES CONTROLLED DETERMINATION-YES, APPLICABLE AS OF THIS DATE

Event date: 03/26/2009
Event: RELEASE TO GW CONTROLLED DETERMINATION-YES, APPLICABLE AS OF THIS DATE

Event date: 03/26/2009
Event: HUMAN EXPOSURES CONTROLLED DETERMINATION-YES, APPLICABLE AS OF THIS DATE

Event date: 03/26/2009
Event: RELEASE TO GW CONTROLLED DETERMINATION-YES, APPLICABLE AS OF THIS DATE

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

Event date: 09/24/2009
Event: READY FOR ANTICIPATED USE DETERMINATION - READY FOR ANTICIPATED USE

Facility Has Received Notices of Violations:
Regulation violated: Not reported
Area of violation: TSD - Financial Requirements
Date violation determined: 12/08/1987
Date achieved compliance: 07/27/1988
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 07/27/1988
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD IS-Ground-Water Monitoring
Date violation determined: 12/02/1987
Date achieved compliance: 07/27/1988
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD IS-Ground-Water Monitoring
Date violation determined: 10/16/1987
Date achieved compliance: 11/30/1987
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - Closure/Post-Closure
Date violation determined: 10/16/1987
Date achieved compliance: 11/30/1987
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 10/16/1987
Date achieved compliance: 11/30/1987
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - Financial Requirements
Date violation determined: 05/18/1987
Date achieved compliance: 07/27/1988
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 05/18/1987
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Permits - Application
Date violation determined: 03/19/1987
Date achieved compliance: 11/30/1987
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 11/30/1987
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 03/19/1987
Date achieved compliance: 11/30/1987
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 11/30/1987
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

Paid penalty amount: Not reported

Evaluation Action Summary:

Evaluation date: 12/08/1987
Evaluation: FINANCIAL RECORD REVIEW
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 12/02/1987
Evaluation: GROUNDWATER MONITORING EVALUATION
Area of violation: TSD - Financial Requirements
Date achieved compliance: 07/27/1988
Evaluation lead agency: State

Evaluation date: 12/02/1987
Evaluation: GROUNDWATER MONITORING EVALUATION
Area of violation: TSD IS-Ground-Water Monitoring
Date achieved compliance: 07/27/1988
Evaluation lead agency: State

Evaluation date: 10/16/1987
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD IS-Ground-Water Monitoring
Date achieved compliance: 11/30/1987
Evaluation lead agency: State

Evaluation date: 10/16/1987
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - Closure/Post-Closure
Date achieved compliance: 11/30/1987
Evaluation lead agency: State

Evaluation date: 10/16/1987
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 11/30/1987
Evaluation lead agency: State

Evaluation date: 05/18/1987
Evaluation: FINANCIAL RECORD REVIEW
Area of violation: TSD - Financial Requirements
Date achieved compliance: 07/27/1988
Evaluation lead agency: State

Evaluation date: 03/19/1987
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 11/30/1987
Evaluation lead agency: State

Evaluation date: 03/19/1987
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Permits - Application
Date achieved compliance: 11/30/1987
Evaluation lead agency: State

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

RCRA NonGen / NLR:
Date form received by agency: 12/31/2000
Facility name: GEOTHERMAL INDUSTRIES INC
Facility address: BUTTS CANYON RD
MIDDLETOWN, CA 95461
EPA ID: CAD098080484
Contact: Not reported
Contact address: Not reported
Not reported
Contact country: US
Contact telephone: Not reported
Contact email: Not reported
EPA Region: 09
Land type: Other land type
Classification: TSDF
Description: Handler is engaged in the treatment, storage or disposal of hazardous waste
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: NOT REQUIRED
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: 415-555-1212
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Owner/operator name: NOT REQUIRED
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: 415-555-1212
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 09/01/1996
Site name: GEOTHERMAL INDUSTRIES INC
Classification: Small Quantity Generator

Corrective Action Summary:
Event date: 01/01/1990
Event: LEAD AGENCY DETERMINATION

Event date: 09/06/1991
Event: INVESTIGATION WORKPLAN APPROVED

Event date: 09/06/1991
Event: INVESTIGATION IMPOSITION

Event date: 02/01/1995
Event: INVESTIGATION COMPLETE

Event date: 12/05/1995
Event: CA PRIORITIZATION-MEDIUM CA PRIORITY

Event date: 12/05/1995
Event: STABILIZATION MEASURES EVALUATION-FACILITY NOT AMENABLE TO STABILIZATION

Event date: 10/07/1997
Event: CA PRIORITIZATION-MEDIUM CA PRIORITY

Event date: 10/07/1997
Event: RELEASE TO GW CONTROLLED DETERMINATION-FACILITY DOES NOT MEET DEFINITION

Event date: 10/07/1997
Event: HUMAN EXPOSURES CONTROLLED DETERMINATION-FACILITY DOES NOT MEET DEFINITION

Event date: 10/07/1997
Event: RELEASE TO GW CONTROLLED DETERMINATION-FACILITY DOES NOT MEET DEFINITION

Event date: 10/07/1997
Event: HUMAN EXPOSURES CONTROLLED DETERMINATION-FACILITY DOES NOT MEET DEFINITION

Event date: 10/07/1997
Event: STABILIZATION MEASURES EVALUATION-FACILITY IS AMENABLE TO STABILIZATION

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

Event date: 10/07/1997
Event: STABILIZATION MEASURES EVALUATION-FACILITY IS AMENABLE TO STABILIZATION

Event date: 10/07/1997
Event: REFERRED TO A NON-RCRA AUTHORITY

Event date: 01/01/2009
Event: REMEDY CONSTRUCTION-REMEDY CONSTRUCTED

Event date: 03/26/2009
Event: REMEDY CONSTRUCTION-REMEDY CONSTRUCTED

Event date: 03/26/2009
Event: HUMAN EXPOSURES CONTROLLED DETERMINATION-YES, APPLICABLE AS OF THIS DATE

Event date: 03/26/2009
Event: RELEASE TO GW CONTROLLED DETERMINATION-YES, APPLICABLE AS OF THIS DATE

Event date: 03/26/2009
Event: HUMAN EXPOSURES CONTROLLED DETERMINATION-YES, APPLICABLE AS OF THIS DATE

Event date: 03/26/2009
Event: RELEASE TO GW CONTROLLED DETERMINATION-YES, APPLICABLE AS OF THIS DATE

Event date: 09/24/2009
Event: READY FOR ANTICIPATED USE DETERMINATION - READY FOR ANTICIPATED USE

Facility Has Received Notices of Violations:
Regulation violated: Not reported
Area of violation: TSD - Financial Requirements
Date violation determined: 12/08/1987
Date achieved compliance: 07/27/1988
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 07/27/1988
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD IS-Ground-Water Monitoring
Date violation determined: 12/02/1987
Date achieved compliance: 07/27/1988
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD IS-Ground-Water Monitoring
Date violation determined: 10/16/1987
Date achieved compliance: 11/30/1987
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - Closure/Post-Closure
Date violation determined: 10/16/1987
Date achieved compliance: 11/30/1987
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 10/16/1987
Date achieved compliance: 11/30/1987
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - Financial Requirements
Date violation determined: 05/18/1987
Date achieved compliance: 07/27/1988
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 05/18/1987
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

Regulation violated: Not reported
Area of violation: Permits - Application
Date violation determined: 03/19/1987
Date achieved compliance: 11/30/1987
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 11/30/1987
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 03/19/1987
Date achieved compliance: 11/30/1987
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 11/30/1987
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Evaluation Action Summary:
Evaluation date: 12/08/1987
Evaluation: FINANCIAL RECORD REVIEW
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 12/02/1987
Evaluation: GROUNDWATER MONITORING EVALUATION
Area of violation: TSD - Financial Requirements
Date achieved compliance: 07/27/1988
Evaluation lead agency: State

Evaluation date: 12/02/1987
Evaluation: GROUNDWATER MONITORING EVALUATION
Area of violation: TSD IS-Ground-Water Monitoring
Date achieved compliance: 07/27/1988
Evaluation lead agency: State

Evaluation date: 10/16/1987
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD IS-Ground-Water Monitoring
Date achieved compliance: 11/30/1987
Evaluation lead agency: State

Evaluation date: 10/16/1987
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - Closure/Post-Closure
Date achieved compliance: 11/30/1987

GEOTHERMAL INDUSTRIES INC (Continued) **1000409170**

Evaluation lead agency: State

Evaluation date: 10/16/1987
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 11/30/1987
Evaluation lead agency: State

Evaluation date: 05/18/1987
Evaluation: FINANCIAL RECORD REVIEW
Area of violation: TSD - Financial Requirements
Date achieved compliance: 07/27/1988
Evaluation lead agency: State

Evaluation date: 03/19/1987
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 11/30/1987
Evaluation lead agency: State

Evaluation date: 03/19/1987
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Permits - Application
Date achieved compliance: 11/30/1987
Evaluation lead agency: State

2020 COR ACTION:
EPA ID: CAD098080484
Region: 9
Action: Remedy Construction

D17 **BUTTS CANYON RD FACILITY** **LDS** **S109287554**
NE **19020 BUTTS CANYON** **Cortese** **N/A**
1/4-1/2 **MIDDLETOWN, CA 95461** **ENF**
0.473 mi. **CIWQS**
2500 ft. **Site 3 of 7 in cluster D** **CERS**

Actual:
1155 ft.

Focus Map:
6

LDS:
Name: GEOTHERMAL INC. LANDFILL (FORMERLY BUTTS CANYON RD FACILITY)
Address: 19020 BUTTS CANYON
City,State,Zip: MIDDLETOWN, CA 95461

Global Id: L10005342355
Latitude: 38.73256
Longitude: -122.5587
Case Type: Land Disposal Site
Status: Open - Closed/with Monitoring
Status Date: 12/30/2014
Lead Agency: CENTRAL VALLEY RWQCB (REGION 5S)
Caseworker: KWC
Local Agency: Not reported
RB Case Number: 5A170304001
LOC Case Number: Not reported
File Location: Regional Board
Potential Media Affect: Not reported
EDR Link ID: L10005342355
Potential Contaminants of Concern: Not reported
Site History: Not reported

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Click here to access the California GeoTracker records for this facility:

CORTESE:

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	CORTESE
Envirostor Id:	Not reported
Global ID:	Not reported
Site/Facility Type:	Not reported
Cleanup Status:	Not reported
Status Date:	Not reported
Site Code:	Not reported
Latitude:	Not reported
Longitude:	Not reported
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	CORTESE
Order No:	86-087
Waste Discharge System No:	Not reported
Effective Date:	03/28/1986
Region 2:	5S
WID Id:	5A170304001
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported
File Name:	Cease Desist Orders & Cleanup Abatement Orders

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	CORTESE
Envirostor Id:	Not reported
Global ID:	Not reported
Site/Facility Type:	Not reported
Cleanup Status:	Not reported
Status Date:	Not reported
Site Code:	Not reported
Latitude:	Not reported
Longitude:	Not reported
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	CORTESE
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported
File Name:	Cease Desist Orders & Cleanup Abatement Orders

ENF:

Name:	BUTTS CANYON RD FACILITY

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	210951
Agency Name:	Geothermal Inc
Place Type:	Utility
Place Subtype:	Power Plant
Facility Type:	Industrial
Agency Type:	Privately-Owned Business
# Of Agencies:	1
Place Latitude:	38.731995
Place Longitude:	-122.557956
SIC Code 1:	4961
SIC Desc 1:	Steam and Air-Conditioning Supply
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	0.075
Threat To Water Quality:	1
Complexity:	A
Pretreatment:	N - POTW does not have EPA approved pretreatment prog.
Facility Waste Type:	Drilling muds
Facility Waste Type 2:	Erosion wastes
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	LNDISP
Program Category1:	LNDISP
Program Category2:	LNDISP
# Of Programs:	1
WDID:	5A170304001
Reg Measure Id:	140127
Reg Measure Type:	WDR
Region:	Not reported
Order #:	86-087
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Historical
Status Date:	09/15/2017
Effective Date:	03/28/1986
Expiration/Review Date:	11/01/2004
Termination Date:	12/05/2007
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported

BUTTS CANYON RD FACILITY (Continued) **S109287554**

WDR Review - Rescind:	12/6/2007
WDR Review - No Action Required:	3/15/2002
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	14 - Court order
Direction/Voice:	Passive
Enforcement Id(EID):	224114
Region:	Not reported
Order / Resolution Number:	R5-1987-0198
Enforcement Action Type:	Formal Refer to Attorney Gen
Effective Date:	10/23/1987
Adoption/Issuance Date:	Not reported
Achieve Date:	Not reported
Termination Date:	Not reported
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Active
Title:	RAG R5-1987-0198 for Geothermal Inc, Butts Canyon Rd Facility
Description:	VIOL OF TPCA, WATER CODE 13267 & C&D ORDER 85-092
Program:	LNDISP
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	210951
Agency Name:	Geothermal Inc
Place Type:	Utility
Place Subtype:	Power Plant
Facility Type:	Industrial
Agency Type:	Privately-Owned Business
# Of Agencies:	1
Place Latitude:	38.731995
Place Longitude:	-122.557956
SIC Code 1:	4961
SIC Desc 1:	Steam and Air-Conditioning Supply
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported

BUTTS CANYON RD FACILITY (Continued) **S109287554**

# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	0.075
Threat To Water Quality:	1
Complexity:	A
Pretreatment:	N - POTW does not have EPA approved pretreatment prog.
Facility Waste Type:	Drilling muds
Facility Waste Type 2:	Erosion wastes
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	LNDISP
Program Category1:	LNDISP
Program Category2:	LNDISP
# Of Programs:	1
WDID:	5A170304001
Reg Measure Id:	140127
Reg Measure Type:	WDR
Region:	Not reported
Order #:	86-087
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Historical
Status Date:	09/15/2017
Effective Date:	03/28/1986
Expiration/Review Date:	11/01/2004
Termination Date:	12/05/2007
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	12/6/2007
WDR Review - No Action Required:	3/15/2002
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	14 - Court order
Direction/Voice:	Passive
Enforcement Id(EID):	224113
Region:	Not reported
Order / Resolution Number:	R5-1987-0199
Enforcement Action Type:	Admin Civil Liability
Effective Date:	10/23/1987
Adoption/Issuance Date:	Not reported
Achieve Date:	Not reported
Termination Date:	Not reported
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Withdrawn
Title:	ACLO R5-1987-0199 for Geothermal Inc, Butts Canyon Rd
Description:	$10,000 FINE- FAILURE TO SUBMIT SWAT REPORT (WC 13273) (BANKRUPT - UNCOLLECTABLE) Referred to AG; bankrupt; uncollectable.
Program:	LNDISP

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	210951
Agency Name:	Geothermal Inc
Place Type:	Utility
Place Subtype:	Power Plant
Facility Type:	Industrial
Agency Type:	Privately-Owned Business
# Of Agencies:	1
Place Latitude:	38.731995
Place Longitude:	-122.557956
SIC Code 1:	4961
SIC Desc 1:	Steam and Air-Conditioning Supply
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	0.075
Threat To Water Quality:	1
Complexity:	A
Pretreatment:	N - POTW does not have EPA approved pretreatment prog.
Facility Waste Type:	Drilling muds
Facility Waste Type 2:	Erosion wastes
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	LNDISP
Program Category1:	LNDISP
Program Category2:	LNDISP
# Of Programs:	1
WDID:	5A170304001
Reg Measure Id:	140127
Reg Measure Type:	WDR
Region:	Not reported
Order #:	86-087
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Historical
Status Date:	09/15/2017
Effective Date:	03/28/1986
Expiration/Review Date:	11/01/2004
Termination Date:	12/05/2007
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	12/6/2007
WDR Review - No Action Required:	3/15/2002
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	14 - Court order
Direction/Voice:	Passive
Enforcement Id(EID):	224015
Region:	Not reported
Order / Resolution Number:	R5-1984-0076
Enforcement Action Type:	Cease and Desist Order
Effective Date:	06/22/1984
Adoption/Issuance Date:	Not reported
Achieve Date:	Not reported
Termination Date:	04/26/1985
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Historical
Title:	CDO R5-1984-0076 for Geothermal Inc, Butts Canyon Rd Facility
Description:	Amended by CDO 85-092
Program:	LNDISP
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	210951
Agency Name:	Geothermal Inc
Place Type:	Utility
Place Subtype:	Power Plant
Facility Type:	Industrial
Agency Type:	Privately-Owned Business
# Of Agencies:	1
Place Latitude:	38.731995
Place Longitude:	-122.557956
SIC Code 1:	4961

BUTTS CANYON RD FACILITY (Continued) **S109287554**

SIC Desc 1:	Steam and Air-Conditioning Supply
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	0.075
Threat To Water Quality:	1
Complexity:	A
Pretreatment:	N - POTW does not have EPA approved pretreatment prog.
Facility Waste Type:	Drilling muds
Facility Waste Type 2:	Erosion wastes
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	LNDISP
Program Category1:	LNDISP
Program Category2:	LNDISP
# Of Programs:	1
WDID:	5A170304001
Reg Measure Id:	140127
Reg Measure Type:	WDR
Region:	Not reported
Order #:	86-087
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Historical
Status Date:	09/15/2017
Effective Date:	03/28/1986
Expiration/Review Date:	11/01/2004
Termination Date:	12/05/2007
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	12/6/2007
WDR Review - No Action Required:	3/15/2002
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	14 - Court order
Direction/Voice:	Passive
Enforcement Id(EID):	224012
Region:	Not reported
Order / Resolution Number:	R5-1987-0500
Enforcement Action Type:	Admin Civil Liability
Effective Date:	01/23/1987

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Adoption/Issuance Date:	Not reported
Achieve Date:	4/3/1987
Termination Date:	04/03/1987
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Historical
Title:	ACLC R5-1987-0500 for Geothermal Inc, Butts Canyon Rd Facility
Description:	FAILURE TO COMPLY WITH C&A DATED 1 JANUARY 1987.
Program:	LNDISP
Latest Milestone Completion Date:	4/3/1987
# Of Programs1:	1
Total Assessment Amount:	15000
Initial Assessed Amount:	0
Liability $ Amount:	15000
Project $ Amount:	0
Liability $ Paid:	15000
Project $ Completed:	0
Total $ Paid/Completed Amount:	15000

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	210951
Agency Name:	Geothermal Inc
Place Type:	Utility
Place Subtype:	Power Plant
Facility Type:	Industrial
Agency Type:	Privately-Owned Business
# Of Agencies:	1
Place Latitude:	38.731995
Place Longitude:	-122.557956
SIC Code 1:	4961
SIC Desc 1:	Steam and Air-Conditioning Supply
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	0.075
Threat To Water Quality:	1
Complexity:	A
Pretreatment:	N - POTW does not have EPA approved pretreatment prog.
Facility Waste Type:	Drilling muds
Facility Waste Type 2:	Erosion wastes
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	LNDISP
Program Category1:	LNDISP
Program Category2:	LNDISP

BUTTS CANYON RD FACILITY (Continued) **S109287554**

# Of Programs:	1
WDID:	5A170304001
Reg Measure Id:	140127
Reg Measure Type:	WDR
Region:	Not reported
Order #:	86-087
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Historical
Status Date:	09/15/2017
Effective Date:	03/28/1986
Expiration/Review Date:	11/01/2004
Termination Date:	12/05/2007
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	12/6/2007
WDR Review - No Action Required:	3/15/2002
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	14 - Court order
Direction/Voice:	Passive
Enforcement Id(EID):	224011
Region:	Not reported
Order / Resolution Number:	LT870106
Enforcement Action Type:	Clean-up and Abatement Order
Effective Date:	01/06/1987
Adoption/Issuance Date:	Not reported
Achieve Date:	Not reported
Termination Date:	Not reported
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Active
Title:	CAO LT870106 for Geothermal Inc, Butts Canyon Rd Facility
Description:	C&A FOR CLEANUP OF DISCH TO UNNAMED TRIBUTARY, MAINTAIN POND 4 IN DEWATERED CONDITION.
Program:	LNDISP
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0
Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Facility Id:	210951
Agency Name:	Geothermal Inc
Place Type:	Utility
Place Subtype:	Power Plant
Facility Type:	Industrial
Agency Type:	Privately-Owned Business
# Of Agencies:	1
Place Latitude:	38.731995
Place Longitude:	-122.557956
SIC Code 1:	4961
SIC Desc 1:	Steam and Air-Conditioning Supply
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	0.075
Threat To Water Quality:	1
Complexity:	A
Pretreatment:	N - POTW does not have EPA approved pretreatment prog.
Facility Waste Type:	Drilling muds
Facility Waste Type 2:	Erosion wastes
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	LNDISP
Program Category1:	LNDISP
Program Category2:	LNDISP
# Of Programs:	1
WDID:	5A170304001
Reg Measure Id:	140127
Reg Measure Type:	WDR
Region:	Not reported
Order #:	86-087
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Historical
Status Date:	09/15/2017
Effective Date:	03/28/1986
Expiration/Review Date:	11/01/2004
Termination Date:	12/05/2007
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	12/6/2007
WDR Review - No Action Required:	3/15/2002
WDR Review - Pending:	Not reported

BUTTS CANYON RD FACILITY (Continued) **S109287554**

WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	14 - Court order
Direction/Voice:	Passive
Enforcement Id(EID):	224010
Region:	Not reported
Order / Resolution Number:	R5-1985-0092
Enforcement Action Type:	Cease and Desist Order
Effective Date:	04/26/1985
Adoption/Issuance Date:	Not reported
Achieve Date:	Not reported
Termination Date:	Not reported
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Active
Title:	CDO R5-1985-0092 for Geothermal Inc, Butts Canyon Rd Facility
Description:	AMENDED C&D ORDER 84-076 TO PROVIDE LONGER RETROFIT TIME SCHEDULE. DISCHARGER HAS YET TO COMPLY.
Program:	LNDISP
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	210951
Agency Name:	Geothermal Inc
Place Type:	Utility
Place Subtype:	Power Plant
Facility Type:	Industrial
Agency Type:	Privately-Owned Business
# Of Agencies:	1
Place Latitude:	38.731995
Place Longitude:	-122.557956
SIC Code 1:	4961
SIC Desc 1:	Steam and Air-Conditioning Supply
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Design Flow:	0.075
Threat To Water Quality:	1
Complexity:	A
Pretreatment:	N - POTW does not have EPA approved pretreatment prog.
Facility Waste Type:	Drilling muds
Facility Waste Type 2:	Erosion wastes
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	LNDISP
Program Category1:	LNDISP
Program Category2:	LNDISP
# Of Programs:	1
WDID:	5A170304001
Reg Measure Id:	140127
Reg Measure Type:	WDR
Region:	Not reported
Order #:	86-087
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Historical
Status Date:	09/15/2017
Effective Date:	03/28/1986
Expiration/Review Date:	11/01/2004
Termination Date:	12/05/2007
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	12/6/2007
WDR Review - No Action Required:	3/15/2002
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	14 - Court order
Direction/Voice:	Passive
Enforcement Id(EID):	223899
Region:	Not reported
Order / Resolution Number:	R5-1987-0507
Enforcement Action Type:	Admin Civil Liability
Effective Date:	08/24/1987
Adoption/Issuance Date:	Not reported
Achieve Date:	Not reported
Termination Date:	Not reported
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Withdrawn
Title:	ACLC R5-1987-0507 for Geothermal Inc, Butts Canyon Rd Facility
Description:	WC 13273(A) & 13267(B), LEAKING WASTE MANAGEMENT UNITS, UNACCEPTABLE SWAT REPORT. Per ACL Logbook: Board reaffirmed ACL and referred to AG; bankrupt; uncollectable; closed
Program:	LNDISP
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	210951
Agency Name:	Geothermal Inc
Place Type:	Utility
Place Subtype:	Power Plant
Facility Type:	Industrial
Agency Type:	Privately-Owned Business
# Of Agencies:	1
Place Latitude:	38.731995
Place Longitude:	-122.557956
SIC Code 1:	4961
SIC Desc 1:	Steam and Air-Conditioning Supply
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	0.075
Threat To Water Quality:	1
Complexity:	A
Pretreatment:	N - POTW does not have EPA approved pretreatment prog.
Facility Waste Type:	Drilling muds
Facility Waste Type 2:	Erosion wastes
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	LNDISP
Program Category1:	LNDISP
Program Category2:	LNDISP
# Of Programs:	1
WDID:	5A170304001
Reg Measure Id:	140127
Reg Measure Type:	WDR
Region:	Not reported
Order #:	86-087
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported

BUTTS CANYON RD FACILITY (Continued) **S109287554**

301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Historical
Status Date:	09/15/2017
Effective Date:	03/28/1986
Expiration/Review Date:	11/01/2004
Termination Date:	12/05/2007
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	12/6/2007
WDR Review - No Action Required:	3/15/2002
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	14 - Court order
Direction/Voice:	Passive
Enforcement Id(EID):	223895
Region:	Not reported
Order / Resolution Number:	LT870824
Enforcement Action Type:	Formal Refer to Attorney Gen
Effective Date:	08/24/1987
Adoption/Issuance Date:	Not reported
Achieve Date:	Not reported
Termination Date:	Not reported
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Historical
Title:	Formal Refer to AG 08/24/1987 for Geothermal Inc, Butts Canyon Rd Facility
Description:	1/6/87 C&A, WDR 86-087, WC 13261, 13268 - CLEANUP OF SURFACE AND GROUND WATER.
Program:	LNDISP
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	210951
Agency Name:	Not reported
Place Type:	Utility
Place Subtype:	Power Plant
Facility Type:	Industrial
Agency Type:	Not reported
# Of Agencies:	Not reported
Place Latitude:	38.731995
Place Longitude:	-122.557956
SIC Code 1:	4961

BUTTS CANYON RD FACILITY (Continued) **S109287554**

SIC Desc 1:	Steam and Air-Conditioning Supply
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Enf Action
Design Flow:	Not reported
Threat To Water Quality:	Not reported
Complexity:	Not reported
Pretreatment:	Not reported
Facility Waste Type:	Not reported
Facility Waste Type 2:	Not reported
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	Not reported
Program Category1:	Not reported
Program Category2:	UNREGS
# Of Programs:	Not reported
WDID:	Not reported
Reg Measure Id:	Not reported
Reg Measure Type:	Not reported
Region:	Not reported
Order #:	Not reported
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	Not reported
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Not reported
Status Date:	Not reported
Effective Date:	Not reported
Expiration/Review Date:	Not reported
Termination Date:	Not reported
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	Not reported
WDR Review - No Action Required:	Not reported
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	Not reported
Individual/General:	Not reported
Fee Code:	Not reported
Direction/Voice:	Not reported
Enforcement Id(EID):	381940
Region:	Not reported
Order / Resolution Number:	Not reported
Enforcement Action Type:	13267 Letter
Effective Date:	08/19/2011

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Adoption/Issuance Date:	08/19/2011
Achieve Date:	Not reported
Termination Date:	Not reported
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Active
Title:	13267 Letter 08/19/2011 for Geothermal Inc
Description:	The Discharger+s method of presenting adjusted data in monitoring reports prevents staff from determining compliance with the CAO and from identifying a preliminary indication of a release.
Program:	ENFCAO
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Region:	Not reported
Facility Id:	210951
Agency Name:	Not reported
Place Type:	Utility
Place Subtype:	Power Plant
Facility Type:	Industrial
Agency Type:	Not reported
# Of Agencies:	Not reported
Place Latitude:	38.731995
Place Longitude:	-122.557956
SIC Code 1:	4961
SIC Desc 1:	Steam and Air-Conditioning Supply
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Enf Action
Design Flow:	Not reported
Threat To Water Quality:	Not reported
Complexity:	Not reported
Pretreatment:	Not reported
Facility Waste Type:	Not reported
Facility Waste Type 2:	Not reported
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Program:	Not reported
Program Category1:	Not reported
Program Category2:	UNREGS
# Of Programs:	Not reported
WDID:	Not reported
Reg Measure Id:	Not reported
Reg Measure Type:	Not reported
Region:	Not reported
Order #:	Not reported
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	Not reported
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Not reported
Status Date:	Not reported
Effective Date:	Not reported
Expiration/Review Date:	Not reported
Termination Date:	Not reported
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	Not reported
WDR Review - No Action Required:	Not reported
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	Not reported
Individual/General:	Not reported
Fee Code:	Not reported
Direction/Voice:	Not reported
Enforcement Id(EID):	246051
Region:	Not reported
Order / Resolution Number:	R5-2002-0204
Enforcement Action Type:	Clean-up and Abatement Order
Effective Date:	12/06/2002
Adoption/Issuance Date:	Not reported
Achieve Date:	Not reported
Termination Date:	Not reported
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Active
Title:	CAO R5-2002-0204 for Geothermal Inc, Butts Canyon Rd Facility
Description:	Order to close facility (surface impoundments and disposal trenches). Order includes closure, post-closure and groundwater cleanup requirements.
Program:	ENFCAO
Latest Milestone Completion Date:	11/1/2003
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

BUTTS CANYON RD FACILITY (Continued) **S109287554**

CIWQS:

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Agency:	Geothermal Inc
Agency Address:	3401 Crow Canyon Road, San Ramon, CA 94583
Place/Project Type:	Power Plant
SIC/NAICS:	4961
Region:	5S
Program:	LNDISP
Regulatory Measure Status:	Historical
Regulatory Measure Type:	WDR
Order Number:	86-087
WDID:	5A170304001
NPDES Number:	Not reported
Adoption Date:	03/28/1986
Effective Date:	03/28/1986
Termination Date:	12/05/2007
Expiration/Review Date:	11/01/2004
Design Flow:	0.075
Major/Minor:	Not reported
Complexity:	A
TTWQ:	1
Enforcement Actions within 5 years:	0
Violations within 5 years:	0
Latitude:	38.731995
Longitude:	-122.557956

CERS:

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON
City,State,Zip:	MIDDLETOWN, CA 95461
Site ID:	345852
CERS ID:	210951
CERS Description:	Land Disposal

Evaluation:

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	02-08-2007
Violations Found:	No
Eval Type:	RWQCB Type B compliance inspection
Eval Notes:	Not reported
Eval Division:	Water Boards
Eval Program:	LNDISPOTH
Eval Source:	CIWQS

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	02-10-2006
Violations Found:	No
Eval Type:	RWQCB Type B compliance inspection
Eval Notes:	Not reported
Eval Division:	Water Boards
Eval Program:	LNDISPOTH
Eval Source:	CIWQS

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	02-16-2000

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Sampling Inspection
Eval Date: 02-24-1993
Violations Found: No
Eval Type: RWQCB Type A compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 03-10-2004
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 03-30-1999
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-18-2001
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-13-2011
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-17-2016
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 06-16-2004
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 06-20-2002
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-05-2004
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-29-2002
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-14-2005
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-25-2003
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-27-2006
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-23-2007
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-28-2008
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-17-2009
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-18-1993
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-18-2004
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-04-2018
Violations Found: No

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-11-2017
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-22-1992
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: LNDISPOTH
Eval Source: CIWQS

Enforcement Action:
Site ID: 345852
Site Name: Butts Canyon Rd Facility
Site Address: 19020 BUTTS CANYON
Site City: MIDDLETOWN
Site Zip: 95461
Enf Action Date: 01-06-1987
Enf Action Type: Clean-up and Abatement Order
Enf Action Description: Clean-up and Abatement Order
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: LNDISPOTH
Enf Action Source: CIWQS

Site ID: 345852
Site Name: Butts Canyon Rd Facility
Site Address: 19020 BUTTS CANYON
Site City: MIDDLETOWN
Site Zip: 95461
Enf Action Date: 01-23-1987
Enf Action Type: Administrative Enforcement with Penality
Enf Action Description: Administrative Enforcement with Civil Liability (Penality)
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: LNDISPOTH
Enf Action Source: CIWQS

Site ID: 345852
Site Name: Butts Canyon Rd Facility
Site Address: 19020 BUTTS CANYON
Site City: MIDDLETOWN
Site Zip: 95461
Enf Action Date: 04-26-1985

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Enf Action Type:	Cease and Desist Order
Enf Action Description:	Cease and Desist Order
Enf Action Notes:	Not reported
Enf Action Division:	Water Boards
Enf Action Program:	LNDISPOTH
Enf Action Source:	CIWQS
Site ID:	345852
Site Name:	Butts Canyon Rd Facility
Site Address:	19020 BUTTS CANYON
Site City:	MIDDLETOWN
Site Zip:	95461
Enf Action Date:	06-22-1984
Enf Action Type:	Cease and Desist Order
Enf Action Description:	Cease and Desist Order
Enf Action Notes:	Not reported
Enf Action Division:	Water Boards
Enf Action Program:	LNDISPOTH
Enf Action Source:	CIWQS
Site ID:	345852
Site Name:	Butts Canyon Rd Facility
Site Address:	19020 BUTTS CANYON
Site City:	MIDDLETOWN
Site Zip:	95461
Enf Action Date:	08-19-2011
Enf Action Type:	Enforcement Letter (Formal)
Enf Action Description:	Enforcement Letter Citing Violations and with Required Actions (Formal)
Enf Action Notes:	Not reported
Enf Action Division:	Water Boards
Enf Action Program:	LNDISPOTH
Enf Action Source:	CIWQS
Site ID:	345852
Site Name:	Butts Canyon Rd Facility
Site Address:	19020 BUTTS CANYON
Site City:	MIDDLETOWN
Site Zip:	95461
Enf Action Date:	08-24-1987
Enf Action Type:	Administrative Enforcement with Penality
Enf Action Description:	Administrative Enforcement with Civil Liability (Penality)
Enf Action Notes:	Not reported
Enf Action Division:	Water Boards
Enf Action Program:	LNDISPOTH
Enf Action Source:	CIWQS
Site ID:	345852
Site Name:	Butts Canyon Rd Facility
Site Address:	19020 BUTTS CANYON
Site City:	MIDDLETOWN
Site Zip:	95461
Enf Action Date:	08-24-1987
Enf Action Type:	Formal Refer to Attorney Gen
Enf Action Description:	Formal Refer to Attorney Gen
Enf Action Notes:	Not reported
Enf Action Division:	Water Boards

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Enf Action Program: LNDISPOTH
Enf Action Source: CIWQS

Site ID: 345852
Site Name: Butts Canyon Rd Facility
Site Address: 19020 BUTTS CANYON
Site City: MIDDLETOWN
Site Zip: 95461
Enf Action Date: 10-23-1987
Enf Action Type: Administrative Enforcement with Penality
Enf Action Description: Administrative Enforcement with Civil Liability (Penality)
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: LNDISPOTH
Enf Action Source: CIWQS

Site ID: 345852
Site Name: Butts Canyon Rd Facility
Site Address: 19020 BUTTS CANYON
Site City: MIDDLETOWN
Site Zip: 95461
Enf Action Date: 10-23-1987
Enf Action Type: Formal Refer to Attorney Gen
Enf Action Description: Formal Refer to Attorney Gen
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: LNDISPOTH
Enf Action Source: CIWQS

Site ID: 345852
Site Name: Butts Canyon Rd Facility
Site Address: 19020 BUTTS CANYON
Site City: MIDDLETOWN
Site Zip: 95461
Enf Action Date: 12-06-2002
Enf Action Type: Clean-up and Abatement Order
Enf Action Description: Clean-up and Abatement Order
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: LNDISPOTH
Enf Action Source: CIWQS

Name: GEOTHERMAL INC. LANDFILL (FORMERLY BUTTS CANYON RD FACILITY)
Address: 19020 BUTTS CANYON
City,State,Zip: MIDDLETOWN, CA 95461
Site ID: 239744
CERS ID: L10005342355
CERS Description: Land Disposal Site

Affiliation:
Affiliation Type Desc: Regional Board Caseworker
Entity Name: KENNY W CROYLE - CENTRAL VALLEY RWQCB (REGION 5S)
Entity Title: Not reported
Affiliation Address: 11020 SUN CENTER DRIVE #200
Affiliation City: RANCHO CORDOVA
Affiliation State: CA
Affiliation Country: Not reported

BUTTS CANYON RD FACILITY (Continued) **S109287554**

Affiliation Zip: Not reported
Affiliation Phone: Not reported

D18 **BUTTS CANYON RD. FACILITY** **WMUDS/SWAT** **S101175220**
NE **19020 BUTTS CANYON RD** **HAZNET** **N/A**
1/4-1/2 **MIDDLETOWN CA, CA 95461** **NPDES**
0.473 mi. **WDS**
2500 ft. **Site 4 of 7 in cluster D** **CIWQS**

Actual:
1155 ft.

Focus Map:
6

WMUDS/SWAT:

Edit Date:	Not reported
Complexity:	Category A - Any major NPDES facility, any non-NPDES facility (particularly those with toxic wastes) that would be a major if discharge was made to surface or ground waters, or any Class I disposal site. Includes any small-volume complex facility (particularly those with toxicwastes) with numerous discharge points, leak detection systems or ground water monitoring wells.
Primary Waste:	DRILLS
Primary Waste Type:	Designated/Influent or Solid Wastes that pose a significant threat to water quality because of their high concentrations (E.G., BOD, Hardness, TRF, Chloride). 'Manageable' hazardous wastes (E.G., inorganic salts and heavy metals) are included in this category.
Secondary Waste:	Erosion Wastes
Secondary Waste Type:	I
Base Meridian:	Not reported
NPID:	Not reported
Tonnage:	0
Regional Board ID:	Not reported
Municipal Solid Waste:	False
Superorder:	False
Open To Public:	False
Waste List:	False
Agency Type:	Private
Agency Name:	GEOTHERMAL INC.
Agency Department:	GEOTHERMAL INC
Agency Address:	PO BOX 480
Agency City,St,Zip:	MIDDLETOWN CA 95461
Agency Contact:	JAMES A. LEHRMAN
Agency Telephone:	9254606300
Land Owner Name:	Not reported
Land Owner Address:	Not reported
Land Owner City,St,Zip:	CA
Land Owner Contact:	Not reported
Land Owner Phone:	Not reported
Region:	5S
Facility Type:	Industrial - Facility that treats and/or disposes of liquid or semisolid wastes from any servicing, producing, manufacturing or processing operation of whatever nature, including mining, gravel washing, geothermal operations, air conditioning, ship building and repairing, oil production, storage and disposal operations, water pumping.
Facility Description:	Not reported
Facility Telephone:	Not reported
SWAT Facility Name:	GEOTHERMAL INCORPORATED
Primary SIC:	4961
Secondary SIC:	Not reported
Comments:	Not reported

BUTTS CANYON RD. FACILITY (Continued) **S101175220**

Last Facility Editors: Not reported
Waste Discharge System: True
Solid Waste Assessment Test Program: True
Toxic Pits Cleanup Act Program: True
Resource Conservation Recovery Act: False
Department of Defence: False
Solid Waste Assessment Test Program: W.T. KRITIKOS
Threat to Water Quality: Major Threat to Water Quality. A violation could render unusable a ground water or surface water resource used as a significant drink water supply, require closure of an area used for contact recreation, result in long-term deleterious effects on shell fish spawning or growth areas of aquatic resources, or directly expose the public to toxic substances.
Sub Chapter 15: True
Regional Board Project Officer: WLB
Number of WMUDS at Facility: 2
Section Range: Not reported
RCRA Facility: No
Waste Discharge Requirements: A
Self-Monitoring Rept. Frequency: Quarterly Submittal
Waste Discharge System ID: 5A170304001
Solid Waste Information ID: Not reported

HAZNET:

Name: PG&E GEOTHERMAL INC LANDFILL
Address: 19020 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
Year: 2017
GEPAID: CAL000383937
Contact: LEAH UPCHURCH
Telephone: 2093239617
Mailing Name: Not reported
Mailing Address: PO BOX 7640
Mailing City,St,Zip: SAN FRANCISCO, CA 941207640
Gen County: Lakes
TSD EPA ID: CAD059494310
TSD County: Santa Clara
Tons: 0.125
CA Waste Code: 352-Other organic solids
Method: H141-Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Facility County: Lakes

Name: PG&E GEOTHERMAL INC LANDFILL
Address: 19020 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
Year: 2017
GEPAID: CAL000383937
Contact: LEAH UPCHURCH
Telephone: 2093239617
Mailing Name: Not reported
Mailing Address: PO BOX 7640
Mailing City,St,Zip: SAN FRANCISCO, CA 941207640
Gen County: Lakes
TSD EPA ID: CAT000646117
TSD County: Kings
Tons: 28.2

BUTTS CANYON RD. FACILITY (Continued) **S101175220**

CA Waste Code: 611-Contaminated soil from site clean-up
Method: H132-Landfill Or Surface Impoundment That Will Be Closed As Landfill(To Include On-Site Treatment And/Or Stabilization)
Facility County: Lakes

Name: PG&E GEOTHERMAL INC LANDFILL
Address: 19020 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
Year: 2016
GEPAID: CAL000383937
Contact: LEAH UPCHURCH
Telephone: 2093239617
Mailing Name: Not reported
Mailing Address: PO BOX 7640
Mailing City,St,Zip: SAN FRANCISCO, CA 941200000
Gen County: Lakes
TSD EPA ID: CAT000646117
TSD County: Kings
Tons: 23.97
CA Waste Code: 611-Contaminated soil from site clean-up
Method: H132-Landfill Or Surface Impoundment That Will Be Closed As Landfill(To Include On-Site Treatment And/Or Stabilization)
Facility County: Lakes

Name: PG&E GEOTHERMAL INC LANDFILL
Address: 19020 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
Year: 2015
GEPAID: CAL000383937
Contact: LEAH UPCHURCH
Telephone: 2093239617
Mailing Name: Not reported
Mailing Address: PO BOX 7640
Mailing City,St,Zip: SAN FRANCISCO, CA 941200000
Gen County: Lakes
TSD EPA ID: CAD980884183
TSD County: Sacramento
Tons: 0.0375
CA Waste Code: 151-Asbestos containing waste
Method: H141-Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Facility County: Lakes

NPDES:
Name: GEOTHERMAL INC LANDFILL DRAINAGE IMPROVEMENTS
Address: 19020 BUTTS CANYON ROAD
City,State,Zip: MIDDLETOWN, CA 95461
Facility Status: Not reported
NPDES Number: Not reported
Region: Not reported
Agency Number: Not reported
Regulatory Measure ID: Not reported
Place ID: Not reported
Order Number: Not reported
WDID: 5S17C374559
Regulatory Measure Type: Construction
Program Type: Not reported

BUTTS CANYON RD. FACILITY (Continued) **S101175220**

Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Discharge Address:	Not reported
Discharge Name:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
Status:	Terminated
Status Date:	03/11/2016
Operator Name:	Pacific Gas and Electric Company
Operator Address:	3401 Crow Canyon Road
Operator City:	San Ramon
Operator State:	California
Operator Zip:	94583

NPDES as of 03/2018:

NPDES Number:	Not reported
Status:	Not reported
Agency Number:	Not reported
Region:	5S
Regulatory Measure ID:	465923
Order Number:	Not reported
Regulatory Measure Type:	Construction
Place ID:	Not reported
WDID:	5S17C374559
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	03/11/2016
Discharge Name:	Not reported
Discharge Address:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
Received Date:	11/06/2015
Processed Date:	11/10/2015
Status:	Terminated
Status Date:	03/11/2016
Place Size:	460
Place Size Unit:	Acres
Contact:	Rob Saur
Contact Title:	PG&E Project Manager
Contact Phone:	925-415-6371
Contact Phone Ext:	Not reported
Contact Email:	R4Sw@pge.com
Operator Name:	Pacific Gas and Electric Company
Operator Address:	3401 Crow Canyon Road
Operator City:	San Ramon
Operator State:	California
Operator Zip:	94583
Operator Contact:	Daniel Sanchez
Operator Contact Title:	Not reported
Operator Contact Phone:	925-244-3628
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	d2sy@pge.com

BUTTS CANYON RD. FACILITY (Continued) **S101175220**

Operator Type:	Private Business
Developer:	PG&E Project Manager
Developer Address:	3401 Crow Canyon Road
Developer City:	San Ramon
Developer State:	California
Developer Zip:	94583
Developer Contact:	Rob Saur
Developer Contact Title:	PG&E Project Manager
Constype Linear Utility Ind:	N
Emergency Phone:	Not reported
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	N
Constype Below Ground Ind:	N
Constype Cable Line Ind:	N
Constype Comm Line Ind:	N
Constype Commertial Ind:	N
Constype Electrical Line Ind:	N
Constype Gas Line Ind:	N
Constype Industrial Ind:	N
Constype Other Description:	Not reported
Constype Other Ind:	N
Constype Recons Ind:	N
Constype Residential Ind:	N
Constype Transport Ind:	N
Constype Utility Description:	Storm Drain Improvements
Constype Utility Ind:	Y
Constype Water Sewer Ind:	N
Dir Discharge Uswater Ind:	N
Receiving Water Name:	Detert Reservoir
Certifier:	Daniel Sanchez
Certifier Title:	HazMat and Water Quality Manager
Certification Date:	06-NOV-15
Primary Sic:	Not reported
Secondary Sic:	Not reported
Tertiary Sic:	Not reported
NPDES Number:	CAS000002
Status:	Terminated
Agency Number:	0
Region:	5S
Regulatory Measure ID:	465923
Order Number:	2009-0009-DWQ
Regulatory Measure Type:	Enrollee
Place ID:	Not reported
WDID:	5S17C374559
Program Type:	Construction
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	11/10/2015
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	03/11/2016
Discharge Name:	Pacific Gas and Electric Company
Discharge Address:	3401 Crow Canyon Road
Discharge City:	San Ramon
Discharge State:	California
Discharge Zip:	94583
Received Date:	Not reported
Processed Date:	Not reported

BUTTS CANYON RD. FACILITY (Continued) **S101175220**

Status:	Not reported
Status Date:	Not reported
Place Size:	Not reported
Place Size Unit:	Not reported
Contact:	Not reported
Contact Title:	Not reported
Contact Phone:	Not reported
Contact Phone Ext:	Not reported
Contact Email:	Not reported
Operator Name:	Not reported
Operator Address:	Not reported
Operator City:	Not reported
Operator State:	Not reported
Operator Zip:	Not reported
Operator Contact:	Not reported
Operator Contact Title:	Not reported
Operator Contact Phone:	Not reported
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	Not reported
Operator Type:	Not reported
Developer:	Not reported
Developer Address:	Not reported
Developer City:	Not reported
Developer State:	Not reported
Developer Zip:	Not reported
Developer Contact:	Not reported
Developer Contact Title:	Not reported
Constype Linear Utility Ind:	Not reported
Emergency Phone:	Not reported
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	Not reported
Constype Below Ground Ind:	Not reported
Constype Cable Line Ind:	Not reported
Constype Comm Line Ind:	Not reported
Constype Commertial Ind:	Not reported
Constype Electrical Line Ind:	Not reported
Constype Gas Line Ind:	Not reported
Constype Industrial Ind:	Not reported
Constype Other Description:	Not reported
Constype Other Ind:	Not reported
Constype Recons Ind:	Not reported
Constype Residential Ind:	Not reported
Constype Transport Ind:	Not reported
Constype Utility Description:	Not reported
Constype Utility Ind:	Not reported
Constype Water Sewer Ind:	Not reported
Dir Discharge Uswater Ind:	Not reported
Receiving Water Name:	Not reported
Certifier:	Not reported
Certifier Title:	Not reported
Certification Date:	Not reported
Primary Sic:	Not reported
Secondary Sic:	Not reported
Tertiary Sic:	Not reported

BUTTS CANYON RD. FACILITY (Continued) **S101175220**

WDS:

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON RD
City:	MIDDLETOWN
Facility ID:	Sacramento River 170304001
Facility Type:	Industrial - Facility that treats and/or disposes of liquid or semisolid wastes from any servicing, producing, manufacturing or processing operation of whatever nature, including mining, gravel washing, geothermal operations, air conditioning, ship building and repairing, oil production, storage and disposal operations, water pumping.
Facility Status:	Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements.
NPDES Number:	Not reported
Subregion:	0
Facility Telephone:	Not reported
Facility Contact:	WILLIAM KRITIKOS
Agency Name:	GEOTHERMAL INC.
Agency Address:	PO BOX 480
Agency City,St,Zip:	MIDDLETOWN 95461
Agency Contact:	JAMES A. LEHRMAN
Agency Telephone:	Not reported
Agency Type:	Private
SIC Code:	4961
SIC Code 2:	Not reported
Primary Waste Type:	Designated/Influent or Solid Wastes that pose a significant threat to water quality because of their high concentrations (E.G., BOD, Hardness, TRF, Chloride). 'Manageable' hazardous wastes (E.G., inorganic salts and heavy metals) are included in this category.
Primary Waste:	DRILLS
Waste Type2:	I
Waste2:	Drilling Muds
Primary Waste Type:	Designated/Influent or Solid Wastes that pose a significant threat to water quality because of their high concentrations (E.G., BOD, Hardness, TRF, Chloride). 'Manageable' hazardous wastes (E.G., inorganic salts and heavy metals) are included in this category.
Secondary Waste:	Erosion Wastes
Secondary Waste Type:	Inert/Influent or Solid Wastes that do not contain soluble pollutants or organic wastes and have little adverse impact on water quality. Such wastes could cause turbidity and siltation. Uncontaminated soils, rubble and concrete are examples of this category.
Design Flow:	0
Baseline Flow:	0
Reclamation:	No reclamation requirements associated with this facility.
POTW:	The POTW Does not have an approved pretreatment program. Some POTWs may have local pretreatment programs that have not been approved by the regional board and/or EPA.
Treat To Water:	0
Complexity:	Not reported

Name:	BUTTS CANYON RD FACILITY
Address:	19020 BUTTS CANYON RD
City:	MIDDLETOWN
Facility ID:	Sacramento River 170304001
Facility Type:	Industrial - Facility that treats and/or disposes of liquid or semisolid wastes from any servicing, producing, manufacturing or processing operation of whatever nature, including mining, gravel

BUTTS CANYON RD. FACILITY (Continued) **S101175220**

	washing, geothermal operations, air conditioning, ship building and repairing, oil production, storage and disposal operations, water pumping.
Facility Status:	Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements.
NPDES Number:	Not reported
Subregion:	0
Facility Telephone:	Not reported
Facility Contact:	WILLIAM KRITIKOS
Agency Name:	GEOTHERMAL INC.
Agency Address:	PO BOX 480
Agency City,St,Zip:	MIDDLETOWN 95461
Agency Contact:	JAMES A. LEHRMAN
Agency Telephone:	Not reported
Agency Type:	Private
SIC Code:	4961
SIC Code 2:	Not reported
Primary Waste Type:	Designated/Influent or Solid Wastes that pose a significant threat to water quality because of their high concentrations (E.G., BOD, Hardness, TRF, Chloride). 'Manageable' hazardous wastes (E.G., inorganic salts and heavy metals) are included in this category.
Primary Waste:	DRILLS
Waste Type2:	I
Waste2:	Drilling Muds
Primary Waste Type:	Designated/Influent or Solid Wastes that pose a significant threat to water quality because of their high concentrations (E.G., BOD, Hardness, TRF, Chloride). 'Manageable' hazardous wastes (E.G., inorganic salts and heavy metals) are included in this category.
Secondary Waste:	Erosion Wastes
Secondary Waste Type:	Inert/Influent or Solid Wastes that do not contain soluble pollutants or organic wastes and have little adverse impact on water quality. Such wastes could cause turbidity and siltation. Uncontaminated soils, rubble and concrete are examples of this category.
Design Flow:	0
Baseline Flow:	0
Reclamation:	No reclamation requirements associated with this facility.
POTW:	The POTW Does not have an approved pretreatment program. Some POTWs may have local pretreatment programs that have not been approved by the regional board and/or EPA.
Treat To Water:	Major Threat to Water Quality. A violation could render unusable a ground water or surface water resource used as a significant drink water supply, require closure of an area used for contact recreation, result in long-term deleterious effects on shell fish spawning or growth areas of aquatic resources, or directly expose the public to toxic substances.
Complexity:	Category A - Any major NPDES facility, any non-NPDES facility (particularly those with toxic wastes) that would be a major if discharge was made to surface or ground waters, or any Class I disposal site. Includes any small-volume complex facility (particularly those with toxicwastes) with numerous discharge points, leak detection systems or ground water monitoring wells.

CIWQS:

Name:	GEOTHERMAL INC LANDFILL DRAINAGE IMPROVEMENTS
Address:	19020 BUTTS CANYON ROAD
City,State,Zip:	MIDDLETOWN, CA 95461
Agency:	Pacific Gas and Electric Company

BUTTS CANYON RD. FACILITY (Continued) **S101175220**

Agency Address:	3401 Crow Canyon Road, San Ramon, CA 94583
Place/Project Type:	Construction - Utility: Storm Drain Improvements
SIC/NAICS:	Not reported
Region:	5S
Program:	CONSTW
Regulatory Measure Status:	Terminated
Regulatory Measure Type:	Storm water construction
Order Number:	2009-0009-DWQ
WDID:	5S17C374559
NPDES Number:	CAS000002
Adoption Date:	Not reported
Effective Date:	11/10/2015
Termination Date:	03/11/2016
Expiration/Review Date:	Not reported
Design Flow:	Not reported
Major/Minor:	Not reported
Complexity:	Not reported
TTWQ:	Not reported
Enforcement Actions within 5 years:	0
Violations within 5 years:	0
Latitude:	38.7361
Longitude:	-122.5555

D19 **GEOTHERMAL, INC** **ENVIROSTOR** **S109422438**
NE **19020 BUTTS CANYON ROAD (BOX 480)** **N/A**
1/4-1/2 **MIDDLETOWN, CA 95461**
0.473 mi.
2500 ft. **Site 5 of 7 in cluster D**

Actual:
1155 ft.

Focus Map:
6

ENVIROSTOR:

Name:	GEOTHERMAL, INC
Address:	19020 BUTTS CANYON ROAD (BOX 480)
City,State,Zip:	MIDDLETOWN, CA 95461
Facility ID:	17490002
Status:	Refer: RWQCB
Status Date:	02/20/1996
Site Code:	100066
Site Type:	Evaluation
Site Type Detailed:	Evaluation
Acres:	1
NPL:	NO
Regulatory Agencies:	NONE SPECIFIED
Lead Agency:	NONE SPECIFIED
Program Manager:	Not reported
Supervisor:	Referred - Not Assigned
Division Branch:	Cleanup Sacramento
Assembly:	04
Senate:	02
Special Program:	* Rural County Survey Program
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	Not reported
Latitude:	38.73987
Longitude:	-122.5563
APN:	NONE SPECIFIED
Past Use:	NONE SPECIFIED
Potential COC:	NONE SPECIFIED
Confirmed COC:	NONE SPECIFIED

GEOTHERMAL, INC (Continued) **S109422438**

Potential Description: NONE SPECIFIED
Alias Name: Butts Canyon Rd Facility
Alias Type: Alternate Name
Alias Name: CAD098080484
Alias Type: EPA Identification Number
Alias Name: L10005342355
Alias Type: GeoTracker Global ID
Alias Name: 100066
Alias Type: Project Code (Site Code)
Alias Name: 17490002
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Discovery
Completed Date: 04/12/1988
Comments: SITE SCREENING DONE. RP LEAD SITE.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 02/20/1996
Comments: Site Screening Completed. The Regional Water Quality Control Board is overseeing a Remedial Investigation at the Site and the monitoring of the ponds. Refer to RWQCB.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 04/12/1988
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

D20 **BUTTS CANYON RD. FACILITY** **HIST CORTESE** **S105024959**
NE **19020 BUTTS CNYN** **N/A**
1/4-1/2 **MIDDLETOWN, CA 95461**
0.473 mi.
2500 ft. **Site 6 of 7 in cluster D**

Actual:
1155 ft.

Focus Map:
6

HIST CORTESE:
edr_fname: BUTTS CANYON RD. FACILITY
edr_fadd1: 19020 BUTTS CNYN
City,State,Zip: MIDDLETOWN, CA 95461
Region: CORTESE
Facility County Code: 17
Reg By: WBC&D
Reg Id: 5A170304001

D21 **GEOTHERMAL INC** **ENVIROSTOR** **S109467202**
NE **19020 BUTTS CANYON RD** **HWP** **N/A**
1/4-1/2 **MIDDLETOWN, CA 95461** **CERS**
0.473 mi.
2500 ft. **Site 7 of 7 in cluster D**

Actual:
1155 ft.

Focus Map:
6

ENVIROSTOR:

Name:	GEOTHERMAL INC
Address:	19020 BOTTS CANYON ROAD
City,State,Zip:	MIDDLETOWN, CA 933080000
Facility ID:	80001735
Status:	Refer: RWQCB
Status Date:	01/01/2008
Site Code:	Not reported
Site Type:	Corrective Action
Site Type Detailed:	Corrective Action
Acres:	0
NPL:	NO
Regulatory Agencies:	RWQCB 5S - Central Valley
Lead Agency:	RWQCB 5S - Central Valley
Program Manager:	Not reported
Supervisor:	* Unknown
Division Branch:	Cleanup Sacramento
Assembly:	11, 04
Senate:	07, 02
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	Not reported
Latitude:	38.73526
Longitude:	-122.5626
APN:	NONE SPECIFIED
Past Use:	NONE SPECIFIED
Potential COC:	NONE SPECIFIED
Confirmed COC:	NONE SPECIFIED
Potential Description:	NONE SPECIFIED
Alias Name:	CAD098080484
Alias Type:	EPA Identification Number
Alias Name:	17490002
Alias Type:	Envirostor ID Number
Alias Name:	80001735
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedy Construction Complete
Completed Date:	03/26/2009
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Groundwater Migration Controlled
Completed Date:	10/07/1997
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Human Exposure Controlled
Completed Date:	10/07/1997

GEOTHERMAL INC (Continued) **S109467202**

Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Groundwater Migration Controlled
Completed Date: 03/26/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Human Exposure Controlled
Completed Date: 03/26/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: RFI Report
Completed Date: 02/01/1995
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Interim Measures Questionnaire
Completed Date: 10/07/1997
Comments: BCOFER 20010611.11:16E

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * RFI Imposition
Completed Date: 09/06/1991
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Interim Measures Questionnaire
Completed Date: 10/07/1997
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Interim Measures Questionnaire
Completed Date: 12/05/1995
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Other Instrument
Completed Date: 09/06/1991
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: RFI Workplan
Completed Date: 09/06/1991
Comments: Not reported

Future Area Name: Not reported

GEOTHERMAL INC (Continued) **S109467202**

Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

HWP:
Name: GEOTHERMAL INC
Address: 19020 BUTTS CANYON RD
City,State,Zip: MIDDLETOWN, CA 95461
EPA Id: CAD098080484
Cleanup Status: CLOSED
Latitude: 38.73526
Longitude: -122.5626
Facility Type: Historical - Non-Operating
Facility Size: Not reported
Team: Not reported
Supervisor: Not reported
Site Code: Not reported
Assembly District: 11, 04
Senate District: 07, 02
Public Information Officer: Not reported
Public Information Officer: Not reported

Closure:
EPA Id: CAD098080484
Facility Type: Historical - Non-Operating
Unit Names: PONDS1, TRENCHES1
Event Description: Closure - 1ST NOTICE OF DEFICIENCY ISSUED
Actual Date: 09/21/1987

EPA Id: CAD098080484
Facility Type: Historical - Non-Operating
Unit Names: PONDS1, TRENCHES1
Event Description: Closure - ISSUE CLOSURE VERIFICATION
Actual Date: 03/26/2009

EPA Id: CAD098080484
Facility Type: Historical - Non-Operating
Unit Names: PONDS1, TRENCHES1
Event Description: Closure - CLOSURE PLAN RECEIVED
Actual Date: 06/11/1986

Alias:
EPA Id: CAD098080484
Facility Type: Historical - Non-Operating
Alias Type: Envirostor ID Number
Alias: 17490002

CERS:
Name: GEOTHERMAL INC
Address: 19020 BOTTS CANYON ROAD

GEOTHERMAL INC (Continued) **S109467202**

City,State,Zip: MIDDLETOWN, CA 933080000
Site ID: 337830
CERS ID: 80001735
CERS Description: Corrective Action

Affiliation:
Affiliation Type Desc: Supervisor
Entity Name: * Unknown
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

22
West
1/2-1
0.509 mi.
2686 ft.

NEW MINNIE CANNON ELEMENTARY SCHOOL
20771 & 20931 BIG CANYON ROAD
MIDDLETOWN, CA 95461

ENVIROSTOR SCH **S109548299 N/A**

Actual:
1092 ft.

Focus Map:
1

ENVIROSTOR:
Name: NEW MINNIE CANNON ELEMENTARY SCHOOL
Address: 20771 & 20931 BIG CANYON ROAD
City,State,Zip: MIDDLETOWN, CA 95461
Facility ID: 60001113
Status: No Further Action
Status Date: 11/15/2010
Site Code: 104668
Site Type: School Investigation
Site Type Detailed: School
Acres: 9.84
NPL: NO
Regulatory Agencies: SMBRP
Lead Agency: SMBRP
Program Manager: Harold (Bud) Duke
Supervisor: Juan Koponen
Division Branch: Northern California Schools & Santa Susana
Assembly: 04
Senate: 02
Special Program: Not reported
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: School District
Latitude: 38.7566
Longitude: -122.616
APN: 014-490-13, 014-490-15, 01449013, 01449015
Past Use: AGRICULTURAL - LIVESTOCK
Potential COC: Arsenic Mercury (elemental Naturally Occurring Asbestos (NOA Nickel
Confirmed COC: 30001-NO 30014-NO 31000-NO 30407-NO 40002-NO
Potential Description: SOIL
Alias Name: 014-490-13
Alias Type: APN
Alias Name: 014-490-15
Alias Type: APN
Alias Name: 01449013

NEW MINNIE CANNON ELEMENTARY SCHOOL (Continued) **S109548299**

Alias Type: APN
Alias Name: 01449015
Alias Type: APN
Alias Name: 104668
Alias Type: Project Code (Site Code)
Alias Name: 60001113
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 09/14/2009
Comments: Project manager change notification from Mike Hall to Bud Duke

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Phase 1
Completed Date: 06/03/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Workplan
Completed Date: 01/14/2010
Comments: DTSC issued conditional approval of PEA Work Plan.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Environmental Oversight Agreement Application
Completed Date: 09/14/2009
Comments: EOA Application

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 07/13/2010
Comments: DTSC approved the PEA with a no further action determination

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Cost Recovery Closeout Memo
Completed Date: 11/16/2010
Comments: Issued Cost Recovery Letter and closed project.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Environmental Oversight Agreement
Completed Date: 09/14/2009
Comments: DTSC issued a fully executed environmental oversight agreement

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported

NEW MINNIE CANNON ELEMENTARY SCHOOL (Continued) **S109548299**

Schedule Due Date: Not reported
Schedule Revised Date: Not reported

SCH:

Name: NEW MINNIE CANNON ELEMENTARY SCHOOL
Address: 20771 & 20931 BIG CANYON ROAD
City,State,Zip: MIDDLETOWN, CA 95461
Facility ID: 60001113
Site Type: School Investigation
Site Type Detail: School
Site Mgmt. Req.: NONE SPECIFIED
Acres: 9.84
National Priorities List: NO
Cleanup Oversight Agencies: SMBRP
Lead Agency: SMBRP
Lead Agency Description: DTSC - Site Cleanup Program
Project Manager: Harold (Bud) Duke
Supervisor: Juan Koponen
Division Branch: Northern California Schools & Santa Susana
Site Code: 104668
Assembly: 04
Senate: 02
Special Program Status: Not reported
Status: No Further Action
Status Date: 11/15/2010
Restricted Use: NO
Funding: School District
Latitude: 38.7566
Longitude: -122.616
APN: 014-490-13, 014-490-15, 01449013, 01449015
Past Use: AGRICULTURAL - LIVESTOCK
Potential COC: Arsenic, Arsenic, Mercury (elemental, Naturally Occurring Asbestos (NOA, Nickel
Confirmed COC: 30001-NO, 30014-NO, 31000-NO, 30407-NO, 40002-NO
Potential Description: SOIL
Alias Name: 014-490-13
Alias Type: APN
Alias Name: 014-490-15
Alias Type: APN
Alias Name: 01449013
Alias Type: APN
Alias Name: 01449015
Alias Type: APN
Alias Name: 104668
Alias Type: Project Code (Site Code)
Alias Name: 60001113
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 09/14/2009
Comments: Project manager change notification from Mike Hall to Bud Duke

Completed Area Name: PROJECT WIDE

NEW MINNIE CANNON ELEMENTARY SCHOOL (Continued) **S109548299**

Completed Sub Area Name: Not reported
Completed Document Type: Phase 1
Completed Date: 06/03/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Workplan
Completed Date: 01/14/2010
Comments: DTSC issued conditional approval of PEA Work Plan.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Environmental Oversight Agreement Application
Completed Date: 09/14/2009
Comments: EOA Application

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 07/13/2010
Comments: DTSC approved the PEA with a no further action determination

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Cost Recovery Closeout Memo
Completed Date: 11/16/2010
Comments: Issued Cost Recovery Letter and closed project.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Environmental Oversight Agreement
Completed Date: 09/14/2009
Comments: DTSC issued a fully executed environmental oversight agreement

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

23
SW
1/2-1
0.750 mi.
3960 ft.

REDBUD COMMUNITY HOSP-MIDDLETOWN CLINIC **ENVIROSTOR** **S118756493**
21268 CALISTOGA STREET **N/A**
MIDDLETOWN, CA 95461

Actual:
1113 ft.

Focus Map:
4

ENVIROSTOR:
Name: REDBUD COMMUNITY HOSP-MIDDLETOWN CLINIC
Address: 21268 CALISTOGA STREET
City,State,Zip: MIDDLETOWN, CA 95461
Facility ID: 17800001
Status: No Action Required
Status Date: 11/28/1994

REDBUD COMMUNITY HOSP-MIDDLETOWN CLINIC (Continued) **S118756493**

Site Code: 100522
Site Type: Calmortgage
Site Type Detailed: Calmortgage
Acres: 0.25
NPL: NO
Regulatory Agencies: SMBRP
Lead Agency: SMBRP
Program Manager: Sandra Karinen
Supervisor: William Beckman
Division Branch: Cleanup Sacramento
Assembly: 04
Senate: 02
Special Program: Not reported
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: CalMortgage
Latitude: 38.75012
Longitude: -122.6157
APN: NONE SPECIFIED
Past Use: NONE
Potential COC: NONE SPECIFIED No Contaminants found
Confirmed COC: No Contaminants found
Potential Description: NMA
Alias Name: 100522
Alias Type: Project Code (Site Code)
Alias Name: 17800001
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Phase 1
Completed Date: 11/28/1994
Comments: Pursuant to the MOU, DTSC has prepared a Phase I Environmental Assessment for the Redbud Community Hospital Middletown Clinic. The property, currently a vacant lot, is owned by Redbud Community Hospital and is intended for the relocation of their Middletown Medical Clinic. A Phase I Report was prepared by DTSC and concluded that no action was needed for this property; there is no contamination on the property.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

Count: 7 records

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
MIDDLETOWN	1018148647	MIDDLETOWN VALLEY FIRE RESPONSE 2015	1234 MAIN STREET - FAKE ADDRESS BEING USED	95461	SEMS
MIDDLETOWN	S123298129		BUTTS CANYON RD, MILE MARKER 266		CHMIRS
MIDDLETOWN	S124450545		BUTTS CANYON ROAD // MM 9.38		CHMIRS
MIDDLETOWN	1024149082	MIDDLETOWN WASTEWATER IMPROVEMENTS SEW COLLECTION SYSTEM EXTENSIONS	22223 HIGHWAY CA-29	95461	FINDS, ECHO
MIDDLETOWN	1023222421	MIDDLETOWN SCHOOL DISTRICT	11710 BUTTS CANYON RD	95461	FINDS
MIDDLETOWN	1023325982	NELLA OIL COMPANY	HIGHWAY 29	95461	FINDS
MIDDLETOWN	S121650251	LANGTRY GOLF COURSE LANGTRY ESTATE & VIN	21423 BUTTS CANYON RD & 23000 OAT HILL RD	95461	CIWQS

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: N/A
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 5
Telephone 312-886-6686

EPA Region 10
Telephone 206-553-8665

EPA Region 6
Telephone: 214-655-6659

EPA Region 7
Telephone: 913-551-7247

EPA Region 8
Telephone: 303-312-6774

EPA Region 9
Telephone: 415-947-4246

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: N/A
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: N/A
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Quarterly

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 04/03/2019
Date Data Arrived at EDR: 04/05/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 10/04/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Quarterly

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Quarterly

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 08/13/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 08/26/2019
Number of Days to Update: 6

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 08/07/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 08/19/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 08/26/2019
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 08/19/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 08/26/2019
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/09/2019
Date Data Arrived at EDR: 09/09/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 14

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

STANDARD ENVIRONMENTAL RECORDS

State- and tribal - equivalent NPL

CA RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 07/29/2019
Date Data Arrived at EDR: 07/31/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 69

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

CA ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 07/29/2019
Date Data Arrived at EDR: 07/31/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 69

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

CA SWF/LF (SWIS): Solid Waste Information System
Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 05/13/2019
Date Data Arrived at EDR: 05/14/2019
Date Made Active in Reports: 07/17/2019
Number of Days to Update: 64

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 08/13/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

CA LUST REG 9: Leaking Underground Storage Tank Report
Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

CA LUST REG 8: Leaking Underground Storage Tanks
California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

CA LUST REG 7: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

CA LUST REG 5: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

CA LUST REG 4: Underground Storage Tank Leak List

Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

CA LUST REG 3: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

CA LUST REG 2: Fuel Leak List

Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

CA LUST REG 1: Active Toxic Site Investigation

Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

CA LUST REG 6V: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

CA LUST REG 6L: Leaking Underground Storage Tank Case Listing

For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

CA LUST: Leaking Underground Fuel Tank Report (GEOTRACKER)

Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 55
Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/13/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/13/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/13/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/13/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/13/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/13/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/13/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/13/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

CA CPS-SLIC: Statewide SLIC Cases (GEOTRACKER)
Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 55

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

CA SLIC REG 1: Active Toxic Site Investigations
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

CA SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

CA SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

CA SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

CA SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

CA SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

CA SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

CA SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

CA SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

CA SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: No Update Planned

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 05/15/2017
Date Data Arrived at EDR: 05/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 136

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 08/26/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Varies

State and tribal registered storage tank lists

CA MILITARY UST SITES: Military UST Sites (GEOTRACKER)
Military ust sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

CA UST CLOSURE: Proposed Closure of Underground Storage Tank (UST) Cases
UST cases that are being considered for closure by either the State Water Resources Control Board or the Executive Director have been posted for a 60-day public comment period. UST Case Closures being proposed for consideration by the State Water Resources Control Board. These are primarily UST cases that meet closure criteria under the decisional framework in State Water Board Resolution No. 92-49 and other Board orders. UST Case Closures proposed for consideration by the Executive Director pursuant to State Water Board Resolution No. 2012-0061. These are cases that meet the criteria of the Low-Threat UST Case Closure Policy. UST Case Closure Review Denials and Approved Orders.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 41

Source: State Water Resources Control Board
Telephone: 916-327-7844
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

CA UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 42

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Semi-Annually

CA AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 07/06/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 09/19/2016
Number of Days to Update: 69

Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 09/12/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

INDIAN UST R1: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27
Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

CA VCP: Voluntary Cleanup Program Properties
Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 07/29/2019
Date Data Arrived at EDR: 07/31/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 69
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Quarterly

INDIAN VCP R1: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27
Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

State and tribal Brownfields sites

CA BROWNFIELDS: Considered Brownfieds Sites Listing
A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 57
Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 06/03/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/26/2019
Number of Days to Update: 83
Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Semi-Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Landfill / Solid Waste Disposal Sites

CA WMUDS/SWAT: Waste Management Unit Database

Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 07/25/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: No Update Planned

CA SWRCY: Recycler Database

A listing of recycling facilities in California.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 64

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

CA HAULERS: Registered Waste Tire Haulers Listing

A listing of registered waste tire haulers.

Date of Government Version: 03/26/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/30/2019
Number of Days to Update: 34

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 08/07/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 07/25/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land

A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 08/02/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/13/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 82

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: No Update Planned

Local Lists of Hazardous waste / Contaminated Sites

CA HIST CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

CA SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 07/29/2019
Date Data Arrived at EDR: 07/31/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 69

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Quarterly

CA CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/16/2019
Date Made Active in Reports: 09/24/2019
Number of Days to Update: 70

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Varies

CA CERS HAZ WASTE: CERS HAZ WASTE

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, and RCRA LQ HW Generator programs.

Date of Government Version: 08/14/2019
Date Data Arrived at EDR: 08/14/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 7

Source: CalEPA
Telephone: 916-323-2514
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Quarterly

CA TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/13/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 82

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Quarterly

CA PFAS: PFAS Contamination Site Location Listing

A listing of PFAS contaminated sites included in the GeoTracker database.

Date of Government Version: 06/28/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 26

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

Local Lists of Registered Storage Tanks

CA SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CA UST MENDOCINO: Mendocino County UST Database

A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 12/04/2018
Date Data Arrived at EDR: 12/06/2018
Date Made Active in Reports: 12/14/2018
Number of Days to Update: 8

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Annually

CA HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CA SAN FRANCISCO AST: Aboveground Storage Tank Site Listing

Aboveground storage tank sites

Date of Government Version: 09/11/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/11/2018
Number of Days to Update: 29

Source: San Francisco County Department of Public Health
Telephone: 415-252-3896
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CA CERS TANKS: California Environmental Reporting System (CERS) Tanks

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Aboveground Petroleum Storage and Underground Storage Tank regulatory programs.

Date of Government Version: 08/14/2019
Date Data Arrived at EDR: 08/14/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 7

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Quarterly

Local Land Records

CA LIENS: Environmental Liens Listing

A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 06/05/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 08/09/2019
Number of Days to Update: 64

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 07/30/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Semi-Annually

CA DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 65

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Semi-Annually

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/26/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 89

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

Records of Emergency Release Reports

CA CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 05/15/2019
Date Data Arrived at EDR: 06/24/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 58

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 07/26/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Semi-Annually

CA LDS: Land Disposal Sites Listing (GEOTRACKER)

Land Disposal sites (Landfills) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 55

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

CA MCS: Military Cleanup Sites Listing (GEOTRACKER)

Military sites (consisting of: Military UST sites; Military Privatized sites; and Military Cleanup sites [formerly known as DoD non UST]) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

CA SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 05/15/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 79

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 08/23/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 07/09/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 10/07/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 08/16/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/26/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 89

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 08/09/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/21/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 198

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 01/10/2018
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 2

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 08/23/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 09/30/2018
Date Data Arrived at EDR: 04/24/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 106

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 07/26/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 04/25/2019
Date Data Arrived at EDR: 05/02/2019
Date Made Active in Reports: 05/23/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 08/20/2019
Date Data Arrived at EDR: 09/05/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 18

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

PADS: PCB Activity Database System
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 03/20/2019
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 34

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 07/12/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 10/07/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 06/20/2019
Date Data Arrived at EDR: 06/20/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 49

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76
Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 09/06/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 09/03/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 05/24/2017
Date Data Arrived at EDR: 11/30/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 15
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 08/09/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/01/2019
Date Data Arrived at EDR: 07/01/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 84
Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 10/01/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 04/01/2019
Date Data Arrived at EDR: 04/30/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 100

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 06/30/2019
Date Data Arrived at EDR: 07/16/2019
Date Made Active in Reports: 10/02/2019
Number of Days to Update: 78

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 09/28/2017
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 10/06/2019
Next Scheduled EDR Contact: 01/19/2020
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 08/08/2017
Date Data Arrived at EDR: 09/11/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 3

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 07/30/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 06/23/2017
Date Data Arrived at EDR: 10/11/2017
Date Made Active in Reports: 11/03/2017
Number of Days to Update: 23

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites
A listing of former lead smelter site locations.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites
A listing of former lead smelter site locations.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Varies

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem

Date of Government Version: 10/27/2009
Date Data Arrived at EDR: 11/10/2009
Date Made Active in Reports: 12/08/2009
Number of Days to Update: 28

Source: N/A
Telephone: N/A
Last EDR Contact: 11/12/1996
Next Scheduled EDR Contact: N/A
Data Release Frequency: Annually

US AIRS MINOR: Aerometric Information Retrieval System Facility Subsystem

Date of Government Version: 10/27/2009
Date Data Arrived at EDR: 11/10/2009
Date Made Active in Reports: 12/08/2009
Number of Days to Update: 28

Source: N/A
Telephone: N/A
Last EDR Contact: 11/12/1996
Next Scheduled EDR Contact: N/A
Data Release Frequency: Annually

US MINES: Active Mines & Mineral Plants Database Listing
Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 08/30/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

US MINES 2: Active Mines & Mineral Plants Database Listing
Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 08/30/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 08/30/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 03/27/2019
Date Data Arrived at EDR: 03/28/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 34

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 09/10/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 05/03/2019
Date Data Arrived at EDR: 06/05/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 90

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 01/17/2019
Date Made Active in Reports: 04/01/2019
Number of Days to Update: 74

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 07/15/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Varies

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 07/26/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 71

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 07/06/2019
Date Data Arrived at EDR: 07/09/2019
Date Made Active in Reports: 10/02/2019
Number of Days to Update: 85

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 10/08/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Quarterly

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 05/20/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 79

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Quarterly

Other Ascertainable Records

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CA CORTESE: "Cortese" Hazardous Waste & Substances Sites List

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 57

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

CA CUPA SAN FRANCISCO CO: CUPA Facility Listing

Cupa facilities

Date of Government Version: 04/18/2019
Date Data Arrived at EDR: 04/19/2019
Date Made Active in Reports: 04/30/2019
Number of Days to Update: 11

Source: San Francisco County Department of Environmental Health
Telephone: 415-252-3896
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

CA CUPA LIVERMORE-PLEASANTON: CUPA Facility Listing

list of facilities associated with the various CUPA programs in Livermore-Pleasanton

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 05/14/2019
Date Made Active in Reports: 07/17/2019
Number of Days to Update: 64

Source: Livermore-Pleasanton Fire Department
Telephone: 925-454-2361
Last EDR Contact: 08/15/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Varies

CA DRYCLEAN SOUTH COAST: South Coast Air Quality Management District Drycleaner Listing

A listing of dry cleaners in the South Coast Air Quality Management District

Date of Government Version: 03/19/2019
Date Data Arrived at EDR: 03/22/2019
Date Made Active in Reports: 04/09/2019
Number of Days to Update: 18

Source: South Coast Air Quality Management District
Telephone: 909-396-3211
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

CA DRYCLEAN AVAQMD: Antelope Valley Air Quality Management District Drycleaner Listing

A listing of dry cleaners in the Antelope Valley Air Quality Management District.

Date of Government Version: 06/03/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 65

Source: Antelope Valley Air Quality Management District
Telephone: 661-723-8070
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

CA DRYCLEANERS: Cleaner Facilities

A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 55

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Annually

CA EMI: Emissions Inventory Data

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 06/24/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 59

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 09/18/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Varies

CA ENF: Enforcement Action Listing

A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/22/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 66

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 07/18/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

CA Financial Assurance 1: Financial Assurance Information Listing

Financial Assurance information

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/23/2019
Date Made Active in Reports: 09/30/2019
Number of Days to Update: 69

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

CA Financial Assurance 2: Financial Assurance Information Listing

A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 05/15/2019
Date Data Arrived at EDR: 05/16/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 63

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 08/07/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Varies

CA HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 05/29/2019
Date Made Active in Reports: 07/22/2019
Number of Days to Update: 54

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 07/12/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Annually

CA ICE: ICE

Contains data pertaining to the Permitted Facilities with Inspections / Enforcements sites tracked in Envirostor.

Date of Government Version: 05/20/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 58

Source: Department of Toxic Subsances Control
Telephone: 877-786-9427
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Quarterly

CA HIST CORTESE: Hazardous Waste & Substance Site List

The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CA HWP: EnviroStor Permitted Facilities Listing

Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 05/20/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 58

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Quarterly

CA HWT: Registered Hazardous Waste Transporter Database

A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 07/08/2019
Date Data Arrived at EDR: 07/09/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 73

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 10/08/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Quarterly

CA MINES: Mines Site Location Listing
A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 65
Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

CA MWMP: Medical Waste Management Program Listing
The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 05/17/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/09/2019
Number of Days to Update: 66
Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

CA NPDES: NPDES Permits Listing
A listing of NPDES permits, including stormwater.

Date of Government Version: 05/13/2019
Date Data Arrived at EDR: 05/14/2019
Date Made Active in Reports: 07/17/2019
Number of Days to Update: 64
Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 08/13/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Quarterly

CA PEST LIC: Pesticide Regulation Licenses Listing
A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/09/2019
Number of Days to Update: 66
Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

CA PROC: Certified Processors Database
A listing of certified processors.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 64
Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

CA NOTIFY 65: Proposition 65 Records
Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 06/17/2019
Date Data Arrived at EDR: 06/18/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 65
Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: No Update Planned

CA UIC: UIC Listing

A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 04/27/2018
Date Data Arrived at EDR: 06/13/2018
Date Made Active in Reports: 07/17/2018
Number of Days to Update: 34

Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

CA UIC GEO: Underground Injection Control Sites (GEOTRACKER)

Underground control injection sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resource Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

CA WASTEWATER PITS: Oil Wastewater Pits Listing

Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water boards review found that more than one-third of the region's active disposal pits are operating without permission.

Date of Government Version: 05/08/2018
Date Data Arrived at EDR: 07/11/2018
Date Made Active in Reports: 09/13/2018
Number of Days to Update: 64

Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 07/12/2019
Next Scheduled EDR Contact: 10/21/2019
Data Release Frequency: Varies

CA WDS: Waste Discharge System

Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: No Update Planned

CA WIP: Well Investigation Program Case List

Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: No Update Planned

CA MILITARY PRIV SITES: Military Privatized Sites (GEOTRACKER)

Military privatized sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

CA PROJECT: Project Sites (GEOTRACKER)

Projects sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

CA WDR: Waste Discharge Requirements Listing

In general, the Waste Discharge Requirements (WDRs) Program (sometimes also referred to as the "Non Chapter 15 (Non 15) Program") regulates point discharges that are exempt pursuant to Subsection 20090 of Title 27 and not subject to the Federal Water Pollution Control Act. Exemptions from Title 27 may be granted for nine categories of discharges (e.g., sewage, wastewater, etc.) that meet, and continue to meet, the preconditions listed for each specific exemption. The scope of the WDRs Program also includes the discharge of wastes classified as inert, pursuant to section 20230 of Title 27.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 64

Source: State Water Resources Control Board
Telephone: 916-341-5810
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

CA CIWQS: California Integrated Water Quality System

The California Integrated Water Quality System (CIWQS) is a computer system used by the State and Regional Water Quality Control Boards to track information about places of environmental interest, manage permits and other orders, track inspections, and manage violations and enforcement activities.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 65

Source: State Water Resources Control Board
Telephone: 866-794-4977
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

CA CERS: CalEPA Regulated Site Portal Data

The CalEPA Regulated Site Portal database combines data about environmentally regulated sites and facilities in California into a single database. It combines data from a variety of state and federal databases, and provides an overview of regulated activities across the spectrum of environmental programs for any given location in California. These activities include hazardous materials and waste, state and federal cleanups, impacted ground and surface waters, and toxic materials

Date of Government Version: 08/14/2019
Date Data Arrived at EDR: 08/14/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 7

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

CA NON-CASE INFO: Non-Case Information Sites (GEOTRACKER)

Non-Case Information sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

CA OTHER OIL GAS: Other Oil & Gas Projects Sites (GEOTRACKER)

Other Oil & Gas Projects sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

CA PROD WATER PONDS: Produced Water Ponds Sites (GEOTRACKER)
Produced water ponds sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

CA SAMPLING POINT: Sampling Point ? Public Sites (GEOTRACKER)
Sampling point - public sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

CA WELL STIM PROJ: Well Stimulation Project (GEOTRACKER)
Includes areas of groundwater monitoring plans, a depiction of the monitoring network, and the facilities, boundaries, and subsurface characteristics of the oilfield and the features (oil and gas wells, produced water ponds, UIC wells, water supply wells, etc?) being monitored

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

EDR MGP: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations
EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

CA RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

CA RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 01/09/2019
Date Data Arrived at EDR: 01/11/2019
Date Made Active in Reports: 03/05/2019
Number of Days to Update: 53

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Semi-Annually

Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 04/10/2019
Date Data Arrived at EDR: 04/11/2019
Date Made Active in Reports: 06/20/2019
Number of Days to Update: 70

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 04/24/2047
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA Facility List
Cupa Facility List

Date of Government Version: 06/27/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 26

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA Facility Listing
Cupa facility list.

Date of Government Version: 04/21/2017
Date Data Arrived at EDR: 04/25/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 106

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 05/02/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 27

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 09/23/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 05/17/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 58

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 05/22/2019
Date Data Arrived at EDR: 05/23/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 56

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 07/26/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CUPA Facility List
Cupa Facility list

Date of Government Version: 02/20/2019
Date Data Arrived at EDR: 05/01/2019
Date Made Active in Reports: 05/30/2019
Number of Days to Update: 29

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 07/25/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 06/05/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 47

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 09/05/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA Resources List
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 07/11/2019
Date Data Arrived at EDR: 07/11/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 71

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 09/25/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Semi-Annually

GLENN COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 49

Source: Glenn County Air Pollution Control District
Telephone: 830-934-6500
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: No Update Planned

HUMBOLDT COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 07/08/2019
Date Data Arrived at EDR: 07/10/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 72

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 08/19/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Semi-Annually

IMPERIAL COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/23/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 65

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INYO COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/03/2018
Date Made Active in Reports: 06/14/2018
Number of Days to Update: 72

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 08/01/2019
Date Data Arrived at EDR: 08/06/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 63

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 05/16/2019
Date Data Arrived at EDR: 05/17/2019
Date Made Active in Reports: 05/30/2019
Number of Days to Update: 13

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

LAKE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 05/30/2019
Date Data Arrived at EDR: 05/31/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 53

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 07/15/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Varies

LASSEN COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CUPA Facility List
Cupa facility list

Date of Government Version: 07/22/2019
Date Data Arrived at EDR: 07/23/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 65

Source: Lassen County Environmental Health
Telephone: 530-251-8528
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

LOS ANGELES COUNTY:

Key Areas of Concerns in Los Angeles County
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office. Date of Government Version: 3/30/2009 Exide Site area is a cleanup plan of lead-impacted soil surrounding the former Exide Facility as designated by the DTSC. Date of Government Version: 7/17/2017

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: N/A
Telephone: N/A
Last EDR Contact: 09/12/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: No Update Planned

HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 07/09/2019
Date Data Arrived at EDR: 07/11/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 71

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 07/15/2019
Date Data Arrived at EDR: 07/17/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 71

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 07/17/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Varies

City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 01/01/2019
Date Data Arrived at EDR: 01/15/2019
Date Made Active in Reports: 03/07/2019
Number of Days to Update: 51

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 07/12/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Varies

Active & Inactive AST Inventory
A listing of active & inactive above ground petroleum storage tank site locations, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 09/27/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Varies

Methane Producing Landfills

This data was created on April 30, 2012 to represent known disposal sites in Los Angeles County that may produce and emanate methane gas. The shapefile contains disposal sites within Los Angeles County that once accepted degradable refuse material. Information used to create this data was extracted from a landfill survey performed by County Engineers (Major Waste System Map, 1973) as well as historical records from CalRecycle, Regional Water Quality Control Board, and Los Angeles County Department of Public Health

Date of Government Version: 04/30/2012
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 42

Source: Los Angeles County Department of Public Works
Telephone: 626-458-6973
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: No Update Planned

Active & Inactive Hazardous Materials Inventory

A listing of active & inactive hazardous materials facility locations, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 09/27/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Varies

Active & Inactive UST Inventory

A listing of active & inactive underground storage tank site locations and underground storage tank historical sites, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 06/25/2019
Next Scheduled EDR Contact: 10/07/2019
Data Release Frequency: Varies

Site Mitigation List

Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 07/15/2019
Date Data Arrived at EDR: 07/17/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 19

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 07/17/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Annually

City of El Segundo Underground Storage Tank

Underground storage tank sites located in El Segundo city.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 04/19/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 21

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 07/12/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: No Update Planned

City of Long Beach Underground Storage Tank

Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 04/22/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/27/2019
Number of Days to Update: 65

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 06/27/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 10/02/2019
Number of Days to Update: 64

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 05/28/2019
Date Data Arrived at EDR: 05/30/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 67

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

MARIN COUNTY:

Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 09/26/2018
Date Data Arrived at EDR: 10/04/2018
Date Made Active in Reports: 11/02/2018
Number of Days to Update: 29

Source: Public Works Department Waste Management
Telephone: 415-473-6647
Last EDR Contact: 09/25/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 05/29/2019
Date Data Arrived at EDR: 05/30/2019
Date Made Active in Reports: 07/22/2019
Number of Days to Update: 53

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

MONO COUNTY:

CUPA Facility List
CUPA Facility List

Date of Government Version: 05/23/2019
Date Data Arrived at EDR: 05/30/2019
Date Made Active in Reports: 07/22/2019
Number of Days to Update: 53

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

MONTEREY COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 07/25/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/30/2019
Number of Days to Update: 62

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 09/30/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Varies

NAPA COUNTY:

Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 01/09/2017
Date Data Arrived at EDR: 01/11/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 50

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: No Update Planned

Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 02/21/2019
Date Data Arrived at EDR: 02/22/2019
Date Made Active in Reports: 03/08/2019
Number of Days to Update: 14

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 09/05/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 07/23/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 10/02/2019
Number of Days to Update: 64

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 07/25/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

ORANGE COUNTY:

List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 05/09/2019
Date Made Active in Reports: 05/30/2019
Number of Days to Update: 21

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 05/09/2019
Date Made Active in Reports: 05/30/2019
Number of Days to Update: 21

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 04/02/2019
Date Data Arrived at EDR: 05/07/2019
Date Made Active in Reports: 07/16/2019
Number of Days to Update: 70

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

PLACER COUNTY:

Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 06/03/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/12/2019
Number of Days to Update: 69

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Semi-Annually

PLUMAS COUNTY:

CUPA Facility List
Plumas County CUPA Program facilities.

Date of Government Version: 03/31/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/26/2019
Number of Days to Update: 64

Source: Plumas County Environmental Health
Telephone: 530-283-6355
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 07/10/2019
Date Data Arrived at EDR: 07/11/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 71

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Quarterly

Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 07/10/2019
Date Data Arrived at EDR: 07/11/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 74

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 05/06/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 55

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 10/01/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Quarterly

Master Hazardous Materials Facility List

Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 05/06/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 09/13/2019
Number of Days to Update: 77

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 10/01/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Quarterly

SAN BENITO COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 07/16/2019
Date Data Arrived at EDR: 07/16/2019
Date Made Active in Reports: 09/24/2019
Number of Days to Update: 70

Source: San Benito County Environmental Health
Telephone: N/A
Last EDR Contact: 07/16/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

SAN BERNARDINO COUNTY:

Hazardous Material Permits

This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 05/31/2019
Date Data Arrived at EDR: 05/31/2019
Date Made Active in Reports: 07/22/2019
Number of Days to Update: 52

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 65

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

Solid Waste Facilities
San Diego County Solid Waste Facilities.

Date of Government Version: 04/18/2018
Date Data Arrived at EDR: 04/24/2018
Date Made Active in Reports: 06/19/2018
Number of Days to Update: 56
Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

Local Oversight Program Listing
A listing of all LOP release sites that are or were under the County of San Diego's jurisdiction. Included are closed or transferred cases, open cases, and cases that did not have a case type indicated. The cases without a case type are mostly complaints; however, some of them could be LOP cases.

Date of Government Version: 07/16/2019
Date Data Arrived at EDR: 07/23/2019
Date Made Active in Reports: 09/30/2019
Number of Days to Update: 69
Source: Department of Environmental Health
Telephone: 858-505-6874
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

Environmental Case Listing
The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24
Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

Local Oversite Facilities
A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10
Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: No Update Planned

Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 08/01/2019
Date Data Arrived at EDR: 08/02/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 67
Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 06/22/2018
Date Data Arrived at EDR: 06/26/2018
Date Made Active in Reports: 07/11/2018
Number of Days to Update: 15
Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 09/11/2019
Next Scheduled EDR Contact: 12/29/2019
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 05/20/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 58

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

SAN MATEO COUNTY:

Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 08/06/2019
Date Data Arrived at EDR: 08/14/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 1

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Annually

Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 03/29/2019
Date Data Arrived at EDR: 03/29/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 61

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 09/05/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: No Update Planned

SANTA CLARA COUNTY:

Cupa Facility List
Cupa facility list

Date of Government Version: 05/16/2019
Date Data Arrived at EDR: 05/23/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 56

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

HIST LUST - Fuel Leak Site Activity Report
A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LOP Listing
A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13
Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: No Update Planned

Hazardous Material Facilities
Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 07/30/2019
Date Data Arrived at EDR: 08/02/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 67
Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA Facility List
CUPA facility listing.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 90
Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 06/15/2017
Date Data Arrived at EDR: 06/19/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 51
Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

SOLANO COUNTY:

Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 08/13/2019
Number of Days to Update: 68
Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 47
Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

SONOMA COUNTY:

Cupa Facility List
Cupa Facility list

Date of Government Version: 06/18/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 29

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Varies

Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 07/02/2019
Date Data Arrived at EDR: 07/02/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 80

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

STANISLAUS COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 07/18/2019
Date Data Arrived at EDR: 07/18/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 70

Source: Stanislaus County Department of Ennvironmental Protection
Telephone: 209-525-6751
Last EDR Contact: 07/15/2019
Next Scheduled EDR Contact: 10/28/2019
Data Release Frequency: Varies

SUTTER COUNTY:

Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 06/03/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 49

Source: Sutter County Environmental Health Services
Telephone: 530-822-7500
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Semi-Annually

TEHAMA COUNTY:

CUPA Facility List
Cupa facilities

Date of Government Version: 05/20/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 58

Source: Tehama County Department of Environmental Health
Telephone: 530-527-8020
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

TRINITY COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/23/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 65

Source: Department of Toxic Substances Control
Telephone: 760-352-0381
Last EDR Contact: 07/19/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

TULARE COUNTY:

CUPA Facility List
Cupa program facilities

Date of Government Version: 05/09/2019
Date Data Arrived at EDR: 05/10/2019
Date Made Active in Reports: 07/17/2019
Number of Days to Update: 68

Source: Tulare County Environmental Health Services Division
Telephone: 559-624-7400
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

TUOLUMNE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 04/23/2018
Date Data Arrived at EDR: 04/25/2018
Date Made Active in Reports: 06/25/2018
Number of Days to Update: 61

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 05/29/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 09/30/2019
Number of Days to Update: 63

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 09/25/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: No Update Planned

Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 08/07/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: No Update Planned

Medical Waste Program List

To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 05/29/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 09/30/2019
Number of Days to Update: 63

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 07/22/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Quarterly

Underground Tank Closed Sites List

Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 42

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report

Underground storage tank sites located in Yolo county.

Date of Government Version: 06/26/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 07/31/2019
Number of Days to Update: 33

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 09/25/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Annually

YUBA COUNTY:

CUPA Facility List

CUPA facility listing for Yuba County.

Date of Government Version: 07/26/2019
Date Data Arrived at EDR: 07/31/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 69

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 07/25/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

Oil/Gas Pipelines

Source: PennWell Corporation

Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Electric Power Transmission Line Data

Source: PennWell Corporation

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GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish & Game
Telephone: 916-445-0411

STREET AND ADDRESS INFORMATION

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APPENDIX ELEC

ELECTRICAL SYSTEM FEASIBILITY REPORT

MAHA

Guenoc Valley

Electrical System Feasibility Report

February 12, 2020

Prepared by:

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1.0 INTRODUCTION

1.1 Project Background

The Maha Resort at Guenoc Valley (the "Project") sits on approximately 16,000 acres and is three miles southeast of Middletown on the southeast border of Lake County (Project Site). The Project has applied to the County of Lake for a development application. Pursuant to the California Environmental Quality Act ("CEQA") the application will include an Environmental Impact Report ("EIR"). The EIR will include a programmatic analysis (the "Programmatic Review") of the impacts to rezone the 16,000-acre Guenoc Ranch to "Guenoc Valley District ("GVD")." In addition to the programmatic level EIR to allow the rezone, the EIR will include a detailed, Project level analysis (the "Project Level Review") of the impacts at a Project level of the proposed first phase of development ("First Phase"), submitted as the Specific Plan of Development ("SPOD").

The Programmatic Review of the overall Project will occur in the EIR to assess the environmental impacts of the entire Project Proposal. Project Level Review will analyze the specific objectives and environmental impacts of the proposed first phase, as outlined in the SPOD. The Project Level Review EIR will analyze the environmental changes caused by a development including the construction and operation, whereas the Programmatic Review EIR will look at the impacts of the rezone classification rather than a Project specific analysis. Future phases of development ("Future Phases") will require additional CEQA review. Therefore, this technical feasibility analysis is broken into two sections, the first section includes the First Phase Project level impacts and the second section analyzes the potential development within the new zoning classification GVD. Construction and operations impacts are analyzed in a separate report.

The Project requests a general plan amendment and a rezone classification in separate phases. For a breakdown of the development intentions between the Project's First Phase SPOD and Future Phases for allowed uses please see the following table with data obtained from the Notice of Preparation.[1]

Table 1: Unit Breakdown as per GVD Zoning Permitted Use Table[2]

Use	First Phase (qty)	Future Phases (qty)
Hotel Units	225	155
Resort Residential	144	260
Residential Estate Villa	411	989
Workforce Co-Housing Bedrooms	300	200

[1] http://www.lakecountyca.gov/Government/Directory/Community_Development/Planning/GuenocValley.htm Notice of Preparation dated April 23, 2019, Table 1, Primary Permitted Uses, accessed 7/8/2019.

[2] This report is analyzing the total allowable development; therefore, it is conservative as it analyzes a greater density than is proposed in the SPOD.

First Phase of Project: The First Phase of the Project includes the construction of the roads and the utility infrastructure, approximately 225 hotel rooms, 144 resort residential units, and 411 residential villas, 300 workforce and staff housing, and the accessory to resort commercial structures. The section of the report that discusses the electrical system feasibility of the First Phase analyzes the electrical system feasibility of the First Phase of the development as identified in the SPOD.

Future Phases of Project: The Future Phases of the Project, to the extent allowed as part of the GVD, includes up to 155 hotel rooms, 260 resort residential units, 989 residential estate villas, 200 workforce co-housing bedrooms, and accessory to resort commercial structures. Any development proposed as part of the Future Phases will require additional CEQA review. The section of the report that discusses the electrical system feasibility of Future Phases analyzes the electrical system feasibility of the Future Phases of the development as identified in the proposed GVD.

1.2 Technical Assistance Overview

Our technical feasibility study analyzes the electrical system infrastructure options for the Project. In completing this study, our goal was to provide current and accurate information on the best methodology and approaches to developing the electrical infrastructure for the Project, including options for utility services, generation technologies, distribution strategies and demand needs with a focus on complying with all applicable energy codes and providing a safe, resilient electrical infrastructure system for the Project.

This report summarizes our work tasks completed for this Project, and provides options for next steps towards development of the Project's electrical infrastructure. First, we provide our assessment of the Project's existing on-site electrical infrastructure, including the existing demand needs and electrical distribution system that serves the 16,000 acre property. Second, we broke our study into two parts to analyze the Project's electrical infrastructure needs for the First Phase and Future Phases of the Project. For the First Phase, we first provide a set of Project design issues that must be addressed at the Project, and then, we provide four options for the Project's electrical distribution services. The first distribution option, referred to herein as "Option 1," is full electric distribution service by Pacific Gas and Electric Company ("PG&E"). The second distribution option, referred to herein as "Option 2," is private ownership of electric distribution service to all commercial properties and infrastructure and PG&E electric distribution services to all residential lots. The third distribution option, referred to as "Option 3," is the option to create a "Public Utility District"[3] with the entire Project operated as an independent microgrid from PG&E. Community shared solar electric generation and battery storage systems[4] are presented in this report as an

[3] https://calafco.org/sites/default/files/documents/2016%20Formation%20Guide%20WEB.PDF, accessed 7/8/2019.
[4] https://ww2.energy.ca.gov/2018publications/CEC-400-2018-020/CEC-400-2018-020-CMF.pdf, page 42 accessed 7/25, 2019.

option to be considered in lieu of or in addition to roof mounted solar systems for the residential lots. Finally, a fourth option, referred to as "Option 4," is a hybrid of Options 2 and 3. Under this option, several privately owned solar plus storage micro-grids would be created to sell the electricity generated from those systems to the commercial lessors at the Project through traditional Power Purchase Agreements ("PPAs") until the formation of the Public Utility District is completed. Throughout this report in general, and specifically in discussing these Options in more detail in section 3.1.2, reference to Maha or the Developer will refer to either Maha or a third party independent power producer ("IPP") selected by Maha, where the IPP, rather than Maha, will create the Public Utility District and/or perform the power generation, delivery and distribution functions described in section 3.1.2, and elsewhere in this report.[5]

2.0 EXISTING POWER NEEDS & LOAD ANALYSIS

2.1 Existing Electrical Services & Infrastructure[6]

The First Phase of the Project's development area is made of 48 contiguous parcels all within Lake County. Electricity is a currently provided to the development area by PG&E from its substation in Middletown. There are two PG&E distribution circuits that provide overhead electricity to eleven (11) existing service points.[7] The existing electrical infrastructure located at the Project consists of service points, easements, distribution circuits, meters, poles and related infrastructure owned and operated by PG&E.

The existing service points include agricultural wells, pump stations and commercial structures served via overhead power lines that run through the Project. Power density is residential, low density rural residential.

The existing circuits that serve the Project are presented in the table below. Circuit 1102 enters the Project from the north and Circuit 1103 enters the Project from the west along Butts Canyon Road. Both circuits appear to merge at the north entry point enabling the circuits to back each other up via emergency switching procedures by PG&E.

[5] Maha is a real estate developer of resort, commercial and residential properties. It is actively reviewing the options that are the subject of this Report in order to provide a comprehensive electric infrastructure for the Project. Maha does not intend to become an electric utility subject to CPUC regulation, and will only perform such power supply and distribution services if it secures an appropriate ruling from the CPUC that such functions will not subject it to regulation as an electric utility under applicable California law. Otherwise, Maha intends to engage one or more IPPs and/or other third-party developer(s) with experience in solar power production, delivery and distribution, energy storage, micro-grids and/or Public Utility Districts, as applicable, to perform such functions for the Project.

[6] https://www.pge.com/b2b/energysupply/wholesaleelectricsuppliersolicitation/PVRFO/PVRAMMap/index.shtml, accessed 6/24/2019

[7] https://www.pge.com/b2b/energysupply/wholesaleelectricsuppliersolicitation/PVRFO/PVRAMMap/index.shtml, accessed 6/24/2019.

Table 2: Existing PG&E Circuits

Circuit	Transformer size (MVA)	Transformer demand (MVA)	Circuit Capacity (MVA)	Circuit Peak (MVA)
1102	19.20	9.54	12.19	9.72
1103	19.73	5.5	12.19	1.20

The existing PG&E services and infrastructure located on the Project's development area are as shown in Figure 1 below.

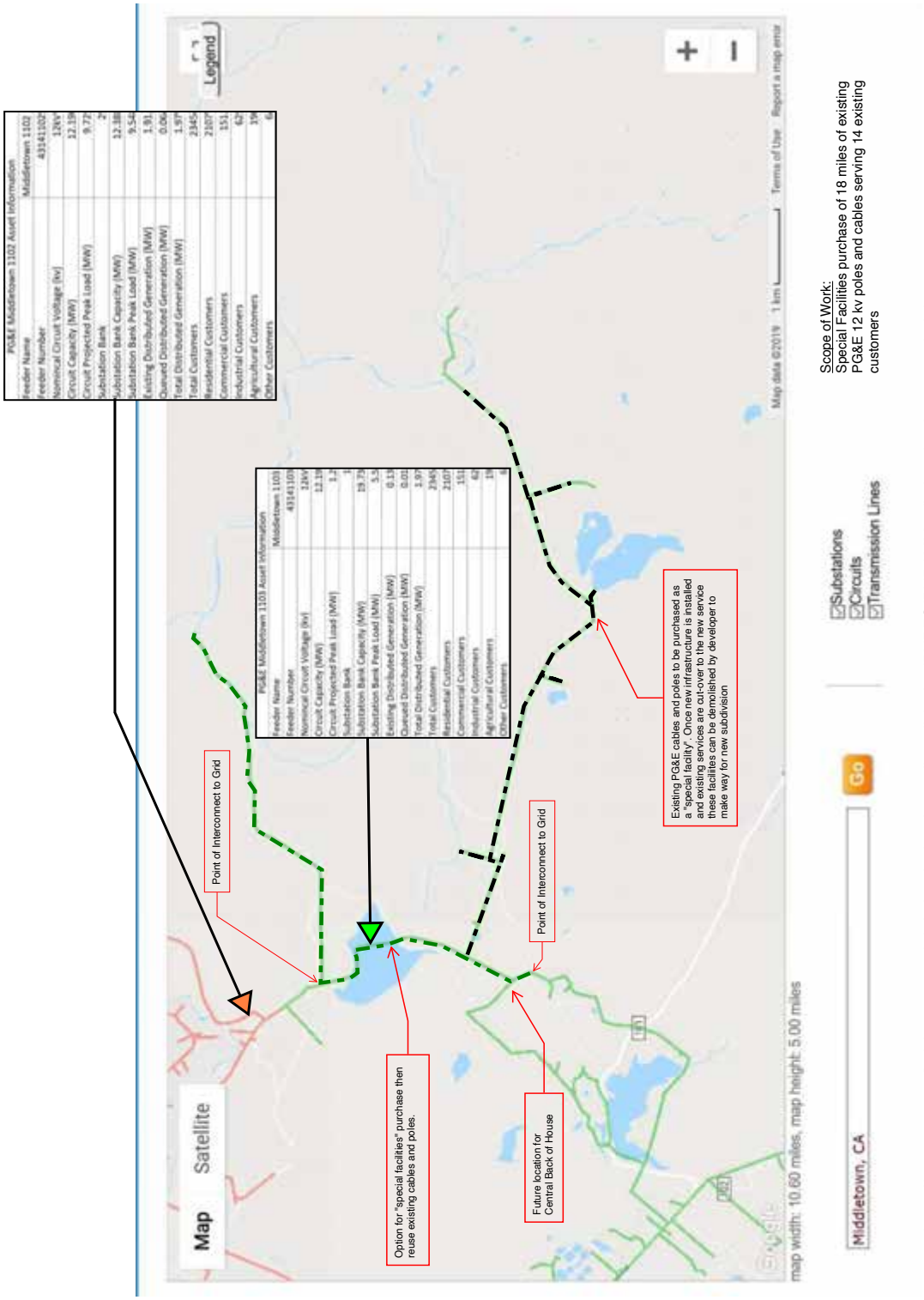


Figure 1. Existing PG&E Services

The existing electrical infrastructure on the Project's development area is all overhead.

2.2 Existing Energy Usage & Demands

The existing circuits serve a mix of customers as presented in Table 3 below.

Table 3: Existing PG&E Customers

Description	1102 circuit	1103 circuit
Residential Customers	2,107	104
Commercial Customers	151	27
Industrial Customers	62	5
Agricultural Customers	19	22
Other Customers	6	0
Total Customers	2,345	158

Based on publicly available PG&E data, Circuit 1103 has an approximate power density of 11 kva/Sq mile with existing energy use on the circuit estimated to be 266 MWh/year based on an average annual energy demand throughout the year of 30 KW. Circuit 1103 only services the Project Site and Circuit 1102 serves areas outside the Project Site. Circuit 1102 has a power density of approximately 900 kva/Sq mile with existing energy use on the circuit estimated to be 30,000 MWh/yr based on an average annual energy demand of 1 KW for each residence and 5.5 KW for each commercial, industrial, agricultural and other customer in the service area.

3 TECHNICAL FEASIBILITY OF ELECTRICAL SERVICE FOR PROJECT

3.1. Electrical Service Infrastructure for First Phase

3.1.1. Project Design Features

For the First Phase, the Project will reuse portions of the existing overhead utility services and provide new services throughout the Project, as required. The electrical infrastructure at the Project will change from all overhead distribution service to a mix of overhead and underground service where required in subdivisions and where necessary to maintain the aesthetic and fire prevention goals of the Project. Approximately 18 miles of existing PG&E 12 KV circuit will either be removed, reused or relocated. The Project proposes the installation of approximately 32 miles of new joint trench and underground electrical infrastructure in the Project's proposed subdivisions. Almost all of the Project's electrical utility routing will be installed with an underground joint trench alongside communications, and in some areas above ground routing may be utilized if aesthetically viable and not adjacent to flammable vegetation. All infrastructure is proposed within existing road corridors and the improvements will occur within the Project Site.

The Project proposes the installation of distributed energy resources[8] combined as an interconnected system of loads and resources, including, but not limited to, distributed energy resources, energy storage, demand response tools or other management, forecasting and analytical tool that can be managed and isolated to withstand larger disturbances and maintain electrical supply to connected critical infrastructure. A key feature of the Project's electrical infrastructure is to ensure the Project's microgrid and resiliency strategies support reliability in anticipation of potential outage events and wildfires.

The building design for facilities in the Primary Permitted Uses Table[9] will meet energy code requirements and endeavor to target between 18 kbtu/sf-yr for ground coupled heat pumps to 30 kbtu/sf-yr to minimize the demands on the systems.

For the most part infrastructure will largely be installed underground in the subdivisions and resort properties with design features that reflect the vision of the Project exceeding minimum safety and efficiency.

As required by California law, the Project will include either the installation of PV solar for every residential structure's needs either on the rooftops or through ground-mounted community solar systems. The installation of energy storage devices, with a range of battery types is being considered, at every location where PV solar is installed. Eleven existing PG&E service points currently exist that can be utilized for development of the electrical infrastructure at the Project. The relocation of existing PG&E easements and poles is expected.

Electrical needs for services that are directly located on Butts Canyon Road such as entrance features, streetlights or any developments proposed adjacent to Butts Canyon Road will be individual service delivery points[10] off the PG&E system. For these individual areas any solar systems would either be roof or ground mounted and interconnected at the Service Delivery Points.

Substations and points of interconnect to PG&E will be determined by the Distribution Option selected in section 3.1.2 below. Electrical infrastructure will be routed in or along existing and/or newly developed roadways.

The following tables identifies the infrastructure systems that are part of the First Phase energy usage and demand analysis.

---

[8] "Distributed energy resource" means an electrical generation or storage technology that complies with the emissions standards adopted by the State Air Resource Board pursuant to the distributed generation certification program requirements of Section 94203 of Title 17 of the California Code of Regulations, or any successor regulation.

[9] http://www.lakecountyca.gov/Government/Directory/Community_Development/Planning/GuenocValley.htm Notice of Preparation dated April 23, 2019, Table 1, Primary Permitted Uses, accessed 7/8/2019.

[10] https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_RULES_2.pdf, accessed 7/8/2019.

Table 4: First Phase Infrastructure Systems

Quantity	Description
24	Wastewater Treatment Facilities with back-up generators[11]
16	Water Systems with back-up generators[12]
3	Main Point of Entry to IT Carriers with back-up generators[13]
11	IT Area Distribution Facilities with back-up generators
4	Cellular/Radio Towers with back-up generators
1	Emergency Communication Systems
1	Centralized Fire Camera System
1	Centralized Alert (Nixle) System
9	Water Features and pools at 9 locations
500	Streetlight and pathway lighting
384	Public Area EV Chargers

3.1.2. Distribution Options

In addition to the Project design features described above, four options to meet the distribution requirements for First Phase of the Project are described in this section of the report and summarized in the table below[14].

Table 5: Summary of Options

Description	Distribution	Service Extensions	Responsible Party
Option 1	PG&E	PG&E	PG&E
Option 2	PG&E and Maha	PG&E and Maha	PG&E and Maha
Option 3	PG&E and Maha	Maha	PG&E and Maha
Option 4	PG&E and Maha	Maha	PG&E and Maha

Option 1

In this option, the Project's current utility provider, PG&E, would provide the

[11] http://www.lakecountyca.gov/Assets/Departments/CDD/Planning/Docs/Guenoc/Maha+SPOD.pdf, page 119 Wastewater Service Areas, accessed 7/8/2019.
[12] http://www.lakecountyca.gov/Assets/Departments/CDD/Planning/Docs/Guenoc/Maha+SPOD.pdf, page 113 Water Management Areas, accessed 7/8/2019.
[13] http://www.lakecountyca.gov/Assets/Departments/CDD/Planning/Docs/Guenoc/Maha+SPOD.pdf, page 141 Communications Proposed IT Network, accessed 7/8/2019.

[14] *See* p. 5, note 5, clarifying that references to functions to be performed by Maha in this section 3.1.2 may be performed by an IPP selected by Maha to perform the solar generation, delivery and distributions functions referenced in this Report.

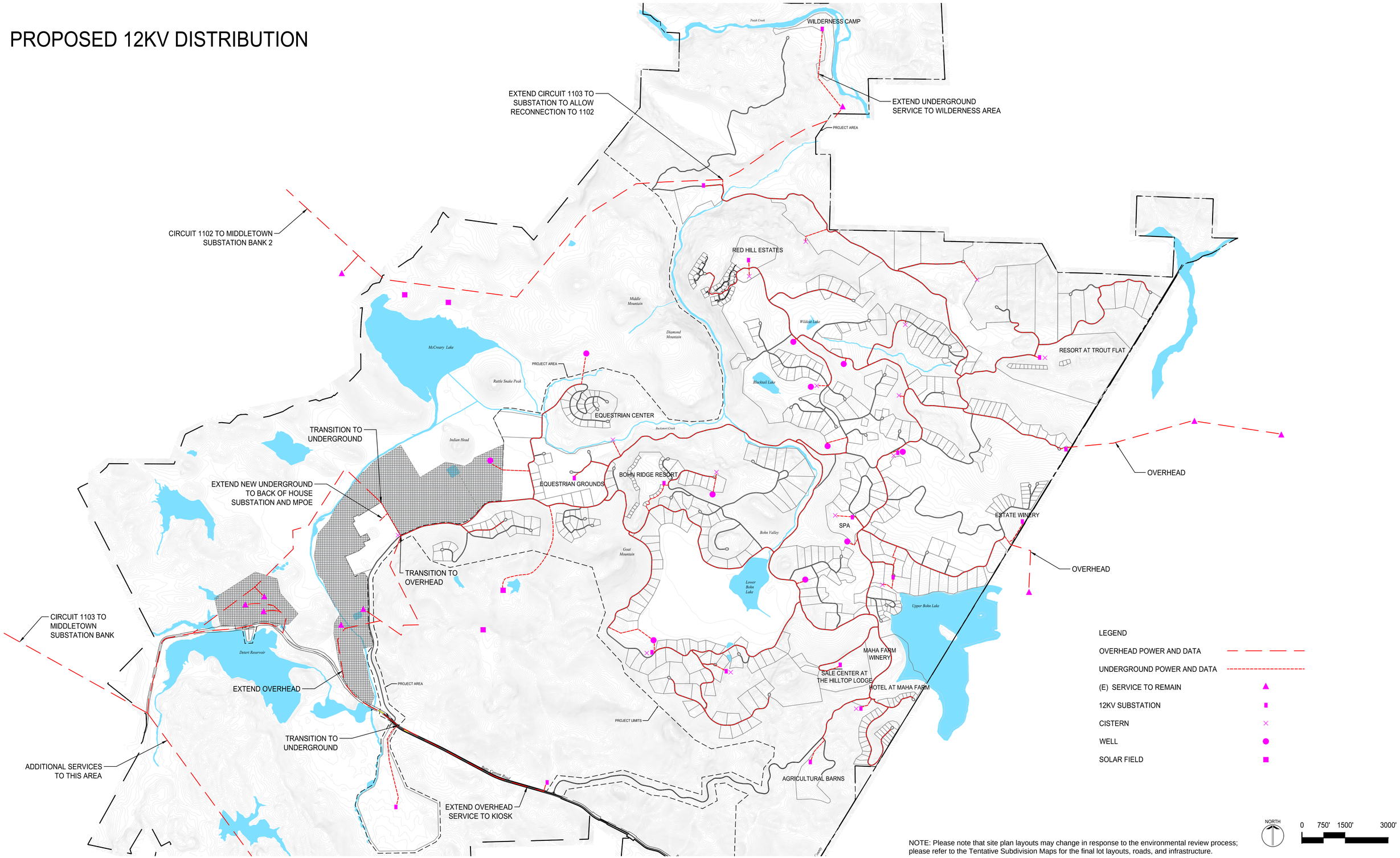
electrical distribution services (metering, distribution, etc.) to all facilities at the Project as shown in the Figure 2 on the following page.

PG&E would be responsible for Distribution Line[15] and Service Extensions[16] from their PG&E facilities both on and off the Project. PG&E will provide all electrical services, including distribution, lines, metering and supply to serve the proposed resort facilities, accessory infrastructure and residential lots. In this option, all PG&E facilities will run within public utility easements that extends 25' out on both sides and from the center of each roadway.

All commercial properties at the Project would be built "Solar Ready" pursuant to applicable California energy code.[17] Each residential structure would be either provided with rooftop solar or the ability to participate in alternative energy developments that would interconnect into the PG&E systems electrical facilities in the vicinity of the Back of House and at the location of the existing overhead service north of McCreary Lake where the PG&E circuit passes through the lake. Alternative energy developments would consist of ground mounted solar arrays coupled with electrical combiner boxes, utility scale inverters, transformers and switchboards with metering, monitoring and relaying as required by PG&E.

[15] https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_RULES_15.pdf, accessed 7/8/2019.
[16] https://www.pge.com/tariffs/tm2/pdf/ELEC_RULES_16.pdf, accessed 7/8/2019.
[17] Pursuant to Section 110.10 of the 2019 California Energy Code, California law contains certain mandatory requirements for "solar ready" non-residential buildings that include minimum solar zone areas and other requirements.

PROPOSED 12KV DISTRIBUTION



NOTE: Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layouts, roads, and infrastructure.

In this option, the Project's current utility provider, PG&E, would provide the electrical distribution services (metering, distribution, etc.) to all residential structures at the Project as in Option 1. PG&E would provide Distribution Line and Service Extensions to serve all residential lots at the Project.

For the commercial and other accessory features at the Project, PG&E would only provide a single delivery point to the Project at the service entrance designated as "Back of House." From this point, the developer of the Project ("Developer") would construct, own and operate new meters and distribution lines to each of the 12 commercial facilities at the Project and to each of the 57 other resort accessory features consisting of water wells, waste water treatment plants, cell towers and IT features. This option would allow for the Developer to own and operate "behind the meter" solar plus storage microgrids for all commercial and resort accessory features. Four locations at the Project have been identified as available for ground mounted solar plus storage systems. (See Section 3.1.5 below.) The independent micro-grids could function independent of PG&E, and could also still utilize PG&E as backup, energy storage, emergency services, and/or any other grid-tied services desired per the final Project's design.

Electrical facilities would be established for the purpose of undergrounding, metering and control at Back of House. This location would be a Service Delivery Point[18] for the Developer owned electrical facilities that could potentially include medium voltage switches, metering facilities and or a transformer and line-up of switchgear and associated overhead and underground utility infrastructure. These facilities would serve the commercial aspects of the GVD. In this option the Emergency Response Center would also be established as a Developer owned electrical facility for the purpose of metering and control of power to the commercial aspects at the Project.

From the electrical facilities, new circuits would be dedicated to serve infrastructure loads such as water wells, wastewater treatment facilities, cellular towers and similar facilities. Separate circuits that provide power to the individual Project commercial facilities. In this option back-up power would also be provided at each of the (2) main electrical facilities and provisions to load shed infrastructure circuits would be added to enable prolonged operation of the commercial facilities and infrastructure independent of PG&E. Operation and maintenance of the privately held electrical infrastructure would be by contractors hired through the Project.

Similar to Option 1, each residential structure at the Project would either be provided with rooftop solar or the ability to participate in alternative energy developments that

[18] https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_RULES_2.pdf, accessed 7/8/2019.

would interconnect into the PG&E systems electrical facilities in the vicinity of the Back of House area of the development, and or at the location of the existing overhead service north of McCreary Lake where the PG&E circuit passes through the Lake. Alternative energy developments would consist of ground mounted solar arrays coupled with electrical combiner boxes, utility scale inverters, transformers and switchboards with metering, monitoring and relaying as required by PG&E.

Option 3

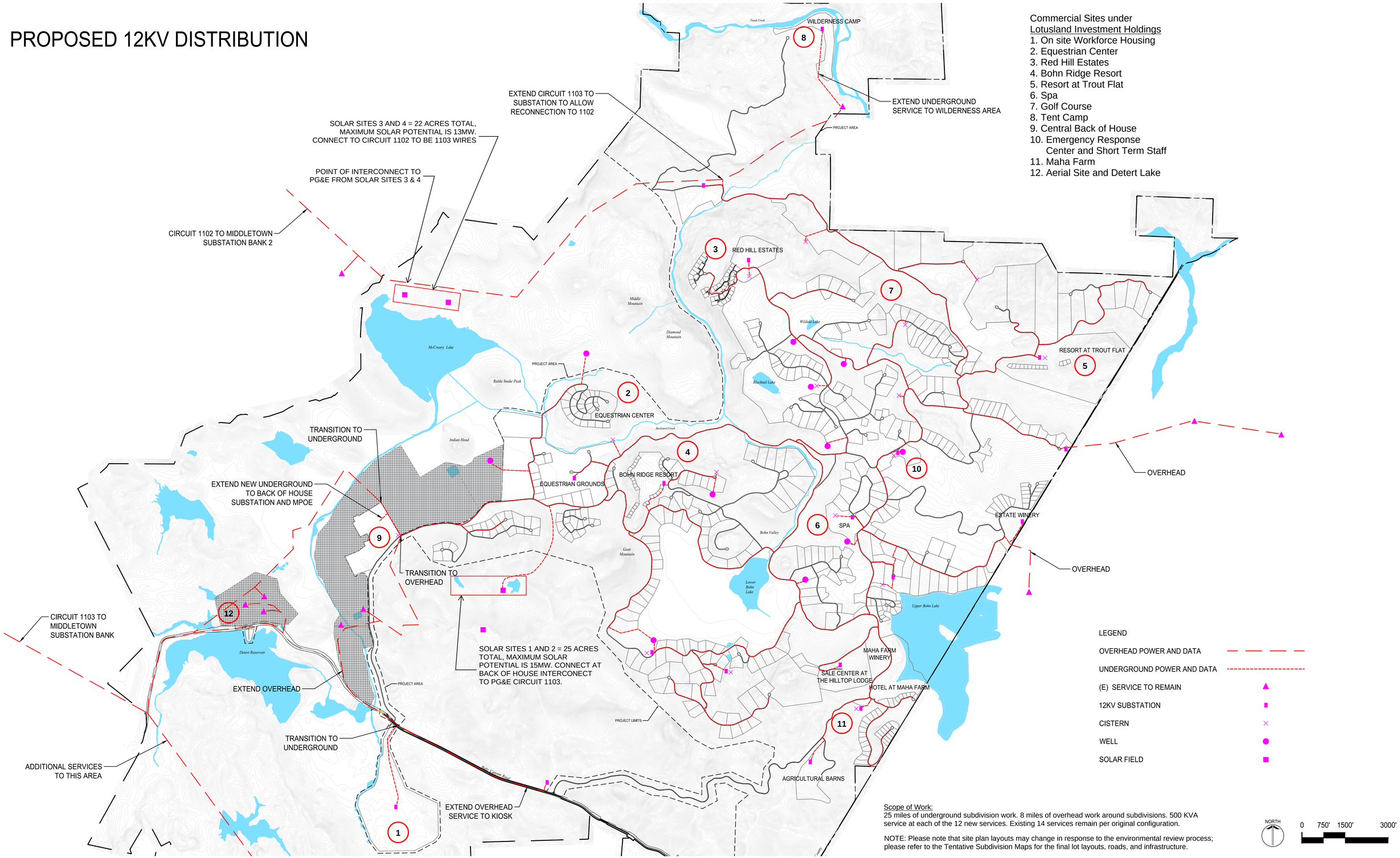
In this option, the Developer would create a "Public Utility District"[19] that would supply power, own all of the electrical infrastructure and provide related services to all of the residential, commercial and accessory buildings and features at the Project. This option includes behind the meter solar for commercial facilities at the central solar locations to enable community solar and community storage to meet the Project's aesthetic goal related to no solar on roofs. Between one to four ground mounted solar plus storage solar systems would be located at the Project, which collectively could generate enough electric supply for the Project's entire energy needs. Similar to Option 2, PG&E would provide a single delivery point to the Project at the service entrance designated as "Back of House."

The Project would establish all services from PG&E at Back of House. PG&E would be responsible for the Distribution Line Extensions up to this point. The Service Delivery Points within The Project would be by the Public Utility District created for that purpose. Like Option 2 the Emergency Response Center would be established as a Developer owned electrical facility for the purpose of metering and control of power to the common ownership facilities within The Project site.

In this option each residential structure would either be provided with rooftop solar or the ability to participate in alternative energy developments that would interconnect into the PG&E systems electrical facilities in the vicinity of the Back of House and at the location of the existing overhead service north of McCreary Lake where the PG&E circuit passes through the lake. Alternative energy developments would consist of ground mounted solar arrays coupled with electrical combiner boxes, utility scale inverters, transformers and switchboards with metering, monitoring and relaying as required by PG&E.

[19] https://calafco.org/sites/default/files/documents/2016%20Formation%20Guide%20WEB.PDF, accessed 7/8/2019.

PROPOSED 12KV DISTRIBUTION



Scope of Work:
25 miles of underground subdivision work. 8 miles of overhead work around subdivisions. 500 KVA service at each of the 12 new services. Existing 14 services remain per original configuration.

NOTE: Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layouts, roads, and infrastructure.

Option 4

This option would provide for a hybrid of Options 2 and 3, wherein Developer would create and own solar plus storage micro-grids that would be constructed for all or certain commercial structures at the Project similar to Option 2. PG&E would service all residential lots at the Project. All commercial facilities served by the privately owned micro-grids would be serviced through traditional solar Power Purchase Agreements ("PPAs") until the formation of the Public Utility District is completed. Under this option, the Project's electrical infrastructure would begin, at least in certain areas of the Project, while the extensive formation processes related to setting up a Public Utility District is accomplished. Option 4 would provide for a phased approach to the development of the Project's distribution infrastructure and include the potential sale of the solar plus storage systems to the Public Utility District at a later date, if desired.

3.1.3. Potential Electrical Infrastructure Improvements

Both on-site and off-site improvements to the existing electrical infrastructure at the Project might be required. Currently, the existing electrical infrastructure at the Project can accommodate up to 12.19 MW of circuit capacity and 19.73 MW of transformer capacity. (See Table 2 above.) These circuit and transformer capacities limit the amount of alternative energy that the existing electrical infrastructure can accommodate. Thus, regardless of the distribution option selected above, both on-site and off-site improvements to the electrical infrastructure will be required if these "allowances" of the existing electrical infrastructure are exceeded.

In order to accommodate increased circuit and transformer capacities, both on-site and off-site infrastructure improvements would be required, as follows: i) a new Trip Transfer Scheme[20] would be required to enable PG&E to remotely turn off power flow from the Project to the utility for the purpose of ensuring safe working conditions for PG&E employees and contractors working on their equipment; (ii) transformer upgrades could be required; and (iii) potential switchboard improvements could be required to accommodate the increased capacity. The potential off-site improvements could include infrastructure improvements, as follows: (i) a potential replacement of the existing PG&E transformer located at PG&E's facility in Middletown to make it larger so that it can accommodate the increased capacity as a result of the Project; and (ii) a potential replacement of the existing overhead lines with new lines that can accommodate the increased capacity. The existing overhead service that could be upgraded runs along Butts Canyon Road and within easements adjacent to the road.

[20] https://peguru.com/2011/04/direct-transfer-trip-scheme/#targetText=Direct%20Transfer%20Trip%20Scheme,is%20assigned%20to%20each%20event.

Any distribution options that include virtual net metering and net energy metering as part of the electrical infrastructure design will require new service requests for Net Energy Metering ("NEM") and/or RES-BCT[21] developments and on-site wire and control upgrades to the applicable areas of the Project's development area as further described in Section 3.1.6 below.

The Developer will be required to work through the PG&E interconnection process to increase capacity to the grid, including the on-site and off-site improvements described above, as applicable, if the alternative energy design requires any of the above on-site or off-site improvements to the existing electrical infrastructure.

3.1.4. Acquisition and/or Reuse of Existing PG&E Easements & Property

Regardless of which distribution option is selected for the Project, certain rights to utilize, re-use and/or purchase existing PG&E easements and property located at the Project will need to be acquired. Several legal processes exist to accomplish this goal, depending on the distribution option elected.

Advice Letter Process (Options 1, 2 or 4)

In the event that Developer elects to pursue either of proposals set forth in Option 1 or 2, (and not form a Public Utility District), then Developer must negotiate with PG&E to purchase, terminate and/or use any PG&E easements and/or property, as desired. Subject to agreed terms being reached, then PG&E would need to file an advice letter or formal application to obtain advance California Public Utilities Commission ("CPUC") approval or file an application to request exemption of the transaction from Section 851 pursuant to Section 853(b). For instance, any such transactions for property of PG&E considered "necessary or useful in the provision of services to the public" require the consent of the CPUC. An exception for minor uses of utility property exempt from CEQA exists that do not require CPUC approval, but it is a factual determination as to whether this exception is met.[22] To obtain CPUC consent for all uses that do not meet the limited use exception requires either a formal application and order from the CPUC or following the utility advice letter procedure.

[21] https://www.pge.com/en_US/for-our-business-partners/interconnection-renewables/export-power/distributed-generation-handbook/net-energy-metering/res-bct-program.page.

[22] GO 69-C provides in pertinent part that " …public utilities covered by the provisions of section 851…are hereby authorized to grant easements, licenses or permits for use or occupancy on, over or under any portion of the operative property of said utilities for rights of way, private roads, agricultural purposes, or other limited uses of their several properties without further special authorization by this Commission whenever it shall appear that the exercise of such easement, license or permit will not interfere with the operations, practices and services of such public utilities to and for their several patrons or customers."

Pursuant to California Public Utilities Code Section 851, PG&E can sell, lease, assign, mortgage, or otherwise dispose of, or encumber the whole or any part of its properties if it received CPUC approval, which shall be obtained either through securing an order from the CPUC for transactions valued at five million dollars ($5,000,000) or more or through the advice letter procedure for transactions valued at five million dollars ($5,000,000) or less. The CPUC determines the types of transactions valued at five million dollars ($5,000,000) or less that qualify for advice letter handling. For a qualified transactions valued at five million dollars ($5,000,000) or less, the CPUC may designate a procedure different than the advice letter procedure if it determines that the transaction warrants a more comprehensive review. Absent protest or incomplete documentation, the CPUC must approve or deny the advice letter within 120 days of its filing by PG&E. It should be noted that although the CPUC has 120 days to assess whether a particular transaction is adverse to the public interest, the CPUC's average time for processing a Section 851 advice letter is approximately 90 days. The CPUC must reject any advice letter that seeks to circumvent the five million dollar ($5,000,000) threshold by dividing a single asset with a value of more than five million dollars ($5,000,000), into component parts, each valued at less than five million dollars ($5,000,000). Every sale, lease, assignment, mortgage, disposition, encumbrance, merger, or consolidation made other than in accordance with the advice letter and approval from the CPUC authorizing it is void.

The purpose of the CPUC review is to ensure that the proposed transaction is not adverse to the public interest – e.g., does not impair the ability of the utility to provide for safe and reliable service to customers at reasonable rates. If a transaction does not qualify for the advice letter process, utility transactions involving the transfer or dispositions of interests in property necessary or useful in the provision of services to the public generally require a formal application and a CPUC decision pursuant to Section 851. The advice letter process expedites and simplifies the CPUC's review and approval of non-controversial transactions by filing an advice letter and obtaining a CPUC resolution approving the transaction. Utilities still must file formal applications, rather than advice letters under the following circumstances: (i) to seek approval of transactions that require CEQA review by the CPUC as either a Lead Agency or a Responsible Agency,[23] or (ii) when a transaction will materially impact the ratebase of the utility, even if the transaction is valued at $5 million or less.

Formation of a Public Utility District (Option 3 or 4)

Alternatively, if Developer selects Option 3 or 4, many regulatory requirements would be required to set up the Public Utility District. Once established pursuant to "The Public

[23] Transactions subject to Section 851 which require CEQA review by the CPUC as either the Lead Agency or a Responsible Agency "jurisdictionally triggers" the CPUC's oversight and review responsibilities under CEQA and therefore does not qualify for advice letter treatment pursuant to Section 853(d). When acting as a Responsible Agency, the CPUC has significant duties under CEQA. For example, as a Responsible Agency, the CPUC must review the environmental documents prepared by the Lead Agency and make its own findings regarding whether the transaction will have significant environmental impacts, and whether these impacts can be mitigated. *State CEQA Guidelines Sections 15096(f) and (h)*. The CPUC may also require additional mitigation measures for significant adverse environmental impacts related to aspects of the Project that the CPUC decides to carry out, finance, or approve. *State CEQA Guidelines Section 15096(g).*

Utility District Act" set forth in California Public Utilities Code § 15501 *et seq.* (the "Act"), the Developer could pursue terminating and/or acquiring any existing PG&E easements and facilities located on the Project through the powers of a Public Utility District. The Act allows residents of an unincorporated area to form a public utility district ("PUD") with the powers to establish, purchase, and operate public works to furnish its inhabitants with power and other utility services. The PUD may furnish those services outside its boundaries, but not in another municipality that furnishes the same service without its consent. The laws governing PUDs and their powers are similar to those for Municipal Utility Districts. A PUD has a wide range of powers, including the provision of electric or other utility services, the construction of utility systems, and issuing bonds. In addition, the voters in a PUD can petition the PUD board to acquire utility works or a utility. The PUD must obtain estimates of the cost of original construction of the existing facilities and completion by the PUD of similar facilities. The PUD may ask the CPUC to value existing utility facilities for the purpose of submitting estimates of the cost of acquiring them to the PUD 's voters at an election.

A PUD has a wide range of powers, including the provision of electric or other utility services, the construction of utility systems, and issuing bonds. For instance, PUDs may take by eminent domain any property necessary or convenient to the exercise its powers. Section §16404 of the Act. Additionally, PUDs may acquire, construct, own, operate, control, or use, within or without or partly within and partly without the district, works for supplying its inhabitants with light, water, power, heat, transportation, telephone service, or other means of communication, or means for the disposition of garbage, sewage, or refuse matter, and may do all things necessary or convenient to the full exercise of the powers granted in this article. Section §16461 of the Act. PUDs may also acquire, construct, own, complete, use, and operate a fire department, street lighting system, public parks, public playgrounds, golf courses, public swimming pools, public recreation buildings, buildings to be used for public purposes, and works to provide for the drainage of roads, streets, and public places, including, but not limited to, curbs, gutters, sidewalks, and pavement of streets. For purposes of this division, all of those projects shall be considered a public utility or public utility works. Section §16461 of the Act.

Pursuant to Public Utilities Code Section 1402 et seq.*,* a PUD can petition the CPUC to determine the value of utility property it seeks to acquire. A PUD may file a petition when it intends to (1) acquire public utility property by eminent domain or otherwise or (2) submit to its voters a proposition for such acquisition. The CPUC must give the utility an opportunity to show cause why it should not act on the petition. Otherwise, the CPUC must hold a hearing and determine the just compensation the PUD must pay the utility for the property. Within 20 days after the commission does this, the utility may file a written stipulation agreeing to accept the compensation set by the PUC with the political subdivision's governing body. Upon filing the stipulation, the political subdivision must proceed with all due diligence to provide the funding. When the political subdivision pays the compensation, the utility must provide it with the property deed. If the utility does not file the stipulation within 20 days, the PUD must (1) begin a court action (suit) to take the property or (2) submit a proposition to the voters to do so. The PUD must act within 60 days after the CPUC makes its determination. In the second case, if the voters approve the proposition, the PUD must file an action to take the property within 60 days of the vote

unless the utility and the PUD agree on terms for the acquisition.

The CPUC's finding on just compensation is final and may not be modified, reversed, or reviewed by any state court. If the court where the PUD pursues the condemnation proceeding decides that it has the right to take the utility's property, the court must enter a judgment in favor of the PUD fixing the compensation in the amount set by the CPUC. If the utility spent money on the property after the CPUC made its determination, it can go back to the CPUC within 30 days after the court enters its judgment to increase the compensation. Similarly, the PUD can go to the CPUC in this period if the property's value deteriorated after the CPUC made its original finding to reduce the compensation. The CPUC's decision on the extent to which the compensation should be adjusted is final. If the PUD does not act within 60 days after the CPUC makes its initial determination, the utility can petition the CPUC to determine that (1) the PUD failed to pursue diligently its rights; (2) its finding as to just compensation is no longer in force; and (3) the utility's reasonable expenditures in connection with the proceedings, which in the CPUC's opinion, could be assessed against the PUD.

3.1.5. First Phase Energy Usage and Demands

During the First Phase, the load on the Project's electrical infrastructure will increase over time. The combined impacts of the proposed power density, peak demand and annual energy usage are summarized in the table below. The resulting power density remains in the residential, low density rural area range of 10- 300 kva/Sq mile.

Table 6: Power Density and Usage

Power Density	Power Density (KVA/Sq mile)	Annual Consumption (MWh)	Peak Demand (MW)
Existing	11	266	0.4
Proposed First Phase	114	25,824	3.7
Proposed First Phase Infrastructure	144	4,735	1.1
Proposed Future Phases	269	28,462	4.5
Proposed First Phase and Future Phases	269	59,021	9.7

In response to the threat of wildfires fires started from overhead wires PG&E's Public Safety Power Shutoff Program[24] is in effect. This program shuts off power to customers under certain conditions related to humidity, wind speed, environmental conditions and on the ground observations. PG&E estimates a Public Safety Power Shutoff event to occur several times per year in PG&E's service area. Because the Project has significant areas within CPUC's Fire-Threat Map[25] areas ,it is anticipated the Project will be subject to

[24] https://www.pge.com/en_US/safety/emergency-preparedness/natural-disaster/wildfires/public-safety-power-shutoff-faq.page, accessed 7/8/2019.
[25] https://www.cpuc.ca.gov/FireThreatMaps/, accessed 7/8/2019.

multiple outages through the Fire Season.

For this reason and to support continuous service to the Project, each area of the Project could be provided with a standby generator to provide essential services to the individual resort properties, and infrastructure systems. In Electrical Infrastructure Options 2, 3 and 4, each switchboard will have standby power available in the event of an extended Public Safety Power Shutoff. When power from PG&E is turned off the standby power's control system will sense the loss of voltage and start the standby supply.

3.1.6. Standby Power

All distribution options include the development of standby power to enable prolonged electricity generation during times of limited on-site generation and/or to limit dependency on PG&E sources. The standby power sources could be batteries ("Energy Storage Systems") or generators with on-site fuel storage or a mix of Energy Storage Systems and generators. Potential fuel sources for the generators include diesel, propone, LNG or CNG. The number of generators required, if any, will be dependent on the types and capabilities of any Energy Storage System(s) included in the final design.

The standby power sources would be developed consisting of some level of generator(s) and/or Energy Storage System(s) with paralleling capabilities. Approximately 30,000 gallons of on-site fuel could be required for each generator depending on the quantity of battery storage containers refined in schematic design.

To cover each water and wastewater facility proposed in the SPOD, a potential total of forty 40-HP generators (30 kW), each with 96 hours of fuel storage could be required. These would be emergency generators with Automatic Transfer Switches or a form of Energy Storage System(s). The IT facilities could require a total of eight 125-kW generators (93 HP), and similarly each would require storage of 96 hours of standby fuel.

Since the standby power sources would only be utilized as necessary, the sources would not have set operating hours. All standby power sources would be tested monthly. The units over 50 HP will, by permit, be limited to 60 hours per year for testing not including emergency operations such as during a PG&E Emergency Power Safety Shutdown.

3.1.7. Alternative Energy Resources

A number of areas at the Project have been identified as appropriate for the development of solar energy systems for generation of the Project's energy needs, as indicated in Figure 4 below.

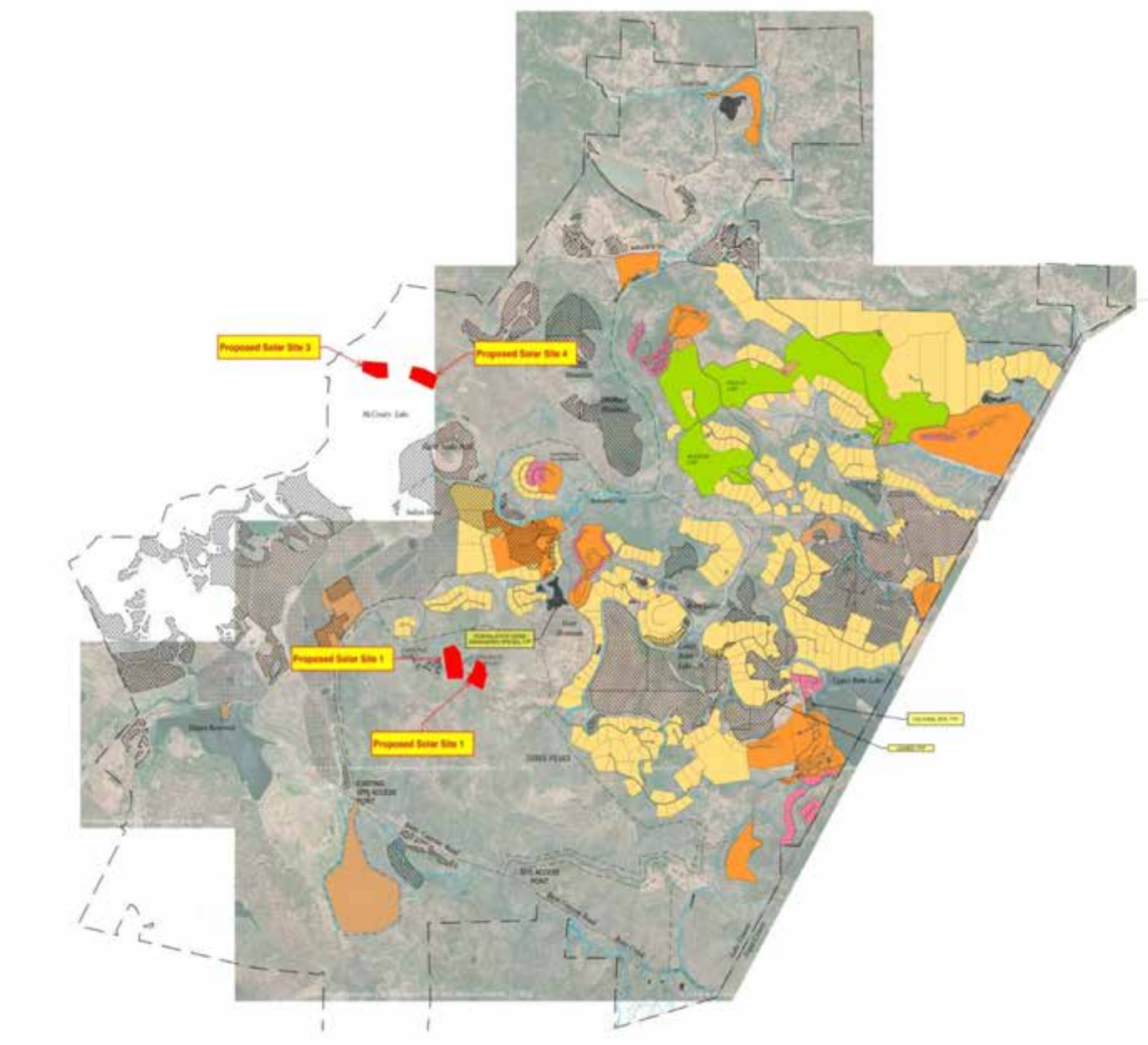


Figure 4. Proposed Solar Sites

Given that California law requires all new residential construction to contain rooftop solar or be provided solar from a community solar system, the development of either rooftop or ground-mounted community solar systems for the residential structures and the applicable contractual requirements related thereto will be a required part of any electrical infrastructure for the Project. Rooftop solar will be integrated into the building architecture as much as possible; in addition, up to four areas within the development area are identified for potential ground mounted solar arrays and associated

equipment.[26]

The maximum size of all ground mounted solar systems that could be built in the Project's development area are as shown in Table 7 below. The selection of the sizes of these ground mounted solar systems will be optimized to meet the needs of the projected energy demands and as the design progresses.

Table 7: Solar Site Maximum Potential

Solar Site	Gross Area (acres)	Maximum Size of Solar Array (MW-AC)
1	15	9
2	10	6
3	10	6
4	11	7
Total	46	28

Battery technology-based Energy Storage Systems will be collocated with the solar fields to optimize discharge and storage of energy. This enables sizing of both the solar arrays and the energy storage such that all energy generated by the solar systems are either used at the instant power is generated or the power is stored in the Energy Storage Systems for use later when the sun has set. Alternate uses of the Energy Storage Systems are to shape the loads, provide grid services, minimize demand and avoid costs that would otherwise be required.

[26] http://www.lakecountyca.gov/Assets/Departments/CDD/Planning/Docs/Guenoc/Maha+SPOD.pdf, page 11 Sustainability Efforts, accessed 7/8/2019.

Figure 5. Solar Sites 1 and 2

The off-site improvements to the electrical infrastructure for these solar systems would require the installation of a Trip Transfer Scheme and include a Panel located at the Middletown Substation, as more fully described in Section 3.1.2 above. A telemetry cable would be required to be installed on existing PG&E poles down Butts Canyon to the point of interconnect. Another utility panel would be required to be installed at the point of interconnect on-site.

On the Project's development area north of McCreary Lake, two ground mounted solar systems could be constructed as shown in Figure 6. Each of the ground mounted solar systems on Solar Sites 3 and 4 could be located on the Project's development area and configured in the manner shown below.

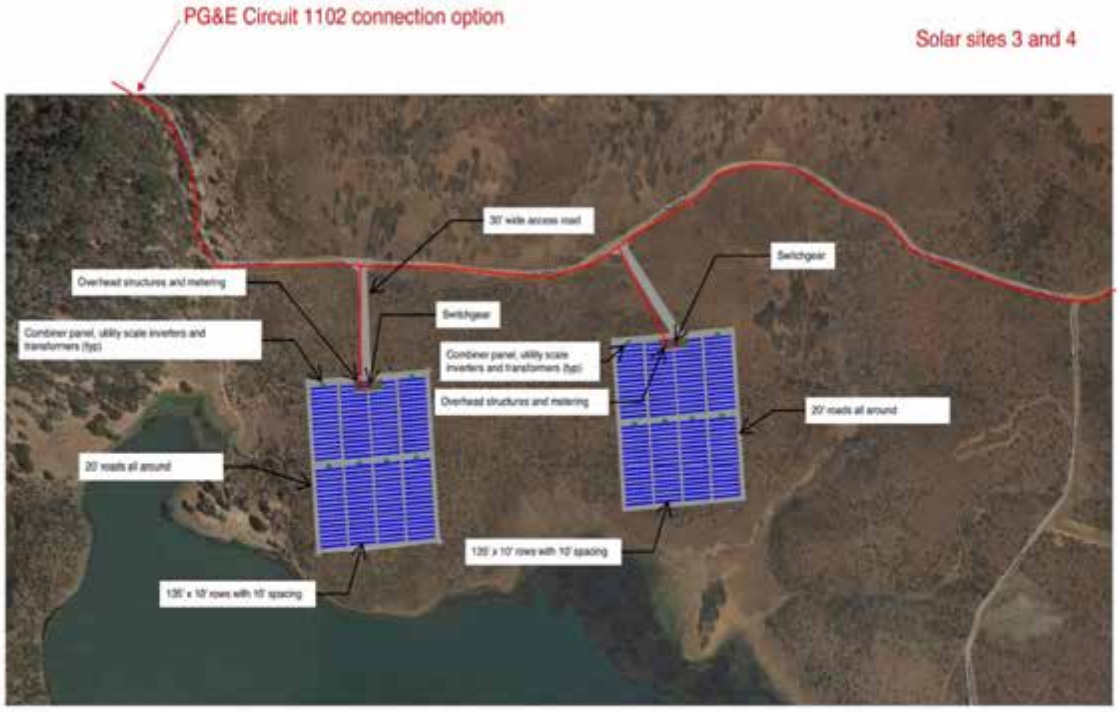


Figure 6. Solar Sites 3 and 4

If Developer elected to maximize the alternative energy resources in the Project's development area, then plans and specifications for approval of the balance of power on all Solar Sites 1 through 4 would add up to the limits of the alternative energy resources of 28 MW as described in Table 7 above. The Developer would be required to work through the PG&E interconnect process to increase capacity of the grid to support any off-site

export from the Project. Additionally, the Developer would be required to work through the CalISO interconnect process to enable power transmission to local utilities, as ultimately desired. The combined work to construct these solar resources would result in modifications to the PG&E infrastructure, as follows: (i) upgrade of the Middletown Transformer to a larger size as shown on Circuit 1103 per Table 2 above; (ii) upgrade electrical buss[27] at Middletown substation to accommodate increased capacity from the Project's solar systems; and (iii) upgrade of the wires on the poles in Butts Canyon per Table 2.

To the extent that Developer elects to construct any alternative energy resources on structures in a manner that relies upon net-energy metering ("NEM") or virtual net energy metering through PG&E, then, new service requests for NEM or RES-BCT developments on Butts Canyon would be required.

3.1.8. Microgrid Operation

A microgrid is a contained energy system capable of balancing captive supply and demand resources to maintain reliability. Microgrids have the following key elements and features:

- Defined by function, not size
- Incorporates multiple distributed technologies
- Maximizes reliability and efficiency
- Can include other utilities – steam, hot water, chilled water, network connectivity
- Can function in "islanded mode" disconnected from larger utility grid

The distribution Options 2, 3 and 4 all include the potential of all or portions of the electrical infrastructure at the Project being developed as alternative energy microgrid(s). Under normal conditions, the on-site micro-grid system(s) could be connected to PG&E with alternative energy systems operating to produce adequate power to both charge batteries and supply all of the power needs for the Project. In such case, the emergency and standby systems would be off unless otherwise needed.

If connected to PG&E, and in the event of a Public Safety Power Shutoff event, when PG&E secures power, the on-site energy systems will continue to serve the microgrid. The emergency and standby systems will operate in the event the microgrid is not available or the demands on the Project exceed available capacity. In distribution Options 2, 3 and 4 the standby systems will be designed to operate for up to five days with all other generation systems in the Project and GVD off.

[27] In electric power distribution, a busbar (also electrical buss) is a metallic strip or bar, typically housed inside switchgear, panel boards, and busway enclosures for local high current power distribution. They are also used to connect high voltage equipment at electrical switchyards, and low voltage equipment in battery banks. They are generally uninsulated, and have sufficient stiffness to be supported in air by insulated pillars. These features allow sufficient cooling of the conductors, and the ability to tap in at various points without creating a new joint.

3.1.9. Offtake of Export Energy & Ancillary Products

Any electricity generation and/or Energy Storage System products in excess of that required for the Project's energy demands, may be exported to a local municipality or Customer Choice Aggregator ("CCA")[28] or utility as determined appropriate. Such export of energy and/or ancillary products is a common feature of alternative energy projects and a component of microgrid operations when functioning in a grid-tied service area, especially due to the intermittent nature of alternative energy resources. Depending on the distribution option selected for the Project, the Developer may elect to connect the Project to the energy grid "in front" of the Project's development area revenue meter in order to enter into a front-of-meter contract to provide one or multiple functions to a CCA or utility, such as a generation resource, energy load or "sink." Front-of-meter contracts are frequent elements of alternative energy developments in California providing important streams of income for cash flow and assisting CCAs and utilities with respect to meeting California's Renewable Procurement Standards ("RPS") and managing intermittent supplies of alternative energy on the grid.[29]

A front-of-meter contract for the solar plus storage at the Project's development area could take the form of an Energy Capacity Sales Agreement or a Hybrid Power Purchase Agreement ("PPA"). Under a Capacity Sales Agreement, a utility or CCA would contract with the Developer for Resource Adequacy benefits or other capacity attributes solely from the Energy Storage System(s) located at the Project. The utility or CCA would purchase only the capacity and capacity attributes form the Energy Storage Systems leaving the Developer free to sell all of the Energy Storage System's and solar products, including energy, ancillary services, etc. to other parties, such as tenants at the Project's development area. The utility or CCA would pay a monthly capacity charge to the Developer, but no variable or energy charge. The Developer would retain the operational

[28] In 2002, California State Legislature passed Assembly Bill 117, enabling Community choice aggregation (CCA). CCA, also known as municipal aggregation, are programs that allow local governments to procure power on behalf of their residents, businesses, and municipal accounts from an alternative supplier while still receiving transmission and distribution service from their existing utility provider. In 2018, six of California's 19 CCAs had PPAs for new renewables.

[29] California's Renewables Portfolio Standard (RPS) was established in 2002 via SB 1078, which required 20 percent of the State's energy portfolio to be supplied by renewable sources such as solar, wind, hydroelectricity, geothermal, and bioenergy renewable energy by 2017. RPS goals have been accelerated over time to require the State's energy portfolio to be supplied by renewable sources in increasingly higher percentages. Since 2011, the RPS target has required all electricity retailers in the state, including CCAs and investor-owned utilities such as PG&E to procure 33 percent of their energy sales from renewable sources by the end of 2020. SB 350, passed in 2015, directs California utilities to further increase the amount of renewable energy to be delivered to customers to 50 percent by 2050. Collectively, PG&E, SCE, and SDG&E met the 33 percent goal in 2016 and are forecasted to reach 50 percent in 2020 (CPUC 2018c). Additionally, California CCAs submitted 2018 RPS compliance reports which showed that of the 19 CCAs that are currently providing energy load, three (15%) have already procured long term contracts above the 65% requirement, four have procured some long-term contracts but need to procure more to meet the 65% requirement, 11 have procured only short-term contracts, and one has not procured any RPS energy.

control and full authority over charging and discharging the Energy Storage System(s). The Developer could agree to certain exceptions, such as the utility or CCA's right to dispatch the Energy Storage System(s) during a limited number of peak hours each year.

Under a Hybrid PPA, the Developer would sell bundled products from the alternative energy generated from the solar systems integrated with some type of Energy Storage System product. Two main types of Hybrid PPAs could be selected. An as-available, take-or-pay Hybrid PPA typically requires the Energy Storage System(s) are only charged by on-site renewable energy generation. The Energy Storage System(s) would be discharged to moderate renewable intermittent energy flows on the grid. The Developer could sell as available energy bundled with other available products such as capacity attributes or RECs to the utility or CCA and would receive a fixed or escalating price in return. Under this type of Hybrid PPA, the utility or CCA typically has full discretion to charge and discharge the Energy Storage Systems, subject to certain operating parameters. The Energy Storage Systems would be designed to satisfy minimum levels of operating and technical requirements assessed based on the Solar Plus Storage Systems' performance in smoothing out energy flows.

Alternatively, the Developer may elect to execute a Hybrid PPA that sells renewable energy generated by the solar sources to the utility or CCA and allows the utility or CCA to decide when to charge and discharge the Energy Storage Systems and whether to charge the Energy Storage Systems from the on-site renewable energy generation or the grid. This type of hybrid PPA provides a grid service to the utility or CCA and is increasing popular with utilities and CCAs in California.

The compensation structures in Hybrid Renewable PPAs vary but typically the Developer would receive either (i) an energy charge ($/MWh) for energy delivered plus a capacity payment in relation to the Energy Storage Systems ($.KW-month) or (ii) just an energy charge ($/MWh), but with an agreed "adder" per MWh to compensate the Developer for the Energy Storage Systems.

In addition to the on-site and off-site improvements that would be required to accommodate the alternative energy resources, as discussed in Sections 3.1.2 and 3.1.6 above, the Developer would begin working through the California ISO interconnection process to enable power transmission to utilities or CCAs, as applicable. Once such processes are completed, the Developer could enter into a negotiation process with a CCA or other type of utility to execute one or more of the above described front-of-meter agreements.

3.2. Electrical Service Infrastructure for Future Phases

As the Future Phases of the Project are developed, the electrical infrastructure implemented in First Phase will be built upon with the goal of maintaining the Project's goals of reliability, clean power and resiliency. The potential development within the new zoning classification GVD

includes additional PV solar, energy storage and other energy generation technology to support the distribution option selected in the First Phase and Future Phases. Infrastructure systems to be built in the First Phase of the Project will support Future Phases.

4.0 OTHER CONSIDERATIONS

4.1 Direct and Indirect Environmental and Community Benefits

All electrical infrastructure developed at the Project as described herein will enable resilience, reliability and consistent power supply and distribution services for the Project. There are many direct and indirect benefits from solar energy, energy storage and microgrids to the Project, ranging from emergency power services to clean air.

In regard to direct environmental benefits, the proposed electrical infrastructure's distribution Options 2 through 4 offers distinct advantages. Option 1 would respond to California state law and generate approximately 2,775 KW of PV solar energy. Options 2 through 4 would go beyond California state law requirements, being the most environmentally superior options, and result in up to 28 MW of clean PV solar energy generated by the Project's electrical infrastructure.

There are also other indirect benefits that could be more readily monetized by the Project regardless of the chosen distribution option. The National Renewable Energy Laboratory ("NREL"), for instance, examined the value that energy storage has in reducing demand charges which are utility charges that are typically based on the peak amount of energy used in a specified time interval. Demand charges are designed to enable the utility to recover costs associated with having to build distribution capacity that is idle except for during peak demand periods. The end user's demand charge is usually set by a formula that considers, among other things, how that end user's peak demand coincides with the grid's peak demand. An end user whose own peak coincides with grid peak pays a higher demand charge.

Demand charges are not trivial. NREL determined that 25% of commercial customers pay demand charges greater than $0.015/kWh.[30] A microgrid can reduce this cost substantially. The Project can manage coincident peak contribution during peak grid times, such as hot summer afternoons. Likewise, the Project could manage peak load contribution for capacity charges and could even sell power back to the grid during peak load periods. Microgrids have been found to be cost-effective based upon indirect value to the community, providing emergency power and clean energy.

[30] *See* J. McLaren et al, "Identifying Potential Markets for Behind the Meter Battery Energy Storage: A Survey of the U.S. Demand Charges." National Renewable Energy Laboratory (2017) https://www.nrel.gov/docs/fy17osti/68963.pdf See also: E. Wood, "Wondering if Energy Storage Can Reduce Your Demand Charges," Microgrid Knowledge, August 24, 2017, found at: https://microgridknowledge.com/demand- charges-energy-storage/

4.2 Energy Impacts[31]

Analysis of the energy impacts reveals there will be a significant increase in energy use on the Project when compared to usage in the agricultural setting today. All aspects of the Project will be built to meet energy use code requirements and systems will be put in place to minimize wasteful, inefficient and unnecessary use of energy resources within the buildings in accordance with the California building and energy codes.

During the construction of First Phase and Future Phases, electrical energy will be consumed in the course of constructing the facility. Overall demolition and construction activities will be analyzed in a separate report prepared by the Developer. Operations will increase electrical consumption on the Project. The Project will be built in phases and the electricity usage will grow over time and generally in accordance with the Table 6.

5.0 CONCLUSION

As can be seen from the analyses presented in this report, the development of the proposed PV solar based electrical infrastructure options for the Project are all technically feasible, meet the needs of the Project and comply with California state law. Each of the four distribution options described herein would meet the energy demand needs of the Project, and the possibility of developing the distribution options in phases is feasible. With PV solar systems as the primary source of energy generation, nearly all of the electrical energy requirements at the Project will be met in an environmentally sound manner.

We have created a work flow for the Project's electrical infrastructure development, which is included in Exhibit A –Work Flow attached hereto. This Work Flow sets forth in detail the specific tasks related to the Project's electrical infrastructure development, the applicable processes related thereto and estimated timelines for completion of the electrical distribution options analyzed in this report.

[31] http://resources.ca.gov/ceqa/docs/2018_CEQA_FINAL_TEXT_122818.pdf, page 30 accessed 7/8/2019.

- EXHIBIT A -
Work Flow

	ELECTRICAL INFRASTRUCTURE DEVELOPMENT ISSUES	ACTION ITEMS & PROCESSES	ESTIMATED TIMEFRAMES
1	Submit Public Draft of EIR	• Finalize DEIR	TBD
2	Developer must purchase from the current utility provider, PG&E, 18 miles of existing PG&E 12 KV circuit (which needs to be either removed or reused).	• Either through Advice Letter process with PG&E & CPUC or the creation of a Public Utility District & CPUC approval or seeking an exemption. • Further legal due diligence required.	TBD
3	Developer must install 25 miles of new joint trench and underground electrical infrastructure in the Project's proposed subdivisions.	• TBD - Dependent on construction timelines, development agreement and other factors still needed to be worked out. • Further legal due diligence required.	TBD
4	Developer must install 8 miles of overhead cables and poles to connect the proposed subdivisions.	• TBD – Dependent on construction timelines, development agreement and other factors still needed to be worked out. • Further legal due diligence required.	TBD
5	Per California law, for all residential structures, Developer must either install PV solar on the rooftops or provide solar through ground-mounted community solar systems.	• Further financial analysis as to best option for Developer would be beneficial here – eg. Financial modeling for Developer owned and operated community solar projects v. if Developer contracts out supply/servicing of solar projects to a third-party to own & operate the systems should be considered. • Whatever method of ownership is selected, this action item will require certain contracts to be drafted/negotiated with third-parties such as EPC contractors, vendors and end-users. Terms of warranties are important considerations in these types of documents. • A community solar ground mounted project would require additional legal work structure. A 20 year minimum commitment required for dedicated solar from any ground mounted project to each residential structure. • If ground mounted community solar project selected, Developer must submit an application to California Energy Commission ("Commission") for approval to administer a community shared solar electric generation or community shared battery storage system to provide partial or total compliance with the onsite electric generation system and/or battery storage system required by Section 150.1 of Title 24, California Code of Regulations, Part 6. The application must demonstrate to the Commission's satisfaction that each of the requirements for Section 10-115(a)1-	TBD: If ground-mounted community solar method selected as the solar installation choice, then such community solar systems must be installed and ready for inspection no later than the time the residential structures are inspected for compliance by the building department. All documentation for the community solar electric generation system and/or community solar battery storage system that is required to demonstrate compliance for the building must be completed prior to building permit applications.

		6 will be meet and shall include detailed explanation of the actions that will be taken by the applicant to ensure that each requirement is met over the period of time specified Section 10-115(a)4 for each building for which a partial or total offset is used to demonstrate compliance. • Further legal due diligence required.	
6	Per California law, all commercial structures must be build "Solar Ready" or, alternatively, Developer can elect to develop ground-mounted community solar projects to supply the commercial buildings' energy needs.	• See similar comments to Item 7 above. • Additionally, if ground mounted solar plus storage micro-grid are created and owner operated, then the development of solar PPAs for the sale of electricity to end user customers will need to occur. • Further legal due diligence required.	TBD
7	Recommendation that Developer install storage (battery type TBD) at every location where PV solar is installed – eg., regardless of choice to do rooftop solar or community solar.	• Further financial analysis as to best option for Developer would be beneficial here. • Decision partly dependent on which distribution option is chosen below. E.g., an independent microgrid requires some type of battery storage paired with the solar. Even if Option 1 is chose, the majority professional opinion in the industry is that solar system should either be sized for a baseload, e.g., never export to PG&E, or add storage to solar because PG&E retail rates extend the payback of a solar system when selling back to PG&E.	TBD
8	Based review of PG&E's Solar Photovoltaic ("PV) and Renewable Auction Mechanism ("RAM") Program Map, the SPOD, and the Project's tentative map, it appears that the construction plans for the Project contain residential and commercial buildings and other accessory features in areas directly over (to be constructed on top of) existing PG&E easements and poles.	• Further legal due diligence required. • Potential coordination/negotiation with PG&E required to reach agreement on moving or co-using the applicable easements and PG&E property over which construction is desired. If the uses do not qualify for a de minimis use exception of PG&E property, either the Advice Letter process with PG&E & CPUC *or* the creation of a Public Utility District & CPUC approval is required.	TBD
9	**Option 1:** The Project's current utility provider, PG&E, would provide the electrical distribution services (metering, distribution, etc.) to all facilities at the Project. This would require Developer to work with PG&E to request that PG&E, in coordination with Developer, build standard subdivision reconnects to the 11 existing PG&E service points on the Project. These subdivision reconnects would be built across the multiple newly created parcels and "remaining parcels" as shown on the tentative subdivision maps for the Project. All commercial properties would be built "Solar Ready" pursuant to applicable California energy code.	• Further legal due diligence required.	TBD

10	**Option 2:** The Project's current utility provider, PG&E, would provide the electrical distribution services (metering, distribution, etc.) to all residential structures at the Project as in Option 1. However, for the commercial and other accessory features at the Project, PG&E would only provide a single delivery point to the Project at the service entrance designated as "Back of House." From this point, Developer would construct, own and operate new meters and distribution lines to each of the 12 commercial facilities at the Project and to each of the 57 other resort accessory features consisting of water wells, waste water treatment plants, cell towers and IT features. This option would allow for Developer to own and operate "behind the meter" solar plus storage microgrids for all commercial and resort accessory features. Four locations at the Project have been identified as available for ground mounted solar plus storage systems. The independent micro-grids could function independent of PG&E, and could also still utilize PG&E as backup, energy storage, emergency services, and/or any other grid-tied services desired per the final Project's design.	• The development of independent behind the meter solar plus storage microgrids for the commercial and other facilities at the Project could be accomplished with the projects owned by Developer and the electricity sold to the lessors of the buildings at the Project through traditional solar Power Purchase Agreements ("PPAs). The development of such PPA documents would be relatively straightforward given the lack of apparent tax equity investor and Developer's position of also owning the land and buildings; however, the transactional documents would still require a certain amount of time to set up from a legal perspective. • Further legal due diligence required.	TBD
11	**Option 3:** This option envisions that Developer would create a "Public Utility District" that would supply power, own all of the electrical infrastructure and provide related services to all of the residential, commercial and accessory buildings and features at the Project. This option includes behind the meter solar for commercial facilities at the central solar locations to enable community solar and community storage to meet the Project's aesthetic goal related to no solar on roofs. Between one to four ground mounted solar plus storage solar systems would be located at the Project, which collectively could generate enough electric supply for the Project's entire energy needs. Similar to Option 2, PG&E would provide a single delivery point to the Project at the service entrance designated as "Back of House" and the "remainder parcels" including roads connecting the commercial properties would be recorded as a single parcel or multiple parcel's with a designated network of easements to accommodate the micro-grid design.	• Finish feasibility study. • Further legal due diligence / analysis required. • Conduct study with legal input to estimate the value of the electric distribution system. • Hold referendum to create District. • Potentially hire third-party to assist with running the day to day operations of the Public Utility District. • Construct, own and operate community solar and storage systems at the Project. • Ongoing operations and maintenance obligations of electrical infrastructure required. • Evaluate financing alternatives for any debt desired/required for the acquisition of District/utility assets. • Exercise rights to acquire PG&E easements and property for District.	TBD: Uncertain and lengthy process.
12	**Option 4:** This option would provide for a hybrid of Options 2 and 3, wherein Developer would create and own solar	• Similar comments to 13 and 14 above	TBD

	plus storage micro-grids that would be constructed for all or certain commercial structures at the Project similar to Option 2. PG&E would service all residential lots at the Project. All commercial facilities served by the privately owned micro-grids would be serviced through traditional solar Power Purchase Agreements ("PPAs") until the formation of the Public Utility District is completed. Under this option, the Project's electrical infrastructure would begin, at least in certain areas of the Project, while the extensive formation processes related to setting up a Public Utility District is accomplished. Option 4 would provide for a phased approach to the development of the Project's distribution infrastructure and include the potential sale of the solar plus storage systems to the Public Utility District at a later date, if desired.		

APPENDIX FIRE

GUENOC VALLEY WILDFIRE PREVENTION PLAN

MAHÁ

GUENOC VALLEY

DRAFT WILDFIRE PREVENTION PLAN

FOR THE FIRST PHASE OF THE
MAHA RESORT AT GUENOC VALLEY

FEBRUARY 5, 2020

ACKNOWLEDGMENTS

The *Maha Guenoc Valley Wildfire Prevention Plan* was created as part of collaborative effort between the County of Lake, representatives from the California Department of Forestry & Fire Protection (CAL FIRE), design and engineering teams, and grazing consultants. The group relied upon local knowledge and trusted resources to identify the key fire risks throughout the site and then develop an innovative and comprehensive wildfire prevention strategy.

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Note: Site plans throughout this document are intended to demonstrate key wildfire prevention concepts. Final site plans are subject to change; please refer to the tentative and final maps for detailed site plan information, including parcel layouts and circulation alignments. In addition, the wildfire prevention commitments for the McCain Canyon entry road option are detailed in the McCain Canyon entry road grading plan.

OVERVIEW

GOALS & INTENT

The Maha Resort at Guenoc Valley is situated in a unique northern California landscape. The site's hills and valleys filled with oak woodlands, grasslands, vineyards, and grazing pastures will create an exceptional visitor and resident experience. Yet, this same setting also presents critical wildfire risks. A development of this size and expense requires a comprehensive approach to protect the environment and buildings from wildfire damage.

The *Maha Guenoc Valley Wildfire Prevention Plan* presents an integrated approach to wildfire management throughout the project site. This plan includes a thorough consideration of the site's wildfire history as well as vegetative, topographic, and climatic wildfire risks. These risk patterns inform a series of essential wildfire prevention strategies for all components of the project. This includes innovative concepts and commitments that will contribute to a wildfire resilient setting. For example, goat, sheep, and cattle will reach many hard-to-access areas of the property to graze dry grasses and reduce understory vegetation, both of which are significant wildfire risk factors. As determined by the Homeowner's Association, the project site will additionally be protected with fire breaks along the roadway network as well as along unprotected areas of the property boundary. In the case of an actual wildfire, the on-site emergency response system will quickly be deployed–which includes everything from high-definition fire detection cameras to an on-site emergency and fire response center.

These efforts will be part of an overall commitment to developing long-term wildfire resilience through innovative partnerships, research, and strategies. The resort will follow the guidance and establish collaborations with the County of Lake, the California Department of Forestry & Fire Protection (CAL FIRE) and the local fire department, South Lake County Fire, to continuously improve the wildfire prevention plan. These actions will all contribute to the resort's plege to become a Firewise Community as designated by the National Fire Protection Association (NFPA), which will reinforce the long-term ability to address wildfire risk. With comprehensive and careful planning, Maha Resort at Guenoc Valley will offer an dynamic and effective ability to reduce wildfire risk for all residents, visitors, and workers.

OVERVIEW
COMPREHENSIVE WILDFIRE PREVENTION SITE PLAN

The *Maha Guenoc Valley Wildfire Prevention Plan* establishes a comprehensive approach to wildfire management throughout the project site. Each section of this plan will provide a brief introduction to the following wildfire prevention strategies.

- **PRIMARY TWO-WAY ACCESS ROADWAYS & FIRE BREAKS***
- **VOLUNTARY PROPERTY BOUNDARY FIRE BREAKS***
- **ACTIVE LANDSCAPE MANAGEMENT FUEL REDUCTION**
  GRAZING AND MANUAL VEGETATION REMOVAL
- **RESIDENTIAL/RESORT/FACILITY FUEL REDUCTION**
  STRUCTURE FIRE SPRINKLERS AND STRICT FUEL REDUCTION ZONES
- **IRRIGATED RECREATIONAL FIRE BREAKS**
  EQUESTRIAN FIELDS AND GOLF COURSE GREENS
- **IRRIGATED VINEYARDS FIRE BREAKS**
  CURRENTLY PLANTED IN DEVELOPMENT AREAS AND AREAS LONG-TERM LEASED BY THIRD PARTY
- **POTENTIAL IRRIGATED VINEYARDS FIRE BREAKS**
  IN AREAS LONG-TERM LEASED BY THIRD PARTY
- **EXISTING RANCH ROADWAYS**
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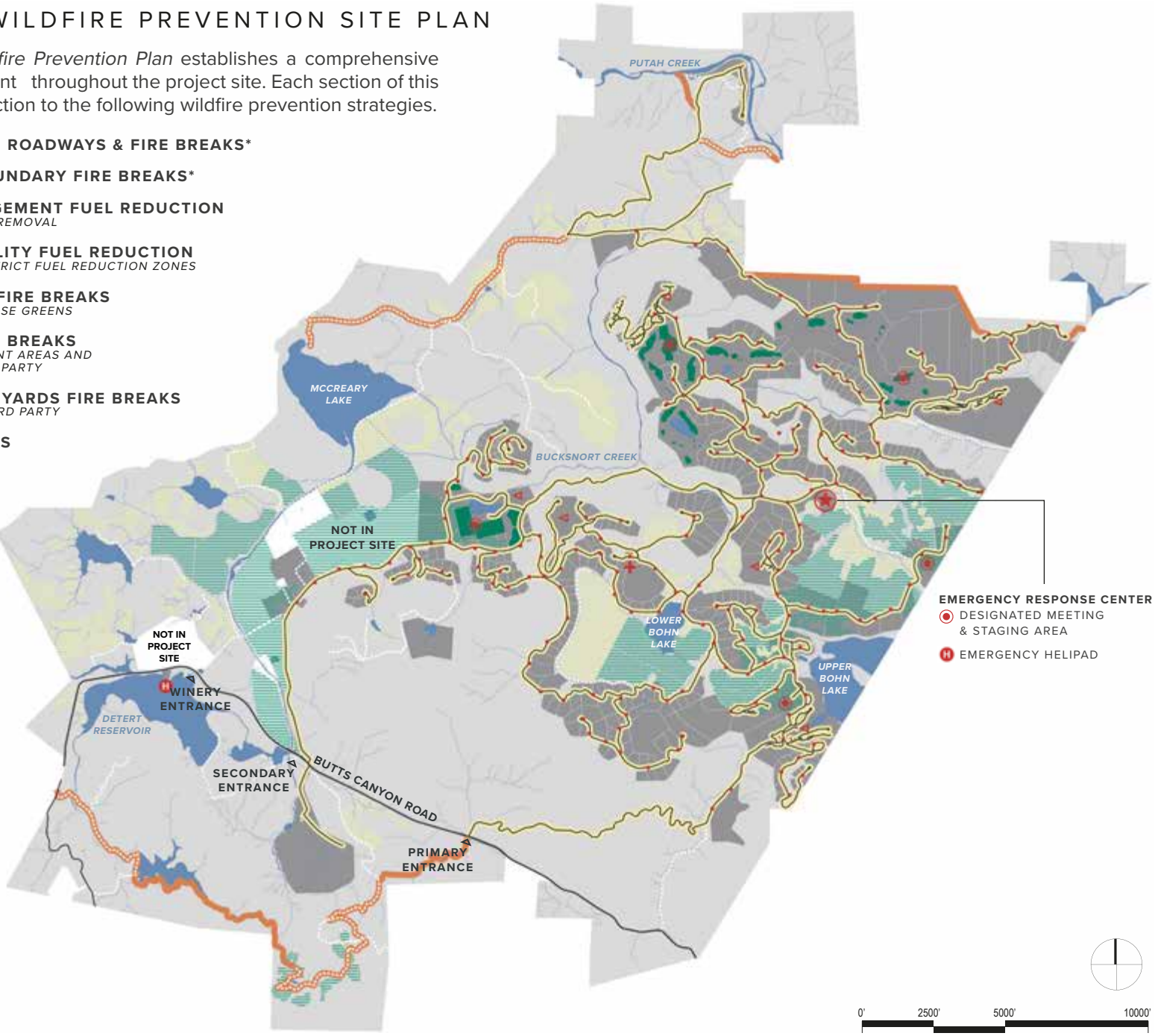
- **EMERGENCY RESPONSE CENTER**
- **EARLY DETECTION SYSTEM**
  HIGH-DEFINITION CAMERA
- **EMERGENCY NOTIFICATION SIREN SYSTEM**
  EXACT LOCATIONS TBD
- **DESIGNATED MEETING & STAGING AREA**
- **HELIPADS**
- **FIRE HYDRANTS**
- **WATER SOURCES**
  RESERVOIRS, LAKES, PONDS, CREEKS & STREAMS

**To be constructed at the discretion of the Homeowner's Association if and when necessary*



OVERVIEW
IMPLEMENTATION & MANAGEMENT

The *Maha Guenoc Valley Wildfire Prevention Plan* will create a comprehensive framework to guide the plan's continuous development, implementation, and management. Beyond meeting code requirements defined by the County of Lake and the State of California, the project team will work closely with the California Department of Forestry & Fire Protection (CAL FIRE) and the local fire department, South Lake County Fire, to continuously identify strategies to improve the wildfire prevention plan.

The plan will be implemented through the resort's Covenants, Conditions, & Restrictions (CC&Rs), development agreement, and Guenoc Vally District (GVD) zoning ordinance documents, which will all be overseen by the County of Lake through the development permitting process. The resort's residential homeowner's association (HOA) will provide ongoing oversight of the plan's management, operations, and enforcement. The ability for this organization to oversee the wildfire plan will be specified within the resort's CC&Rs.

SITE CONTEXT
PROJECT SETTING & HISTORY

The Maha Resort at Guenoc Valley is located approximately 100 miles north of the Bay Area in the agricultural and viticultural region of North–central California. The resort is located in the southeastern corner of the County of Lake, three miles southeast of Middletown and on Napa County's northern border.

Guenoc Valley, a small inland valley, is comprised of varying landscapes and conditions. The valley experiences greater seasonal temperature extremes than neighboring areas, and has a wide range of elevation changes throughout the property. These varying elevations support various vegetation types and uses; a series of vineyards generally cover the lower areas and slopes, while oak woodlands, grasslands, and chaparral covered hillsides offer plenty of opportunities for livestock grazing.

At approximately 16,000 acres, the resort site remains one of the largest privately owned properties in the state of California. The property first came to public attention when a portion of the ranch was owned by the British Actress, Lillie Langtry. Through the years the land has continued to be utilized for outdoor recreational pursuits, vineyards, and agriculture.

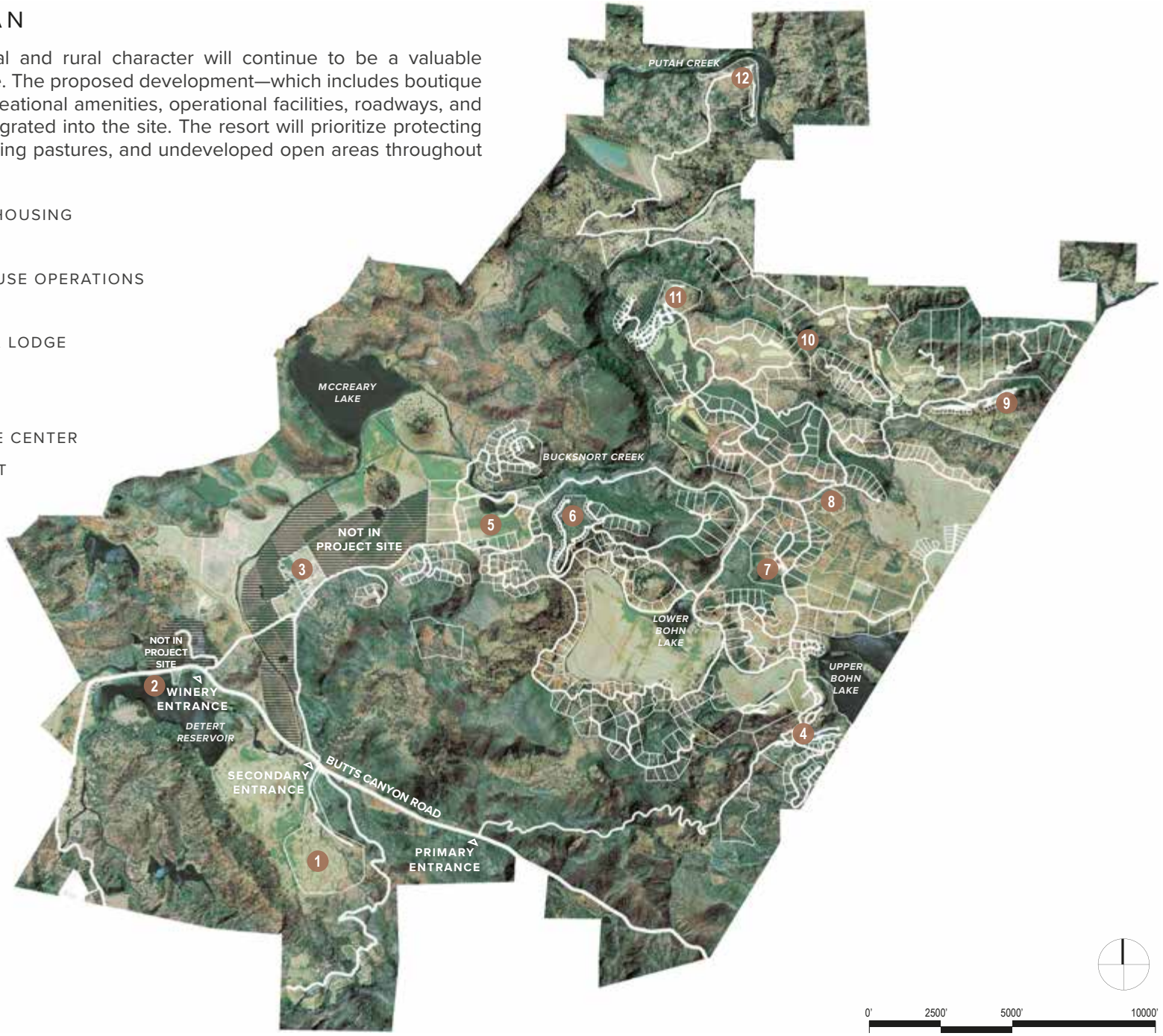
PROJECT SITE LOCATION

In resort site is located approximately 100 miles north of the Bay Area on the border of Napa and Lake County with close access to Clearlake and Santa Rosa.

SITE CONTEXT
PROJECT SITE PLAN

This site's inherent agricultural and rural character will continue to be a valuable aspect of the resort experience. The proposed development—which includes boutique hotels, residential estates, recreational amenities, operational facilities, roadways, and trailways—will be carefully integrated into the site. The resort will prioritize protecting and enhancing vineyards, grazing pastures, and undeveloped open areas throughout the development process.

1 ON-SITE WORKFORCE HOUSING
2 AERIAL SITE ACCESS
3 CENTRAL BACK-OF-HOUSE OPERATIONS
4 MAHA FARM
5 EQUESTRIAN CENTER & LODGE
6 BOHN RIDGE RESORT
7 SPA & WELLNESS
8 EMERGENCY RESPONSE CENTER
9 RESORT AT TROUT FLAT
10 GOLF COURSE
11 RED HILL RESORT
12 TENT CAMP AREA

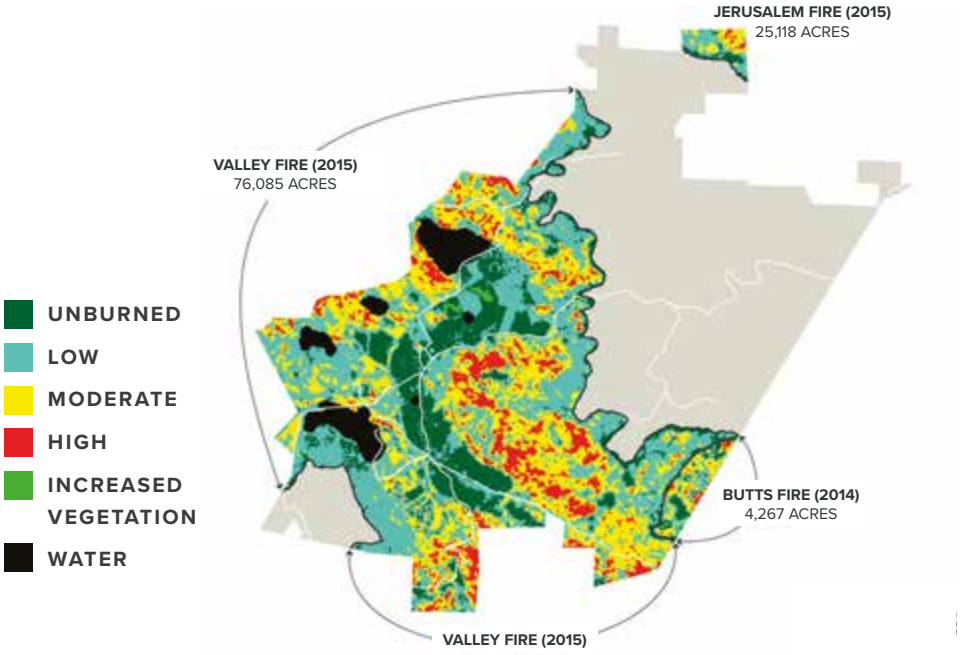


SITE CONTEXT
WILDFIRE HISTORY

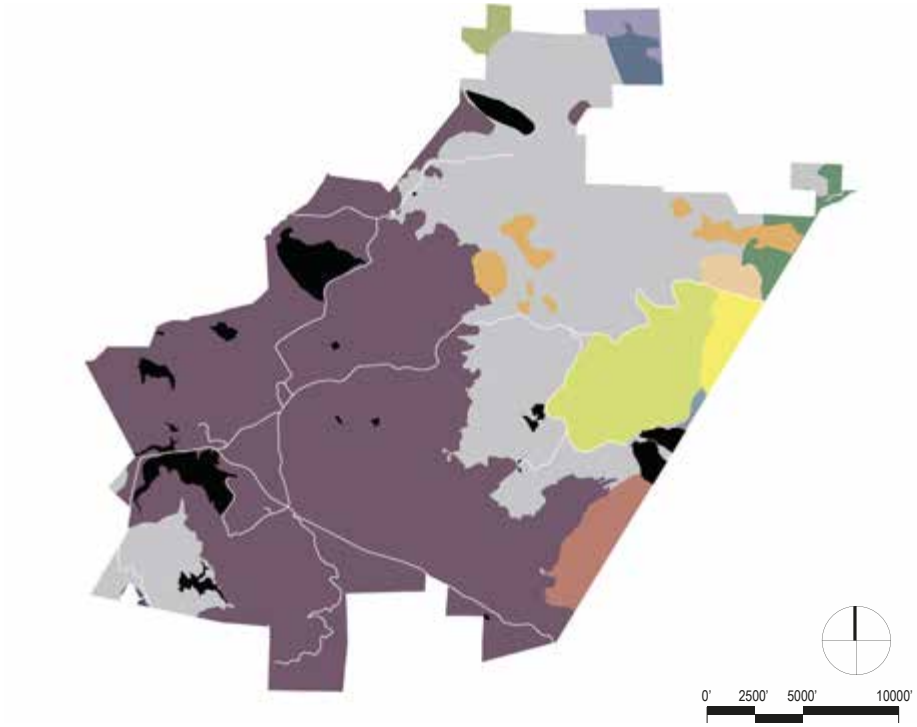
Guenoc Valley is located in a fire prone region of California. Although wildfire is a year-round possibility, risk increases during the late summer into the fall. During this time of the year, hot days with a lack of precipitation dries out vegetation, which increases the risk for wildfire, particularly during windy days. Climate change could further affect these risk factor patterns.

Wildfires have affected the site throughout its history. Since the 1950s, fires of varying size and intensity have burned parts of the project site. A few of the more recent fires, including the Butts Fire in 2014 and the Jerusalem and Valley Fires in 2015, were large-scale fires which spread from off-site and affected large portions of the site as well as nearby properties. In particular, the Valley Fire caused wide-spread damage to the southern portion of the site, particularly along Butts Canyon Road. These affects are still visible and present today.

The scale, severity, and effects of the most recent wildfires are all important considerations in developing a rigorous wildfire prevention strategy.



BURN SEVERITY OF MOST RECENT WILDFIRES
SOURCE: National Burn Severity Mapping Project, National Park Service - U.S. Geologic Survey, 2014 and 2015



SITE WILDFIRE HISTORY SINCE 1950s
SOURCE: California Fire Return Interval Departure (FRID), USDA Forest Service, Pacific Southwest Region, 2012 with 2016 update

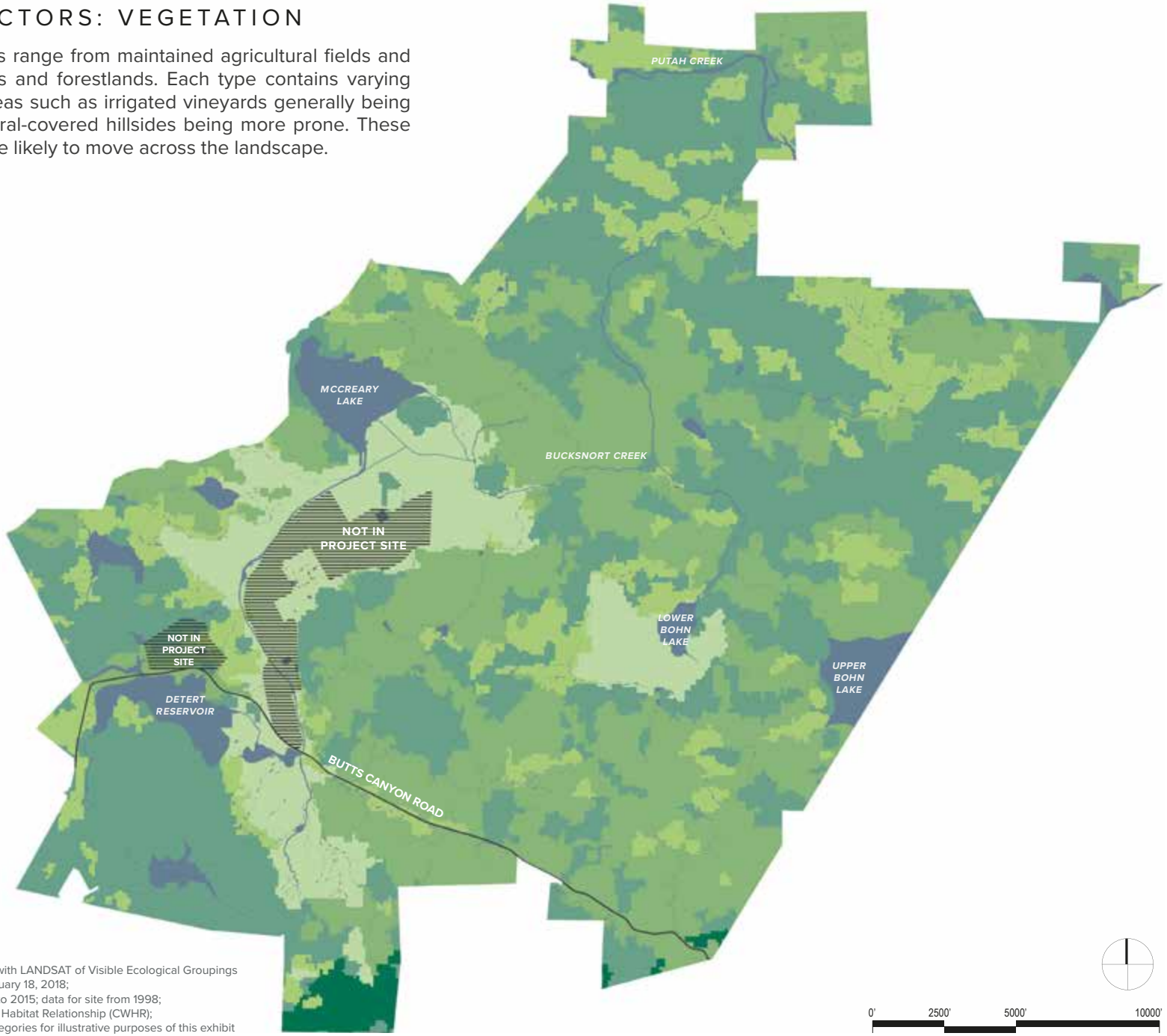
SITE CONTEXT

WILDFIRE RISK FACTORS: VEGETATION

The dominant vegetation types range from maintained agricultural fields and vineyards to dense woodlands and forestlands. Each type contains varying levels of wildfire fuels, with areas such as irrigated vineyards generally being less prone to fires and chaparral-covered hillsides being more prone. These patterns affect how wildfires are likely to move across the landscape.

VEGETATION COVERAGE

- **AGRICULTURE**
- **GRASSLANDS**
- **CHAPARRAL**
- **OAK WOODLANDS**
- **GENERAL FORESTLANDS**
- **WATER**

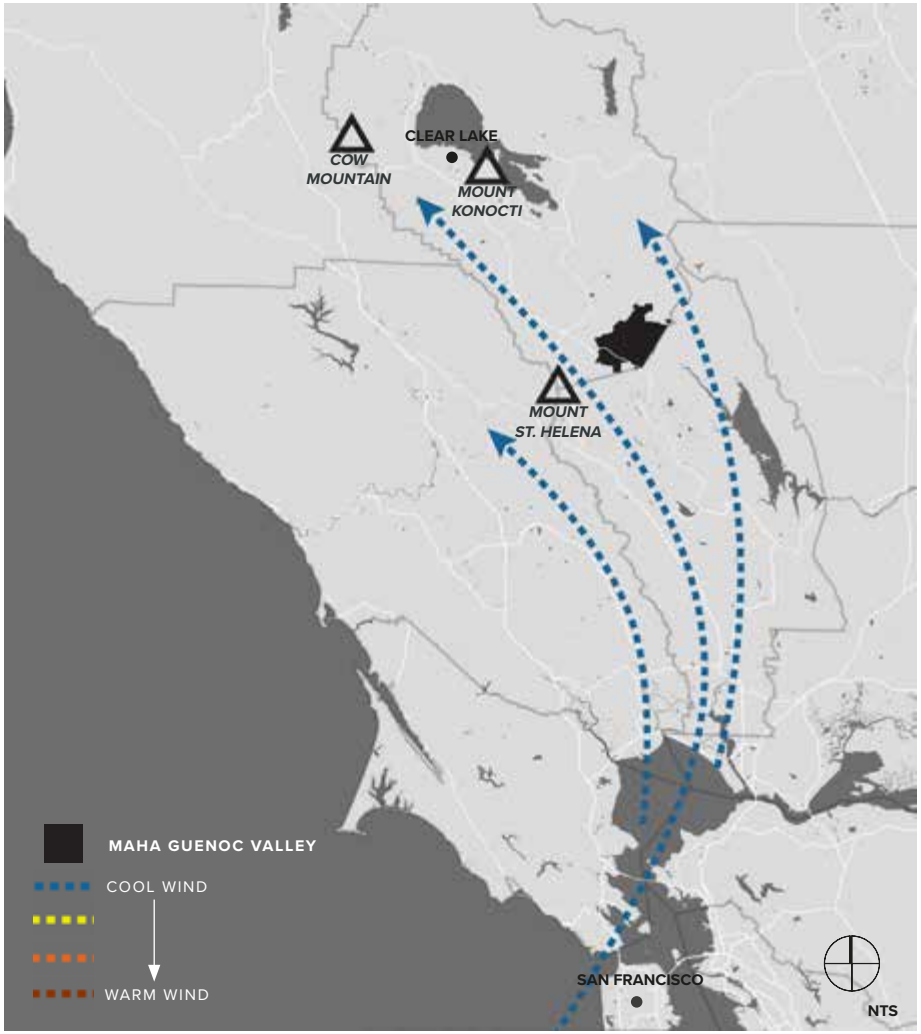


SOURCE:
U.S. Forest Service, Classification and Assessment with LANDSAT of Visible Ecological Groupings (CALVEG), EVeg Mid Region 5 North Coast Mid, January 18, 2018;
data source information ranges from the year 1998 to 2015; data for site from 1998;
data source crosswalked with the California Wildlife Habitat Relationship (CWHR);
CWHR categories simplified to the above seven categories for illustrative purposes of this exhibit

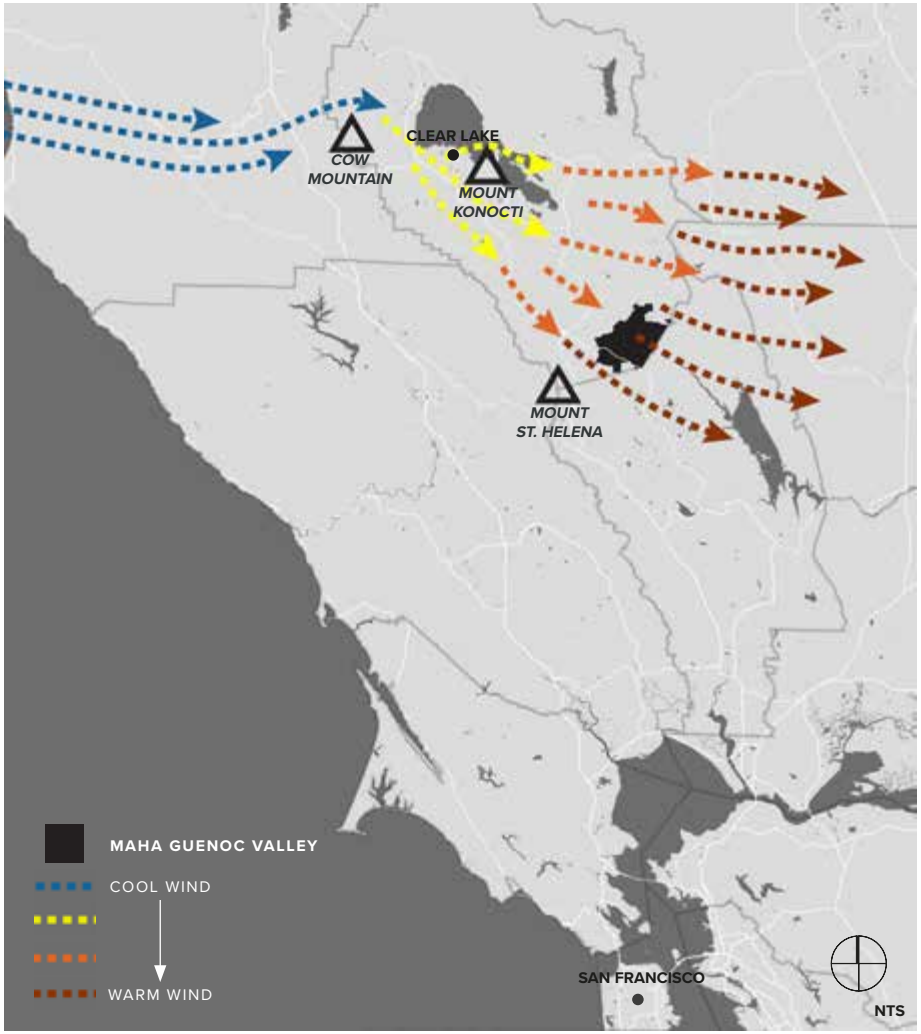
SITE CONTEXT
WILDFIRE RISK FACTORS: REGIONAL WIND PATTERNS

Windy conditions during the fire season increase the likelihood of fires erupting, rapidly escalating, and increasing in intensity and scale. Depending on various climatic conditions, regional wind patterns may vary seasonally and even daily. However, the resort site is primarily affected by two regional wind patterns: the Konocti Winds and Diablo Winds.

The Konocti Winds, as shown below, affect the site with varying morning and afternoon wind patterns. In the morning, wind typically flows northward from the Bay Area. In the afternoon, cool air flows eastward from the coast over Cow Mountain and towards Clear Lake, splits around Mount Konocti, and then increases in speed and temperature as it flows southwards towards Highway 20, Morgan Valley, and Guenoc Valley.



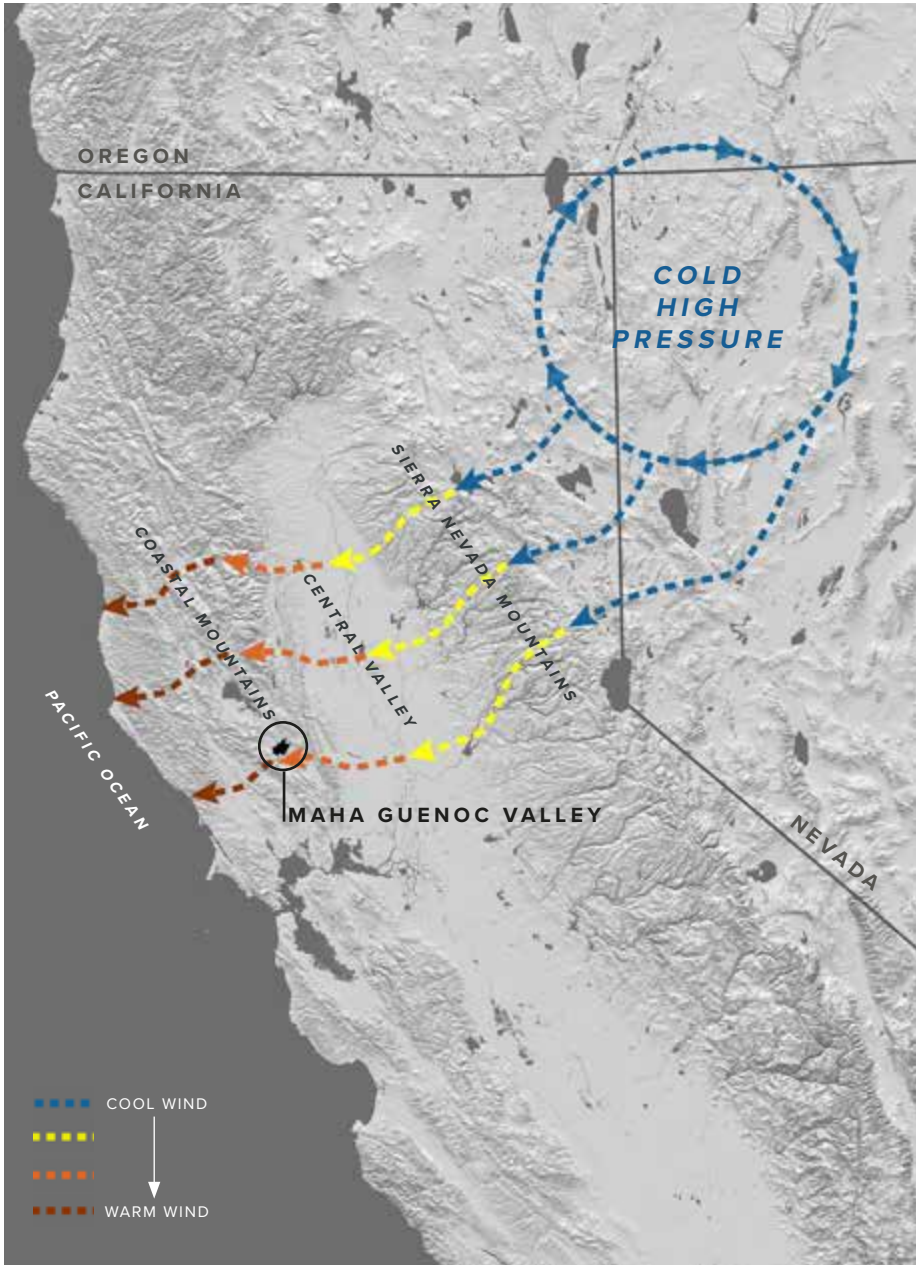
MORNING KONOCTI WIND PATTERNS
SUNRISE – NOON



AFTERNOON KONOCTI WIND PATTERNS
NOON – SUNSET

SOURCE:
South Lake County Fire Protection District and National Weather Service San Francisco Bay Area, 2019

SITE CONTEXT
WILDFIRE RISK FACTORS: REGIONAL WIND PATTERNS



DIABLO WIND PATTERNS

As shown on the right, the resort site is also subject to the Diablo Winds. This wind pattern begins in the Great Basin area of Nevada and Utah. The jet stream pushes cool, high pressure air from the area down to California. Once crossing over and cascading down the Sierra Nevada mountain range, the air increases in temperature and decreases in humidity; the air continues to increase in temperature as it crosses the Central Valley.

Finally, the warm air increases in speed as it pushes between narrow gaps in the Coastal Mountain ranges towards the Pacific Ocean. This pattern primarily affects the region during high fire risk seasons in the fall and winter.

FIRE WEATHER WATHCES & RED FLAG WARNINGS

When certain climate conditions combine, the National Weather Service may issue either a Fire Weather Watch or a Red Flag Warning.

A **Fire Weather Watch** indicates that local conditions resulting in extreme fire could occur in the next 12 - 72 hours. Wildfires are possible, but not imminent or currently occurring.

A **Red Flag Warning**—the highest and most serious type of alert—indicates to residents that local conditions may result in extreme fire behavior within 24 hours. Wilfires are ongoing or may begin shortly.

Various combinations of climate conditions can result in either a watch or warning, including:

- Low relative humidity
- Strong winds
- Dry fuels
- Potential for dry lightening strikes

During both Fire Weather Watches and Red Flag Warnings, residents are urged to practice extreme caution, as major wildfires could be started with a simple spark.

SOURCE:
California Department of Forestry & Fire Protection, “Red Flag Warning & Fire Weather Watches,” 2019
National Oceanic and Atmospheric Administration: National Weather Service, “Understanding Wildfire Warnings, Watches and Behavior,” 2019
San Francisco Chronicle, “Are infamous Diablo winds responsible for recent wildfires?,” 2019

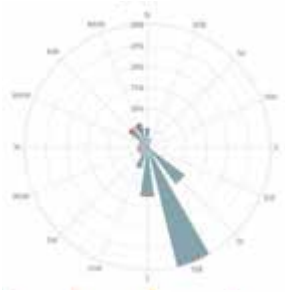
SITE CONTEXT

WILDFIRE RISK FACTORS: LOCAL WIND PATTERNS

While affected by the larger Konocti and Diablo wind patterns, the resort site's topography and microclimates also contribute to unique wind conditions. The wind patterns shown in this map are based on three local wind stations and demonstrate a likely wind condition for a typical day during the July through November fire season. Depending on a variety of climatic conditions, local wind patterns could easily change direction and speed and affect the spread of potential wildfires.

WIND DIRECTION

1 LOWER BOHN

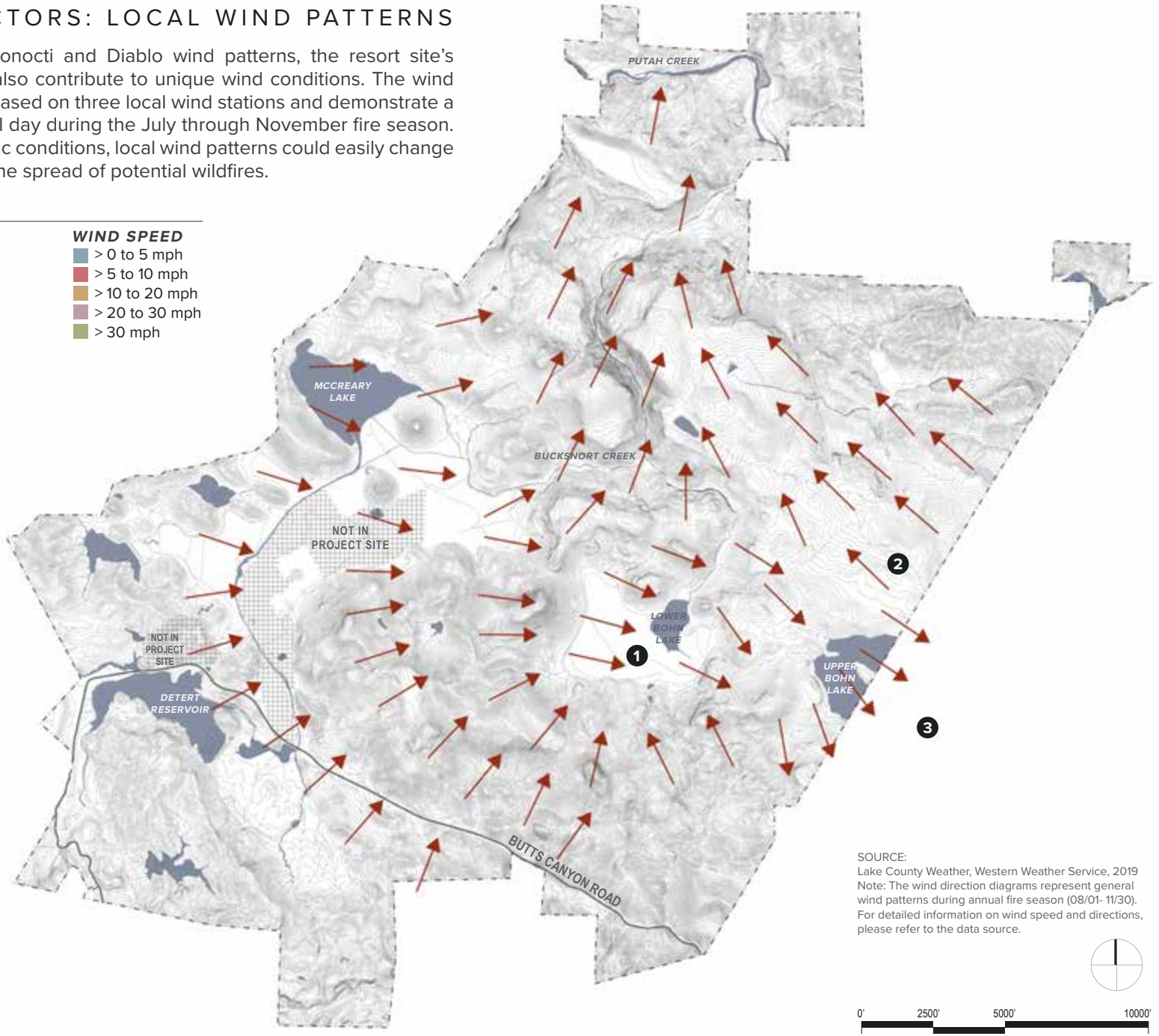


2 UPPER BOHN NORTH

3 UPPER BOHN SOUTH

WIND SPEED

- > 0 to 5 mph
- > 5 to 10 mph
- > 10 to 20 mph
- > 20 to 30 mph
- > 30 mph



SOURCE:
Lake County Weather, Western Weather Service, 2019
Note: The wind direction diagrams represent general wind patterns during annual fire season (08/01- 11/30). For detailed information on wind speed and directions, please refer to the data source.

0' 2500' 5000' 10000'

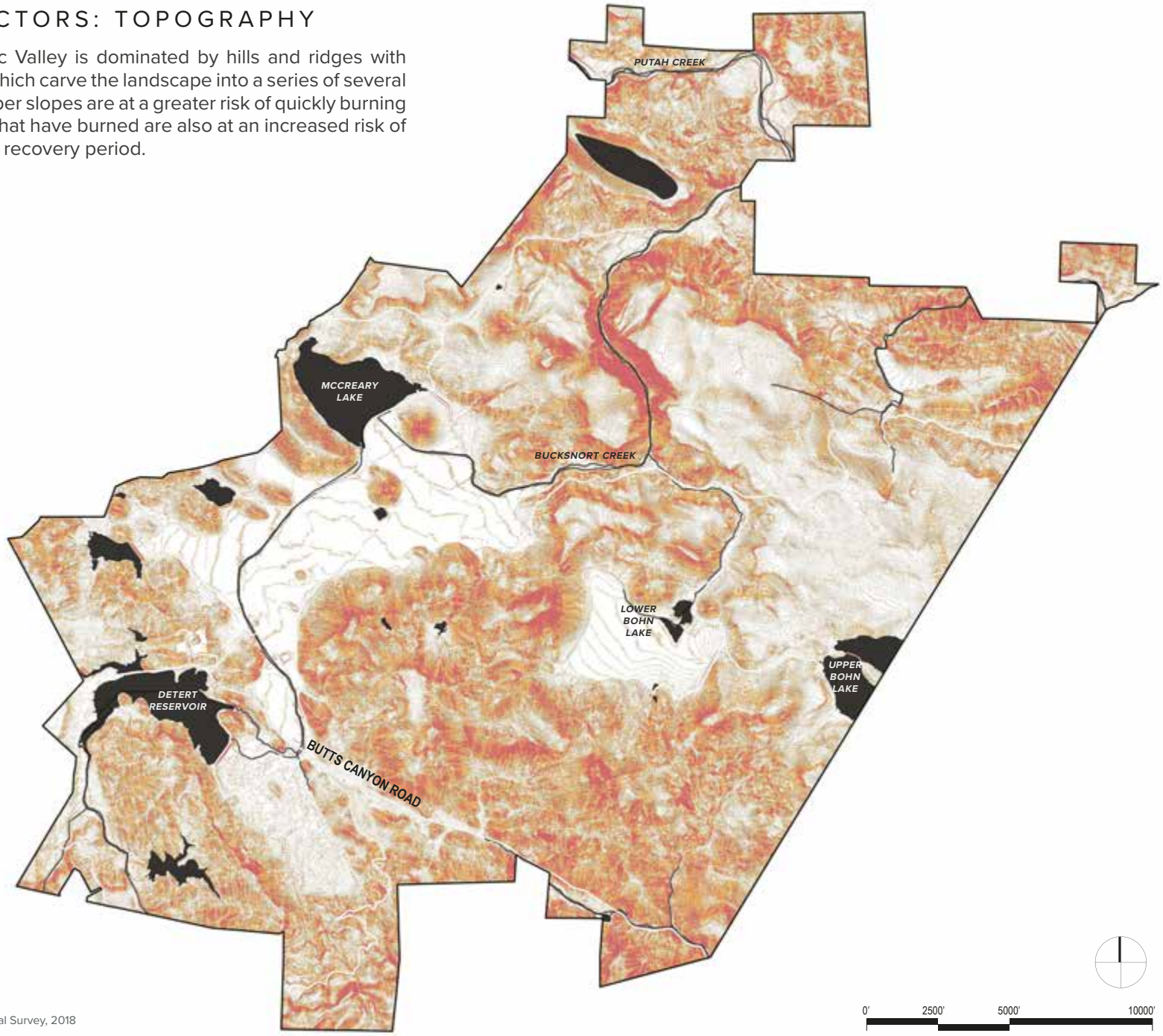
SITE CONTEXT

WILDFIRE RISK FACTORS: TOPOGRAPHY

A significant portion of Guenoc Valley is dominated by hills and ridges with slopes exceeding 30 percent, which carve the landscape into a series of several smaller valleys. Areas with steeper slopes are at a greater risk of quickly burning during a wildfire. Steep slopes that have burned are also at an increased risk of erosion during the post-wildfire recovery period.

SLOPE PERCENTAGE

- 0-5%
- 5-10%
- 10-20%
- 20-30%
- 30-50%
- 50%+



SOURCE:
1 meter Digital Elevation Model (DEM), U.S. Geological Survey, 2018

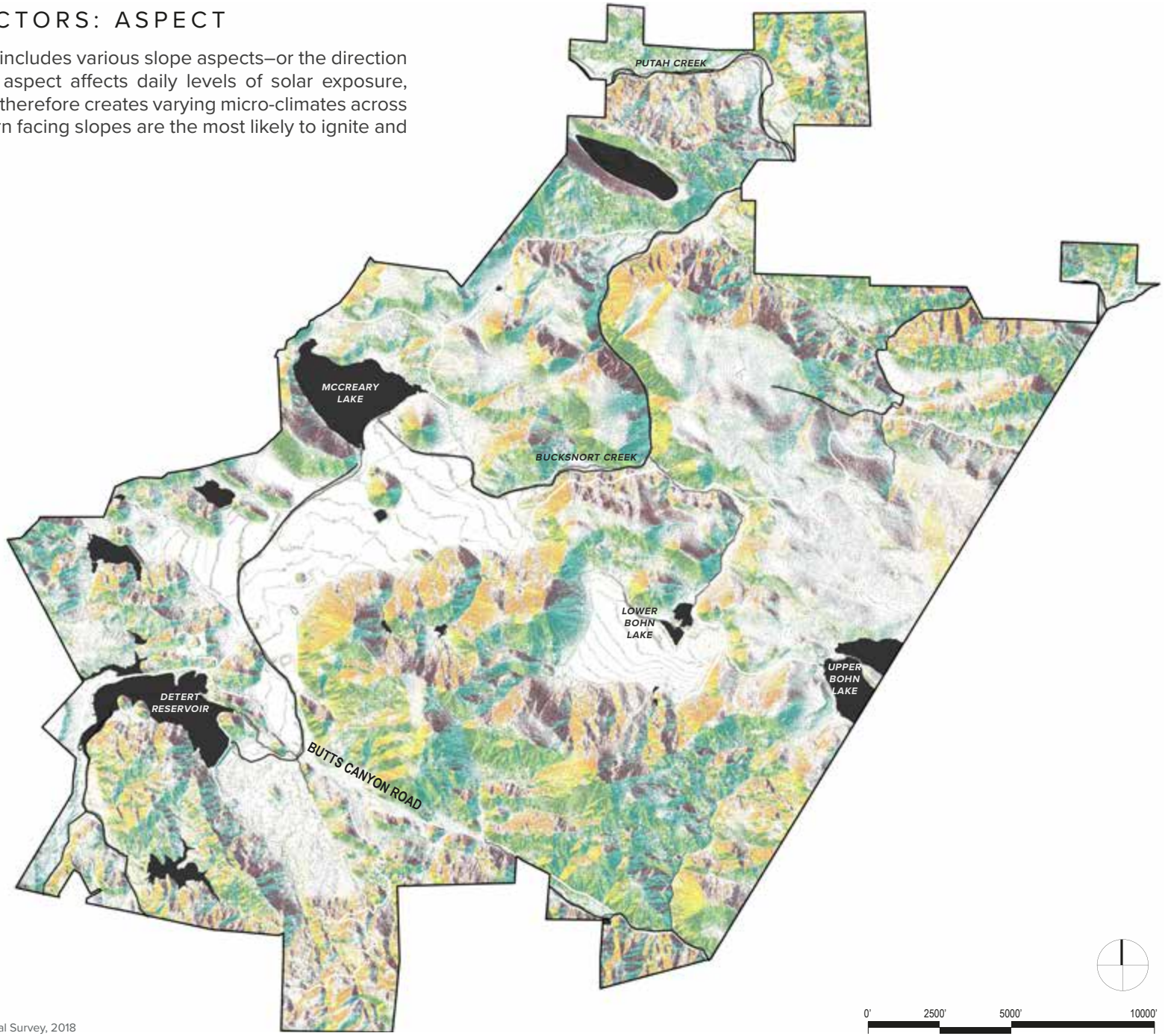
SITE CONTEXT

WILDFIRE RISK FACTORS: ASPECT

The resort site's diverse terrain includes various slope aspects–or the direction that a slope faces. The slope aspect affects daily levels of solar exposure, humidity, and temperature, and therefore creates varying micro-climates across the site. South and southwestern facing slopes are the most likely to ignite and burn.

ASPECT

- FLAT
- NORTH
- NORTHEAST
- EAST
- SOUTHEAST
- SOUTH
- SOUTHWEST
- WEST
- NORTHWEST



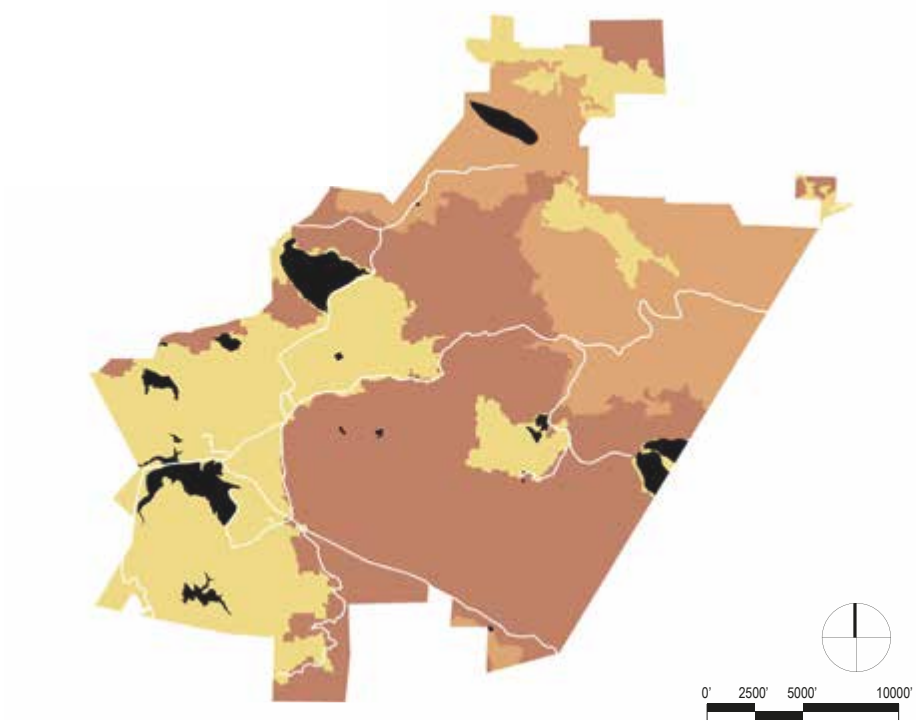
SOURCE:
1 meter Digital Elevation Model (DEM), U.S. Geological Survey, 2018

SITE CONTEXT
WILDFIRE RISK SEVERITY

The specific factors that affect wildfire risk are complicated. A wide range of topographic and landscape conditions create a complex environment to predict and prepare for potential wildfires.

Various risk factors—including those described in the preceding pages—are considered in developing CAL FIRE's Fire Hazard Severity Zones rating system and map. This rating system situates the resort site in a moderate to very high severity zone. The highest risk areas are in the southeast and central parts of the site. These areas have the steepest slopes, are more likely to have a chaparral vegetation coverage, and are exposed to northern-moving winds.

Given the connection between fire risk and slopes, the site's lower risk locations tend to be the flatter valley areas to southwest and northeast. This risk is further reduced where the land is more actively cultivated with vineyards and others farming practices. The areas around the site's many water bodies also generally have a lower risk severity.



FIRE HAZARD SEVERITY ZONES
SOURCE: Lake County Fire Hazard Severity Map, CAL FIRE, 2007

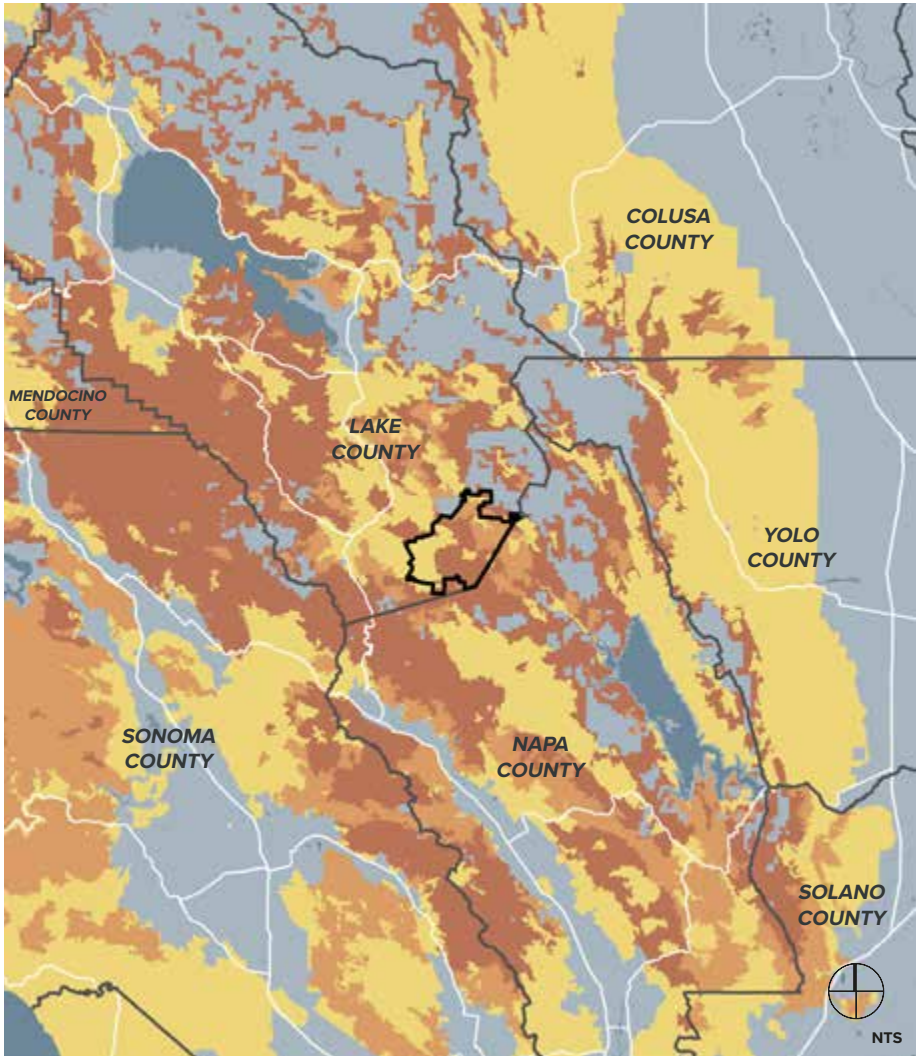
- MODERATE SEVERITY
- HIGH SEVERITY
- VERY HIGH SEVERITY

SITE CONTEXT
WILDFIRE REGIONAL RISK

Cataloging environmental risks is the first step to successfully develop a wildfire prevention plan. However, even with the best research and preparation within the site, fires on neighboring properties can rapidly move across the property boundaries.

While Guenoc Valley's setting is an inherent part of its attraction, the surrounding rural landscapes can also increase the site's wildfire risk. The property is bordered by ranches, pastures, woodlands, and forests with various levels of fire hazard severity. The northern edge of the property is adjacent to the Snow Mountain National Monument, an area of land stretching across approximately 330,000 acres and managed by the Bureau of Land Management (BLM).

The minimally managed landscapes within these neighboring areas tend to have less rigorous wildfire prevention practices, which can result in larger fuel reserves. As detailed in the following pages, additional precautions will be taken along the property boundaries where the risk of fires spreading onto the site is greater.



FIRE HAZARD SEVERITY ZONES

SOURCE: California Fire Hazard Severity Map, CAL FIRE, 2007

- *MAHA GUENOC VALLEY*
- FEDERAL OR LOCAL RESPONSIBILITY AREA
- MODERATE SEVERITY
- HIGH SEVERITY
- VERY HIGH SEVERITY

GENERAL WILDFIRE PREVENTION

GENERAL WILDFIRE PREVENTION STRATEGIES

In order to retain the resort site's inherent rural quality, a low-impact design plan prioritizes limited buildings, roadways, or infrastructure. Undeveloped areas will be managed to reduce wildfire risk through the following strategies:

- **Fire Breaks**
  Fire breaks will be established and maintained along all roadway corridors as well as vulnerable property boundary edges.

- **Active Landscape Management**
  Fields, pastures, woodlands will be actively managed to reduce fire risk. These areas will be continuously grazed with a rotation of cattle, sheep, and goat livestock. In certain locations, dead or fire-prone vegetation may also be manually thinned or removed with machinery and crews.

- **Irrigated Green Belt**
  Vineyards, orchards, gardens, and recreational fields—as well as irrigated residential, resort, and facility landscapes—will all become part of a site-wide irrigated green belt.

FIRE BREAKS

DISRUPT FIRE PATHWAYS

A network of fire breaks will be developed throughout the site, especially along roadways; they will be established and maintained as phases are built.

ACTIVE LANDSCAPE MANAGEMENT

LOP & SCATTER

This involves thinning and removing flammable and dead vegetation through felling and cutting; material is then distributed across the ground.

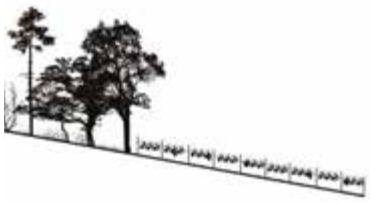
MASTICATE

Flammable and dead vegetation is thinned and removed with chopping, grinding, and mowing; material is then scattered across the ground.

GRAZE WITH LIVESTOCK

Sheep, goat, and cattle livestock will graze understory grasses and vegetation; the livestock will continuously rotate throughout the property.

IRRIGATED GREEN BELT

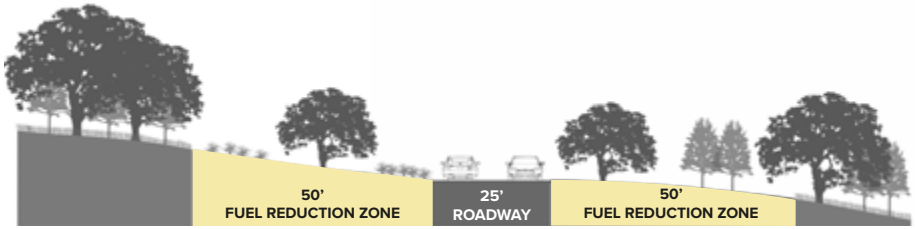


CONNECT IRRIGATED AREAS

Where feasible, contiguous green belts with irrigated farmlands, landscapes, and recreational fields will be developed.

GENERAL WILDFIRE PREVENTION
FIRE BREAK NETWORK

TYPICAL ROADWAY FIRE BREAK

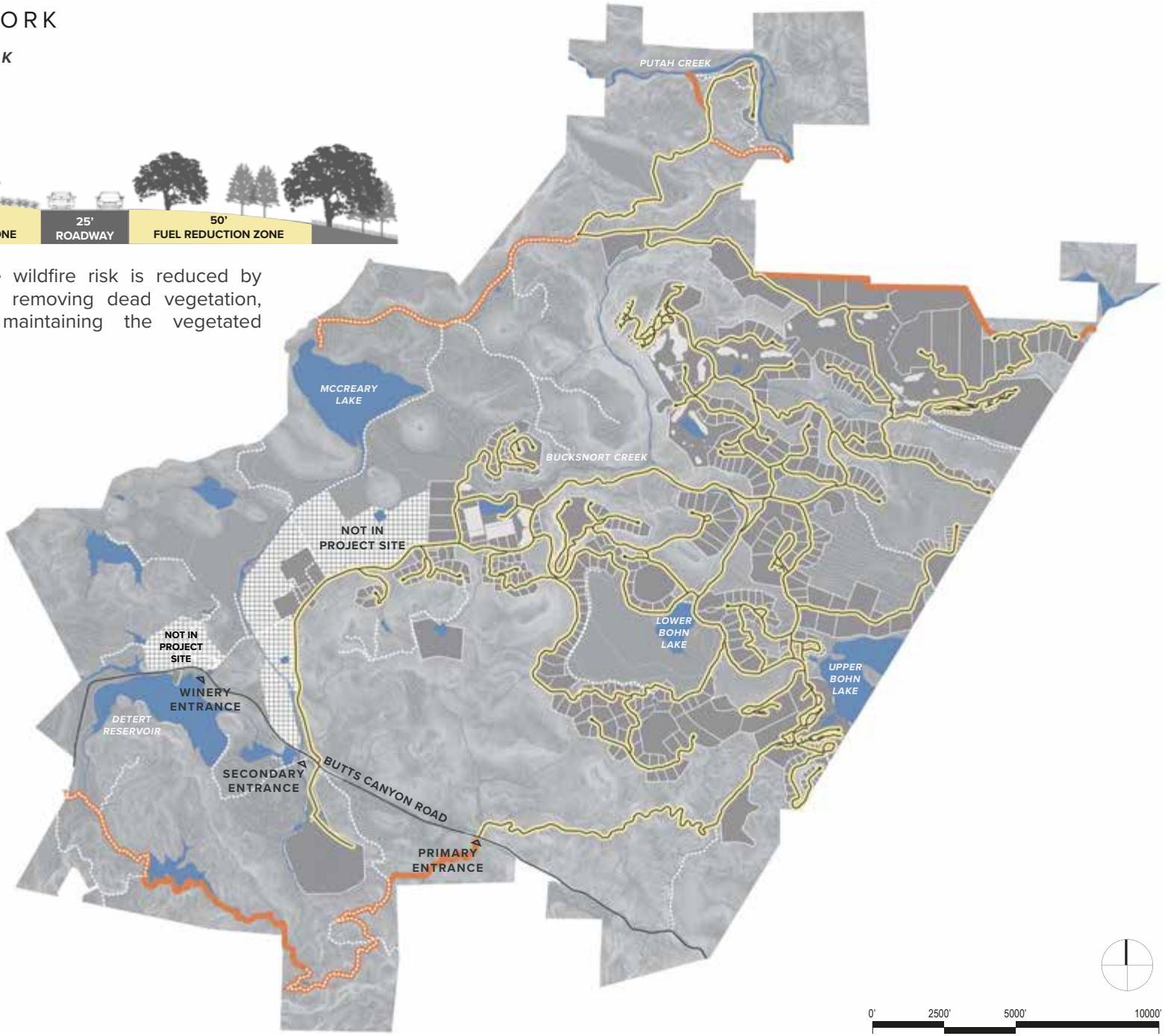


Fire breaks are areas where wildfire risk is reduced by strategies such thinning and removing dead vegetation, separating canopies, and maintaining the vegetated understory through grazing.

All roadways will be bordered on each side by a fuel reduction zone. As an overall defense strategy, 100 foot wide fire breaks could also be established and maintained at select vulnerable areas of the property boundary.

PRIMARY TWO-WAY ACCESS ROUTES & ROADWAY FIRE BREAKS

VOLUNTARY PROPERTY BOUNDARY FIRE BREAKS



GENERAL WILDFIRE PREVENTION
ACTIVE LANDSCAPE FIRE MANAGEMENT

The resort's landscapes will be actively managed to reduce fire risk. This will be achieved through a two-part strategy. First, livestock grazing will be heavily relied upon to reduce fire risk (see next page). Grazing will primarily take place within the site's undeveloped rural landscapes; where feasible and permissible, grazing may also be used to manage landscapes within resort, residential, and facility parcels as well as within vineyards.

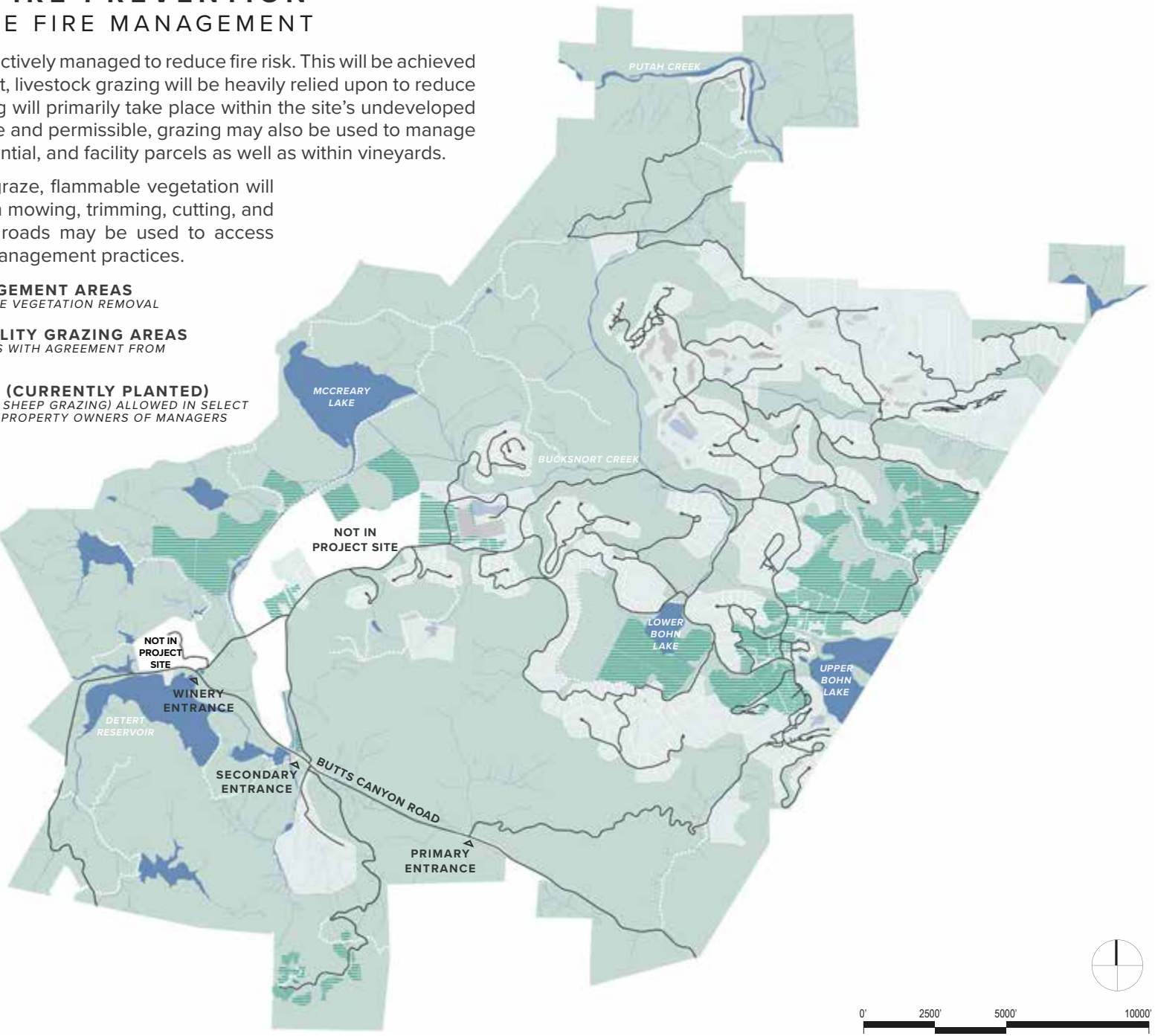
In areas that are infeasible to graze, flammable vegetation will be manually addressed through mowing, trimming, cutting, and brush removal. Existing ranch roads may be used to access more remote areas for active management practices.

ACTIVE LANDSCAPE MANAGEMENT AREAS
CONTINUED GRAZING AND SELECTIVE VEGETATION REMOVAL

RESIDENTIAL/RESORT/FACILITY GRAZING AREAS
GRAZING ALLOWED IN SELECT AREAS WITH AGREEMENT FROM PROPERTY OWNERS OR MANAGERS

VINEYARD GRAZING AREAS (CURRENTLY PLANTED)
MINIMALLY IMPACTFUL GRAZING (I.E. SHEEP GRAZING) ALLOWED IN SELECT VINEYARDS WITH AGREEMENT FROM PROPERTY OWNERS OF MANAGERS

EXISTING RANCH ROADS



GENERAL WILDFIRE PREVENTION
GRAZING PRACTICES

As a key component of the active landscape management plan, goat, sheep, and cattle livestock will continuously rotate throughout the resort site to reduce and remove overgrown and dead vegetation.

As these animals are capable of moving around difficult terrain, allowing them to graze throughout the site will ensure that hard-to-reach areas are regularly maintained. And, as each of these species prefers different types of vegetation, a regular rotation will broaden the types of flammable vegetation that is reduced and removed.

The following matrix provides general standards of site-wide, long-term grazing practices. Although the exact configuration of grazing areas and corridors may shift over time, these general parameters will help to coordinate the placement and movement of herds throughout the site.

Species	**Primary Foraging Behavior**	**Equivalent Animal Unit** *	**Preferred Vegetation**	**Minimum Practical Grazing Area** (Acres) **	**Maximum Practical Grazing Slope** (Percent %) (Wet Ground / Dry Ground)	**Maximum Density** (lbs per acre) (Wet Ground/Dry Ground) ***	**Grazing Season**	**Herd Type**
Goats	Browsing	0.2	Chaparral, Brush, Poison Oak, Weeds	0.15 AC	60% / 80%	15,000 lbs / 60,000 lbs	April - October	Seasonal/ Contracted
Sheep	Grazing	0.2	Oak Woodland/ Grassland, select weeds	0.15 AC	60% / 80%	15,000 lbs / 60,000 lbs	April - June	Seasonal/ Contracted
Cattle	Grazing	1.0	Oak Woodland/ Grassland	0.5 AC	50% / 70%	10,000 lbs / 50,000 lbs	Year Round	Resident

* "Equivalent Animal Units" establishes a consistent unit factor to compare herd sizes; for example, a herd of 10 cows (1.0 AU) is equivalent to a herd of 50 goats (0.2 AU)

** The "Minimum Practical Grazing Area" is significantly dependent on herd size; these minimum practical grazing areas assume that herd sizes will remain equally small in order to accommodate efficient grazing in and around small spaces between buildings and roads.

*** The "Maximum Density" is the maximum collective herd weight supported per graze-able acre

GENERAL WILDFIRE PREVENTION
IRRIGATED GREEN BELT

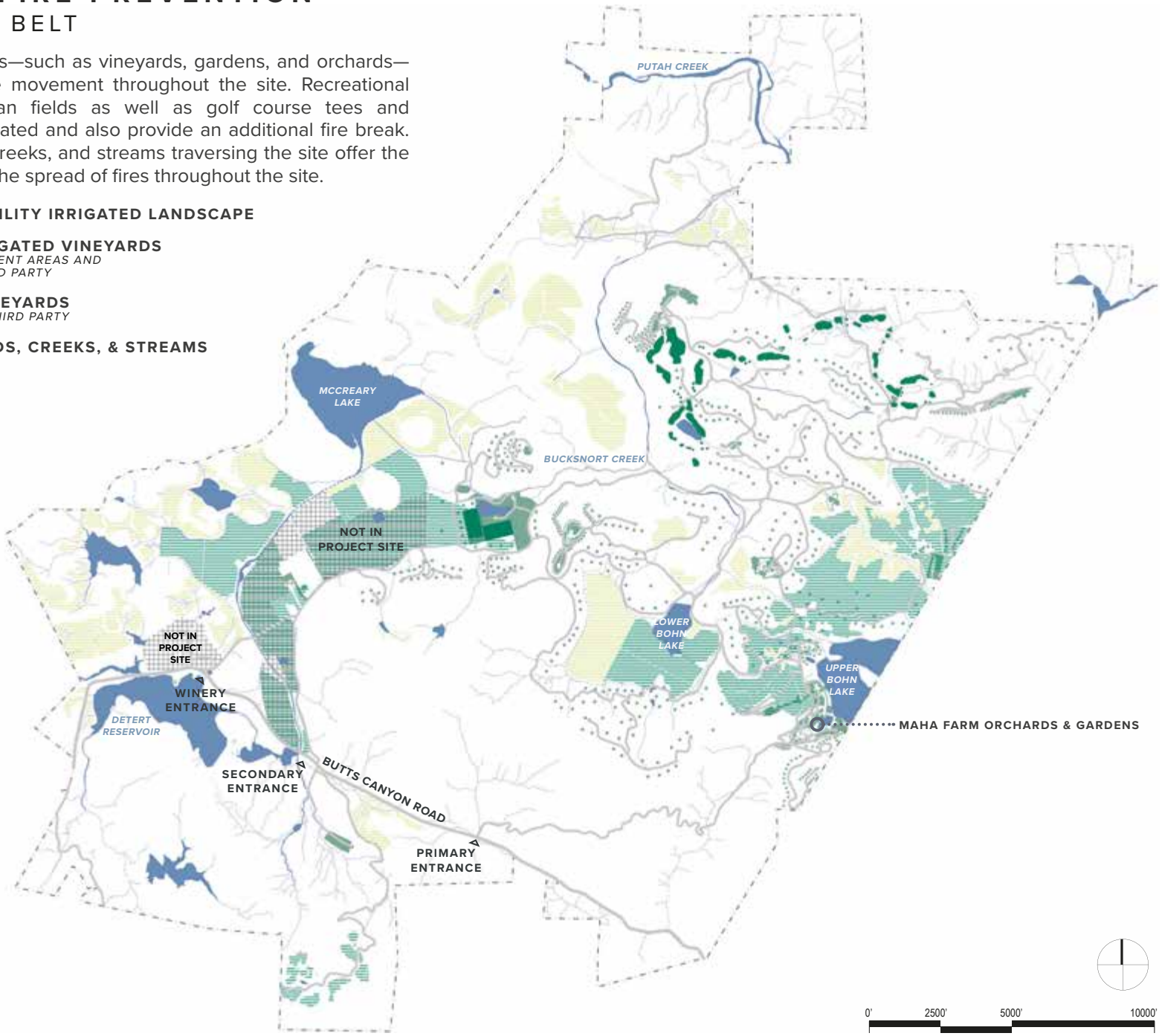
Irrigated agricultural operations—such as vineyards, gardens, and orchards—will interrupt potential wildfire movement throughout the site. Recreational amenities—including equestrian fields as well as golf course tees and fairways—will be regularly irrigated and also provide an additional fire break. The reservoirs, lakes, ponds, creeks, and streams traversing the site offer the additional benefit of reducing the spread of fires throughout the site.

RESIDENTIAL/RESORT/FACILITY IRRIGATED LANDSCAPE

CURRENTLY PLANTED IRRIGATED VINEYARDS
CURRENTLY PLANTED IN DEVELOPMENT AREAS AND AREAS LONG-TERM LEASED BY THIRD PARTY

POTENTIAL IRRIGATED VINEYARDS
IN AREAS LONG-TERM LEASED BY THIRD PARTY

RESERVOIRS, LAKES, PONDS, CREEKS, & STREAMS



CONSTRUCTION WILDFIRE PREVENTION

RESPONSIBILITIES & PROCEDURES

Construction practices will be carefully monitored to ensure that operations which could ignite a wildfire are minimized to the greatest extent possible.

Fire Safety Oversight and Responsibilities

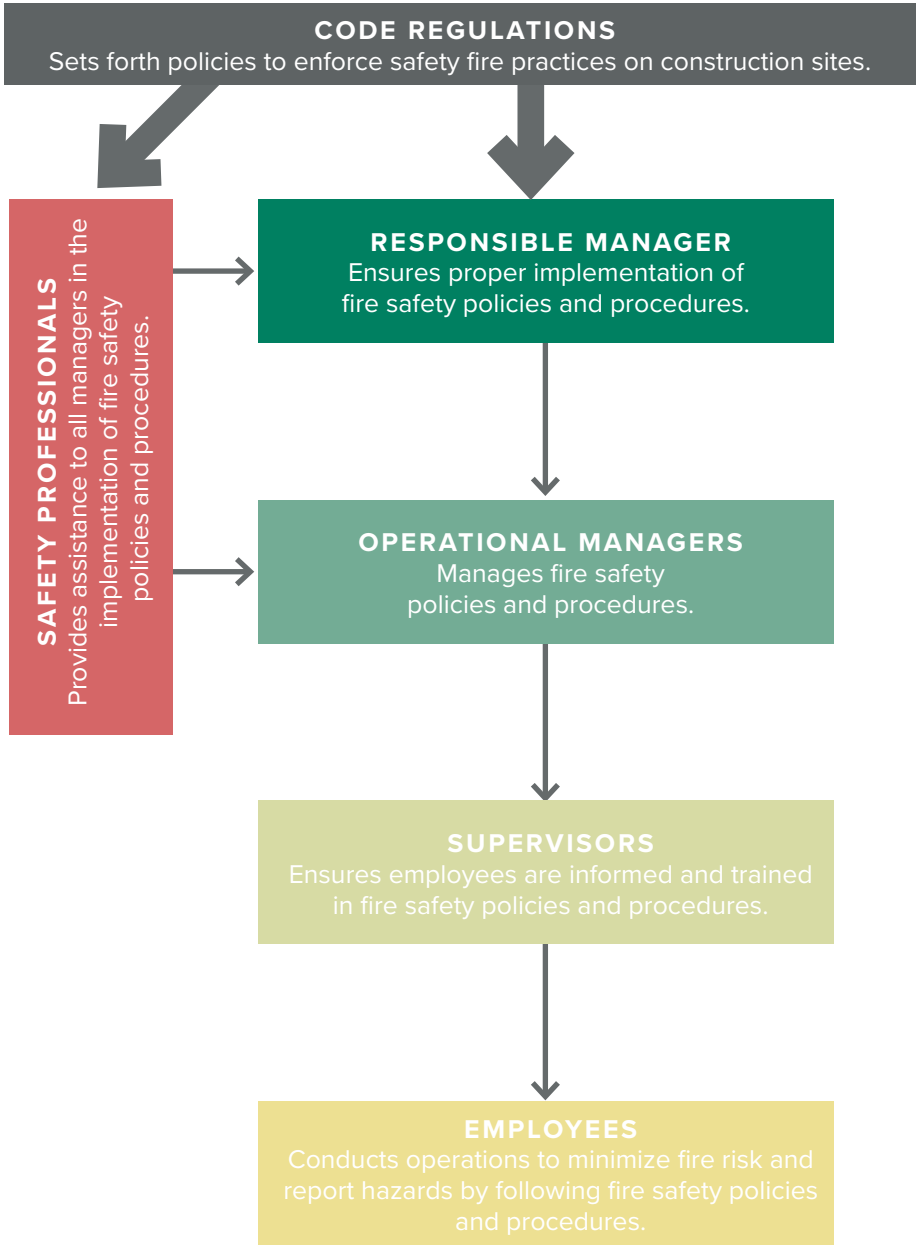
Beyond set code regulations, the project's general contractor has established fire prevention and protection procedures for every level of management and employment (see flowchart). This includes the following:

- Safety Professionals will advise and assist the Responsible and Operational Managers in charge of the project on fire safety;
- Supervisors–as advised by the Safety Professionals–will play a pivtol role in ensuring employees are informed and trained in fire safety. They will often conduct workforce training to educate employees about the fire hazards associated with specific tasks. They will also approve and carefully monitor any hot work or the use of temporary portable heaters. Supervisors will ensure that fire extinguishing equipment is present on all work sites and regularly inspected; and
- All managers and employees will be well-informed on procedures to immediately report fires.

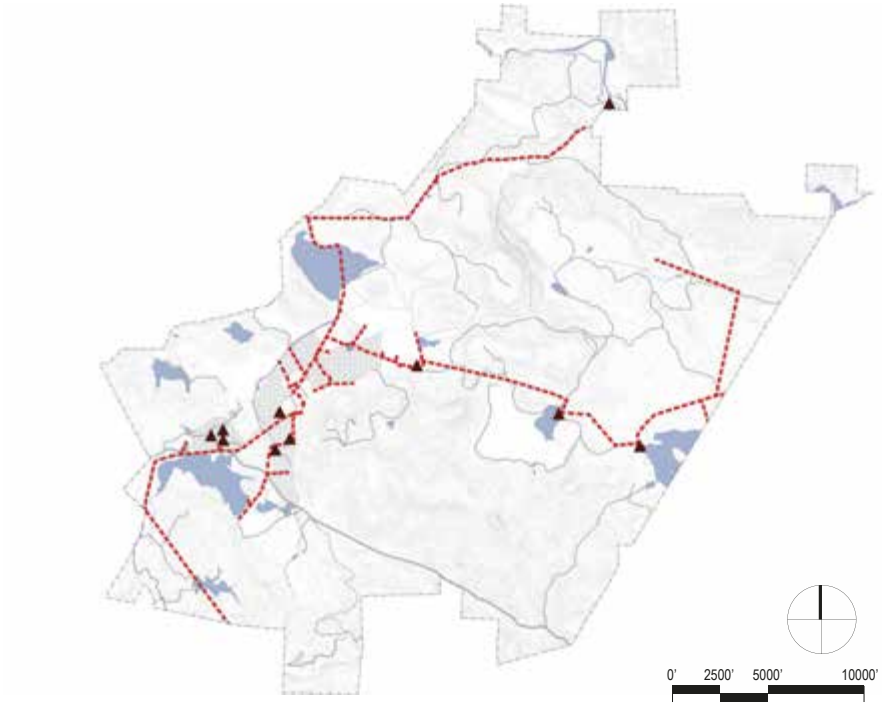
Fire Safety Procedures

During wildfire season, there is a heightened risk of construction-caused fires. In particular, heavy machinery has the potential to ignite fires during site preparation, preliminary grading, and utility line establishment. In order to mitigate fire risk during construction, the local CAL FIRE unit has recommended the following fire safety procedures, among others:

- One round-tip shovel and one water fire extinguisher should be available within 10 feet of all work areas;
- Portable fire extinguishers should be kept in every construction vehicle and piece of equipment;
- Vegetation within the work area should generally be mowed by noon during wildfire season or whenever wildfire conditions are present;
- Hot work should establish a wildfire watch for the duration of work and for 30 minutes after;
- Everyone working on-site should be aware of their location within the project in the event that they must report a fire;
- Everyone working on-site should have access to a cell phone or radio system to report a fire; and
- Everyone working on-site should have access to a pressurized air horn available to alert others in case of an emergency.



UTILITY WILDFIRE PREVENTION
ELECTRIC NETWORK

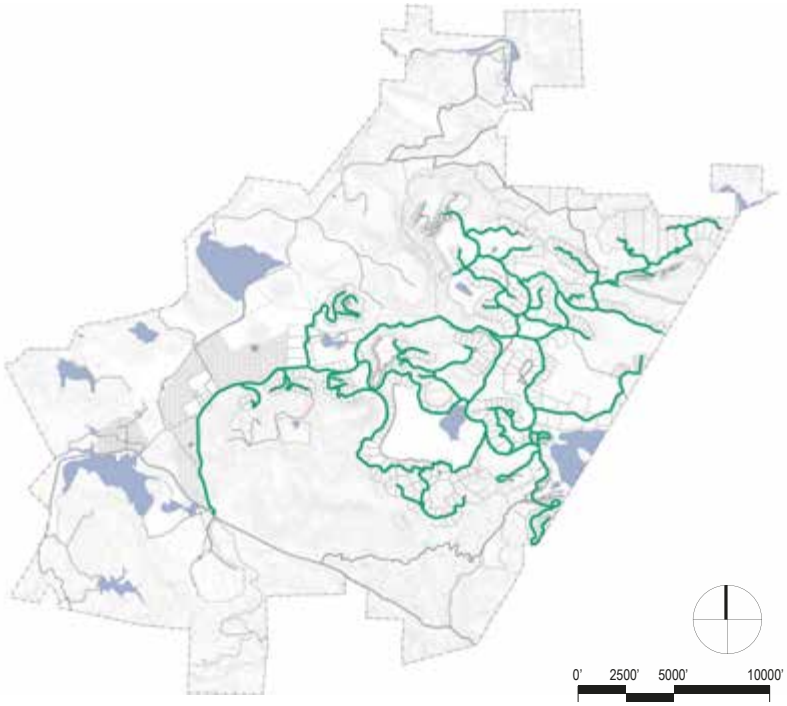


EXISTING OVERHEAD NETWORK

The existing power distribution network primarily relies upon overhead electrical lines, which can pose fire risk in the event of downed or sparking lines.

▲ **EXISTING SERVICE CONNECTION**

EXISTING OVERHEAD SERVICE LINES



PROPOSED UNDERGROUND NETWORK

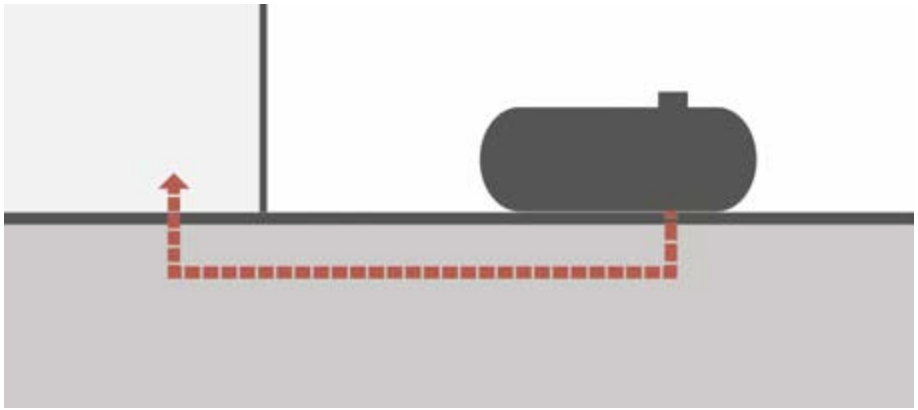
To the maximum extent feasible, the proposed electric network will be undergrounded in a joint trench system. This will ensure a safer distribution of power and reduce or eliminate the risk of overhead powerlines causing wildfires during windy conditions.

UNDERGROUND POWER AND DATA LINES

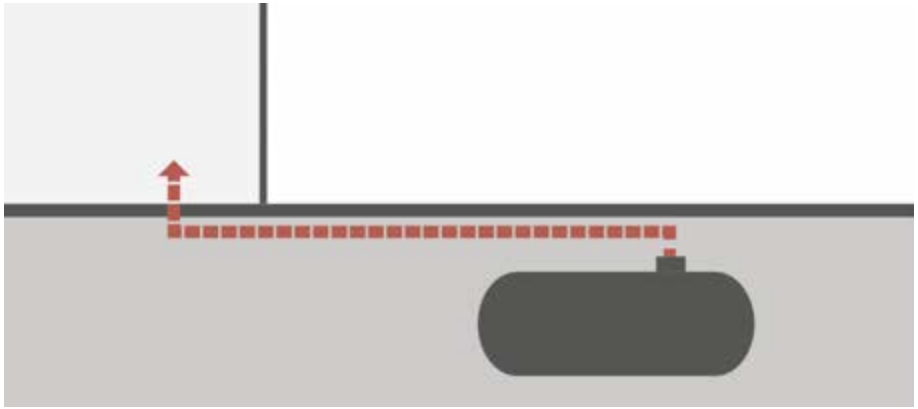
UTILITY WILDFIRE PREVENTION
PROPANE GAS SYSTEM

Similar to the strategy of undergrounding power lines, gas propane tanks will be undergrounded throughout the resort. This approach reduces the risk of gas related wildfires while also controlling for temperature fluctuations.

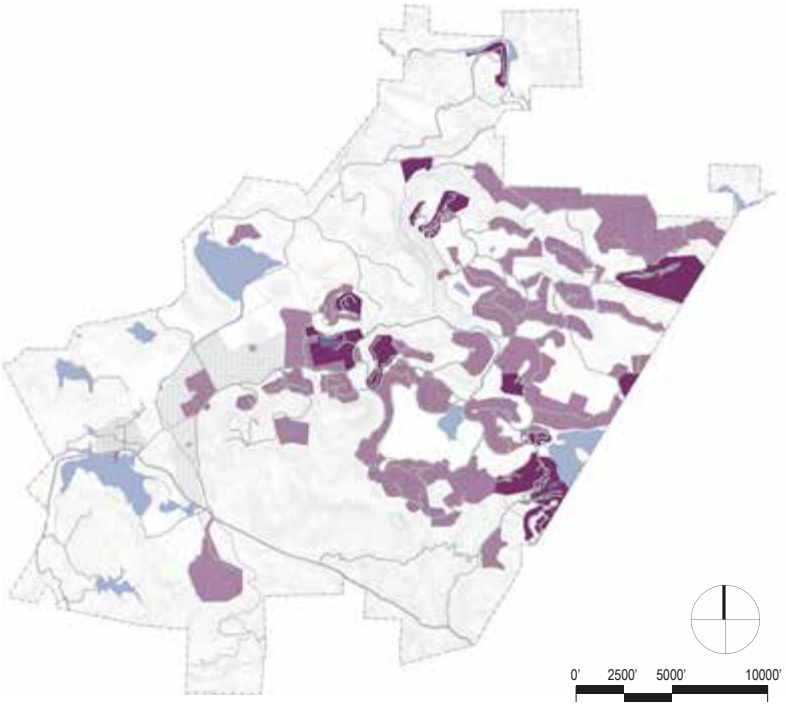
Each residential estate will be serviced by an individual underground gas tanks. Resort communities–which includes both resort and resort residential structures– will utilize a shared propane gas tank system with a localized underground distribution system.



TYPICAL ABOVE GROUND PROPANE TANKS
Above ground tanks are the standard and more affordable option, but present a greater risk of gas leaks and the potential to fuel wildfires.



PROPOSED UNDERGROUND PROPANE TANK
Propane tanks will be undergrounded to improve wildfire safety and benefit from the stabilized temperature control.



PROPOSED PROPANE GAS NETWORK
To the maximum extent feasible, propane gas tanks will be undergrounded throughout the resort, with residential estates serviced by individual tanks and resort communities serviced by shared tanks and distribution systems.

RESIDENTIAL ESTATES AND SUPPORTING FACILITIES SERVICED BY INDIVIDUAL UNDERGROUND TANKS

RESORT COMMUNITIES SERVICED BY SHARED UNDERGROUND TANKS

RESIDENTIAL LANDSCAPE WILDFIRE PREVENTION

SITE BUILDING & DETERMINE TOTAL DEFENSIBLE SPACE

If a wildfire occurs, it poses a considerable risk to residential homes and their occupants. Homeowners will be advised to implement various wildfire prevention strategies.

Site Structures to Reduce Fire Risk

The first step in addressing wildfire risk is to properly site residential structures. While the ideal residential structure location will be based on many factors (including views, accessibility, and privacy), residential property owners will be encouraged to closely consider certain criteria which reduces fire risk.

This includes siting buildings on the most level portion of the property. Wherever possible, residential structures should avoid being placed on mid-slopes, ridge edges, or directly between high points.

Determine Total Defensible Space

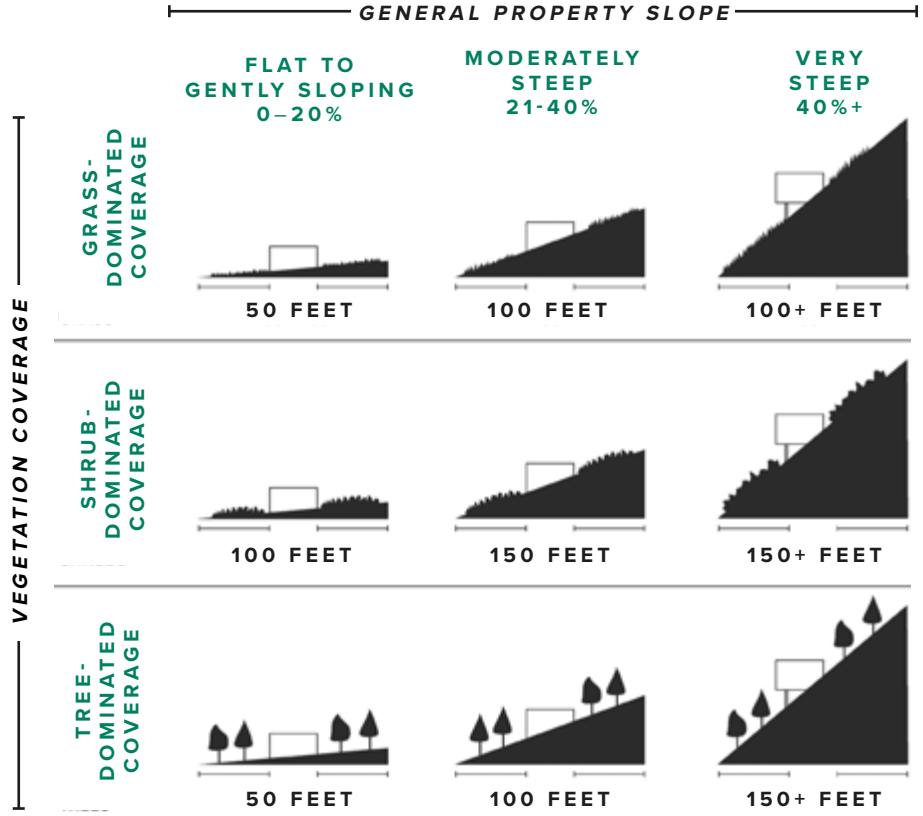
Homeowners will be advised to establish and maintain defensible space for the purposes of reducing fire risk in the immediate vicinity of the residential structure. The total defensible space will depend on the unique vegetated coverage and topographic conditions of each residential property (see right):

- **Grass-Dominated Coverage**
  Depending on slopes, 50 to 100 feet of total defensible space from the building edge in landscapes dominated by grasses, weeds, and widely scattered shrubs

- **Shrub-Dominated Coverage**
  Depending on slopes, 100 to 150+ feet of total defensible space from the building edge in landscapes dominated by shrubs, scrub, or chaparral

- **Tree-Dominated Coverage**
  Depending on slopes, 50 to 150+ feet of total defensible space from the building edge in landscapes dominated by trees; if understory is substantially shrubs, homeowners should follow “shrub-dominated coverage” category

Wherever necessary or possible, adjacent residential property owners and the resort ownership will cooperatively address defensible space concerns which cannot be fully established or maintained within the residential property line.



DETERMINING TOTAL DEFENSIBLE SPACE

The total defensible space will vary based on the unique vegetated coverage and topographic conditions of each property. In the above diagrams, the indicated length relates to the total defensible space measured from the building edge.

RESIDENTIAL LANDSCAPE WILDFIRE PREVENTION

DETERMINE DEFENSIBLE ZONES

Once the building has been sited and the total defensible space has been determined, homeowners will be advised to establish and maintain two zones of defense. These zones and associated fuel reduction strategies will reduce the risk of fire in the immediate vicinity of the residential structure:

- **Zone 1: Remove Flammable Vegetation**

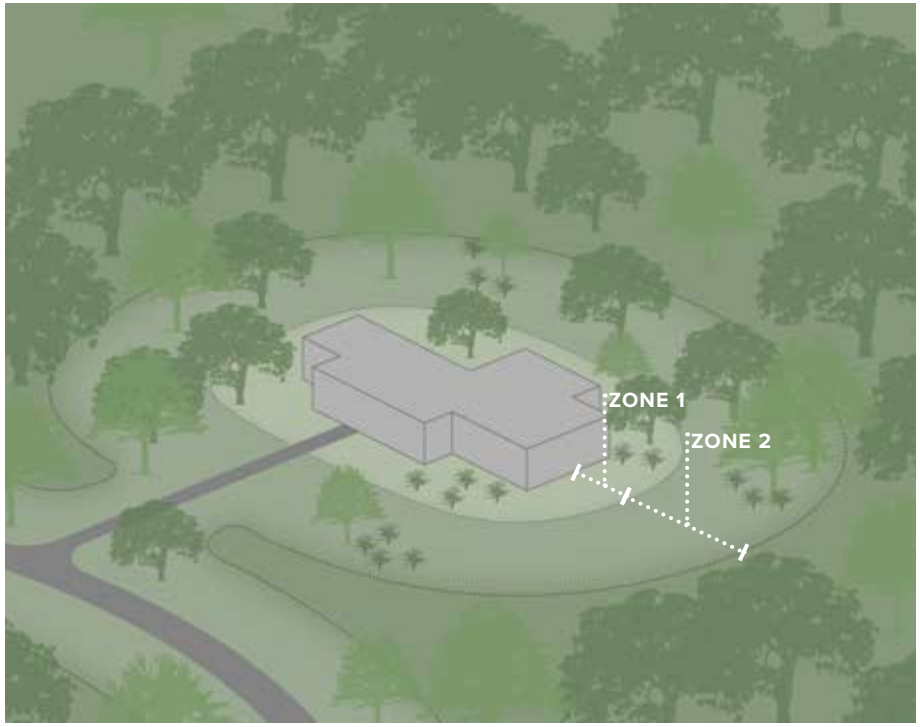
  Regardless of the total defensible space, the first defense zone will be maintained zero to 30 feet from the edge of the residential structure.

  Within this zone, flammable vegetation should be removed. This includes removing all standing dead trees and shrubs. All downed dead trees, tree branches, and shrubs should also be removed if not yet decayed. Trees should generally be pruned up to a height of 10 feet, depending on tree species and understory conditions. Flammable shrub species should be thoroughly pruned.

- **Zone 2: Reduce Flammable Vegetation**

  The second defense zone should be maintained from 30 feet from the building edge to the edge of the total defensible space (e.g. 50 feet, 100 feet, 150 feet–see previous page); this includes a defensible space of zero to 15 feet from the driveway edge.

  Within this zone, flammable vegetation should be reduced. Trees and shrubs should be selectively addressed to reduce flammable vegetation parts, including pruning dead or lower branches. Dead vegetation should also be selectively removed within this wider zone.



STANDARD RESIDENTIAL DEFENSIBLE ZONES

Two defensible zones should be established and maintained within the total defensible space.

ZONE 1 REMOVE FLAMMABLE VEGETATION

ZONE 2 REDUCE FLAMMABLE VEGETATION

RESIDENTIAL LANDSCAPE WILDFIRE PREVENTION
PREPARE THE PROPERTY

After the defensible space and zones have been determined, the residential property should be assessed for key fire risks. Primarily, continuous and dense vegetation creates a condition in which fires can quickly spread. Trees and shrubs should be vertically and horizontally separated in order to reduce “ladder fuel” conditions–or situations in which flames can easily move upwards from the vegetation understory to the canopy.

The following offers general vegetation clearance and spacing recommendations in order prepare the site for residential dwellings. Although these standards should be followed across the entire defensible space, greater adherence to these standards should be followed within Zone 1.

Tree and Shrub Vertical Clearance
In general, the lowest level of the canopy branches should be three times greater than the height of the vegetation understory. This vertical separation relationship can be established through either pruning the vegetation understory or the overhead tree limbs. For example, if a shrub is three feet in height, the lowest level of the directly overhead canopy branches would be trimmed or pruned to a height of 12 feet.

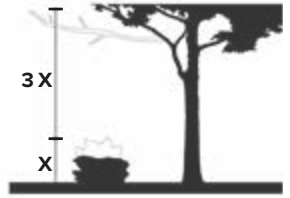
Tree and Shrub Horizontal Spacing
Individual or small clusters of trees and shrubs should generally be separated based on the horizontal spacing standards (see right) in order to reduce potential fire movement. For example, if a residential property is “moderately steep,” shrubs that are three feet in height should be separated by 12 feet. Note that the recommended tree and shrub horizontal separation distances are measured from the canopy edge, not the trunk.

LADDER FUELS

Flames burning at lower levels can ignite taller plants by moving up vegetated “ladder fuels”.

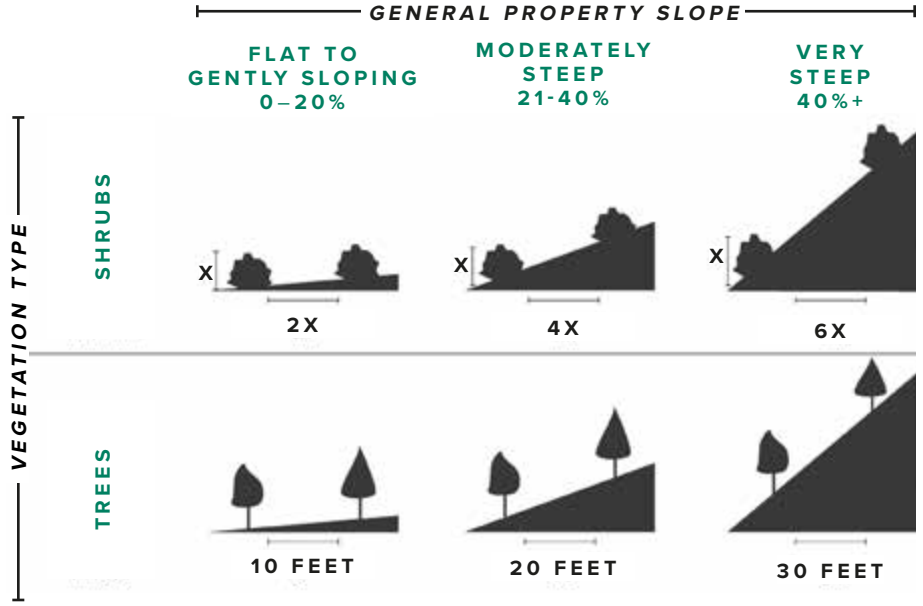
The potential for ladder fuels can be avoided by separating vegetation vertically and horizontally.

VERTICAL CLEARANCE



The lowest level of the canopy branches should be three times greater than the height of the vegetation understory.

HORIZONTAL SPACING



Individual or small clusters of trees and shrubs should be separated in order to reduce potential fire movement

RESIDENTIAL LANDSCAPE FIRE PREVENTION
ESTABLISH NEW LANDSCAPE

After the residential property has been cleared of flammable vegetation and ladder fuels have been addressed, various strategies can reduce wildfire risk where establishing a new landscape design.

Fire-Resistant Planting Design and Selection
New planting design should follow the spacing and clearance strategies delineated above. Planting designs and patterns should anticipate the mature size of new trees and shrubs. Simple, low-volume, and well-separated planting designs will generally achieve these spacing and clearance objectives. All efforts should be made to avoid tree limbs touching the residential structure or powerlines; tree limbs should also not be within 10 feet of the chimney.

Planting selection should avoid fire-prone species and instead prioritize fire-resistant species. In general, fire-resistant species are low-growing with a high moisture content and have stems or leaves that are not resinous, oily, or waxy.

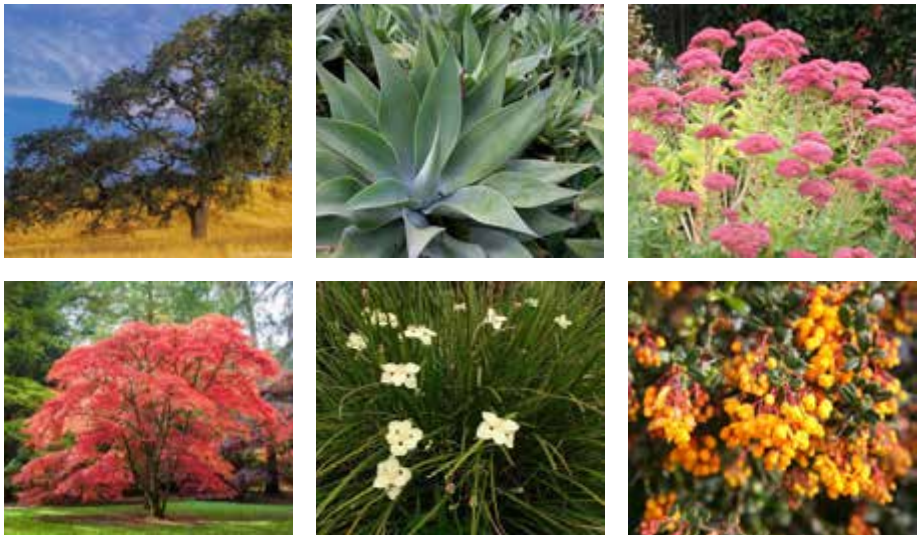
Small-Scale Fire Breaks: Hardscapes and Irrigation
Wherever possible, the landscape design should be configured to create a series of smaller-scale fire breaks in the immediate vicinity of the residential structure.

For example, driveways, walkways, patios, and parking areas could be selectively spread out to impede a potential fire path; non-combustible materials (such as mulch, boulders, and rocks) will additionally reduce fire risk. Pools, water features, ponds, or streams could also be creatively used as small-scale fire breaks. Irrigation systems used to establish or maintain landscapes could also create an irrigated fire break.

Additional Strategies
Additional landscape design strategies should be prioritized to reduce fire risk and improve emergency response. This includes the following:

- Constructing fencing with non-combustible materials, such as stone or metal, rather than wood;
- Enclosing areas below decks to reduce the risk of debris ignition;
- Clearly marking the address number on the house itself and at the driveway entry to aid in identification in the case of a fire emergency; and
- As much as possible, designing driveways and bridges to allow for large-scale emergency vehicle access.

FIRE PRONE PLANTING TO AVOID
Certain plants should be avoided because of their fire prone characteristics, such as resinous, oily, or waxy leaves. This includes trees such as the Eucalyptus.



FIRE RESISTANT PLANTING TO USE
Fire resistant plants should be used as much as possible. This includes plants that are low-growing and have a high moisture content.

RESIDENTIAL LANDSCAPE FIRE PREVENTION

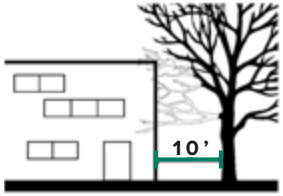
MANAGE LANDSCAPE TO REDUCE RISK

Various landscape management practices can address wildfire hazards within the residential landscape over time.

This includes the following recommendations for residential property owners:

- Periodically inspect the residential property to maintain defensible space—which includes ongoing removal and reduction of flammable vegetation and reestablishment of vegetation clearance and spacing standards;
- Prune tree limbs which are within 10 feet of buildings or chimneys or are otherwise encroaching on powerlines;
- Within the defensible space, trim tree limbs below 10 feet in height; for smaller trees, prune the lower 1/3 of the branches;
- Routinely mow grasses and wildflowers within the defensible space to a maximum height of 4 inches, particularly during dry seasons;
- Keep vegetation well-irrigated, particularly within the first defense zone;
- Where feasible, irrigation systems used for plant establishment should be maintained for additional wildfire protection;
- Install fine mesh metal on eaves, roofs, and vents to prevent embers from entering the structure;
- Remove vegetation debris that accumulates on the roof or within the rain gutters;
- Place combustible debris (such as firewood, wood scraps, grass clippings, leaf piles, or garbage cans) and propane tanks outside of the first defense zone; and
- Keep any ignitable outdoor furniture and equipment (i.e. wooden brooms and shovels) 10 feet away from the residential structure.

PRUNE, TRIM, AND MOW



PRUNE: Prune tree limbs which are within 10 feet of building or chimneys or are otherwise encroaching on powerlines.

TRIM: Within the defensible space, trim tree limbs below 10 feet in height; for smaller trees, prune the lower 1/3 of the branches

MOW: Mow and grass to a maximum of 4 inches in height.

LEAN, CLEAN, AND GREEN

LEAN: Minimize or eliminate the use of flammable vegetation and emphasize the use of low-growing herbaceous (non-woody) plants. Ornamental trees and shrubs should be kept green.

CLEAN: Remove all dead trees and shrubs within the defensible area. Remove all dead leaves, twigs, cones and branches. Reduce thick layers of pine needles to a depth of 2 inches.

GREEN: Keep plants green and healthy by irrigating throughout the fire season.

RESIDENTIAL BUILDING WILDFIRE PREVENTION

EXTERIOR BUILDING STRATEGIES

The fire safety of a building starts with design and material decisions. All residential buildings will abide by relevant California Building Codes “CBC” and Wildland Urban Interface “WUI” standards. The following are a selection of strategies to prevent fires on the building exterior:

1 | Class A rated roof with non-combustible covering
The roof is the most vulnerable part of the home in the event of a wildfire. Class A rated roofs are highly resistant to fire by minimizing the ability of flames to spread.

2 | Fire resistant eaves, overhangs, and soffits
The risk of embers getting caught in the eaves and igniting can be minimized by the eliminating or shortening overhangs, or otherwise constructing eaves, overhangs, and soffits with non-combustible materials.

3 | Building vents precautions
Vents in roofs, soffits, and exterior walls should be made of non-combustible materials with screens to prevent the penetration of embers.

4 | Underground utility connections
Wherever possible, utility connections should be undergrounded, particularly for electrical and fuel-related utilities.

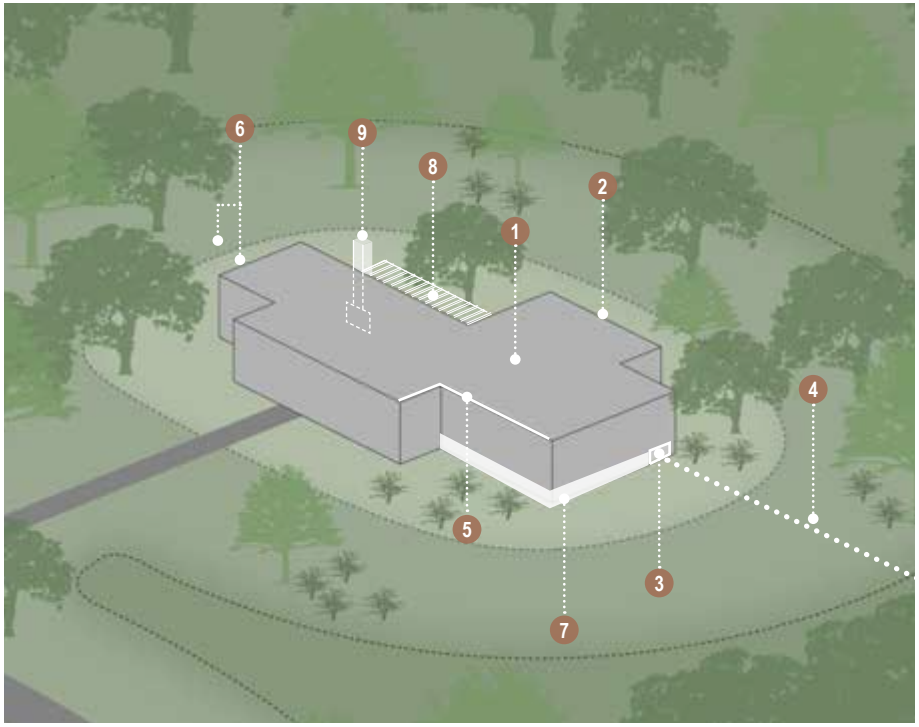
5 | Non-combustible leaf guards over gutters
Leaf guards can reduce the build-up of combustible leaf debris. Guards, gutters, and downspouts should be made of noncombustible material.

6 | Exterior fire suppression systems
Exterior fire suppression systems will be encouraged for all primary residential structures; these systems will be required for primary residential structures on dead-end roads that exceed ¼ mile in length. Fire suppression systems are remote or heat-activated. During a fire, they prevent substantial damage to the primary building as well as nearby outdoor features.

7 | Fire resistant material for exposed foundations
Fire resistant materials should be used for all exposed foundations above grade, including both open and closed foundations.

8 | Fire resistant deck materials
Decks connected to residential structures should be fire resistant, which can be achieved by using fire retardant treated timber, fire resistant plastic, and non-combustible materials for all deck components, including skirting to protect the deck underside.

9 | Exterior fire places and wood stoves
Anything with an exposed flame, such as a outside fireplace or wood stove, should have a screen built into the design to protect against stray embers.



RECOMMENDED EXTERIOR DESIGN STRATEGIES

The highlighted items are a selection of strategies to incorporate into the residential building to address wildfire safety.

1. CLASS A RATED ROOFS WITH NON-COMBUSTIBLE COVERING
2. FIRE RESISTANT EAVES, OVERHANGS, AND SOFFITS
3. BUILDING VENT PRECAUTIONS
4. UNDERGROUND UTILITY CONNECTIONS
5. NON-COMBUSTIBLE LEAF GUARDS OVER GUTTERS
6. EXTERIOR FIRE SUPPRESSION SYSTEMS
7. FIRE RESISTANT MATERIAL FOR EXPOSED FOUNDATIONS
8. FIRE RESISTANT DECK MATERIALS
9. EXTERIOR FIRE PLACES AND WOOD STOVES

SOURCE: FEMA, Home Builder’s Guide to Construction in Wildfire Zones, 2008

RESIDENTIAL BUILDING WILDFIRE PREVENTION
INTERIOR BUILDING STRATEGIES

On the inside of residential structures, certain precautions and practices can further protect the home. The following are a selection of interior building strategies to reduce wildfire risk:

1 | Smoke detectors throughout the home
Smoke detectors should be located throughout the house to cover all livable areas. If placed in hallways between living and sleeping areas, smoke detectors can reach many rooms. In addition, smoke detectors shall be programmed to communicate directly to a fire and security monitoring companies.

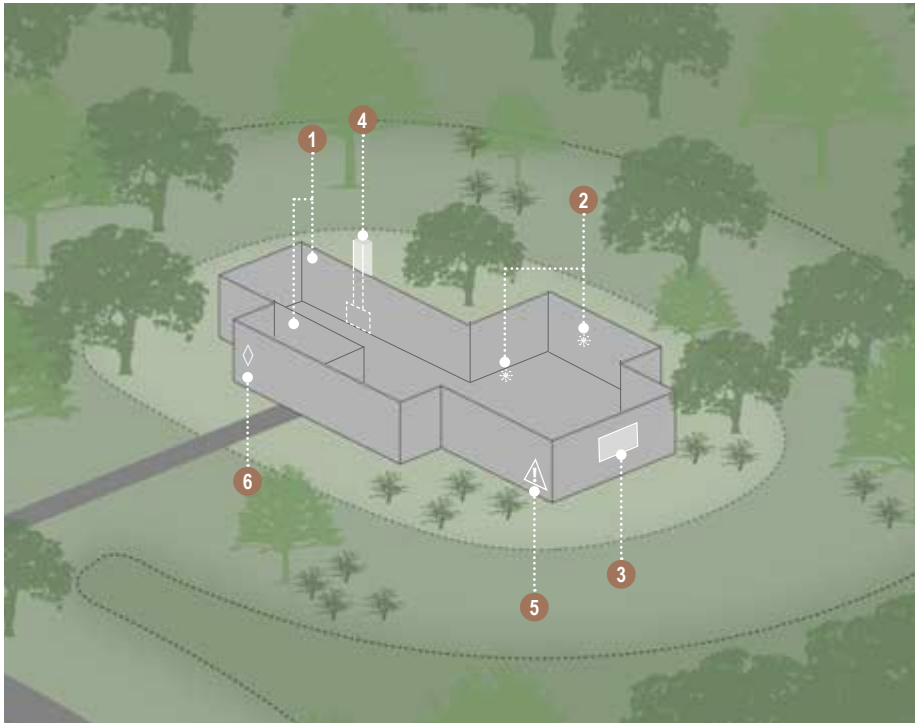
2 | Interior fire sprinklers
Interior fire sprinklers come in a variety of styles in order to blend with the home's aesthetic. They are automatically activated by high heat and can include a warning system.

3 | Window security quick-release
If window security bars or other protection systems are installed, a quick-release system should be included to allow for immediate escape in the case of a wildfire emergency.

4 | Chimney maintenance
Chimneys should be inspected yearly to remove all flammable debris and material.

5 | Combustible hazardous material protection
All combustible materials should be stored in protected safety containers away from appliances with ignition sources, such as stoves and water heaters.

6 | Wildfire fighting tools
Homeowners should have easy access to wildfire emergency tools, such as a shovel, hoe, rake, and bucket.



RECOMMENDED INTERIOR DESIGN ELEMENTS

The fire safety of a structure starts with design decisions. The highlighted items are a selection of some strategies to incorporate into residential architecture.

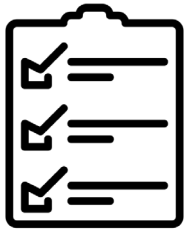
1. SMOKE DETECTORS THROUGHOUT THE HOUSE
2. INTERIOR FIRE SPRINKLERS
3. WINDOW SECURITY QUICK-RELEASE
4. CHIMNEY MAINTENANCE
5. COMBUSTIBLE MATERIAL PROTECTION
6. WILDFIRE FIGHTING TOOLS

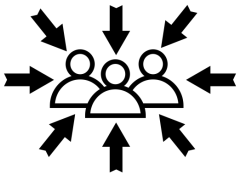
SOURCES: FEMA, Home Builder's Guide to Construction in Wildfire Zones, 2008; CalFire, Homeowners Checklist, 2009

WILDFIRE PREVENTION PREPAREDNESS

RESIDENT RECOMMENDATIONS

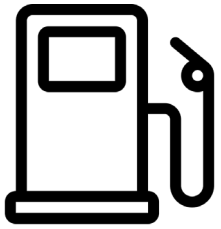
Homeowners will be advised to plan for the event of a wildfire. This will require preparing in advance and developing specific action plans for different scenarios.





Pre-Fire Preparations

- Develop an emergency plan with your family;
- Place important documents in a fire-proof box close to the exit;
- Practice how to shut off key utilities, including water, gas, and electricity;
- Discuss plans for evacuation, including what to bring and where to go;
- Determine multiple evacuation routes in case one is blocked;
- Develop a communication plan in case your family is separated;
- Select meeting places a safe distance the home; and
- Identify a non-local contact person who knows your emergency plan.

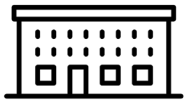


Potential Fire Threat (including Red Flag Warnings)

- Pay attention to local news for updates and evacuation notices;
- Keep flashlights and portable chargers ready in case of power shutoff;
- Ensure that your car has gas, as stations often become crowded;
- Confirm that all garden hoses are attached and accessible;
- Prop a ladder against the house for the potential need for roof access;
- Disable electronic garage openers so this area can be manually opened;
- Prepare and pack essential items to prepare for potential evacuation; and
- Gather pets in kennel of on leashes to keep them close and safe

Notice to Evacuate

- Stay together as a household and remember that time is of the essence;
- Dress appropriately with long pants/sleeves, layers, and face protection;
- Shut off the home's gas supply, but leave lights and water on;
- Close all doors and windows but leave exterior doors unlocked;
- Pack water, supplies, and other essentials in the car;
- Ensure all car windows are closed while evacuating;
- Choose evacuation routes selected by emergency personnel; and
- Follow all directions and signage provided by emergency personnel.



Shelter in Place

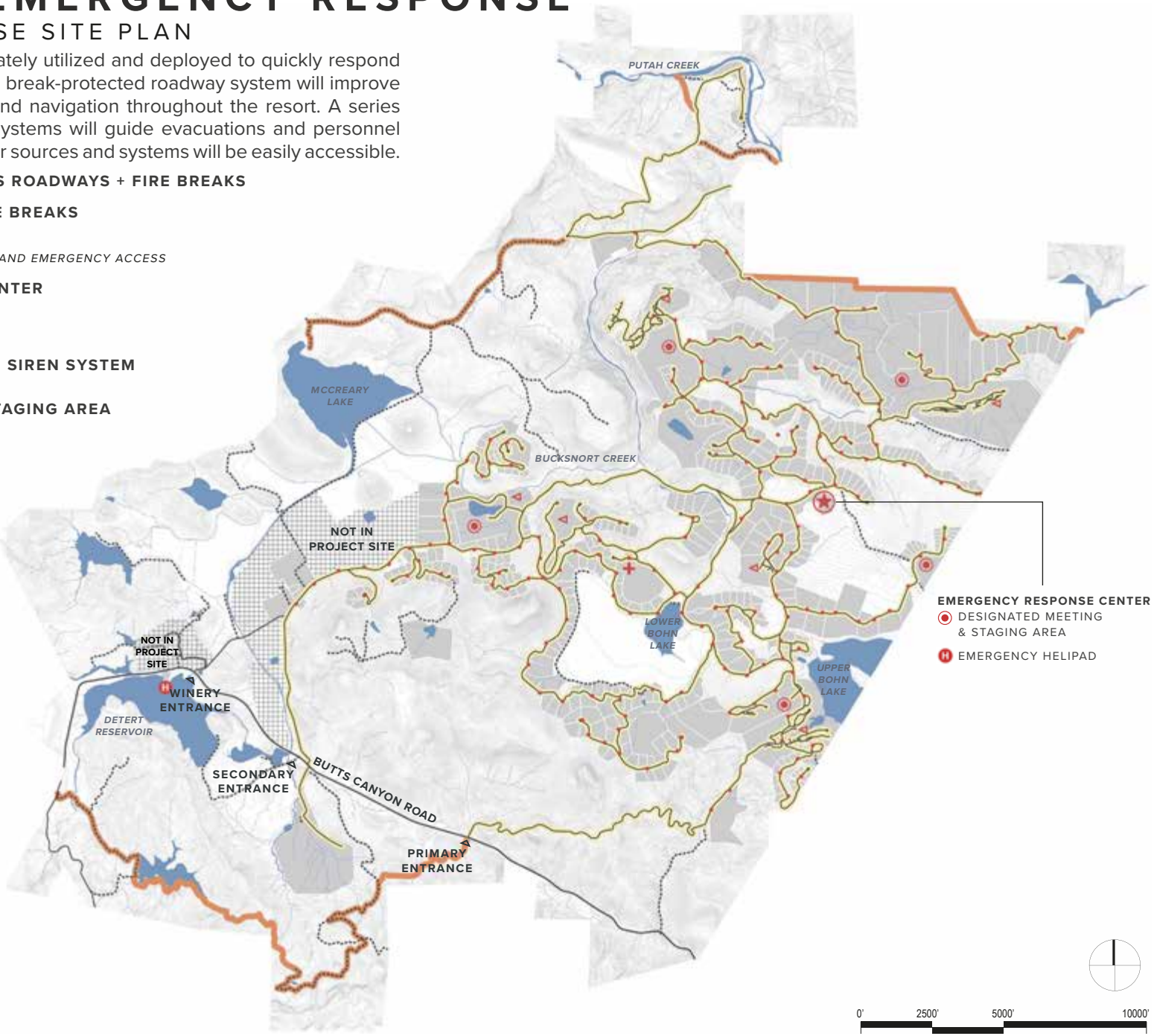
- Take shelter within a building whenever possible;
- Close all windows and doors, but leave unlocked;
- Remain close to the front door and low to the ground;
- Continue to monitor the fire and stay observant;
- If not at home, proceed to a designated meeting & staging area;
- If unable to reach either home or a designated meeting & stage area, park and take shelter in your car;
- If in the car, stay on paved roads and park away from vegetation; and
- Leave headlights and emergency flashers on while you wait for aid.

WILDFIRE EMERGENCY RESPONSE

WILDFIRE RESPONSE SITE PLAN

Various systems will be immediately utilized and deployed to quickly respond to a wildfire emergency. The fire break-protected roadway system will improve emergency personnel access and navigation throughout the resort. A series of emergency communication systems will guide evacuations and personnel response. Fire suppression water sources and systems will be easily accessible.

- **PRIMARY TWO-WAY ACCESS ROADWAYS + FIRE BREAKS**
- **PROPERTY BOUNDARY FIRE BREAKS**
- **EXISTING RANCH ROADS**
  USED FOR ACTIVE FUEL REDUCTION AND EMERGENCY ACCESS
- **EMERGENCY RESPONSE CENTER**
- **EARLY DETECTION SYSTEM**
  HIGH-DEFINITION CAMERA
- **EMERGENCY NOTIFICATION SIREN SYSTEM**
  EXACT LOCATIONS TBD
- **DESIGNATED MEETING & STAGING AREA**
- **HELIPAD**
- **FIRE HYDRANTS**
- **WATER SOURCES**
  RESERVOIRS, LAKES, PONDS, CREEKS & STREAMS



WILDFIRE EMERGENCY RESPONSE

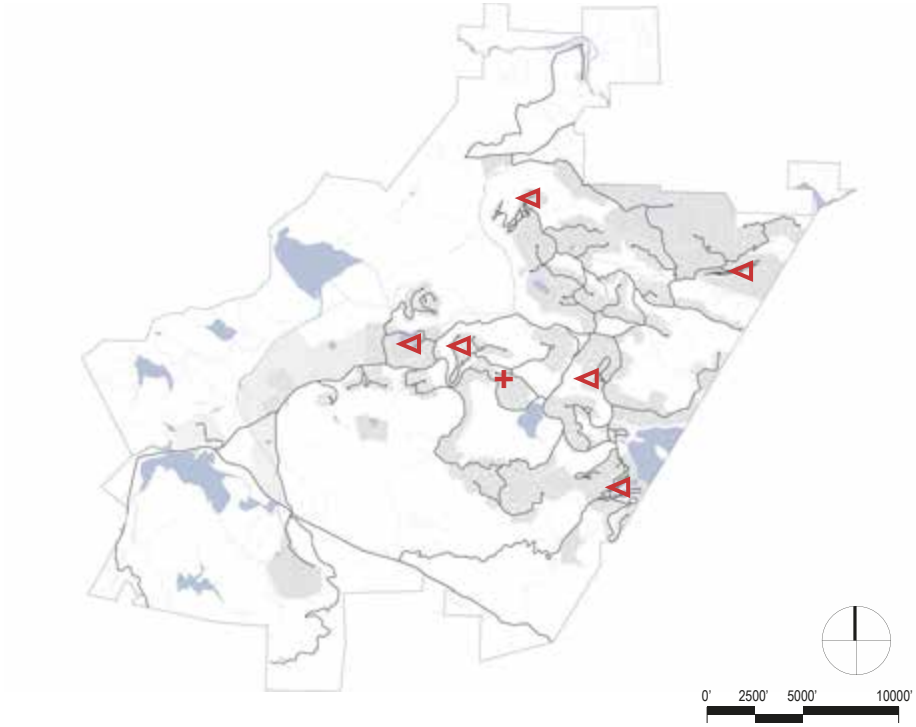
WILDFIRE EMERGENCY DETECTION & COMMUNICATION SYSTEMS

Efficient emergency communication is critical for providing immediate information to residents, visitors, and employees. In the event of a wildfire emergency, the following detection and communication systems will quickly be deployed:

Early Detection System
An early detection system will immediately identify potential fires igniting on site or in the vicinity. This system includes a high-definition camera installed in the center of the resort.

Emergency Notification Siren System
Located throughout the resort, the siren system will alert people to a wildfire emergency and announce updated information and directions.

Opt-out Communication System
All residents, visitors, and employees will be enrolled in an opt-out phone-based communication system, such as Nixle, to receive emergency notifications. This system will supplement the site-wide emergency siren system to ensure that everyone is alerted of important emergency information and updates.



COMMUNICATION RESPONSE SYSTEM

Key communication technologies will aid in detecting and communicating wildfire emergencies.

+ **EARLY DETECTION SYSTEM**
HIGH-DEFINITION CAMERA

◁ **EMERGENCY NOTIFICATION SIREN SYSTEM**
EXACT LOCATIONS TBD

WILDFIRE EMERGENCY RESPONSE

WILDFIRE EMERGENCY RESPONSE CENTER & REFUGE AREAS

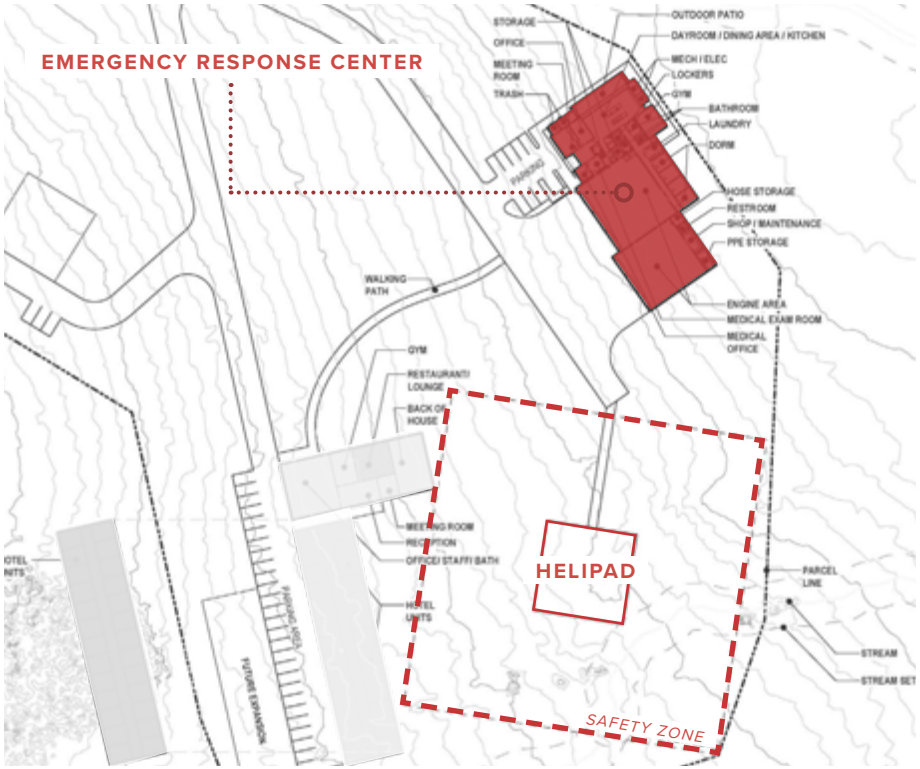
Various areas of the site will play a pivotal role in servicing evacuees and emergency personnel in the case of wildfire emergency.

Emergency Response Center

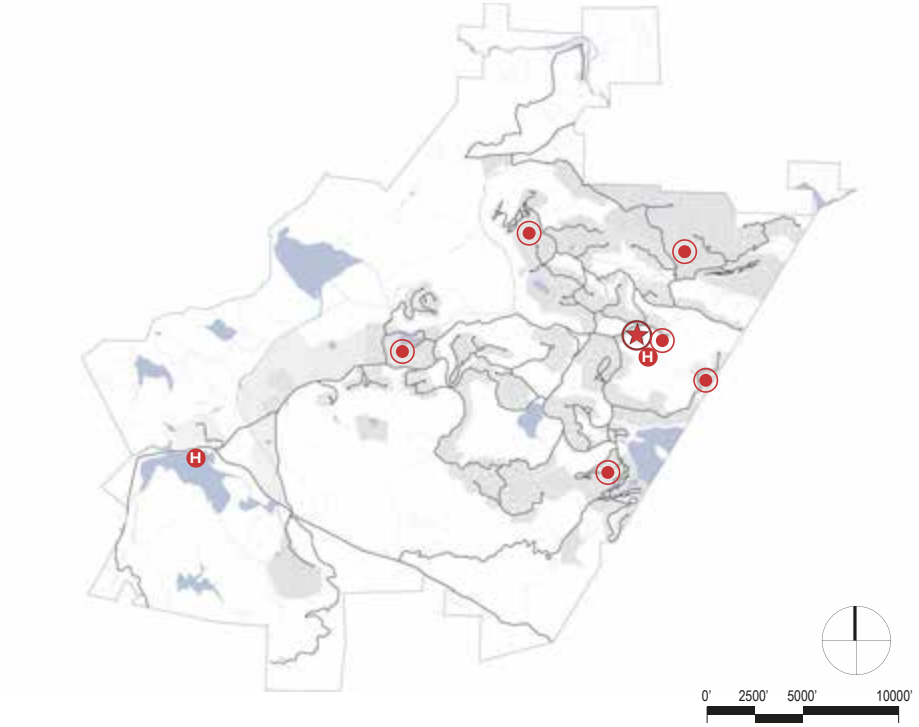
The on-site Emergency Response Center will serve as a primary location for first responders to gather and coordinate efforts. The center will include essential fire-fighting equipment and minor medical supplies. In the case of a major wildfire, the center can act as a headquarters for operations. A helipad will be located on-site for emergency landings and take-offs; and additional helipad at Detert Reservoir can also be used during emergencies

Designated Meeting & Staging Areas

Depending on the circumstances of a wildfire emergency, it may be difficult to evacuate. In this situation, residents, visitors, and employees will be directed to gather at designated meeting & staging areas where they will be provided information and assistance.



EMERGENCY RESPONSE CENTER SITE PLAN



EMERGENCY RESPONSE CENTER & MEETING POINTS

The emergency response center is located in a centralized area to service the entire site; temporary meeting points are dispersed throughout the site in order to provide easily accessible locations for all residents, visitors, and employees.

- **EMERGENCY RESPONSE CENTER**
- **HELIPADS**
- **DESIGNATED MEETING & STAGING AREAS**

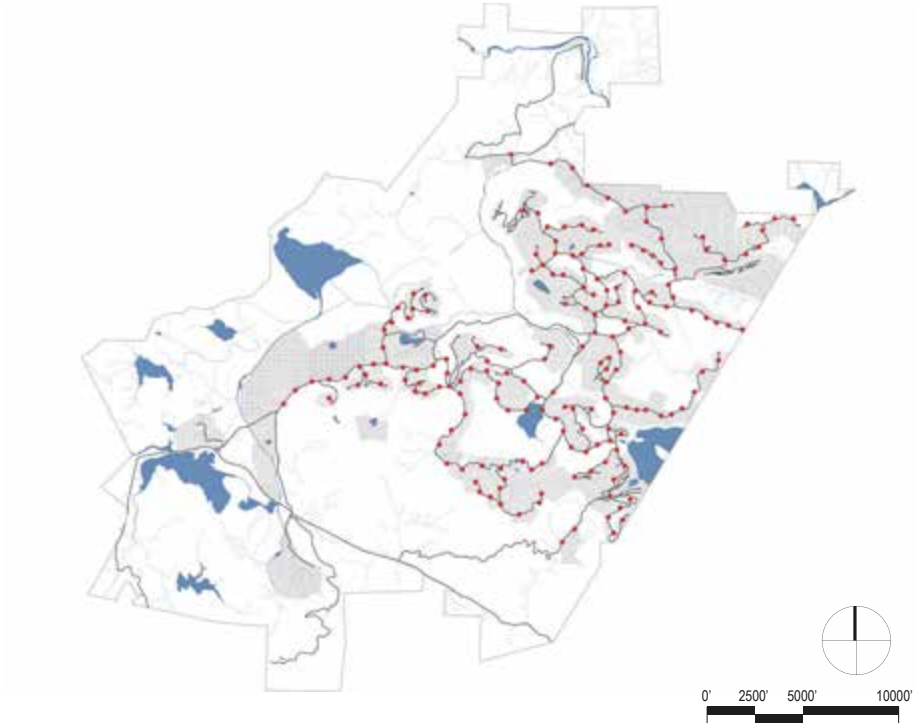
WILDFIRE EMERGENCY RESPONSE
WILDFIRE WATER SUPPLY & SUPPRESSION SYSTEM

If wildfires occur, a comprehensive, on-site water supply and fire suppression system will service firefighting needs.

Fire Suppression Water Sources
Fire suppression systems will be serviced by reclaimed and non-potable water sources, such as recycled wastewater, non-treated groundwater, and surface water reservoirs. Surface water sources—including reservoirs, lakes, ponds, creeks, and streams—can also be drawn upon by fire engines or helicopter buckets in the case of a wildfire emergency.

Fire Suppression Water System
A connected non-potable water distribution system will supply all water to fire hydrants as well as interior and exterior fire suppression systems. Portions of the system will be designed as a loop to maximize flow. Booster pump systems will also maintain water pressure above minimum requirements. Additional water storage may also be established in areas further from water sources for wildfire emergencies.

Fire Hydrants
All hydrants will have the capacity to maintain a minimum of a two-hour flow. Hydrants will be located within close proximity to roadways and spaced to maintain required flow to all parts of the site.



WILDFIRE WATER SUPPLY & SUPPRESSION SYSTEM
A network of fire hydrants and surface water sources will service the entire site.

- **FIRE HYDRANTS**
- **WATER SOURCES**
  RESERVOIRS, LAKES, PONDS, CREEKS & STREAMS

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SOURCES

1 meter Digital Elevation Model (DEM), U.S. Geological Survey, 2018

Calscape, California Native Plant Society, 2019

California Department of Forestry & Fire Protection, “Red Flag Warning & Fire Weather Watches,” 2019

California Fire Return Interval Departure (FRID), USDA Forest Service, Pacific Southwest Region, 2012 with 2016 update

FIRESafe MARIN, 2019

Guenoc Ranch Safety Alert, California Department of Forestry and Fire Protection (CAL FIRE), July 2019

Home Builder’s Guide to Construction in Wildfire Zones, Federal Emergency Management Agency, 2008

Homeowners Checklist: How to Make Your Home Fire Safe, California Department of Forestry and Fire Protection (CAL FIRE), 2009

Konocti Wind Patterns, South Lake County Fire Protection District and National Weather Service San Francisco Bay Area, 2019

Lake County Fire Hazard Severity Map, California Department of Forestry and Fire Protection (CAL FIRE), 2007

Living with Fire in Napa County: A Guide for the Homeowner, Napa Communities Firewise Foundation, 2005

Local Wind Patterns, Lake County Weather, Western Weather Service, 2019
Note: The wind direction diagrams represent general wind patterns during annual fire season (08/01- 11/30). For detailed information on wind speed and directions, please refer to the data source.

National Burn Severity Mapping Project, National Park Service - U.S. Geologic Survey, 2014 and 2015

National Oceanic and Atmospheric Administration: National Weather Service, “Understanding Wildfire Warnings, Watches and Behavior,” 2019

National Landscape Conservation System, Bureau of Land Management, 2019

San Francisco Chronicle, “Are infamous Diablo winds responsible for recent wildfires?,” 2019

Standard Operating Procedure: Fire Prevention and Protection, Granite Construction, 2015

TIGER/Line Shapefiles, U.S. Census Bureau, 2018

U.S. Forest Service, Classification and Assessment with LANDSAT of Visible Ecological Groupings (CALVEG), EVeg Mid Region 5 North Coast Mid, January 18, 2018;
Note: Data source information ranges from the year 1998 to 2015; data for site from 1998; data source crosswalked with the California Wildlife Habitat Relationship (CWHR); CWHR categories simplified seven categories for illustrative purposes of the exhibit.

APPENDIX GEOTECH

PRELIMINARY GEOTECHNICAL STUDY REPORT

Experience is the difference

PRELIMINARY GEOTECHNICAL STUDY REPORT

MAHA RESORT AT GUENOC VALLEY
22000 BUTTS CANYON ROAD
MIDDLETOWN, CALIFORNIA

Project Number:

7192.04.01.3

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May 29, 2019
(Revised December 6, 2019)

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INTRODUCTION

This report presents the results of our preliminary geotechnical study for the proposed Maha Resort at Guenoc Valley to be constructed at 22000 Butts Canyon Road in Middletown, California. The project includes dozens of parcels totaling approximately 16,000 acres. The terrain varies from relatively level valley floor areas to rolling hills and contains several lakes, established vineyards, and vast undeveloped areas. The site location is shown on Plate 1 in Appendix A.

We understand that the planned Maha Resort at Guenoc Valley will be an extensive, multi-phased resort including boutique hotels, residential communities, farmstead, golf course, equestrian facilities, and shops. As outlined in our proposal dated May 24, 2019, our preliminary study was broken into two phases. The purpose of Phase 1 was to evaluate the geologic hazards and pertinent geologic features and characteristics within certain proposed areas of development, and to comment on the geotechnical feasibility of the project. The purpose of Phase 2 was to refine the geologic hazards by collection of samples and testing for naturally-occurring asbestos (NOA) in areas that we identified as potentially containing serpentinite bedrock, landslide areas, and/or areas selected by the project team.

SCOPE

Our scope of work for Phase 1 was limited to a site reconnaissance, a review of selected published geologic data, aerial photographs and LiDAR, and preparation of this report. Our scope of work for Phase 2 included collection of samples and testing for NOA (see Appendix B). Based on the geologic literature review (References, see Appendix C), site reconnaissance, limited subsurface exploration and laboratory testing, we were to develop the following information:

1. A brief description of geologic, surface soil, and seepage/spring or other conditions observed during our reconnaissance;

2. Our opinion of potential cut and fill slope inclinations;

3. Distance to nearby active faults and a discussion of geologic hazards that may affect the proposed project;

4. Our opinions regarding the geotechnical feasibility of the project; and

5. Preliminary conclusions and recommendations concerning site-specific geotechnical services needed for actual development, design and construction of the project.

SERVICES PROVIDED

We reviewed aerial photographs of the site, 2-foot LiDAR contours of the entire property, and other select published geologic information pertinent to the site. A list of the geologic references reviewed is presented at the end of this report. On October 8, 9, 10, and November 12 and 20, 2018, our Engineering Geologist conducted a surficial reconnaissance of the property to observe exposed topographic features, surface soils, rock outcroppings and cut banks. We also excavated test pits on these days for the collection of preliminary geotechnical information and to assess the presence of NOA in areas mapped as serpentine-bearing. The test pit locations are shown on Plates 2 and 4A through 4E. Our Principal Engineering Geologist and Principal Geotechnical Engineer also performed a brief site reconnaissance of selected areas on October 8, 2018. Selected samples were laboratory tested to assess their pertinent engineering characteristics and potential presence and concentration of NOA. In addition to the test pits for our preliminary evaluation of the property, additional test pits were excavated for the Farmstead and access road geotechnical studies that were being performed concurrently. The logs for these test pits are included herein.

SITE CONDITIONS

General

Lake and Napa Counties are located within the California Coast Range geomorphic province. This province is a geologically complex and seismically active region characterized by sub-parallel northwest-trending faults, mountain ranges and valleys. The oldest bedrock units are the Jurassic-Cretaceous Franciscan Complex and Great Valley sequence sediments originally deposited in a marine environment. Subsequently, younger rocks such as the Tertiary-age Sonoma Volcanics group, the Plio-Pleistocene-age Clear Lake Volcanics and sedimentary rocks such as the Guinda, Domengine, Petaluma, Wilson Grove, Cache, Huichica and Glen Ellen formations were deposited throughout the province. Extensive folding and thrust faulting during late Cretaceous through early Tertiary geologic time created complex geologic conditions that underlie the highly varied topography of today. In valleys, the bedrock is covered by thick alluvial soils. The site is located in a northwest-trending, structurally-system of valleys and ridges in southeastern Lake county and northwestern Napa County.

Geology

Published geologic maps (Fox et al., 1973) indicate the property is underlain by igneous, sedimentary, and metamorphic bedrock formations ranging from Jurassic to Quaternary in age. The oldest bedrock formations mapped within the project area are the Jurassic Knoxville Formation, the Cretaceous-Jurassic Great Valley Sequence and Franciscan Assemblage. The Knoxville Formation is comprised mainly of massive clayey siltstone with minor sedimentary serpentine, and is mapped primarily within the valley walls of Bucksnort Creek, and in an isolated area south of Butts Canyon Road. The Great Valley Sequence units shown to be present in the project area include mudstone, siltstone, and sandstone. The mapped Franciscan Assemblage outcrops include metagraywacke, metagreenstone, and metachert,

with discrete masses of serpentinite and silica-carbonate rocks strewn throughout the property. One of the predominant rock types present is the Tertiary Clear Lake volcanics olivine basalt. This resistant unit caps the many resistant knobs and ridges throughout the property such as Snell Peak, Goat Hill, Jim Davis Peak, and similar topographic high points. It also blankets a vast, northwest -trending swath north of Upper Bohn Lake and extending to the edge of Bucksnort Creeks valley. It is usually underlain by small bodies of Franciscan silica-carbonates and large masses of Franciscan serpentinite, the other dominant rock type according to the geologic maps. The Tertiary-aged Sonoma Volcanics occurs south of Butts Canyon Road at higher elevations. The valley floors throughout the project area, such as Bohn Valley and the low areas directly south of McCreary Lake, are blanketed by Quaternary alluvium, the youngest unit consisting of unconsolidated gravel, sand, silt, and clay.

Landslides

Published landslide maps (Dwyer, 1976) indicate many isolated areas of large-scale slope instability at the site. Presented on Plate 3 is our interpretation of the locations presented on Dwyer's map. Dwyer's "definite" and "probable" landslides primarily occur within areas mapped by Fox et al. (1973) as Franciscan Assemblage including metagraywacke, metagreenstone, metachert, and bodies of serpentine. We outlined these, as well as other areas with suspicious topographic features we observed using LiDAR, on the LiDAR overlay in Google Earth. Our engineering geologists then excavated test pits in several of the areas where planned roads crossed the mapped landslide areas and other suspicious areas based on our LiDAR review. In some cases, the rubbly surface outcrops and "float" (boulders carried downslope by gravity) prevented excavator access to these areas, such as on the northeastern flank of Goat Mountain. Based on our surface and subsurface observations we revised the landslide mapping. Where these physical areas were observed and revised by RGH, the landslide boundaries are considered approximate. We have not undertaken detailed studies of the individual landslide areas. The scope of this phase of investigation was to confirm or refute the presence of actual landslide debris in certain mapped and conspicuous locations that could directly affect road construction at the site. The revised features are presented on Plates 4A through 4E.

A summary of the subsurface soil, rock, and groundwater conditions found within landslide test pits LSTP-1 through LSTP-25 is presented in the table below. In some cases, our subsurface observations indicate that no landslide was present. Where we interpret the deposits as landslide-derived, our opinion as to the type of landslide, degree of certainty, thickness of deposits, and state of landslide activity is indicated with a 4-digit number in the right-hand column of the table. A key to the numerical landslide identification and nomenclature is given on Plate 5. The soil is described in accordance with the Unified Soil Classification System, outlined on Plate 6. Bedrock is described in accordance with Engineering Geology Rock Terms, shown on Plate 7.

Test Pit #	Depth (ft.)	Description	Landslide Type
LSTP-1	0.0-1.0	DARK BROWN SANDY CLAY WITH GRAVEL (CH) soft, moist (surface soil)	
	1.0-4.75	GRAY GREEN MOTTLED CLAY WITH SAND (CH) soft to medium stiff, moist (Qls)	Possible Landslide

		- possible slide plane -	3312
	4.75-6.5	DARK GRAY GREENSTONE very closely spaced fractures, firm, weak, moderately weathered Seepage at 6 feet	
LSTP-2	0.0-1.25	BROWN SANDY CLAY (CH) soft to medium stiff, moist (surface soil)	
	1.25-5.0	DARK GRAY GREENSTONE closely spaced fractures, firm to moderately hard, weak to moderately strong, slightly weathered	No Landslide
LSTP-3	0.0-1.5	RED-BROWN CLAY WITH SAND (CH) hard, dry to moist, weak and porous to 6 inches, with gravel and cobbles up to 6 inches in diameter, vertical pressure facets (VPF) Qls	
	1.5-3.5	RED-BROWN BRECCIA closely spaced fractures, moderately hard, moderately strong, highly weathered, subangular, poorly sorted clasts from coarse sand to small cobbles, volcanic and ultramafic (healed landslide/Qls)	3323
	3.0-3.5 (locally)	OLIVE GREEN SANDY CLAY (CH) very hard, dry, with gravel Practical refusal at 3½ feet	
LSTP-4	0.0-2.5	RED BROWN SANDY CLAY (CL) very stiff to hard, dry, weak and porous to 6 inches, gravel to 2 inches in diameter, somewhat porous (colluvium)	
	2.5-3.5	RED-BROWN CLAY WITH SAND AND GRAVEL (CH) hard, moist, increased gravels and cobbles, angular, poorly sorted (colluvium)	3323
	3.5-10.0	DARK RED-BROWN BRECCIA no visible fractures, firm, weak, highly weathered, poorly sorted angular to subrounded polished clasts (healed landslide/Qls)	
LSTP-5	0.0-2.0	BROWN TO DARK BROWN CLAY WITH SAND (CL-CH) medium stiff, dry to moist, with coarse sand to gravel, weak and porous to 6 inches, roots to 2 feet (Qls)	
	2.0-5.0	DARK BROWN CLAY WITH SAND AND GRAVEL (CH) hard to very hard, moist, with VPF and shearing from creep, angular gravels to 2 inches in diameter (Qls)	3323
	5.0-9.0	DARK BROWN SANDY CLAY TO CLAYEY SAND (CH) hard/dense, moist, poorly sorted, clay less fat than B unit, coarse sand and small gravels, larger cobbles to 6 inches in diameter starting at 8 feet (Qls)	

	9.0-9.5	GRAY ANDESITE closely spaced fractures, very hard, very strong, slightly weathered, soil infilling Refusal in boulders at 9½ feet	3323
LSTP-6	0.0-2.0	BROWN TO DARK BROWN SANDY CLAY WITH GRAVEL AND COBBLES (CH) soft, dry, weak and porous to 1 foot; hard, moist 1 to 2½, cobbles and clasts to 8 inches in diameter (Qls)	
	2.0-4.5	RED -BROWN BRECCIA no visible fractures, firm, weak, highly weathered, clasts poorly sorted, angular, coarse sand to cobbles 6 inches in diameter (well-indurated/healed Qls)	3213
	4.5-7.0	RED-BROWN SERPENTINIZED GREENSTONE closely spaced fractures, firm, weak, completely to highly weathered	
LSTP-7	0.0-0.5	LIGHT OLIVE-BROWN CLAY (CH) medium stiff, dry, with desiccation cracks, weak and porous	
	0.5-4.0	DARK OLIVE GRAY SILTSTONE/SHALE closely laminated, extremely closely spaced fractures, moderately hard to hard, weak, moderately weathered to brown, dips into hillside; completely weathered to soil-like from ½ to 1 foot	No Landslide
	4.0-5.0	DARK GRAY SANDSTONE massive to thickly bedded, moderately spaced fractures, hard to very hard, strong, slightly weathered, very fine grained	
LSTP-8	0.0-0.5	LIGHT OLIVE-BROWN CLAY (CH) medium stiff, dry, with desiccation cracks, weak and porous	
	0.5-2.0	RED-BROWN CLAY WITH GRAVEL AND COBBLES (CH) very stiff to hard, moist, angular cobbles to 6 inches in diameter, some roots (Qc/residual soil)	Outside of Landslide
	2.0-2.5	DARK GRAY CLAY WITH SAND (CH) very stiff, dry to moist, with shale inclusions (Qls)	3322
	2.5-5.0	DARK OLIVE GRAY SILTSTONE/SHALE closely laminated, extremely closely spaced fractures, moderately hard to hard, weak, moderately weathered to brown, sheared	
LSTP-9	0.0-1.0	LIGHT OLIVE-BROWN CLAY (CH) medium stiff, dry, with desiccation cracks, weak and porous, with angular gravels and cobbles, roots	
	1.0-2.0	DARK GRAY SHALE crushed, sheared, firm, plastic, completely weathered to soil (residual/colluvium/Qc)	Outside of Landslide 3221

	2.0-5.0	DARK OLIVE GRAY SILTSTONE/SHALE closely laminated, extremely closely spaced fractures, sheared, firm, friable, highly weathered to brown, with strong concretions	
LSTP-10	0-1.0	OLIVE BROWN SANDY CLAY (CH) hard, dry, with gravel, with roots (Qls)	
	1.0-5.75	DARK OLIVE BROWN TO DARK OLIVE GREEN CLAY WITH GRAVEL AND COBBLES (CH) very hard, moist, very hard and very strong angular clasts of greenstone from 1 to 8 inches in diameter (Qls)	3122
	5.75-6.5	OLIVE GREEN CLAY WITH SAND (CH) hard, moist, sheared, slicks, healed slide plane	
	6.5-7.5	GREEN SERPENTINE MELANGE sheared, soft to firm, plastic to friable, highly weathered	
LSTP-11	0.0-2.5	RED CLAY WITH SAND (CH) (Qls) soft to hard, weak and porous to ½ foot, dry ½ to 2 feet then moist	
	2.5-3.0	DARK OLIVE-GREEN CLAY (CH) hard, moist, sheared, with slicks, irregular edges, locally pinched out (healed side plane) (Qls)	3312
	3.0-5.0	OLIVE GREEN WITH RED WEATHERING SERPENTINTE MELANGE firm, friable, highly weathered, with hard, strong, greenstone inclusions	
LSTP-12	0.0-1.0	BROWN CLAY (CH) stiff, dry to moist, with angular volcanic cobbles to 6 inches in diameter, weak and porous, with roots (Qc) (Qls)	
	1.0-3.5	RED BROWN CLAY (CH) hard, moist, with coarse sand and volcanic cobbles approximately 6 inches in diameter from 2½ to 3½ feet, with roots at base of layer (Qls)	Question-able 3312
	3.5-5.0	RED-BROWN SANDY CLAY (CL-CH) very hard, dry to moist, with sand to small cobbles and volcanic gravels (completely weathered lithic tuff)	
	5.0-7.0	YELLOW-GREEN LITHIC TUFF closely to very closely spaced fractures, firm, friable, highly weathered	
LSTP-13	0.0-3.0	GRAY BROWN SANDY CLAY WITH GRAVEL AND COBBLES (CH) stiff to very stiff, dry to moist, shrinkage crack ½ inch wide and 12 inches deep	
	3.0-4.0	RED BROWN SANDY CLAY WITH COBBLES (CH) very stiff, moist, with volcanic and greenstone cobbles	3312
	4.0-5.5	GRAY GREEN SERPENTINITE	

		Closely to very closely spaced fractures, firm, weak to friable, moderately weathered	
LSTP-14	0.0-1.5 1.5-2.5 2.5-5.0	RED-BROWN CLAY WITH SAND AND GRAVEL (CL) soft to medium stiff, dry to moist, weak and porous, with angular volcanic cobbles to 1½ feet (Qc) RED-BROWN CLAY (CH) hard, moist (residual soil) SERPENTINIZED GREENSTONE extremely closely spaced fractures, moderately hard, weak, highly weathered	No Landslide
LSTP-15	0.0-4.0 4.0-7.0	RED BROWN SANDY CLAY WITH COBBLES AND BOULDERS (CH) very stiff, moist, porous in upper 1 foot GREEN SERPENTINITE closely spaced fractures, firm, weak, moderately weathered	3212
LSTP-16	0.0-1.0 1.0-3.5 3.5-4.5	BROWN CLAY WITH SAND (CH) soft to medium stiff, dry, with cobbles and small boulders, with boulder float at surface (Qc/Qls) BROWN CLAY WITH SAND AND GRAVEL (CH) hard, moist, with prominent VPF, angular volcanic cobbles (Qls) BROWN CONGLOMERATE no visible fractures, moderately hard, moderately strong, moderately to highly weathered, serpentinite clasts (KJF)	3212
LSTP-17	0.0-1.5 1.5-3.0 3.0-5.0	BROWN SANDY CLAY (CH) soft to medium stiff, dry to moist, with desiccation cracks, with roots, weak and porous to ½ foot, with boulder float at surface (residual soil) GREEN SERPENTINIZED GREENSTONE closely spaced fractures, firm, weak to moderately strong, highly weathered GREEN SERPENTINIZED GREENSTONE closely spaced fractures, moderately hard, weak to moderately strong, moderately weathered	Outside of Landslide
LSTP-18	0.0-1.0 1.0-4.0	BLUE GREEN CLAYEY SAND (SC) medium dense, dry (residual soil) BLUE GREEN SERPENTINITE sheared, very closely spaced fractures, firm to moderately hard, weak, highly to moderately weathered, highly sheared and weathered from 1 to 2 feet	Above Landslide Head Scarp (Outside of Landslide)
LSTP-19	0.0-2.5 2.5-3.0	LIGHT GRAY-BROWN CLAY (CL-CH) hard, dry, weak and porous to 3 feet (Qc) GRAY SILTSTONE	

		extremely closely spaced fractures, moderately hard, weak, highly weathered to brown	No Landslide
	3.0-5.0	GRAY SILTSTONE very closely to closely spaced fractures, moderately hard, moderately strong, moderately weathered	
LSTP-20	0.0-1.5	LIGHT GRAY-BROWN SANDY CLAY (CH) hard, dry, grades to completely weathered siltstone from 1 to 1½ feet, volcanic rubbly float at surface	No Landslide
	1.5-5.0	GRAY-BROWN SHALE closely to very closely spaced fractures, moderately hard, moderately strong, moderately weathered	
LSTP-21	0.0-1.0	VERY LIGHT BROWN SANDY CLAY WITH GRAVEL (CL) medium stiff, dry, with volcanic cobbles and rubbly surface float (Qc)	No Landslide
	1.0-7.0	GRAY SILTSTONE/SHALE extremely closely spaced fractures, moderately hard, moderately strong, moderately weathered	
LSTP-22	0.0-2.0	VERY DARK GRAY BROWN CLAY (CH) hard, dry, with volcanic cobbles and rubbly surface float (Qls)	
	2.0-3.0	VERY DARK GRAY BROWN CLAY WITH COBBLE (CH) medium stiff, dry to moist, with angular gravel and cobbles to 8 inches in diameter, clast-supported (old Qls)	3313
	3.0-4.5	OLIVE BROWN SHALE extremely closely spaced fractures, firm, weak, highly weathered	
LSTP-23	0.0-3.5	LIGHT RED-BROWN SANDY CLAY (CL) medium stiff, dry, with cobbles and boulders, angular gravel, very clayey from 3 to 3½ feet (Qls)	5322
	3.5-4.5	BROWN SANDY CLAYSTONE WITH BOULDERS closely spaced fractures, firm, plastic to friable, highly weathered, with pressure facets	
LSTP-24	0.0-5.0	GRAY BROWN TO DARK GRAY BROWN SANDY CLAY (CH) very stiff to hard, dry to moist, weak and porous to 1½ feet, sparse volcanic gravels (alluvium)	No Landslide
	5.0-6.0	VOLCANIC BOULDERS rubbly flow deposit (Qob – Clearlake Volcanics)	
LSTP-25	0.0-1.0	BROWN SANDY CLAY (CH) medium stiff, dry, with desiccation cracks	No Landslide
	1.0-7.0	DARK GRAY SILTSTONE closely to very closely spaced fractures, firm to moderately hard, weak to moderately strong, moderately weathered	

Faulting

The site is not within a current Alquist-Priolo Earthquake Fault Zone for active faults as defined by California geological Survey (CGS). CGS defines active faults as those exhibiting evidence of surface displacement during Holocene time (last 11,000 years). However, the site is within an area affected by strong seismic activity. Several northwest-trending Earthquake Fault Zones exist in close proximity to, and within several miles of, the site (Bortugno, 1982). The shortest distances from the site to the mapped surface expression of these faults are presented in the table below.

ACTIVE FAULT PROXIMITY		
Fault	**Direction**	**Distance-Miles**
San Andreas	SW	41
Healdsburg-Rodgers Creek	SW	20
Concord-Green Valley	SE	30
Cordelia	SE	30
West Napa	SE	21½
Maacama	SW	16
Konocti	NW	14
Hunting Creek	NE	5¾

Surface

The property extends primarily over relatively level valley floor areas as well as rugged, moderately to steeply sloping terrain. Volcanic-capped peaks are characteristically conical in shape. The vegetation consists of seasonal grasses, chaparral, oak, and other common shrubs of the region. Many acres have been planted in wine grapes.

We understand that several archaeological/cultural historic sites are present on the property. We observed one spring on the southwestern shore of Upper Bohn Lake that reportedly flows all year long (Randy Sternberg, personal communication, 2018).

In general, the ground surface includes both soft, spongy areas, and relatively hard, dry areas. Either condition can generally be associated with weak, porous surface soils. Along existing roads and around existing building areas, some fill soils are present. Undocumented or heterogeneous fill soils, as well as weak, porous surface soils, often have unknown bearing capacity and unpredictable settlement under new loads.

Natural drainage consists of overland flow over the ground surface that concentrates on a natural drainage element such as swales and ravines. Because of the large size of the property, there are several micro-water

sheds that trend toward local low areas, such as Bohn Valley, Bucksnort Creek valley, and the Upper Bohn Lake area.

Subsurface

Our observations of the subsurface materials generally agreed with the published geologic maps with respect to mapped geologic units and bedrock types. The bedrock characteristics vary with the rock type. A summary of the subsurface conditions as observed within our test pits is presented below. Our laboratory testing indicates that two of the five samples of serpentine bedrock tested contained detectable levels of naturally-occurring asbestos mineral fibers (1.58 percent and 2.17 percent; see below and Appendix B for full report).

A composite sample of the near-surface soils from test pits TP-1 through TP-6 exhibits medium plasticity (LL = 48.1; PI = 18.7), very low expansion potential (EI = 8), and moderate to high R-Value (R-Value = 50). A composite sample of the near-surface soils from test pits TP-7 through TP-12 exhibits medium plasticity (LL = 55.8; PI = 28.0), medium expansion potential (EI = 81), and low R-Value (R-Value = 7).

ORIGINAL ENTRY ROAD - TEST PITS TP-1 THROUGH TP-12

Test Pit #	Depth (ft.)	Description	NOA tested/detected
TP-1	0-4	RED-BROWN GRAVEL WITH SILT AND SAND (GP-GM), Loose to medium dense, dry, with roots and rootlets throughout, angular coarse gravel to cobbles (colluvium - Qc)	
	4-5	GREEN SERPENTINITE, crushed, sheared, moderately hard, weak to moderately strong, highly weathered, with hard boulders. No Groundwater encountered	2.17% Chrysotile
TP-2	0-0.5	RED-BROWN CLAYEY SAND (SC), loose, dry, weak and porous, abundant rootlets (surface soil)	
	0.5-1.5	RED-BROWN CLAYEY SAND (SC), with gravel, medium dense, dry to moist, weak and porous, with roots	
	1.5-3	RED-BROWN SILTY GRAVEL WITH SAND (SM), medium dense, moist (Qc)	
	3-4	GRAY SERPENTINIZED GREENSTONE, closely spaced fractures, hard, strong, highly weathered. No Groundwater encountered	
TP-3	0-0.5	RED-BROWN CLAYEY SAND (SC), loose, dry, weak and porous, with gravel, abundant rootlets (Surface soil)	
	0.5-3	GREEN SERPENTINITE, closely to very closely spaced fractures, hard, strong, moderately weathered. No Groundwater encountered	
TP-4	0-0.5	BROWN CLAYEY SAND WITH GRAVEL (SC), loose, moist, weak and porous, with abundant rootlets and organics (surface soil)	

	0.5-2	BLUE-GRAY GREENSTONE, closely spaced fractures, hard, strong, moderately weathered, with serpentinized areas. Very hard digging. No Groundwater encountered	
TP-5	0-0.5	RED-BROWN CLAYEY SAND (SC), loose, dry to moist, weak and porous, with abundant rootlets and organics (surface soil)	
	0.5-1.5	GREEN SERPENTINITE, closely spaced fractures, sheared, moderately hard, weak, highly weathered. No Groundwater encountered	
TP-6	0-2	BROWN CLAYEY SAND WITH GRAVEL (SC), medium dense, dry to moist, with cobbles and boulders, rip rap (fill) Digging refusal in boulders. No Groundwater encountered	
TP-7	0-1.5	RED-BROWN CLAYEY SAND WITH GRAVEL (SC), loose, dry, weak and porous (Qc)	
	1.5-4	ORANGE-BROWN MELANGE, sheared, firm, friable, completely/highly weathered, with hard cobbles of greenstone No Groundwater encountered	ND (non-detect, <0.08%)
TP-8	0-1	RED-BROWN CLAYEY SAND (SC), loose to medium dense, dry, with gravel and cobbles (Qc)	
	1-2	RED CLAY (CH), hard, dry (residual soil)	
	2-6	RED BASALT, closely spaced fractures, firm, weak, highly weathered. No Groundwater encountered	
TP-9	0-0.5	RED CLAY WITH SAND (CL), soft, moist, weak and porous, with abundant rootlets	
	0.5-1	RED CLAY WITH SAND (CL), hard, dry, with gravel (residual soil)	
	1-2.5	RED-BROWN PEBBLY COARSE SANDSTONE, firm, weak, highly weathered No Groundwater encountered	
TP-10	0-2	LIGHT BROWN SILTY-CLAYEY SAND (SC), medium dense, dry to moist, weak and porous	
	2-3	LIGHT BROWN CLAYEY SAND (SC), medium dense to dense, dry to moist, with gravel (residual soil)	
	3-5	ORANGE BROWN GREENSTONE, very to extremely closely spaced fractures, firm, weak, highly weathered No Groundwater encountered	
TP-11	0-1.5	RED-BROWN CLAY WITH SAND (CL), soft to medium stiff, moist, weak and porous, with roots to 2’	
	1.5-3	RED-BROWN SANDY CLAY (CH), hard, dry	

	3-4 4-5	GREEN TO RED-BROWN MELANGE, sheared, firm, weak, highly weathered, with resistant greenstone fragments. DARK GRAY-GREEN GREENSTONE, sheared, moderately hard, moderately strong, moderately weathered to red in color. No Groundwater encountered	
TP-12	0-2 2-5 5-5.5	DARK BROWN SANDY CLAY (CH), hard, dry, weak and porous to 0.5', with roots, GREEN TO BROWN MELANGE, sheared, firm, weak, highly weathered GRAYWACKE SANDSTONE, closely spaced fractures, hard, moderately strong to strong, moderately weathered. No Groundwater encountered	

Our laboratory tests indicate that throughout the Farmstead area, most of the near-surface soils exhibit high plasticity (LL from 60.3 to 91.6; PI from 39.5 to 63.1), and medium to high expansion potential (EI from 88 to 123).

FARMSTEAD/MAHA Farm- TEST PITS TP-13 THROUGH TP-30

Test Pit #	Depth (ft.)	Description	NOA tested/detected
TP-13	0-0.5 0.5-3	BROWN CLAYEY SAND (SC), loose, moist, weak and porous, with gravel and cobbles, with abundant roots, organics YELLOW TO OLIVE GREEN TUFF, firm to moderately hard, weak, highly weathered, hydrothermally altered. No Groundwater encountered	
TP-14	0-1 1-1.5 1.5-2 	RED-BROWN CLAY WITH SAND (CL), soft, moist, weak and porous, with gravel, with roots (surface soil) RED-BROWN CLAY WITH SAND (CH), hard, moist, with cobbles, vertical pressure facets RED-BROWN SILTY GRAVEL WITH SAND (SM), medium dense, moist (Qc) GREEN SERPENTINITE, sheared, moderately hard, moderately strong, highly weathered. No Groundwater encountered	1.58 % Chrysotile
TP-15	0-2 2-2.5 2.5-6	RED-BROWN CLAY WITH SAND AND GRAVEL (CL), medium stiff, dry, with rootlets to 0.5, weak and porous to 1' (surface soil) RED-BROWN CLAYEY GRAVEL (GC), dense, dry to moist, angular volcanic gravels (Qt) RED-BROWN CLAY WITH SAND (CH), hard, dry to moist, vertical pressure facets	

	6-7	RED-ORANGE CLAY WITH SAND (CL), hard, dry, with basalt gravel and cobbles, becomes indurated (MUDSTONE) at 7'. No Groundwater encountered	
TP-16	0-0.75 0.75-2	BROWN SANDY CLAY (CH), medium stiff to very stiff, moist, weak and porous to 0.5', with roots throughout BROWN, GREEN, ORANGE SERPENTINITE, extremely closely spaced fractures, moderately hard, strong, highly weathered; hard digging No Groundwater encountered	ND (<0.08%)
TP-17	0-2 2-2.5 2.5-5 5-5.5	RED-BROWN CLAY WITH SAND AND GRAVEL (CL), medium stiff, dry, with rootlets to 0.5', weak and porous to 1' (Surface soil) RED-BROWN CLAYEY GRAVEL (GC), dense, dry to moist, angular volcanic gravels (terrace deposits - Qt) RED-BROWN CLAY WITH SAND (CH), hard, dry to moist, vertical pressure facets, with sand, with serpentinite and obsidian gravels (Qt and residual soil) GREEN AND BLACK SERPENTINITE, sheared, firm, weak, highly weathered No Groundwater encountered	ND (<0.08%)
TP-18	0-1.5 1.5-3 3-4	LIGHT BROWN CLAYEY SAND (SC), medium dense, dry to moist, weak and porous throughout, with gravel, with large roots to 3', increased gravels at base of layer RED TO OLIVE BROWN CLAY (CH), hard to very hard, moist, vertical pressure facets LIGHT BROWN SANDSTONE, closely to very closely spaced fractures, moderately hard, weak to moderately strong, moderately to highly weathered. No Groundwater encountered	
TP-19	0-1.5 1.5-3.5 3.5-5.5	RED-BROWN CLAY WITH SAND (CH), medium stiff, dry to moist, weak and porous, with abundant roots, with volcanic gravels RED-BROWN CLAY (CH), hard to very hard, moist, with some gravels VOLCANIC BRECCIA, closely spaced fractures, firm, friable, highly weathered No Groundwater encountered	
TP-20	0-2 2-4	RED-BROWN CLAY WITH SAND (CL), medium stiff to very stiff, moist, weak and porous, abundant roots and rootlets RED-BROWN CLAY (CH), hard to very hard, moist, with large gravels/small cobbles of basalt-andesite	

	4-4.5	ORANGE-BROWN SANDY VOLCANIC AGGLOMERATE, closely spaced fractures, firm, weak, highly weathered. No Groundwater encountered	
TP-21	0-1.5 1.5-3	RED-BROWN CLAY WITH SAND (CL), soft to medium stiff, dry, weak and porous, with abundant roots, with weathered silicic gravels LIGHT YELLOW TO RED VOLCANIC AGGLOMERATE, closely spaced fractures, firm to moderately hard, weak, highly weathered, with spheroidally weathered dacite cobbles in a red clay matrix. No Groundwater encountered	
TP-22	0-1.5 1.5-2 2-3 3-3.5	RED-BROWN SANDY CLAY WITH GRAVEL (CL), medium stiff, dry, weak and porous RED-BROWN CLAY WITH SAND (CH), hard, dry, with light gray silicic volcanic gravels RED-BROWN CLAY (CH), hard to very hard, moist ORANGE SANDY LITHIC TUFF, partly welded, closely spaced fractures, firm to moderately hard, weak, highly weathered No Groundwater encountered	
TP-23	0-2 2-5.5	RED CLAYEY SAND (SC), dense, moist, weak and porous to 1', with roots to 2', with abundant small gravels (residual soil) RED AGGLOMERATE, firm, weak, highly weathered No Groundwater encountered	
TP-24	0-2 2-3 3-4	RED-BROWN SANDY CLAY (CL), medium stiff, moist, with abundant volcanic gravel, with abundant roots to 2.5', weak and porous to 0.5' MOTTLED RED-BROWN AND GRAY CLAY (CH), hard to very hard, moist, vertical pressure facets (residual soil) RED TO LIGHT GRAY TUFF AND TUFF AGGLOMERATE, closely spaced fractures, firm, weak, highly weathered No Groundwater encountered	
TP-25	0-2.5 2.5-3 3-3.5	BROWN SANDY CLAY (CL), soft to medium stiff, moist, weak and porous, with abundant roots and volcanic cobbles. GRAY-OLIVE BROWN CLAY WITH SAND (CH), hard, moist RED WELDED TUFF, closely spaced fractures, moderately hard, moderately strong, highly weathered. No Groundwater encountered	
TP-26	0-2 2-3.5	RED-BROWN SANDY CLAY (CL), soft to medium stiff, moist, with abundant dacite cobbles and boulders GRAY AND RED DACITE AGGLOMERATE, spheroidally weathered clasts in a weathered RED CLAY (CH) matrix, clasts are very hard, very strong; clast-supported	

		No Groundwater encountered	
TP-27	0-0.5 0.5-2	RED-BROWN SANDY CLAY (CL), soft, moist, weak and porous, with abundant rootlets and volcanic cobbles DARK GRAY BASALT AGGLOMERATE, moderately to widely spaced fractures, very hard, very strong, moderately weathered to red on fracture surfaces, clast-supported, boulders in a soft, dry clay matrix, very hard digging No Groundwater encountered	
TP-28	0-0.5 0.5-2	RED-BROWN SANDY CLAY (CL), soft, moist, weak and porous, with abundant rootlets and volcanic cobbles DARK GRAY BASALT AGGLOMERATE, moderately to widely spaced fractures, very hard, very strong, moderately weathered to red on fracture surfaces, clast-supported, boulders in a soft, dry clay matrix, very hard digging No Groundwater encountered	
TP-29	0-1 1-1.5 1.5-2.5 2.5-3	RED SANDY CLAY (CL), soft to medium stiff, dry to moist, with gravel RED SILTY GRAVEL (GM), dense, moist, with sand, spheroidally weathered dacite cobbles in a soil matrix RED-BROWN CLAY (CH), hard, moist, with gravel, vertical pressure facets ORANGE-BROWN VOLCANIC AGGLOMERATE, very hard, moderately strong, moderately weathered. No Groundwater encountered	
TP-30	0-3	RED-BROWN SANDY CLAY (CL), soft, weak and porous to 2', hard, clast-supported 2' to 3', dry to moist, with cobbles and boulders of very hard, very strong basalt; digging refusal in boulders at 3' No Groundwater encountered	

OTHER AREAS - TEST PITS TP-31 THROUGH TP-45

Test Pit #	Depth (ft.)	Description	NOA tested/detected
TP-31	0 – 3 3 - 5	BROWN SILTY SAND (SM), loose to medium dense, dry to moist, with cobbles to boulders of serpentinized greenstone, weak & porous to 1.5', roots to 3' Green serpentinite, extremely closely spaced fractures, moderately hard, moderately strong to strong, moderately to highly weathered. No Groundwater encountered	
TP-32	0 - 1	REDDISH BROWN SANDY CLAY (CL), soft to medium stiff, dry, with cobbles. – Hang-dug pit, no excavator access. Float on surface of gray basalt, closely spaced fractures, hard to very hard, very strong, highly to moderately weathered.	

		No Groundwater encountered	
TP-33	0 – 2	LIGHT BROWN CLAY (CL), soft to medium stiff, dry, with cobbles of very light gray dacite; weak and porous to 1’	
	2 – 3.5	LIGHT GRAY & RED AGGLOMERATE. Light gray DACITE cobbles in a very stiff to hard, red CLAY (CH) matrix. Matrix-supported and highly weathered 1 to 2’; clast-supported below 2’; closely spaced fractures. No Groundwater encountered	
TP-34	0 – 1	BROWN SANDY CLAY (CH), very stiff to hard, dry, with gravel (volcanic, angular clasts); weak and porous; desiccation cracks at surface extend 1.5’ below surface.	
	1 – 3	BLACK CLAY (CH), hard, dry to moist, with black and green greenstone fragments; with vertical pressure facets	
	3 – 5.5	BLACK TO GREEN SERPENTINITE & SERPENTINIZED GREENSTONE, extremely closely spaced fracatures, hard to very hard, strong to very strong, moderate weathering. No Groundwater encountered	
TP-35	0 – 5.5	RED-BROWN SANDY CLAY (CL-CH), stiff, dry, weak to 1’, somewhat porous to 2’, roots to 3’, with coarse sand and gravel. Becomes, hard, less porous at 2’, with increased dacite gravel and cobbles.	
	5.5 - 7	LIGHT GRAY & RED AGGLOMERATE. Light gray DACITE cobbles in a very stiff to hard, red CLAY (CH) matrix. Clast-supported; closely spaced fractures. No Groundwater encountered	
TP-36	0 – 1	BROWN CLAY (CH), very stiff, dry, with sand and gravel, weak and porous to 0.5’, sparse roots	
	1 - 5	BLACK AND GREEN SERPENTINIZED GREENSTONE, extremely closely spaced fractures, sheared texture, friable to moderately hard, moderately strong, highly weathered; completely weathered with soil matrix from 1 to 1.5’. No Groundwater encountered	
TP-37	0 – 1.5	BROWN CLAY (CL), very stiff, dry, weak to 0.5’	
	1.5 – 4.5	VERY DARK BROWN SANDY CLAY (CH), hard, moist, with red volcanic cobbles, with serpentinite gravels, some roots to 3.5’.	
	4.5 – 7	RED-BROWN SANDY CLAY (CH), hard, dry to moist, with serpentinite gravels	
	7	RED-BROWN GREENSTONE/BASALT, closely spaced fractures, hard, moderately strong, highly weathered. No Groundwater encountered	ND (< 0.08%)
TP-38	0 – 1	LIGHT BROWN CLAY (CL), medium stiff, dry, with cobbles, weak and porous, with roots	

	1 – 1.5 1.5 - 4	RED CLAY (CH), hard, moist, with sand and gravel RED VOLCANIC AGGLOMERATE – subangular gravel- to cobble-sized andesite-dacite clasts in a hard, red SANDY CLAY (CH) matrix, matrix-supported; massive, no visible fracturing, moderately hard, moderately strong, moderate weathering, hard digging. No Groundwater encountered	ND (< 0.08%)
TP-39	0 – 1.5 1.5 - 4	DARK BROWN SANDY CLAY (CH), medium stiff to hard, dry to moist, weak and porous to 0.5', with abundant roots throughout, with serpentinite clasts/weathered bedrock surface 1-1.5'. DARK GRAY GREEN SERPENTINIZED GREENSTONE & SERPENTININTE, sheared, closely to extremely closely spaced fractures, moderately hard, weak to moderately strong, highly weathered. No Groundwater encountered	Chrysotile (< 0.08%)
TP-40	0 – 1.5 1.5 - 3	RED-BROWN CLAY (CH), medium stiff to very stiff, moist, with gravels and cobbles of serpentinite GREEN SERPENTINITE, sheared, extremely closely spaced fractures, moderately hard, weak to moderately strong, highly weathered from 1.5' to 2.5', moderately weathered 2.5' to 3', hard digging. No Groundwater encountered	3.92% Chrysotile
TP-41	0 – 1 (locally) 0 – 1.5	RED-BROWN SANDY CLAY (CL), soft, dry, weak and porous, with roots GREEN SERPENTINITE, sheared, closely-spaced fractures, moderately hard, moderately strong, highly weathered 0 to 1', moderately to slightly weathered 1 to 1.5;, digging refusal at 1.5'.	1% Chrysotile
TP-42	0 – 2 2 – 3.5	LIGHT REDDISH-BROWN CLAY WITH SAND (CL), medium stiff, dry, with roots, weak and porous; increased large gravels and small cobbles 1' to 2'. VOLCANIC AGGLOMERATE, closely to very closely spaced fractures, hard to very hard, strong to very strong, large cobble-sized clasts of subangular, spheroidally-weathered basalt; clast-supported. Digging refusal at 3'. No Groundwater encountered	
TP-43	0 – 1.5 1.5 - 2	RED-BROWN SILT (ML), medium stiff, dry, weak and porous throughout GRAY TO PINK TUFF AGGLOMERATE, closely spaced fractures, hard, strong, moderate weathering. No Groundwater encountered	ND (< 0.08%)
TP-44	0 – 1 (locally) 0 – 1.5	LIGHT RED-BROWN SILT (ML), medium stiff, dry, weak and porous GRAY ANDESITE, closely spaced fractures, hard, strong, slightly to	ND (< 0.08%)

		moderately weathered to red-brown on fractures. Digging refusal at 1.5'. No Groundwater encountered	
TP-45	0 – 1 1 - 2	LIGHT RED-BROWN SILT (ML), medium stiff, dry, weak and porous GRAY ANDESITE, closely spaced fractures, hard, strong, highly weathered from 1 to 1.5', slightly to moderately weathered to red-brown on fractures below 1.5'. Digging refusal at 2'. No Groundwater encountered	ND (< 0.08%)

DISCUSSION AND CONCLUSIONS

Geologic Hazards

Serpentinite Bedrock and NOA

The site has areas mapped as having ultramafic bedrock units. Some ultramafic bedrock types contain naturally occurring asbestos. Test pits TP-1, -2, -3, -4, -5, -14, -16, -17, -31, -34, -36, -40, and -41 encountered serpentinite and/or serpentinized greenstone bedrock at depths of 0 to 5 feet. This bedrock could be exposed during grading and can contain naturally occurring asbestos fibers. There are State enforced regulations giving specific measures that must be used during grading to mitigate hazards associated with airborne asbestos particles. If these materials are exposed during grading, we will notify the client and the general contractor of the potential hazard. We recommend you retain certified asbestos personnel to develop a work plan to address airborne asbestos during grading.

Landslides

As discussed previously, landslide/debris/earth flow features have been mapped by others (Dwyer, 1976) at the project site and primarily occur with Franciscan Complex bedrock. Development including roadway and utilities should avoid these areas unless remedial work is performed to stabilize the slopes. Remedial work could include removing the landslide debris and constructing a buttress. In addition, debris/earth flow features can have adverse impact on improvements constructed downslope if the feature were to reactivate. The design level geotechnical studies at each structure location should address these issues in detail.

In general, most of the deposits we interpret to have been emplaced through landslide processes are less than 5 feet thick and consist of angular cobbles within a sandy clay matrix. Often, an old clay slide plane and/or layer of larger cobbles or boulders was observed along the base of the deposit. All of the landslides we observed in test pits are at least dormant, with some being ancient and well-indurated or "healed". The oldest of the landslides exhibits a high degree of cementation and induration, being described as hardpan soil or breccia. In test pits LSTP-3 and LSTP-4, we encountered digging refusal within the well-indurated, ancient landslide deposits. In some areas, the material described as landslide debris may be more colluvial in nature (colluvium is unconsolidated soil and rock material that moves downslope primarily due to gravity rather than saturation, material characteristics, or inherent planes of weakness). However, due to the unconsolidated and geologically young nature of these deposits, loose colluvium may pose similar risks to construction as landslide debris, when disturbed.

The most notable areas in which we anticipate the presence of landslide deposits will be a prominent geotechnical consideration during construction are the landslides mapped at LSTP-15 and -16, -11, -13, -6, and along the main entry road. Separate reports addressing the main entry road, other roads, and the Polo Lodge, respectively, will address these landslides on a case by case basis.

Fault Rupture

We did not observe landforms within the area that would indicate the presence of active faults and the site is not within a current Alquist-Priolo Earthquake Fault Zone. Therefore, we believe the risk of fault rupture at the site is low.

Strong Ground Shaking

Data presented by the Working Group on California Earthquake Probabilities (2002) estimates the chance of one or more large earthquakes (Magnitude 6.7 or greater) in the San Francisco Bay region within the next 30 years to be approximately 62 percent. Therefore, future seismic shaking should be anticipated at the site. It will be necessary to design and construct the proposed structures in strict adherence with current standards for earthquake-resistant construction.

Liquefaction

Liquefaction is a rapid loss of shear strength experienced in saturated, predominantly granular soils below the groundwater level during strong earthquake ground shaking due to an increase in pore water pressure. The occurrence of this phenomenon is dependent on many complex factors including the intensity and duration of ground shaking, particle size distribution and density of the soil. The site contains several isolated areas delineated by Slosson and Associates (1976) as liquefaction study zones, including Bohn Valley, the flat, low-lying area south of McCreary Lake, the small basin surrounding Wildcat Lake, and the low-lying areas surrounding Ink Ranch in the far northeastern corner of the property. Therefore, we judge that there is a moderate potential for liquefaction at the site within these areas. The final geotechnical study should address liquefaction in detail, especially if development is planned in these areas.

Densification

Densification is the settlement of loose, granular soils above the groundwater level due to earthquake shaking. Densification typically occurs in old fills and in soils that if saturated would be susceptible to liquefaction. The final geotechnical study should address densification in detail, especially in areas of planned development.

Lurching

Seismic slope failure or lurching is a phenomenon that occurs during earthquakes when slopes or man-made embankments yield and displace in the unsupported direction. Provided the improvements are located outside areas of identified slope instability and the foundations are installed as recommended herein, and the proposed fills are adequately keyed into underlying bedrock material, as subsequently discussed, we judge the potential for impact to the proposed fills from the occurrence of these phenomena

at the site is low. However, some of these secondary earthquake effects are unpredictable as to location and extent, as evidenced by the 1989 Loma Prieta Earthquake.

Volcanism

The Clear Lake volcanic field has experienced a complex and cyclic eruptive history. The youngest eruptive sequence is dated at 10,000 years old (Miller, 1989; Sims and Rymer, 1975), and fumaroles (gas vents) are active throughout the Clear Lake Basin. These conditions suggest that the Clear Lake Volcanic System is not extinct and future eruptions could occur. Volcanic hazards that may be pertinent to the site area include phreatic and tephra eruptions and surges (Miller, 1989). Volcanic impact could range from inundation by several inches of ash to major ash flow eruptions. Due to the complex nature of the past episodic volcanic activity, no prediction regarding the extent or time of future volcanic activity is available. The risk of impact from volcanism at the site can be further influenced by wind and other climatologic conditions, is consistent with that of other properties in the Clear Lake area, and is not considered to be sufficiently defined to preclude site development.

Flooding and Seiche

Our review of the Federal Emergency Management Agency (FEMA) Flood Zone Maps for Lake County, California, Unincorporated Areas (No. 06033C1000D dated September 26, 2008 and 06033C0900D dated September 30, 2005), indicate that the entire property lies within Zone D, defined as an area of undetermined flood hazards. Evaluation of flooding potential is typically the responsibility of the project civil engineer.

The site includes several lakes ranging greatly in size, and as previously discussed, is susceptible to impact from seismic shaking. Strong, sudden earthquake waves can produce surges in bodies of water (seiches) that can cause damage and flooding similar to the effect of tsunami along the coastline. Site-specific evaluation of seiche impact to the project is beyond the scope of this study.

Expansive Soil

We encountered expansive soils in some of our test pits. Expansive soil is considered a geologic hazard because of the costly damage it causes to structures when its effects are not considered during construction. Expansive surface soils shrink and swell as they lose and gain moisture throughout the yearly weather cycle. Near the surface, the resulting movements can heave and crack lightly loaded shallow foundations, slabs and pavements. The zone of significant moisture variation (active layer) is dependent on the expansion potential of the soil and the extent of the dry season. In the Lake and Napa County area, the active layer is generally considered to range in thickness from about 2 to 3 feet. The detrimental effects of the above-described movements can be reduced by treating or capping the expansive soils during grading, and/or by utilizing foundation systems that either gain support below the active layer, or are designed to move with the soils and bridge the heave effects.

Conclusions and Recommendations

Based upon the results of our geologic data review and reconnaissance, we judge that it is geotechnically feasible to construct the resort. The primary geotechnical considerations and potential mitigating measures recommended for parcel creation, building site development and roadway construction are discussed in the

following sections of the report. These conclusions are preliminary and will need to be verified or modified during final design following detailed site-specific subsurface exploration, laboratory testing and geotechnical engineering evaluations, as recommended herein.

Permanent Cut and Fill Slopes

In general, cut and fill slopes should be designed and constructed at slope gradients of 2:1 (horizontal to vertical) or flatter, unless otherwise approved by the geotechnical engineer in specified areas. In expansive soil areas and serpentinite or highly weathered mélange bedrock, cut and fill slopes should be no steeper than 3:1. Where steeper slopes are required, retaining walls should be used. Fill slopes steeper than 2:1 will require the use of geogrid to increase stability.

If the owner is willing to accept on-going maintenance, steeper slopes may be constructed within roadway cutslopes on a case-by-case basis. Cutslopes up to 1:1 may be allowable in certain areas with certain remedial measures.

In general, slopes within serpentinite-derived soils and Franciscan mélange or serpentinite bedrock are highly weathered and are less stable than slopes on younger and/or harder bedrock types. In addition, some of the younger volcanic bedrock formations are rubbly to agglomeritic in nature and may be prone to rockfalls or debris flows as the clayey matrix becomes saturated on steep slopes. The geotechnical engineer should review preliminary site-specific grading plans and profiles for potential slope stability concerns.

Landslide Areas

In general, weak landslide/colluvium deposits on the order of 5 to 10 feet thick can be removed during grading and replaced as drained, buttressed fills. Support for new fills or retaining walls can be found below relatively shallow unconsolidated deposits. Cuts within surficial landslide deposits or loose colluvium can be retained, laid back, and/or the unconsolidated deposits removed on slopes steeper than about 5:1, to prevent reactivation of movement. Denuded slopes should be planted with fast-growing plants to stabilize the bare soils. In the ancient landslide explored with test pits LSTP-3, -4, and -5, the landslide debris is so ancient and consolidated that it constitutes supporting material. In this area, and on stable slopes in general, the younger, weak surface soil and colluvium will still need to be reworked if it is to be used for support.

Residence Locations

The proposed building envelopes must be located outside unstable areas and steep slopes in order to reduce the risks associated with slope instability. Initially, a structural setback of approximately 50-feet from unstable areas and breaks in slope of 2:1 or steeper should be established. A site-specific study should finalize recommended structural setbacks.

Supplemental Services

We should perform detailed, site-specific geotechnical studies prior to the construction of the different phases of the resort, including access roads, the farmstead, hotels, spa, equestrian center, shops, residences, and other planned features. The studies should include test borings or backhoe pits, laboratory testing and engineering analyses. The geotechnical study should address specific design and locating aspects of each planned structure location and the access road, and the data generated should be incorporated into project plans. The plans should then be reviewed by the geotechnical engineer and /or engineering geologist prior to receiving bids for planned work.

LIMITATIONS

This report has been prepared by RGH for the exclusive use of Lotusland Investment Holdings, Inc. and their consultants to evaluate the geotechnical feasibility of the proposed resort.

Our services consist of professional opinions and conclusions developed in accordance with generally accepted geotechnical engineering principles and practices. We provide no warranty, either expressed or implied. Our conclusions and recommendations are based on the information provided to us regarding the project, the results of our field reconnaissance, data review, and professional judgment. As such, our conclusions and recommendations should be considered preliminary and for feasibility and planning purposes only. Additional subsurface study, such as recommended herein, may reveal conditions different from those inferred by surface observation and data review only. Such subsurface study may warrant a revision to our preliminary conclusions.

Site conditions and cultural features described in the text of this report are those existing at the time of our field exploration in 2018 and 2019, and may not necessarily be the same or comparable at other times.

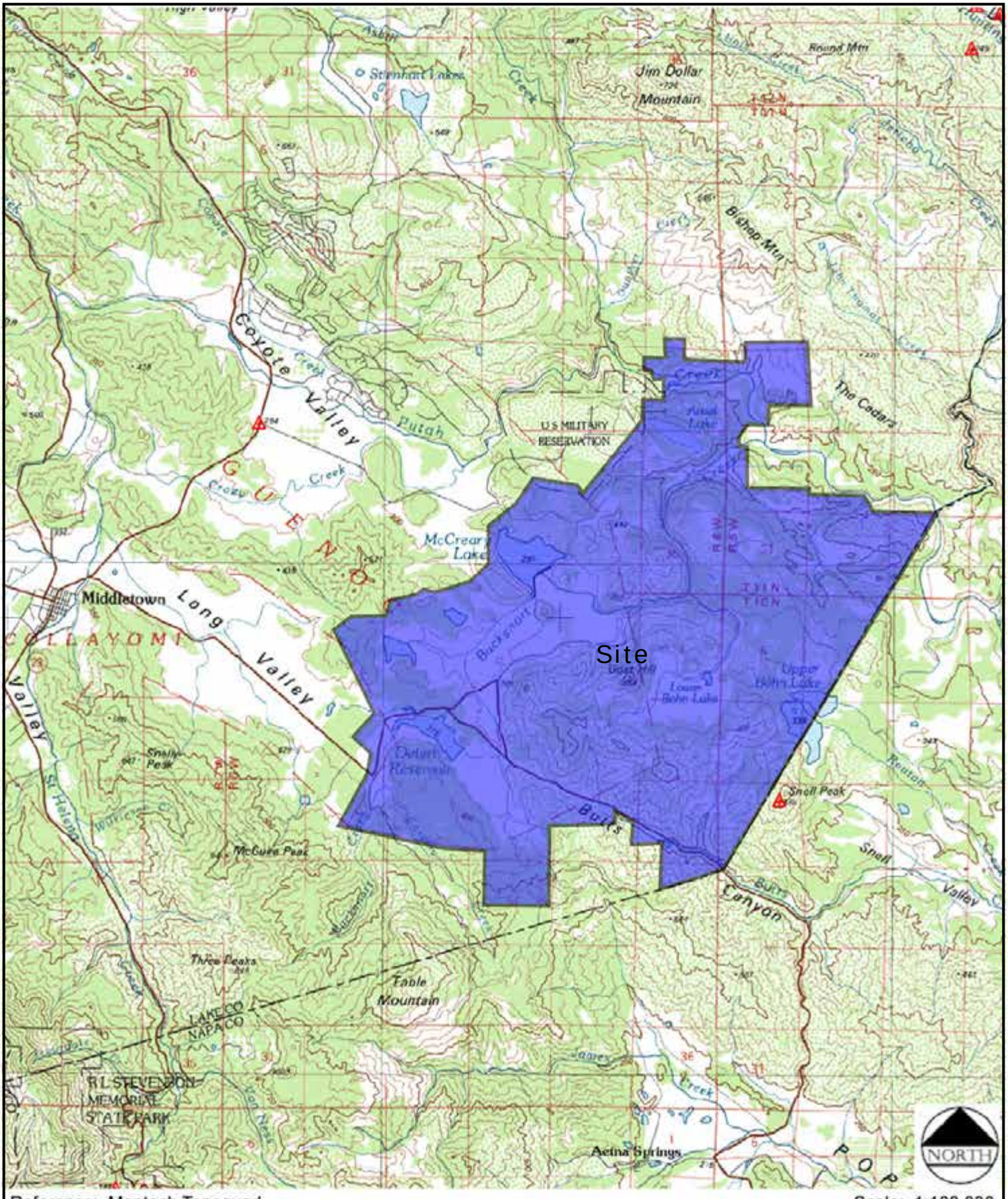
It should be understood that slope failures including landslides, debris flows and erosion are on-going natural processes which gradually wear away the landscape. Residual soils and weathered bedrock can be susceptible to downslope movement, even on apparently stable sites. Such inherent hillside and slope risks are generally more prevalent during periods of intense and prolonged rainfall, which occasionally occur in northern California and/or during earthquakes. Therefore, it must be accepted that occasional slope failure and erosion and deposition of the residual soils and weathered bedrock materials are irreducible risks and hazards of building upon or near the base of any hillside or steep slope throughout northern California. By accepting this report, the client and other recipients acknowledge their understanding and acceptance of these risks and hazards.

Except for the testing for the presence of NOA as discussed herein, the scope of our services did not include an environmental assessment or a study of the presence (or absence) of hazardous, toxic or corrosive materials in the soil, surface water, groundwater or air on, below, or around this site, nor did it include an evaluation or study for the presence (or absence) of wetlands.

APPENDIX A – PLATES

LIST OF PLATES

Plate 1	Site Location Map
Plate 2	Exploration Plan and Mapped Landslide
Plate 3	Map of Published Landslides
Plates 4a through 4e	Aerial Images with Landslide Areas
Plate 5	Landslide Identification Chart
Plate 6	Soil Classification smf Kry To Test Data
Plate 7	Engineering Geology Rock Terms



Reference: Maptech Topoquad

Scale: 1:100,000

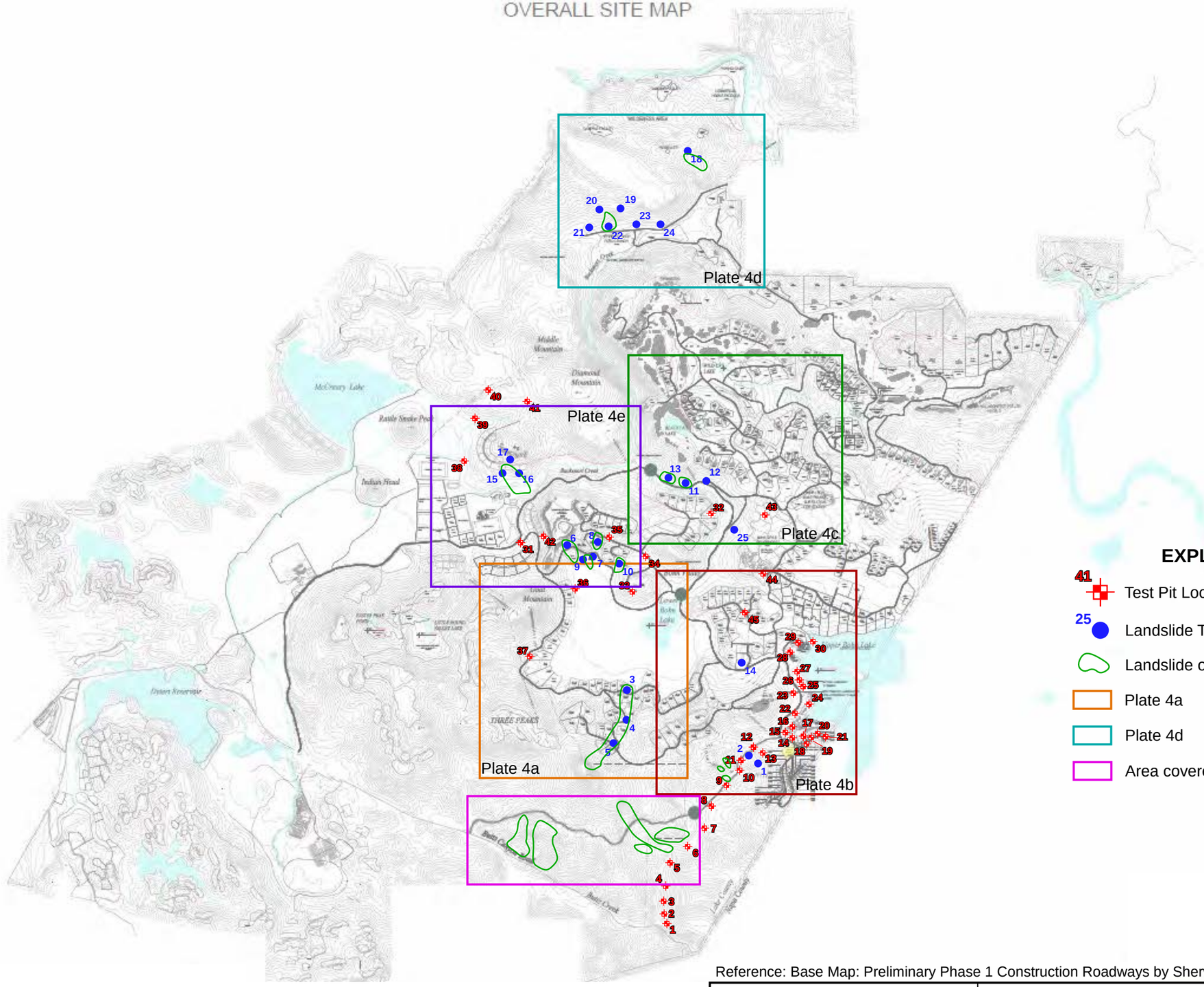
RGH
CONSULTANTS

Job No: 7192.04.01.3 | Date: DEC 2019

SITE LOCATION MAP
MAHA Resort at Guenoc Valley
22000 Butts Canyon Road
Middletown, California

PLATE
1

OVERALL SITE MAP



EXPLANATION

- 41 — Test Pit Location and Number
- 25 — Landslide Test Pit Location and Number (LSTP)
- Landslide observed/mapped by RGH
- Plate 4a
- Plate 4b
- Plate 4c
- Plate 4d
- Plate 4e
- Area covered in detail in Main Entry Road Report

Reference: Base Map: Preliminary Phase 1 Construction Roadways by Sherwood Design Engineers Not To Scale

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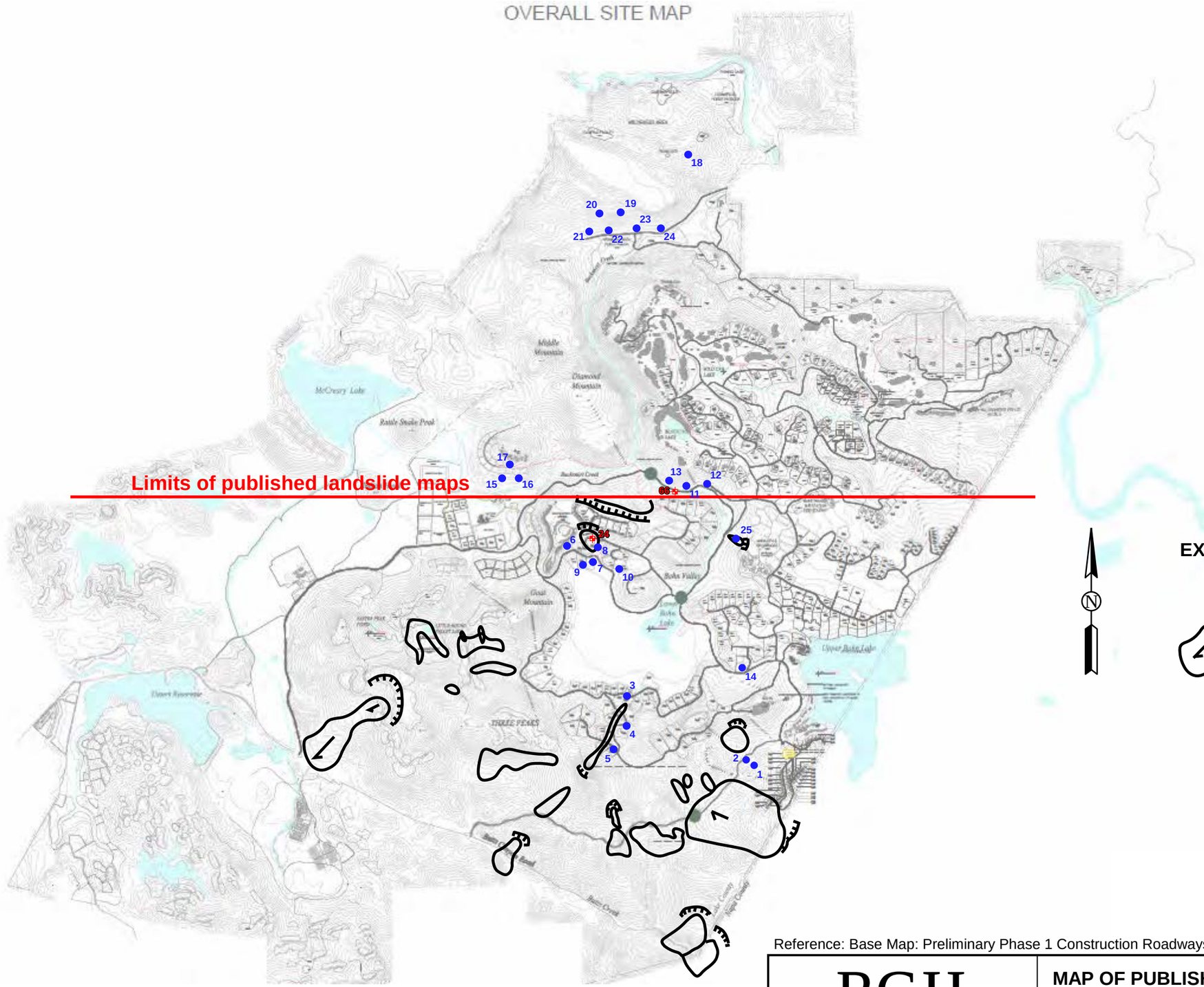
EXPLORATION PLAN WITH LANDSLIDE MAPPING
MAHA Resort at Guenoc Valley
22000 Butts Canyon Road
Middletown, California

PLATE 2

OVERALL SITE MAP



EXPLANATION

Approximate location of published landslide and direction of movement (Dwyer, 1976)

66 Road Test Pit Location and Number (TPR)

25 Landslide Test Pit Location and Number (LSTP)

Reference: Base Map: Preliminary Phase 1 Construction Roadways by Sherwood Design Engineers

Not To Scale

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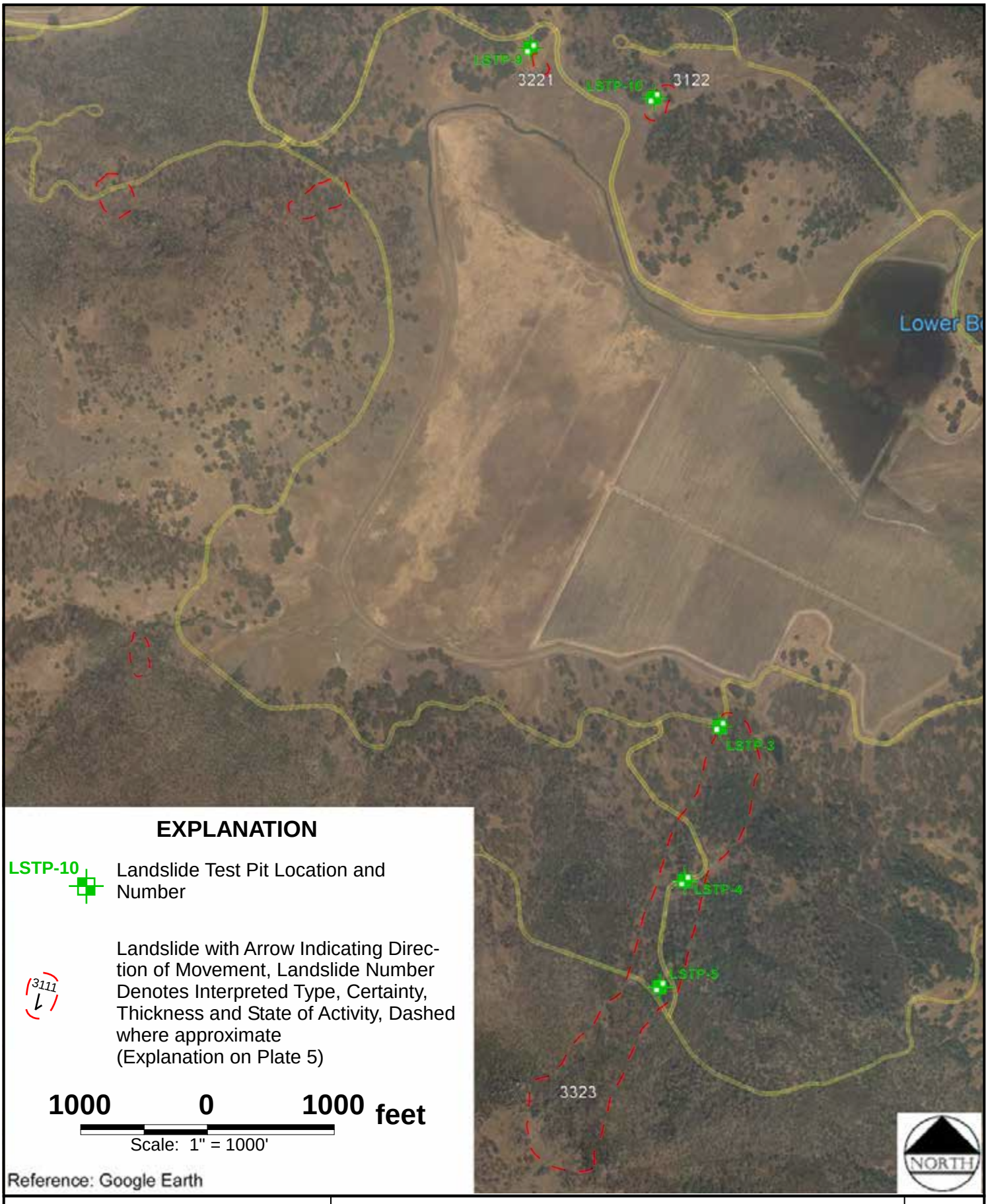
Job No: 7192.04.01.3 | Date: DEC 2019

MAP OF PUBLISHED LANDSLIDES
MAHA Resort at Guenoc Valley
22000 Butts Canyon Road
Middletown, California

PLATE **3**



EXPLANATION

LSTP-10 — Landslide Test Pit Location and Number

3111 — Landslide with Arrow Indicating Direction of Movement, Landslide Number Denotes Interpreted Type, Certainty, Thickness and State of Activity, Dashed where approximate (Explanation on Plate 5)

1000 0 1000 feet

Scale: 1" = 1000'

Reference: Google Earth

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Job No: 7192.04.01.3 | Date: DEC 2019

AERIEAL IMAGES OF LANDSLIDE AREAS

MAHA Resort at Guenoc Valley
2200 Butts Canyon Road
Middletown, California

PLATE
4a

EXPLANATION

LSTP-14 Landslide Test Pit Location and Number

3111 Landslide with Arrow Indicating Direction of Movement, Landslide Number Denotes Interpreted Type, Certainty, Thickness and State of Activity, Dashed where approximate (Explanation on Plate 5)

1000 0 1000 feet

Scale: 1" = 1000'

NORTH

Reference: Google Earth

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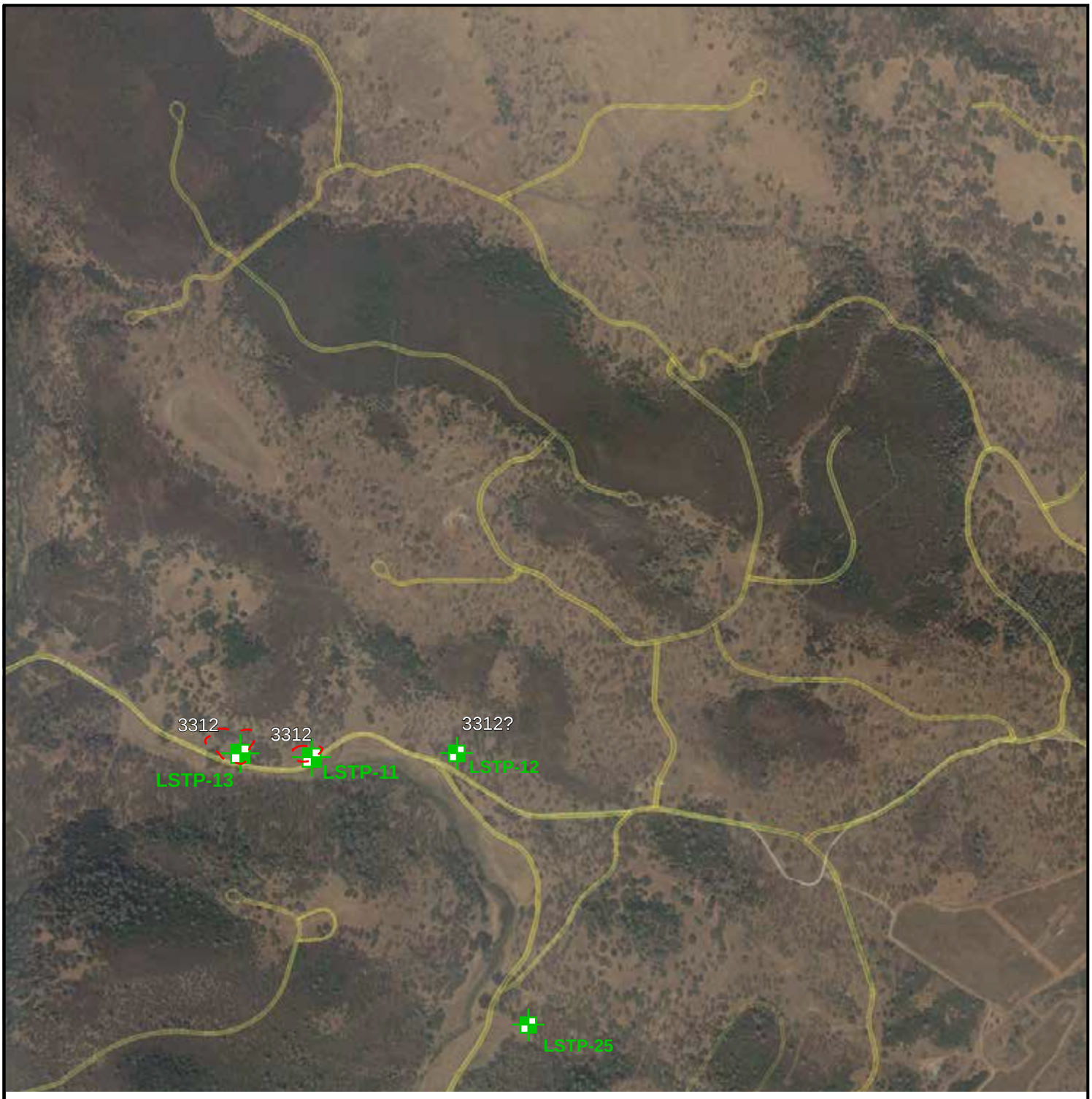
Job No: 7192.04.01.03 | Date: DEC 2019

AERIAL IMAGES OF LANDSLIDE AREAS
MAHA Resort at Guenoc Valley
22000 Butts Canyon Road
Middletown, California

PLATE
4b



EXPLANATION

LSTP-25 Landslide Test Pit Location and Number

3111 Landslide with Arrow Indicating Direction of Movement, Landslide Number Denotes Interpreted Type, Certainty, Thickness and State of Activity, Dashed where approximate (Explanation on Plate 5)

1000 0 1000 feet

Scale: 1" = 1000'

NORTH

Reference: Google Earth

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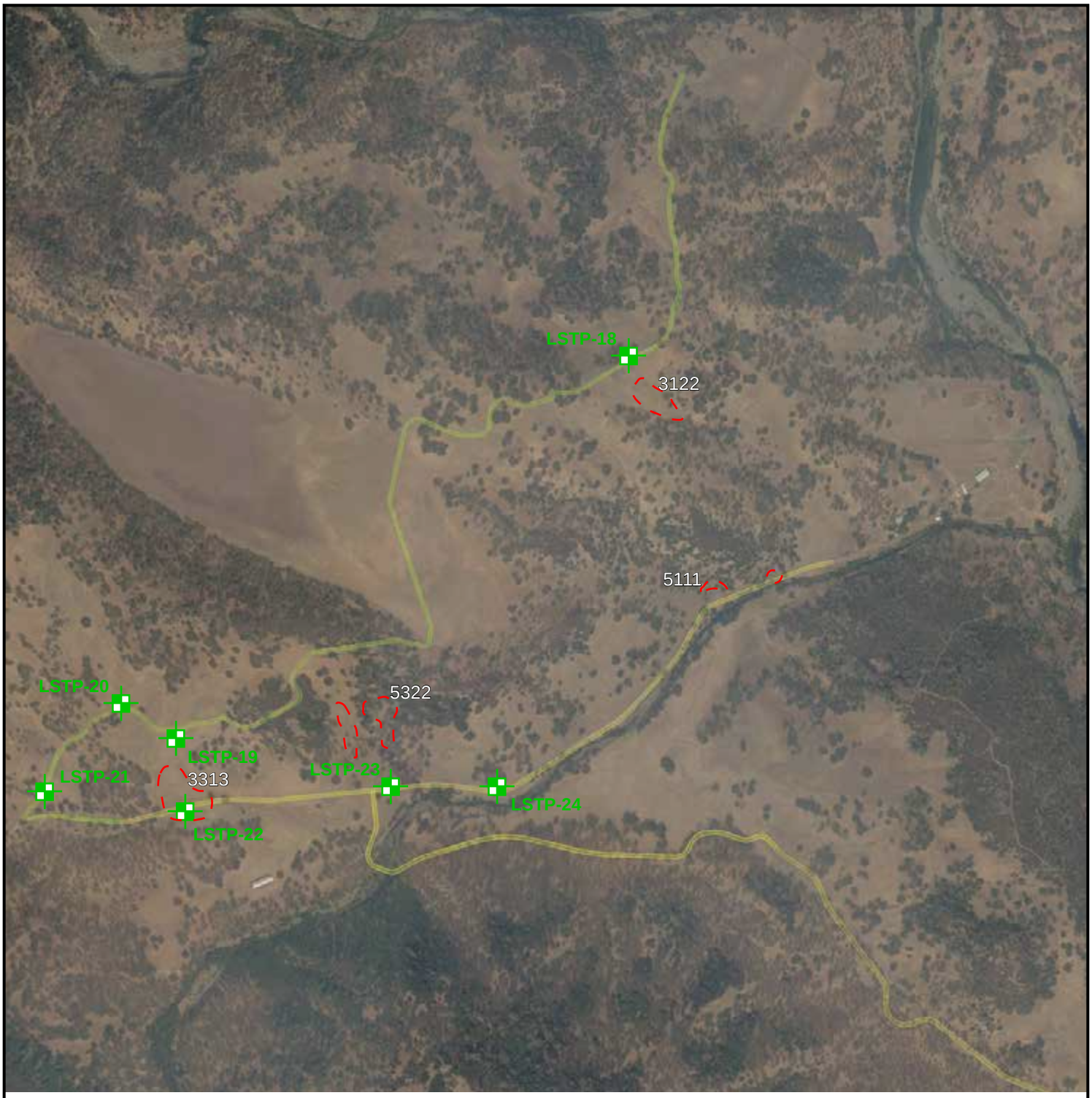
Job No: 7192.04.01.03 | Date: DEC 2019

AERIAL IMAGES OF LANDSLIDE AREAS
MAHA Resort at Guenoc Valley
22000 Butts Canyon Road
Middletown, California

PLATE
4c



EXPLANATION

LSTP-24 Landslide Test Pit Location and Number

3111 Landslide with Arrow Indicating Direction of Movement, Landslide Number Denotes Interpreted Type, Certainty, Thickness and State of Activity, Dashed where approximate (Explanation on Plate 5)

1000 0 1000 feet

Scale: 1" = 1000'

NORTH

Reference: Google Earth

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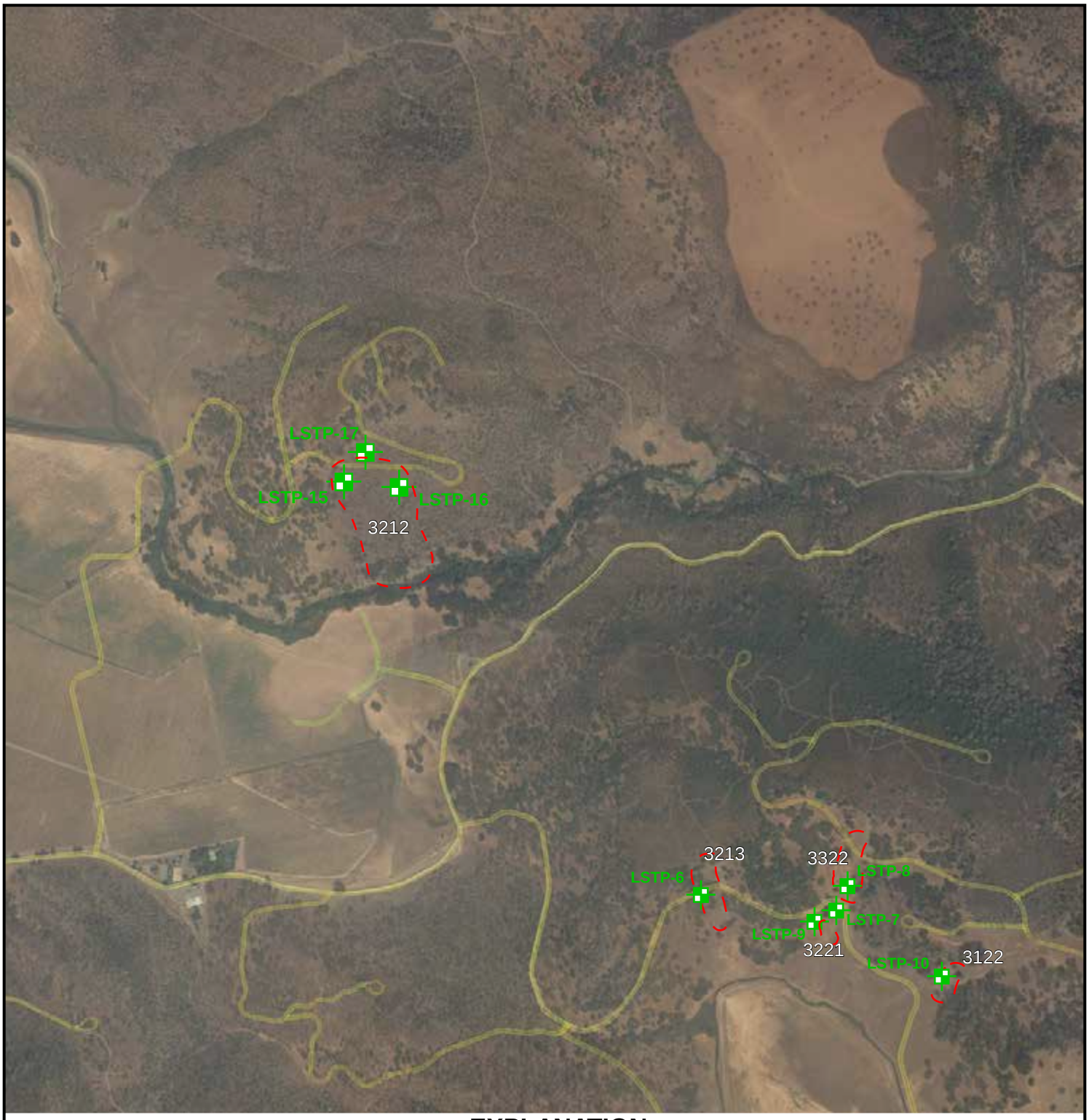
AERIAL IMAGES OF LANDSLIDE AREAS
MAHA Resort at Guenoc Valley
22000 Butts Canyon Road
Middletown, California

PLATE
4d



EXPLANATION

LSTP-17 — Landslide Test Pit Location and Number

3111 — Landslide with Arrow Indicating Direction of Movement, Landslide Number Denotes Interpreted Type, Certainty, Thickness and State of Activity, Dashed where approximate (Explanation on Plate 5)

1000 0 1000 feet

Scale: 1" = 1000'

NORTH

Reference: Google Earth

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Job No: 7192.04.01.3 | Date: DEC 2019

AERIAL IMAGES OF LANDSLIDE AREAS
MAHA Resort at Guenoc Valley
22000 Butts Canyon Road
Middletown, California

PLATE
4e

Landslide Identification Nomenclature *

Type of Landslide Movement

1	Rotational (Earth Slump)	Movement due to forces that cause a turning moment about a point above the center of gravity of the unit.
2	Translational	Movement predominantly along more or less planar or gently undulatory surfaces.
3	Debris Flow	Rapid movement (50 to 80 kph) within displaced mass such that the form taken by moving material or the apparent distribution of velocities and displacements resemble those of viscous fluids.
4	Earth Flow	Downslope viscous flow of fine grained materials that have been saturated and moves under the pull of gravity. Typically slow moving (a few meters per day or less).
5	Debris Slide	Unconsolidated rock and soil moved downslope along a relatively shallow failure plane
6	Rock Fall	Fragments of rock detached by toppling or falling that falls along a vertical or sub-vertical cliff.
C	Many landslides consist of one or more type of movement. The listed type of movement is modified with a "C" to indicate a Complex of landslides.	

Certainty of Landslide Identification

1	Definite
2	Probable
3	Questionable

Estimated Thickness of Landslide Deposits

1	Less than 5 feet
2	5 to 20 feet
3	20 to 50 feet
4	Greater than 50 feet

State of Landslide Activity

1	Recently Active	Currently moving or estimated movement within recent years.
2	Dormant	Marginally stable with mature and subdued expression of the landslide. Mostly re-vegetated.
3	Ancient	Most landslide features are eroded. Heavily vegetated.

* The landslide identification mapping is designed for planning purposes only and should not be used in lieu of a detailed site specific investigation. Our mapping should be considered preliminary and for feasibility and planning purposes only. A subsurface study may reveal conditions different from those inferred by surface observations and data review only. Such subsurface study may warrant a revision to our preliminary mapping.

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Job No: 7192.04.01.3 | Date: DEC 2019

LANDSLIDE IDENTIFICATION CHART
MAHA Resort at Guenoc Valley
22000 Butts Canyon Road
Middletown, California

PLATE
5

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS — MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVEL (LITTLE OR FINES)		GW	WELL-GRADED GRAVEL, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVEL, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVEL WITH FINES (OVER 12% OF FINES)		GM	WELL-GRADED GRAVEL, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
				GC	CLAYEY GRAVEL, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SAND AND SANDY SOILS — MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SAND, GRAVELLY SAND, LITTLE OR NO FINES
				SP	POORLY-GRADED SAND, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (OVER 12% OF FINES)		SM	SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
				SC	CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS — LIQUID LIMIT LESS THAN 50			ML	INORGANICS SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS — LIQUID LIMIT GREATER THAN 50			MH	ORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS AND OTHER SOILS WITH HIGH ORGANIC-CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

KEY TO TEST DATA

Consol - Consolidation
Gs - Specific Gravity
SA - Sieve Analysis
■ - "Undisturbed" Sample
⊠ - Bulk or Disturbed Sample
◥ - Standard Penetration Test
⦸ - Sample Attempt With No Recovery
▯ - Sample Recovered But Not Retained

Shear Strength, psf		Confining Pressure, psf	
Tx	320	(2600)	- Unconsolidated Undrained Traixial
TxCU	320	(2600)	- Consolidated Undrained Triaxial
DS	2750	(2600)	- Consolidated Drained Direct Shear
UC	2000		- Unconfined Compression
FVS	470		- Field Vane Shear
LVS	700		- Laboratory Vane Shear
SS			- Shrink Swell
EXP			- Expansion
P			- Permeability

Note: All strength tests on 2.8-in. or 2.4-in. diameter sample, unless otherwise indicated.

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Job No: 7192.04.01.3 | Date: DEC 2019

SOIL CLASSIFICATION AND KEY TO TEST DATA
MAHA Resort at Guenoc Valley
22000 Butts Canyon Road
Middletown, California

PLATE
6

LAYERING

MASSIVE	Greater than 6 feet
THICKLY BEDDED	2 to 6 feet
MEDIUM BEDDED	8 to 24 inches
THINLY BEDDED	2½ to 8 inches
VERY THINLY BEDDED	¾ to 2½ inches
CLOSELY LAMINATED	¼ to ¾ inches
VERY CLOSELY LAMINATED	Less than ¼ inch

JOINT, FRACTURE, OR SHEAR SPACING

VERY WIDELY SPACED	Greater than 6 feet
WIDELY SPACED	2 to 6 feet
MODERATELY SPACED	8 to 24 inches
CLOSELY SPACED	2½ to 8 inches
VERY CLOSELY SPACED	¾ to 2½ inches
EXTREMELY CLOSELY SPACED	Less than ¼ inch

HARDNESS

Soft - pliable; can be dug by hand

Firm - can be gouged deeply or carved with a pocket knife

Moderately Hard - can be readily scratched by a knife blade; scratch leaves heavy trace of dust and is readily visible after the powder has been blown away

Hard - can be scratched with difficulty; scratch produces little powder and is often faintly visible

Very Hard - cannot be scratched with pocket knife, leaves a metallic streak

STRENGTH

Plastic - capable of being molded by hand

Friable - crumbles by rubbing with fingers

Weak - an unfractured specimen of such material will crumble under light hammer blows

Moderately Strong - specimen will withstand a few heavy hammer blows before breaking

Strong - specimen will withstand a few heavy ringing hammer blows and usually yields large fragments

Very Strong - rock will resist heavy ringing hammer blows and will yield with difficulty only dust and small flying fragments

DEGREE OF WEATHERING

Highly Weathered - abundant fractures coated with oxides, carbonates, sulphates, mud, etc., thorough discoloration, rock disintegration, mineral decomposition

Moderately Weathered - some fracture coating, moderate or localized discoloration, little to no effect on cementation, slight mineral decomposition

Slightly Weathered - a few stained fractures, slight discoloration, little or no effect on cementation, no mineral composition

Fresh - unaffected by weathering agents; no appreciable change with depth

APPENDIX B - ASBESTOS REPORT

ASBESTOS TEM LABORATORIES, INC.

CARB Method 435
Polarized Light Microscopy
Analytical Report

Laboratory Job # 1392-00005

630 Bancroft Way
Berkeley, CA 94710
(510) 704-8930
FAX (510) 704-8429

ASBESTOS TEM LABORATORIES, INC

CA DPH ELAP
Lab No. 1866

NVLAP®
NVLAP Lab Code: 101891-0
Berkeley, CA

Nov/13/2018

Travis Whitted
RGH Consultants
1305 North Dutton Avenue
Santa Rosa, CA 95401

RE: LABORATORY JOB #'s: 1392-00005
Polarized light microscopy analytical results for 5 bulk sample(s).
Job Site: 7192.04.01.3
Job No.: Maha Resort Middletown

Enclosed please find the bulk material analytical results for one or more samples submitted for asbestos analysis. The analyses were performed in accordance with a modified California Air Resources Board (ARB) Method 435 for the determination of asbestos in serpentine aggregate samples.

Prior to analysis, samples are logged-in and all data pertinent to the sample recorded. The samples are checked for damage or disruption of any chain-of-custody seals. A unique laboratory ID number is assigned to each sample. A hard copy log-in sheet containing all pertinent information concerning the sample is generated. This and all other relevant paper work are kept with the sample throughout the analytical procedures to assure proper analysis.

Sample preparation follows a standard CARB 435 prep method. The entire sample is dried at 135-150 C and then crushed to ~3/8" gravel size using a Bico Chipmunk crusher. The sample is then pulverized in a Bico Braun disc pulverizer calibrated to produce a nominal 200 mesh final product. Small aliquots are collected from throughout the pulverized material to create three separate microsope slide mounts containing the appropriate refractive index oil. The prepared slides are placed under a polarizing light microscope where standard mineralogical techniques are used to analyze the various materials present, including asbestos. If asbestos is identified and of less than 10% concentration by visual area estimate then an additional five sample mounts are prepared. Quantification of asbestos concentration is obtained using the modified CAL ARB Method 435 point count protocol. For samples observed to contain visible asbestos of less than 10% concentration, a point counting techinique was performed on multiple sample mounts for a total of 800 or 1200 particle points (a variation from the 400 points called for by the standard CARB 435 method) which is detailed on the test report. The data is then compiled into standard report format and subjected to a thorough quality assurance check before the information is released to the client.

While the CARB 435 method has much to commend it, there are a number of situations where it fails to provide sufficient accuracy to make a definitive determination of the presence/absence of asbestos and/or an accurate count of the asbestos concentration present in a given sample. These problems include, but are not limited to, 1) statistical uncertainty with samples containing <1% asbestos when too few particles are counted, 2) definitive identification and discrimination between various fibrous amphibole minerals such as tremolite/actnolite/ hornblende and the "Libby amphiboles" such as tremolite/winchite/richterite/arfvedsonite, and C) small asbestiform fibers which are near or below the resolution limit of the PLM microscope such as those found in various California coast range serpentine bodies. In these cases, further analysis by transmission electron microscopy (TEM) is recommended to obtain a more accurate result.

Sincerely Yours,

ASBESTOS TEM LABORATORIES, INC.

--- These results relate only to the samples tested and must not be reproduced, except in full, without the approval of the laboratory. ---

POLARIZED LIGHT MICROSCOPY
CARB 435 ANALYTICAL REPORT

Contact: Travis Whitted

Address: RGH Consultants
1305 North Dutton Avenue
Santa Rosa, CA

Samples Submitted: 5

Samples Analyzed: 5

Job Site / No. Maha Resort Middletown
7192.04.01.3

Report No. 361417
Date Submitted: Nov-08-18
Date Reported: Nov-13-18

SAMPLE ID	ASBESTOS POINTS COUNTED	%	TYPE	LOCATION / DESCRIPTION
TP-1-TP-6	26	2.17%	Chrysotile	Chrysotile and Antigorite fibers observed
Lab ID # 1392-00005-001	1200 - Total Points			
TP-7-TP-12		<0.08%	None Detected	No Asbestos Detected
Lab ID # 1392-00005-002	1200 - Total Points			
TP-14@15	19	1.58%	Chrysotile	Chrysotile and Antigorite fibers observed
Lab ID # 1392-00005-003	1200 - Total Points			
TP-16@1'-2'		<0.08%	None Detected	No Asbestos Detected
Lab ID # 1392-00005-004	1200 - Total Points			
TP-17@5'		<0.08%	None Detected	No Asbestos Detected
Lab ID # 1392-00005-005	1200 - Total Points			
Lab ID #	- Total Points			
Lab ID #	- Total Points			
Lab ID #	- Total Points			
Lab ID #	- Total Points			
Lab ID #	- Total Points			

QC Reviewer R. McBride

Analys Jo Ann Hurtado

ASBESTOS TEM LABORATORIES, INC.

CARB Method 435
Polarized Light Microscopy
Analytical Report

Laboratory Job # 1392-00006

630 Bancroft Way
Berkeley, CA 94710
(510) 704-8930
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ASBESTOS TEM LABORATORIES, INC

CA DPH ELAP
Lab No. 1866

NVLAP®
NVLAP Lab Code: 101891-0
Berkeley, CA

Dec/07/2018

Travis Whitted
RGH Consultants
1305 North Dutton Avenue
Santa Rosa, CA 95401

RE: LABORATORY JOB #'s: 1392-00006
Polarized light microscopy analytical results for 9 bulk sample(s).
Job Site: 7192.04.01.3
Job No.: MAHA Resort Middletown

Enclosed please find the bulk material analytical results for one or more samples submitted for asbestos analysis. The analyses were performed in accordance with a modified California Air Resources Board (ARB) Method 435 for the determination of asbestos in serpentine aggregate samples.

Prior to analysis, samples are logged-in and all data pertinent to the sample recorded. The samples are checked for damage or disruption of any chain-of-custody seals. A unique laboratory ID number is assigned to each sample. A hard copy log-in sheet containing all pertinent information concerning the sample is generated. This and all other relevant paper work are kept with the sample throughout the analytical procedures to assure proper analysis.

Sample preparation follows a standard CARB 435 prep method. The entire sample is dried at 135-150 C and then crushed to ~3/8" gravel size using a Bico Chipmunk crusher. The sample is then pulverized in a Bico Braun disc pulverizer calibrated to produce a nominal 200 mesh final product. Small aliquots are collected from throughout the pulverized material to create three separate microsope slide mounts containing the appropriate refractive index oil. The prepared slides are placed under a polarizing light microscope where standard mineralogical techniques are used to analyze the various materials present, including asbestos. If asbestos is identified and of less than 10% concentration by visual area estimate then an additional five sample mounts are prepared. Quantification of asbestos concentration is obtained using the modified CAL ARB Method 435 point count protocol. For samples observed to contain visible asbestos of less than 10% concentration, a point counting techinique was performed on multiple sample mounts for a total of 800 or 1200 particle points (a variation from the 400 points called for by the standard CARB 435 method) which is detailed on the test report. The data is then compiled into standard report format and subjected to a thorough quality assurance check before the information is released to the client.

While the CARB 435 method has much to commend it, there are a number of situations where it fails to provide sufficient accuracy to make a definitive determination of the presence/absence of asbestos and/or an accurate count of the asbestos concentration present in a given sample. These problems include, but are not limited to, 1) statistical uncertainty with samples containing <1% asbestos when too few particles are counted, 2) definitive identification and discrimination between various fibrous amphibole minerals such as tremolite/actnolite/ hornblende and the "Libby amphiboles" such as tremolite/winchite/richterite/arfvedsonite, and C) small asbestiform fibers which are near or below the resolution limit of the PLM microscope such as those found in various California coast range serpentine bodies. In these cases, further analysis by transmission electron microscopy (TEM) is recommended to obtain a more accurate result.

Sincerely Yours,

ASBESTOS TEM LABORATORIES, INC.

--- These results relate only to the samples tested and must not be reproduced, except in full, without the approval of the laboratory. ---

POLARIZED LIGHT MICROSCOPY
CARB 435 ANALYTICAL REPORT

Contact: Travis Whitted

Address: RGH Consultants
1305 North Dutton Avenue
Santa Rosa, CA

Samples Submitted: 9

Samples Analyzed: 9

Job Site / No. MAHA Resort Middletown
7192.04.01.3

Report No. 361758
Date Submitted: Dec-03-18
Date Reported: Dec-07-18

SAMPLE ID	ASBESTOS POINTS COUNTED	%	TYPE	LOCATION / DESCRIPTION
TP-37@7'		<0.08%	None Detected	No Asbestos Detected
Lab ID # 1392-00006-001	1200 - Total Points			
TP-38@4'		<0.08%	None Detected	No Asbestos Detected
Lab ID # 1392-00006-002	1200 - Total Points			
TP-39@1S-4'		<0.08%	Chrysotile	Trace Chrysotile fibers detected.
Lab ID # 1392-00006-003	1200 - Total Points			
TP-40@1S-3'	47	3.92%	Chrysotile	Chrysotile fibers detected.
Lab ID # 1392-00006-004	1200 - Total Points			
TP-41@0-1S	12	1 %	Chrysotile	Chrysotile fibers detected.
Lab ID # 1392-00006-005	1200 - Total Points			
112018A@surface		<0.08%	Chrysotile	Trace Chrysotile fibers detected.
Lab ID # 1392-00006-006	1200 - Total Points			
TP-43@1S		<0.08%	None Detected	No Asbestos Detected
Lab ID # 1392-00006-007	1200 - Total Points			
TP-44@1'		<0.08%	None Detected	No Asbestos Detected
Lab ID # 1392-00006-008	1200 - Total Points			
TP-45@1'-2'		<0.08%	None Detected	No Asbestos Detected
Lab ID # 1392-00006-009	1200 - Total Points			
Lab ID #	- Total Points			

QC Reviewer R Mc Rae

Analys Jo Ann Huerta

APPENDIX C - REFERENCES

Bortugno, E.J., 1982, Map Showing Recency of Faulting, Santa Rosa Quadrangle in Wagner and Bortugno, Geologic Map of the Santa Rosa Quadrangle: California Division of Mines and Geology, Regional Geologic Map Series, Map No. 2A, Santa Rosa Quadrangle, Scale 1:250,000.

Bryant, W.A., and Hart, E.W., Interim Revision 2007, Fault-Rupture Zones in California; California Geological Survey, Special Publication 42, p. 21 with Appendices A through F.

Dwyer, M.J., Noguchi, N., and O'Rourke, J., 1976, Reconnaissance Photo-Interpretation Map of Landslides in 24 Selected 7.5-Minute Quadrangles in Lake, Napa, Solano, and Sonoma Counties, California: U.S. Geological Survey OFR 76-74, 25 Plates, Scale 1:24,000.

Fox, K.F., Jr., et al., 1973, Preliminary Geology Map of Eastern Sonoma County and Western Napa County, California: U.S. Geological Survey, Miscellaneous Field Studies Map MF-483, Basic Data Contribution 56, Scale 1:62,500.

Miller, D.C., 1989, Potential Hazards from Future Volcanic Eruption in California, United States Geologic Survey Bulletin 1847, p. 17.

Slosson and Associates, 1976, Geologic and Seismic Technical Background Report for Seismic Safety Element and Geologic Hazards Portion of Safety Element, General Plan, Lake County, California.

U.S. Department of Housing and Urban Development, Federal Insurance Administration, 1980, Flood Insurance Rate Map, Sonoma County, California, Community Panel Number No. 06033C1000D dated September 26, 2008 and 06033C0900D dated September 30, 2005.

APPENDIX D - DISTRIBUTION

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APPENDIX GPCT

GENERAL PLAN CONSISTENCY TABLE

Appendix GPCT

Policy Analyses

Guenoc Valley Mixed Use Planned Development Project
Consistency with Lake County
General Plan Policies

An EIR must discuss "any inconsistencies between the proposed project and the applicable general plans." CEQA Guidelines,§15125(d). For the Proposed Project, the applicable plan is the Lake County General Plan. The focus of this appendix is the identification of policies in the General Plan that apply to the proposed land uses of this particular project. This appendix does not discuss policies that apply to the County itself or policies that apply only to some other type of land use not included in the proposed project. Policies that are not applicable to the proposed project for either reason have not been included in the following discussion.

While this EIR analyzes the Proposed Project's consistency with applicable policies, it is the County Board of Supervisors who will make the ultimate determination in regard to the Proposed Project's consistency with the General Plan.

TABLE 1
LCGP CONSISTENCY ANALYSIS – LAND USE AND AGRICULTURE

General Plan Policy	Consistency Determination	Analysis
Land Use (LU) Element		
Growth and Development		
Policy LU-1.1: The County shall promote the principles of smart growth, including: • creating walkable neighborhoods; • creating a strong sense of community identity; • mixing land uses; • directing growth toward existing communities; • taking advantage of compact building design; • discouraging sprawl; • encouraging infill; • preserving unique historical, cultural and natural resources; • preserving open space; and, • creating a range of housing opportunities and choices.	Consistent	The Proposed Project is designed with low impact development and smart growth policies. The resort features clustered development, preservation of agricultural and cultural heritage, landscape preservation, diversification of the Lake County housing stock, and conservation of open space. The resort itself would be bikeable, feature active and passive use trails, and create a community center open to the public.
Policy LU-1.2: The County shall promote flexibility and innovation through the use of planned unit developments, development agreements, specific plans, mixed use projects, and other innovative development and planning techniques.	Consistent	The Proposed Project is a planned mixed-use resort development that satisfies the County's desire to support innovative ideas and land use techniques.
Policy LU-1.3: The County shall prevent intrusion of new compatible land uses into existing community areas.	Consistent	The Proposed Project would not be introducing new compatible land uses into an existing community setting because the off-site workforce housing would be residential and therefore match the current land use in Middletown. The Guenoc Valley Site is not within an existing community area.
Policy LU-1.5: The County shall actively support the development of mixed use projects as a means to reduce travel distances and create neighborhood environments that offer a range of residential options.	Consistent	The Proposed Project would offer mixed-use development including retail, residential, and agricultural.
Urban/Rural Boundary		
Policy LU-2.1: The County shall encourage residential growth to locate in existing urban areas where infrastructure is available and capacity is sufficient. The County shall ensure that development does not occur unless adequate infrastructure capacity is available for that area.	Consistent	The Proposed Project would be entirely self-sufficient and would therefore provide adequate infrastructure for its capacity requirements.
Policy LU-2.3: The County shall maintain distinct urban edges for all unincorporated communities, while creating a gradual transition between urban uses and open space.	Consistent	The proposed residential communities would be developed in clusters and preserve approximately 2,765 acres of designated open space.

General Plan Policy	Consistency Determination	Analysis
Policy LU-2.4: The County shall require adequate setbacks between agricultural and non-agricultural uses. Setbacks shall vary depending on type of operation and chemicals used for spraying. Buffers shall consider several factors including building orientation, planting of trees for screening, and unique site conditions (e.g. topography). Buffers shall be provided by the new proposed development.	Consistent	The Proposed Project utilizes native landscape plantings as buffers, stormwater mitigation, and fire preparedness. Natural buffers would be implemented between agricultural and non-agricultural uses.
Policy LU-2.6: The County shall limit urban development to the areas within designated Community Growth Boundaries (as defined on Figures 3 - 2 through 3 - 13). These Community Growth Boundaries are located in the following communities: Clearlake Oaks, Clearlake Riviera, Coyote Valley, Kelseyville, Lower Lake, Lucerne, Middletown, Nice, North Lakeport, Soda Bay, South Lakeport, and Upper Lake.	Consistent	The Middletown Housing Site is within the Community Growth Boundary. Although the Guenoc Valley Site is not within a Community Growth Boundary, the development on this site would be Resort Commercial with low housing density.
Residential Development		
Policy LU-3.1: The County shall encourage major new residential development to locate in close proximity to existing infrastructure and opportunities for employment, services, and recreation.	Consistent	See **Policy LU-2.1** for infrastructure. The Proposed Project would be located in close proximity to existing recreational opportunities and services in addition to creating its own. The Proposed Project would create job opportunities for Lake County.
Policy LU-3.2: The County shall consider rural development intensity in rural areas located outside of Community Growth Boundaries according to its ability to support water and waste disposal needs, access, slope characteristics, protection of sensitive natural resources and the site's susceptibility to natural hazards.	Consistent	This EIR includes an analysis of the suitability of the development areas, including water/waste, accessibility, biological resources, and hazards.
Policy LU-3.3: The County shall encourage proposed rural development to be clustered onto portions of the site that are best suited to accommodate the development, and shall require access either directly onto a public road or via a privately maintained road designed to meet County road standards.	Consistent	The circulation and fire management plan (**FIG 2-10**) shows clustered development with accessible roads and trails.
Policy LU-3.4: The County shall limit lands designated for agricultural use to only allow single-family residences and quarters for farm laborers as secondary uses, agricultural tourism related uses, and agricultural support services.	Consistent	The Proposed Project's Agricultural Preserve Combining District would not include residential use exceeding single-family residences, as described in **Appendix GVD**. Furthermore, agricultural areas would only be utilized for agricultural related purposes in addition to agricultural tourism and support services.
Policy LU-3.6: The County shall encourage higher building intensities (at the high end of the density range) adjacent to parks and other open spaces, along transit routes, and near activity centers such as recreational facilities, libraries, shopping centers, and entertainment areas.	Consistent	The Proposed Project's residential areas will be surrounded in open-space and have access to on-site boutique shops, restaurants, a market, entertainment areas, and recreational opportunities, such as hiking, boating, and horseback riding.
Policy LU-3.8: The Rural Residential land use designation shall be subject to the following requirements: • Areas which qualify for densities greater than 1 unit per 10 acres must meet the following characteristics:	Consistent	The Proposed Project includes an amendment of the Guenoc Valley Site land use designation to Resort Commercial. New road improvements include entrances on Butts Canyon Road consistent with county standards.

General Plan Policy	Consistency Determination	Analysis
• average slopes must be below 30 percent grade; and, • areas not identified as a moderate-to-high landslide hazard area (special study zones). • Access to new development should be via an existing publicly maintained road or via a new road improved consistent with adopted county standards.		
Policy LU-3.10: The County shall allow uses (not related to forest production) on lands designated Resource Conservation in forestry production areas, provided the use or uses: • are consistent with the Aggregate Resources Management Plan or mining operations; • are consistent with the Geothermal Resources Element for geothermal activities; • are consistent with preservation of unique natural landmarks; • are compatible with sustainable forest practices; • are managed so as to minimize impact on designated Lake County viewsheds; • minimize forest site productivity losses; and, • will meet standards relating to the availability of fire protection, water supply, water quality, groundwater recharge and extraction, watershed management or restoration programs, and waste disposal.	Consistent	The Proposed Project does not include lands designated Resource Conservation in forestry production areas.
Commercial Development		
Policy LU-4.5: The County shall use the following guidelines for the proper development and location of commercial centers: • The market area should serve the community and surrounding areas • Typical uses include eating and drinking establishments, food and beverage sales, general personal services, entertainment services, and retail sales. Other uses such as supermarkets, administrative and professional offices, medical services, and financial, insurance, and real estate services may be included. • Where the surrounding area is an agricultural area, the center should include goods and services that serve agricultural needs, and venues for marketing of local, value-added agricultural products should be encouraged. • The center should be located where it can be easily accessed from at least one major local road. • Development should provide for adequate, appropriately placed parking to accommodate patrons to the market area	Consistent	The Proposed Project commercial developments would include centrally located market area featuring local produce, restaurants, winery, entertainment areas, and more. These businesses and areas would be available to the public, which would be accessible through Butts Canyon Road and ample parking would be provided for visitors.

General Plan Policy	Consistency Determination	Analysis
Policy LU-4.8: The County shall require free-standing, travel oriented visitor commercial uses (e.g., entertainment, commercial recreation, lodging, fuel) to be located in areas where traffic patterns are oriented to major arterials and highways. Exceptions may be granted for resort or retreat related developments that are sited based on unique natural features.	Consistent	The Proposed Project would be accessed through a major collector road, Butts Canyon Road, and Butts Canyon Road connects to the SR-29 and SR-175 in less than 5 miles to the east of the Guenoc Valley Site.
Economic Development		
Policy LU-6.1: The County shall actively promote the development of a diversified economic base by continuing to promote agriculture, recreation services, and commerce, and by expanding its efforts to encourage industrial and nonindustrial corporate development, and the development of geothermal resources.	Consistent	The Proposed Project will contribute to the diversification of the County's economic base through the development of a luxury agro-tourism resort that will include amenities such as vacation rentals, the Farmstead community center that will feature an amphitheater, farmers markets, and retail space.
Policy LU-6.4: The County shall encourage high quality development projects that will entice visitors, businesses, and permanent residents to the area.	Consistent	The Proposed Project intends to serve guests from all over the world by creating a luxury agro-tourism resort
Policy LU-6.5: The County shall pursue businesses such as upscale resorts and lodging, wineries and tasting rooms, visitor oriented retail businesses, and other businesses that would attract high income and multi-day visitors to the County.	Consistent	The Proposed Project would attract high income multi-day and long-term visitors through fractioned ownership options, boutique hotel options, and upscale resort amenities including spas, recreational uses, and a winery.
Policy LU-6.7: The County shall encourage community and regional events and recreational activities to bolster community pride and identification	Consistent	The Farmstead community center provides event space for outdoor concerts in the amphitheater, farmers markets, and retail spaces. The Resort also prioritizes outdoor recreational trails and activities creating community pride and expanding existing community outdoor-use space.
Policy LU-6.8: The County shall promote agro-tourism, eco-tourism, and outdoor recreation in Lake County to outside markets	Consistent	The Proposed Project promotes agro-tourism and outdoor recreation to Lake County and outside markets.
Policy LU-6.12: The County shall encourage development of resorts while ensuring land suitability and compatibility with surrounding land uses. Mixed Use Resort proposals requesting increased residential density may be considered outside of Community Growth Boundaries provided that: 1. The primary scope of the project is resort commercial 2. The resort provides substantial resort and recreational facilities that will be available to the public, and the project will specifically enhance the tourism objectives of the County. 3. The developer is able to adequately demonstrate that the additional residential units are necessary to support the infrastructure and public resort amenity costs for the overall project and the overall project is economically infeasible without the additional residential units. 4. The residential component is secondary and subordinate. 5. Applications are submitted as Planned Developments. For	Consistent	The Proposed Project would include Resort Commercial development compatible with surrounding land uses. The residential development supports the agro-tourism facilities.

General Plan Policy	Consistency Determination	Analysis
Mixed Use Resorts to include residential units, the development must be processed as a Planned Development. This process will be used to determine the appropriate number of residential units allowed. **6.12.1:** Except as provided in 6.12.2 below, the residential component of a Mixed Use Resort shall not allow more residential units than resort units during the course of construction and at build out. **6.12.2:** If a Mixed Use Resort is adjacent to a Community Growth Boundary and public infrastructure (sewer, water, fire, schools) are available, the number of residential units needed to support resort amenities may exceed the number of resort units, if it is determined that the project will specifically enhance tourism objectives of the County. However, the number of residential units compared to resort units shall not exceed a 2:1 ratio and in no case shall the residential density exceed one residential unit per gross acre of the total acreage of the Mixed Use Resort project area. (Resolution No. 2011-13, 1/25/2011)		
Policy LU-6.14: The County shall encourage clustering and smart growth concepts that promote fewer vehicle access points and enhance visual and pedestrian access	Consistent	The Proposed Project includes primary and secondary recreational trails for pedestrian access throughout the Guenoc Valley Site (**Figure 2-9**)
Design		
Policy LU-7.4: The County shall ensure that new development respects Lake County's heritage by requiring that development respond to its context, be compatible with the traditions and character of each community, and develop in an orderly fashion which is compatible with the scale of surrounding structures.	Consistent	The Proposed Project includes low impact development with low densities. The GVD zoning district would restrict heights to 40 feet (**Appendix GVD**). Additionally, the Proposed Project includes design features with high-end farm architecture to emanate the community's character.
Policy LU-7.5: The County shall encourage development of diverse and distinctive neighborhoods that build on the patterns of the natural landscape and are responsive in their location and context.	Consistent	The Proposed Project includes distinct clusters of development that are designed in response to the existing natural landscape.
Policy LU-7.9: The County shall emphasize each community's natural features as the visual framework for new development and redevelopment	Consistent	The Proposed Project includes designated open space and landscaping zones to highlight the existing natural features.
Policy LU-7.10: The County shall maintain visual access to views of Clear Lake, hillsides, creeks, and other distinctive natural areas by regulating building orientation, height, and bulk.	Consistent	The Proposed Project would restrict building heights and include clustered development (see **Appendix DG**). Reservoirs on the Guenoc Valley Site would be visual features of proposed development.
Policy LU-7.15: The County shall require screening of storage, trash receptacles, loading docks, and other building or site features required to reduce visual impacts from public areas. Screening shall consist of solid fencing, landscaping, or a combination of both.	Consistent	The GVD Zoning Ordinance Design Guidelines (**Appendix DG**) includes shielding and fencing of utility facilities and structures from the public viewshed.
Policy LU-7.17: The County shall provide code enforcement that protects the cultural and historic value of existing places and	Consistent	The Proposed Project includes efforts to protect culturally important resources.

General Plan Policy	Consistency Determination	Analysis
buildings. This should include demolition by neglect, lack of maintenance, overgrown landscaping, and inappropriate storage of items that may create a public safety or hazard issue.		
Housing Element (HE)		
New Construction		
Policy HE-1.9: The County shall place a priority on the development of new rental housing.	Consistent	On and off-site workforce housing would be leased to employees and local residents and would therefore increase the amount of new rental housing in the County.
Policy HE-1.14: The County shall promote infill development on appropriate sites in existing neighborhoods and reuse underutilized parcels throughout the county.	Consistent	This policy is not applicable to the Guenoc Valley Site because it is not located within an existing neighborhood. However, the Middletown Housing Area Site is located within an existing neighborhood and would constitute infill development.
Policy HE-1.15: Consistency with Surrounding Neighborhoods The County shall ensure that infill development maintains or enhances the positive qualities of the surrounding neighborhoods.	Consistent	This policy is not applicable to the Guenoc Valley Site because it does not constitute as infill development. However, the Middletown Housing Area site is located within an existing neighborhood and would constitute infill development. The Middletown Housing Area site would be generally consistent with the surrounding neighborhoods.
Energy Conservation and Production		
Policy HE-6.1: The County shall promote the use of energy conservation measures and energy production technology in residential units to conserve energy as well as reduce household utility costs.	Consistent	The Proposed Project would comply with all Title 24 energy efficiency standards and all electricity would be provided from on-site solar arrays.
Policy HE-6.3: The County shall encourage, where appropriate, energy efficient site planning in newly proposed land divisions to take advantage of the sun's natural heating abilities.	Consistent	The Proposed Project would comply with all Title 24 energy efficiency standards and all electricity would be provided from on-site solar arrays.
Jobs / Housing Balance		
Policy HE-7.3: The County shall encourage the jobs/housing linkages through the development of housing near jobs. The County shall attempt to increase the supply of affordable housing and support efforts to match job income and housing affordability levels.	Consistent	The Proposed Project would develop workforce housing, and increase the supply and diversity of housing stock options within Lake County that match the job income and affordability levels.
Public Facilities and Services (PFS) Element		
General		
Policy PFS-1.3: The County shall ensure that proposed developments do not create significant adverse impacts on existing natural or manmade infrastructure of the County and that the necessary man made infrastructure to support the project will be in place, bonded for, or other guarantee acceptable to the Approval Authority prior to the filing of final maps or granting of other entitlements.	Consistent	The Proposed Project would fund any necessary infrastructure improvements through mitigation measures in the EIR or through the Development Agreement.
Water Supply		

General Plan Policy	Consistency Determination	Analysis
Policy PFS-2.5: Development proposals that include general plan amendments and rezoning proposals that would result in increased water and wastewater demands above that projected by existing land use and zoning maps will be required to implement mitigation strategies to offset impacts to existing water and wastewater systems. Implementation of these strategies will become conditions of tentative maps and other entitlements.	Consistent	The Proposed Project includes mitigation for safe yield groundwater well monitoring to ensure less-than-significant effects to groundwater supplies.
Policy PSF-2.6: The County shall not approve new use permits or subdivisions unless an adequate supply of quality water and wastewater treatment capacity is available or will be developed prior to breaking ground for construction	Consistent	As analyzed in Section 3.14 Utilities, with construction of the Proposed Project, there would be adequate water and wastewater treatment capacity
Policy PFS-2.7: The County shall give priority to water conservation measures over development of additional water sources where mutually exclusive.	Consistent	The Proposed Project will include water efficient appliances
Policy PFS-2.8: Proposed new development exceeding twenty (20) dwelling units using surface water or ten (10) dwelling units using groundwater (or residential equivalent dwelling units) shall be required to prepare a water supply adequacy study that identifies where the source water is to come from as well as to the sustainability of the source water. The study shall be required prior to considering the application complete for processing in order to be considered during the CEQA review process.	Consistent	**Appendix WSA** is a water supply analysis for the Proposed Project.
Wastewater		
Policy PFS-3.1: The County shall develop, periodically review, and enforce adequate standards for septic tanks to protect water quality and public health. Use of individual septic systems shall be discouraged for larger residential and commercial developments and also for smaller developments where a public wastewater treatment facility is reasonably available. Larger developments should only occur where public wastewater treatment facilities with adequate capacity are available to serve the development.	Consistent	Clustered residential and commercial development on the Guenoc Valley Site would include package water reclamation plants, sized to accommodate the proposed development. The Applicant would coordinate with the County to ensure septic tanks are compliant with the County's standards.
Policy PFS-3.2: The County should promote and support programs to educate homeowners on the care and maintenance of septic systems.	Consistent	Under the Proposed Project, remote residential properties may have septic systems. Homeowners would be educated about these systems.
Policy PFS-3.3: The County should investigate alternative rural wastewater systems before investing in a costly conventional sewage system. For individual homes, such systems include elevated leach fields, sand filtration systems, evapotranspiration beds, osmosis units and holding tanks. In addition, composting toilets should be considered by the County for some situations, if determined to be appropriate and found not to pose a health risk. For clusters of homes, alternative systems include communal septic tank/leach field systems, package treatment plants, lagoon systems, and land treatment.	Consistent	The Proposed Project includes package water reclamation plants for clustered development areas. More remote residential parcels will have individual systems to avoid excessive costs associated with the extension of sewer.

General Plan Policy	Consistency Determination	Analysis
Policy PFS-3.4: The County shall require that developers meet all County wastewater requirements for adequate collection, treatment, and disposal prior to breaking ground for construction.	Consistent	The Applicant will coordinate with the County to ensure consistency with wastewater requirements
Policy PFS-3.5: The County shall minimize wastewater flows through water conservation efforts. Consideration should be given to allow use of gray water for landscape irrigation.	Consistent	The Proposed Project includes recycled water usage for landscape irrigation
Policy PFS-3.6: The County will promote the development of sewer systems and connection of land uses to sanitary sewer systems where (a) failing septic tanks, leachfield, and package systems constitute a threat to water quality and public health that cannot be remedied otherwise; or (b) future development will exceed acceptable standard for septic tanks (such as density or flow of effluent into the groundwater).	Consistent	The Proposed Project includes sewer systems for clustered development
Policy PFS-3.7: The County shall reduce the potential for future land use conflicts near sewer treatment facilities by minimizing development potential on surrounding parcels through zoning and land use designations that limit residential density and/or commercial intensity. Proposals for land division adjacent to sewer treatment facilities should not be approved unless large parcels can be provided with adequate, on - site buffers.	Consistent	All the proposed residential and commercial wastewater facilities are in areas that are remote for adjoining parcels and as planned will not have any potential impacts to the adjoining properties. The design and locations of these facilities will not result in any potential noise or odor nuisance conditions to adjoining property (**Appendix WATER**).
Solid Waste		
Policy PFS-5.3: The County shall ensure that all new facilities have the necessary provisions for solid waste storage, handling, and collection prior to issuing building permits	Consistent	The Proposed Project would utilize the Eastlake Sanitary Landfill, which has adequate capacity.
Policy PFS-5.4: The County shall require the proper disposal and recycling of hazardous materials and should investigate hazardous waste disposal needs for anticipated geothermal and agricultural toxic was	Consistent	During construction, undiscovered geothermal wells will be reported to the Department of Conversation and the County. Furthermore, all hazardous materials will be disposed of according to applicable federal, state, and local laws.
Public Utilities		
Policy PFS-6.3: The County shall require utility lines in new subdivisions to be placed underground, except where it is not feasible due to operational constraints.	Consistent	The Proposed Project includes underground utility lines where feasible
Fire Protection and Law Enforcement		
Policy PFS-8.1: The County shall promote expansion of fire protection service to continue to meet County needs	Consistent	The Proposed Project includes an emergency and fire response center
Policy PFS-8.3: The County shall require that all road networks (public and private) are designed to provide for safe and ready access for emergency fire equipment and provide an alternate route for evacuations.	Consistent	The Proposed Project includes road that are wide enough for emergency access vehicles and emergency evacuations
Policy PFS-8.4: The County shall ensure that all roads and buildings are properly identified by name or number with signs which are non-	Consistent	As per the Wildfire Prevention Plan (Appendix FIRE), addresses would be marked on the houses and driveways

General Plan Policy	Consistency Determination	Analysis
combustible and are clearly visible from main roadways.		
Policy PFS-8.5: The County shall continue to support the fire mitigation fee ordinance.	Consistent	Pursuant to Chapter 27 of the Lake County Code of Ordinances, prior to the issuance of any building permit or development permit, the Applicant will pay a fire mitigation fee proportionate to the square footage of development accounted for in the permit.
Policy PFS-8.7: The County shall promote public safety programs, including neighborhood watch programs, child identification and fingerprinting, public awareness and prevention of fire hazards, and other public education efforts.	Consistent	The Proposed Project includes the Wildfire Prevention Plan, which identifies wildfire prevention and response strategies for the Proposed Project. The Proposed Project does not specifically propose any further public safety programs; however, the Applicant would comply with any County initiatives regarding the development of public safety programs at the Guenoc Valley Site and the Middletown Housing Site.
Policy PFS 8.8: The County shall encourage the locations of fire and police stations to enable the minimum acceptable response time to service calls.	Consistent	The Proposed Project involves the development of an onsite emergency response facility, which will enable faster response times than currently existing. No existing fire or police stations will be expanded.
Community Facilities		
Policy PFS-9.1 The County should work closely with local school districts to develop solutions to the burden of overcrowded schools and to the financial constraints on constructing new facilities.	Consistent	Development impact fees from the Proposed Project would fund schools to provide adequate infrastructure improvements and resources (including desks, teachers, etc.) to support the addition of the students generated by the project.
Transportation and Circulation (T) Element		
Roads and Highways		
Policy T-1.2: Roads should be improved and constructed to the design standards recommended by the County Department of Public Works, as shown in Table 6-1, Lake County Road Design and Construction Standards. Road design standards shall be based on the American Association of State Highway and Transportation Officials (AASHTO) standards, and supplemented by California Department of Transportation (Caltrans) and County standards.	Consistent	All proposed roadway improvements would be consistent with applicable standards
Policy T-1.5: The following standards should be applied to the development of roads within residential areas: • Avoid locating facilities providing through-traffic access in residential areas. • Access to subdivisions proposing more than four lots should be via a paved road constructed to county standards. • Access to projects proposing four or fewer parcels at densities less than one dwelling unit per five acres should at a minimum be via a road improved with processed gravel consistent with county standards. • Roadways shall not be located on naturally occurring	Consistent	All proposed roadway improvements would be consistent with applicable standards

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asbestos when feasible alternative locations exist, or shall be adequately constructed and surfaced with non-asbestos materials in compliance with local and state requirements. • Adequate right-of-way to contain road improvements should be offered for dedication. • Parcels reconfigured through the lot line adjustment process shall contain adequate, safe, all-weather access. In cases where existing road access is not in conformance with current County standards prior to the adjustment, the level of conformity with those standards shall not be further reduced once the lot line adjustment is recorded. Lot line adjustments determined to increase development potential, including potential for future subdivision may be conditioned to require public right-of-way dedication if inadequate access exists or would force future access to a different street.		
Policy T-1.7: Facilities constructed or utilized for new development shall comply with County standards in order to minimize initial and subsequent maintenance costs.	Consistent	The Proposed Project includes mitigation to pay a fair-share for traffic improvements
Policy T-1.8: County maintained roadways should be improved and maintained to provide an adequate peak period Level of Service (LOS) of "C" or better for existing and anticipated traffic volumes if roadway upgrades are feasible, such as roadway widening, addition of lanes via re-striping, and other safety and operational improvements. The County shall allow a limited number of County roadway segments to operate at a level of service of "E" or better where improving the segment to LOS C are deemed infeasible due to cost, negative community and/or environmental impacts, and constructability issues. This "E" level of service for certain roadways shall not include any State Highway unless approved by Caltrans.	Consistent with mitigation	The Proposed Project includes mitigation for intersections below LOS C
Policy T-1.11: Develop and maintain roads and highways in a manner that protects natural and scenic resources.	Consistent with mitigation	With mitigation, impacts to natural resources from roadways would be less than significant. The design guidelines for the GVD (**Appendix DG**) include
Public Transport		
Policy T-2.4: The County should encourage potential transit destinations, including employment centers, schools, personal services, administrative and professional offices, and social/recreational centers, to be clustered within a convenient walking distance of one another and to a transit stop.	Consistent	The Proposed Project includes an employee shuttle.
Aviation		
Policy T-3.2 The County shall promote compatible land use planning in areas surrounding airports. Land uses involving the concentration of	Consistent	None of the development proposed for the sites or off-site infrastructure improvement areas are within 2 miles of an airport. However, all onsite aviation activities will comply with

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people and/or hazardous materials should not be developed in the approach pattern. Federal and state regulations governing operations and land use restrictions related to airports shall be supported by the County.		applicable federal and state regulations governing operations, including for hazardous materials.
Health and Safety (HS) Element		
General		
Policy HS-1.1: The County shall permit development only in areas where the potential danger to the health and safety of people can be mitigated to an acceptable level.	Consistent	Some of the development have existing hazards, such as naturally occurring asbestos, but these can be mitigated to acceptable levels.
Policy HS-1.3: The County shall ensure all buildings for human habitation are designed in compliance with the Uniform Building Code and other requirements based on risk (e.g., seismic hazards, flooding), type of occupancy, and location (e.g., floodplain, fault).	Consistent	All developments will be developed according to the Uniform Building Code
Policy HS-1.6: The County shall continue to implement its comprehensive grading ordinance in order to address dust mitigation including special mitigation for development within Naturally Occurring Asbestos areas.	Consistent with mitigation	During grading and other dust inducing activities, the development will adhere to the County's comprehensive order in order to mitigate dust. Furthermore, special mitigation will be developed for the areas with serpentine soils and therefore NOA.
Geologic and Seismic Hazards		
Policy HS-2.1: Areas in excess of 30 percent slope or in mapped naturally occurring asbestos areas may require submittal of engineered plans for all construction and grading, at the discretion of the Community Development Department. These plans shall address roads, utility corridors, and similar off-site improvements as well as erosion and dust control. Development in other areas possessing potential landslide risk, regardless of slope, shall require engineered plans and/or geotechnical study prior to discretionary approval or approval of grading or building permits	Consistent	The Proposed Project would obtain a grading permit from the County prior to any earthwork and comply with the County's building permit process
Policy HS-2.2: The siting of residential, commercial, recreational, or industrial structures on or adjacent to known active or potentially active fault zones should be avoided. In areas of known seismic hazards, building intensity should be dictated by a scale of acceptable risks as shown in Table 7-1.	Consistent	No residential, commercial, recreational, or industrial structures would be built on or adjacent to known active or potentially active fault zones as a result of the Proposed Project.
Policy HS-2.3: The County shall not allow development on existing unconsolidated landslide debris.	Consistent	A geotechnical investigation will be conducted prior to construction which would also recommend that buildings be located outside unstable areas and steep slopes with a setback of approximately 50-feet.
Policy GR-2.4: The County will encourage the development and testing of new technologies to further reduce environmental impacts. Additionally, Naturally Occurring Asbestos shall be avoided where feasible, or otherwise mitigated as necessary to minimize the release of asbestos dust.	Consistent	NOA shall be avoided if deemed feasible during construction. If not feasible, then during the construction and operation of the developments, if needed, mitigation measures shall be developed for NOA dust.

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Policy HS-2.10: The County shall limit construction of critical transportation structures across the trace of a known active or potentially active fault to those which cannot be reasonably constructed at another location.	Consistent	There would be no construction of critical transportation structures across the trace of a known active or potentially active fault as a result of the Proposed Project, as no known active or potentially active fault zones exist in or adjacent to areas of construction.
Policy HS-2.11: The County shall require that critical facilities be designed and constructed to remain functioning after the Maximum Probable Earthquake and to resist collapse in the event of the Maximum Credible Earthquake as specified in a detailed Geologic/Seismic report based on a site-specific investigation. An example includes designing utilities crossing fault zones to minimize damage by utilizing such measures as flexible units, valving, redundant lines, or automatic valves operated by differential pressure.	Consistent	A geotechnical investigation will be conducted prior to construction plan development to ensure critical facilities are resistant to collapse.
Air Quality		
Policy HS-3.2: The County shall require the use of the best available air pollution control technologies to maintain healthful air quality and high visibility standards, along with continuing compliance with State and Federal Ambient Air Quality Standards.	Consistent	The Proposed Project includes air quality mitigation
Policy HS-3.3: To reduce the number of vehicle trips and miles traveled, residential development should be in close proximity to places of shopping, play, and employment. Where feasible walking and bicycle trails, and cluster development should be considered.	Consistent	The Proposed Project is designed with low impact development and smart growth policies which features clustered development, resulting in fewer vehicle trips and miles traveled.
Policy HS-3.4: As unpaved roads are a major source of the County's particulate emissions, the County should require that all new roads and driveways for new projects that are in close proximity to adjacent residences or the public be paved or treated to reduce dust generation where feasible. Unpaved roads, driveways and parking areas should be considered for surfacing improvements when permits are granted for expanded use.	Consistent	Under the Proposed Project, newly paved and improved roadways would be constructed throughout the Project Site (refer to **Figure 2-11**). Additionally, during construction and grading, roads would be routinely watered to prevent dust density and minimize particulate emissions.
Policy HS-3.8: The County shall require consideration of alternatives or amendments that reduce emissions of air pollutants when reviewing project applications.	Consistent	As part of this Draft EIR, several alternative projects are considered and analyzed, where emissions of air pollutants are discussed (refer to **Section 5.0**). Additionally, the Proposed Project includes mitigation for emissions of air pollutants, such as a dust control plan. A full list of mitigation measures for air pollutants is located in **Section 3.**3.
Policy HS-3.9: The County may require an analysis of potential air quality impacts associated with significant new developments through the environmental review process, and identification of appropriate mitigation measures prior to approval of any major development project.	Consistent	**Section 3.3 Air Qualtiy** includes an analysis of potential air quality impacts of the Proposed Project.
Policy HS-3.10: The County shall require dust-suppression measures for grading activities, and asbestos dust hazard mitigation plans for projects located in Naturally Occurring Asbestos Areas.	Consistent with mitigation	During grading and other dust inducing activities, mitigation measures for dust suppression and specialized mitigation measures for NOA will be implemented.

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Policy HS-3.11: The County shall require that all projects requiring a grading permit or a building permit that would result in earth disturbance, in areas likely to contain naturally occurring asbestos, utilize approved asbestos dust mitigation measures as required by the LCAQMD, CARB and the Lake County Community Development Department	Consistent	Construction of the development areas shall require both grading and building permits. Therefore, adherence to the LCAQMD, CARB and the Lake County Community Development Department in terms of developing mitigation measures for NOA will be done.
Policy HS-3.12: The County shall adopt a mandatory disclosure program, where potential buyers and sellers of real property in all areas likely to contain naturally occurring asbestos are provided information regarding the potential presence of asbestos subject to sale. Information shall include potential for exposure from access roads and from disturbance activities (e.g., landscaping), and shall also include typical mitigation measures and legal requirements.	Consistent	Mitigation requires an Asbestos Dust Mitigation Plan and that disturbed surfaces containing naturally occurring asbestos be stabilized with vegetative cover, 3 inches of non-asbestos containing material, or paving.
Airport Hazards		
Policy HS-4.2: The County shall ensure that development within the airport approach and departure zones are in compliance with Part 77 of the Federal Aviation Administration Regulations (FAA regulations that address objects affecting navigable airspace).	Consistent	None of the development proposed for the sites or off-site infrastructure improvement areas are within airport approach and departure zones. However, the developments will be compliant with Part 77 of the Federal Aviation Administration Regulations due to the onsite floating plane dock.
Hazardous Materials		
Policy HS-5.1: The County shall strive to ensure that hazardous materials are used, transported, and disposed within the County in a safe manner and in compliance with local, state, and federal safety standards. Investigations and enforcement action shall be taken as necessary for any illegal hazardous waste disposal or other violations of federal, state, or local hazardous materials laws and regulations	Consistent	The construction and operation of the development areas shall adhere to all applicable local, state, and federal safety standards. If any violations are found regarding hazardous materials, the Applicant shall comply fully to remedy these violations.
Policy HS-5.2: The County shall work with Caltrans and the Highway Patrol to ensure that hazardous materials transported within the County are restricted to routes that have been designated for such transport.	Consistent	Transportation of the hazardous materials will be necessary as part of the development areas construction and operation. During transportation, all applicable local, state and federal regulation regarding transportation of hazardous materials will be follow in addition to County road restrictions for hazardous materials.
Policy HS-5.5: The County shall prevent incompatible land uses within close proximity to hazardous waste properties.	Consistent	There are no active hazardous wastes sites in close proximity to the development areas, and therefore there will be no inconsistency with land use.
Policy HS-5.6: The County shall review new development proposals to ensure that soils, surface water and groundwater are protected from contamination.	Consistent	The Applicant will submit a proposal to the county for review and comply with their findings concerning soils, surface water and groundwater.
Policy HS-5.11: The County shall require that developers have Phase I or Phase II environmental site assessments performed during the design phase on sites known to contain hazardous materials or which had previously been utilized for the handling or storage of hazardous materials	Consistent	The Applicant shall conduct a Phase I or Phase II should it be deemed necessary. However, no active hazardous material sites are within the development areas.
Flood Hazards		

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Policy HS-6.1: All development within the designated floodway or floodplain zones shall conform to Federal Emergency Management Administration regulations and the Lake County Flood Plain Management Plan.	Consistent with mitigation	The Proposed Project includes mitigation to ensure development within floodplains conforms to regulations.
Policy HS-6.2: The 100-year floodplain zones (as designated on maps prepared by the Federal Emergency Management Administration, refer to Figure 7-2) should be protected and maintained through strict limitation on land use. To carry out this policy, the following guidelines on development should be observed: • Critical facilities (those facilities which should be open and accessible during emergencies) should not be permitted. • Passive recreational activities (those requiring non-intensive development, such as hiking, horseback riding, picnicking) are permissible. • New development and divisions of land, especially residential subdivisions, shall be developed to minimize flood risk to structures, risk to infrastructure, and ensure safe access during flood conditions. • The County shall impose stringent controls on approvals of septic systems where there is a substantial likelihood of infiltration of floodwater into the systems, and/or the discharge from the systems into floodwaters.	Consistent with mitigation	The Proposed Project does not propose any critical facilities, residential structures or septic systems within a 100-year flood zone.
Policy HS-6.6: Prior to the approval of urban development project sites and projects within floodplain areas, the project applicant shall demonstrate that such development will not adversely impact downstream properties or contribute to flooding hazards.	Consistent with mitigation	The Proposed Project includes mitigation to ensure development within floodplains conforms to regulations and does not contribute to flood hazards.
Urban and Wildland Fire Hazards		
Policy HS-7.1: The County shall consult with the appropriate fire service district or California Division of Forestry in areas designated as high and extreme fire hazard, for particular regulations or design requirements prior to issuance of a building permit or approval of subdivisions (refer to Figure 7 - 3).	Consistent	The Proposed Project would actively work with CAL FIRE and local fire protection districts to establish and maintain programs for annual vegetation clearing and fuel breaks, as well provide consultation in regards to fire related regulations and design requirements.
Policy HS-7.2: In areas designated as high or extreme fire hazard, the County should encourage cluster developments to provide for more localized and effective fire protection measures such as consolidations of fuel build - up abatement, firebreak maintenance, fire fighting equipment access, and water service provision.	Consistent	With the implementation of the Wildfire Prevention Plan, wildfire risks within the Project Site would be greatly reduced, as a result of adding an additional fire response center, year round grazing and vegetation removal, fire breaks along main roadways, and incorporating fire resistant landscaping. In addition, fire safe building, which would include thoughtful materials and design, would be implemented to reduce wildfire risk. As a result of the Proposed Project, development would be clustered where appropriate to take advantage of fuel breaks to reduce fire danger.

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Policy HS-7.3: The County shall actively support fuel modification and reduction programs on public and private lands throughout the County, and shall encourage methods other than burning in order to minimize air quality impacts.	Consistent	The Proposed Project would actively work with CAL FIRE and local fire protection districts to establish and maintain programs for annual vegetation clearing and fuel breaks which would not impact air quality.
Policy HS-7.4: The County shall require the development of wildland fire management plans for projects adjoining significant areas of open space that may have high fuel loads.	Consistent	A Wildland Fire Management Plan would be imposed under the Proposed Project, which would include the implementation of fire-resistant landscaping, defensible space, and fire safe building, including projects adjoining significant areas of open space. In addition, an evacuation route map would also be provided.
Policy HS-7.5: Fuel breaks of at least 30 feet should be maintained around all structures. Additional fuel breaks or fuel modifications up to 100 feet around structures should be required when the fire officials find that extra hazardous conditions exist. Secondary fuel breaks up to 200 feet in width should be required when the fire authority finds that additional precautions are necessary. Fire buffers should be created along heavily traveled roads within high and extreme hazard areas by thinning, discing, or controlled burning. Parks, golf courses, utility corridors, roads, and greenbelts should be located so that they may serve a double function as fuel breaks.	Consistent	As a result of the implementation of the Wildfire Prevention Plan, techniques such as fire or fuel breaks, active landscape management, and irrigated green belts would be enforced. Typical fire breaks along roads would include 50 feet of fuel reduction zone on each side of the 25 foot primary roads. There would also be 100-foot fire breaks along particularly vulnerable areas along the Guenoc Valley Site boundary.
Policy HS-7.6: The County should consider fire hazards in evaluating development proposals. Within designated areas where population or residential building densities may be inappropriate to the hazards present, measures should be developed and adopted to mitigate risk to life and property loss. Lands designated as having high and extreme wildfire hazards may be developed provided that the following guidelines are satisfied: ▪ Development should be limited to Rural Residential or Rural lands only; and cluster development is encouraged. ▪ Developers and/or subsequent owners must assume responsibility for ongoing fire prevention maintenance activities for the project, including; abatement of fuel buildup, fire break maintenance, access provision, and provision of adequate water supply to meet fire flow. ▪ Separately developed dwellings with an individual private water supply shall provide an acceptable guaranteed minimum supply of water, in addition to the amount required for domestic needs.	Consistent	Although the development would not be rural residential, the Proposed Project is designed as cluster developments which would help to reduce fire risk. Additionally, in collaboration with the County, Cal Fire, design and engineering teams, and grazing consultants, the Proposed Project would be able to maintain an aggressive fire prevention program and would support and assist in the implementation of adopted emergency preparedness plans and regulations (Appendix FIRE). Furthermore, there would be adequate water supply on-site which would include fire hydrants which are designed to maintain a minimum of a two-hour flow, as well as surface water sources that can be drawn upon in the case of a wildfire emergency.
Policy HS-7.7: The exterior of residential units should be composed of fire resistant materials and designed to reduce fire vulnerability within high and extreme fire hazard areas.	Consistent	All buildings would comply with the California Fire Code and CBC, including the use of fire resistant building materials, such as solid wood doors, and non-combustible metal and tempered glass doors and windows. In addition, all residential structures would include fire suppression systems.
Noise (N) Element		

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Noise		
Policy N-1.1: The County shall consider the compatibility of proposed land uses, utilizing the standards in Table 8 - 1, with the noise environment when preparing or revising community area plans and when reviewing development proposals. Where proposed land uses are likely to produce noise levels exceeding the "normally acceptable" criteria (e.g. "conditionally acceptable", "normally unacceptable"), the County shall require an acoustical analysis prior to development approval to ensure noise mitigation measures are included. Land uses should be prohibited from locating in areas with a noise environment within the "unacceptable" range.	Consistent	Land uses are compatible with surrounding areas
Policy N-1.2: The County shall prohibit the development of new commercial, industrial, or other noise generating land uses adjacent to existing residential uses, and other sensitive noise receptors such as schools, health care facilities, and libraries if CNEL is expected to exceed 55 dBA during daytime (7Am to 10PM) or 45 dBA during nighttime (10PM to 7AM), measured at the property line of the noise sensitive land use, unless effective mitigation measures are incorporated into the project design.	Consistent	The Proposed Project does not propose new commercial, industrial, or other noise generating land uses directly adjacent to existing residential uses or other sensitive noise receptors.
Policy N-1.3: Indoor noise levels for residential uses shall not exceed 45 dBA CNEL.	Consistent	With standard building practices, the Proposed Project does not propose land uses that would increase indoor noise levels for residential uses above 45 dBA CNEL.
Policy N-1.4: The County should encourage proper site planning, architectural layout, and use of building materials as methods of noise attenuation. The following techniques should be considered to reduce noise impacts. ▪ Increase the distance between noise source and receiver through the use of building setbacks and/or dedication of noise easements. ▪ Place noise tolerant land uses such as parking lots, maintenance facilities, and utility areas between noise source and receiver. ▪ Use noise tolerant structures, such as garages or carports, to shield noise - sensitive areas. ▪ Orient buildings to shield outdoor spaces from a noise source. ▪ Use berming and heavy landscaping to reduce noise levels. ▪ Cluster office, commercial, or multiple family residential structures to reduce interior open - space noise levels. ▪ Locate automobile and delivery access to commercial or industrial uses abutting residential parcels at the maximum practical distance from residential uses. ▪ Use multi - glazed or multi - pane windows, tight fitting	Consistent	The Proposed Project will adhere to all County standards for noise reduction.

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doors, and dense building materials where feasible.		
Policy N-1.5: The County shall consider the compatibility of existing and proposed land uses located near highways and major roads. Noise abatement measures should be implemented in these circumstances to reduce noise impacts.	Consistent	The Proposed Project does not propose any land uses near highways or major roads.
Policy N-1.6: Ensure that new development in the vicinity of airports will be compatible with existing and projected noise levels as set forth in the Lake County Airport Land Use Commission (ALUC) Airport Land Use Compatibility Plan.	Consistent	The Proposed Project is not within the vicinity of an airport land use plan.
Policy N-1.7: The County shall require contractors to implement noise-reducing mitigation measures during construction when residential uses or other sensitive receptors are located within 500 feet.	Consistent	During construction of the Phase 1, sensitive receptors shall be within 500 feet of construction in certain areas. Therefore, **MM 3.10-1** will be implemented in addition to other County requirements in order to mitigate the noise impact that would ensue.
Policy N-1.10: The County shall enforce the State Noise Insulation Standards (California Administrative Code, Title 24) and Chapter 35 of the Uniform Building Code.	Consistent	All construction performed as part of the Phase 1 and Future Phases shall comply with State Noise Insulation Standards (California Administrative Code, Title 24) and Chapter 35 of the Uniform Building Code as required.
Policy N-1.13: The County shall incorporate policies pertaining to outdoor entertainment venues into the zoning ordinance ensuring the continued operation of existing venues and siting criteria for new developments.	Consistent	The Proposed Project includes periodic outdoor entertainment as an activity at the amphitheater, equestrian center and other areas. All of these activities shall adhere to the current local noise standards during the development of these facilities.
Policy N-1.14: The County shall utilize existing ordinances to establish limits on boating noise, with specific allowances for tournament races or similar events.	Consistent	The Proposed Project includes boating as a possible recreational activity on Upper Bohn Lake. While this activity is not anticipated to be a substantial source of noise, all boating activities will adhere to any applicable local regulations noise regarding boating activities.
Open Space, Conservation and Recreation (OSC) Element		
Biological Resources		
Policy OSC-1.1: The County should ensure the protection of environmentally sensitive wildlife and plant life, including those species designated as rare, threatened, and/or endangered by State and/or Federal government.	Consistent with Mitigation	A full analysis of habitats and species occurred for the Proposed Project. Through implementation of mitigation, the Proposed Project would not result in take of rare, threatened, and/or endangered wildlife. Additionally, rare, threatened, and/or endangered plant species have been identified for the Proposed Project, and any impacts would be offset through translocation or compensatory planting of rare, threatened, and/or endangered plants. These activities would be performed and monitored by a qualified biologist that would ensure minimum success criteria are met.
Policy OSC-1.2: The County shall limit the encroachment of development within areas that contain a moderate to high potential for sensitive habitat, and direct development into less significant	Consistent	The Proposed Project clusters development and provides for significant open space. Significant riparian corridors are included within dedicated open space, and impacts to oaks have been minimized through extensive avoidance measures. Additional

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habitat areas.		sensitive habits were identified and avoided as possible in project design. Mitigation has been included to offset unavoidable impacts.
Policy OSC-1.3: When reviewing development proposals, the County should encourage cluster development in areas with moderate to high potential for sensitive habitat.	Consistent	All resort communities utilize cluster development in order to minimize the total impact footprint. Non-dedicated open space is still maximized within the development areas.
Policy OSC-1.4: The County shall require that buildings and other forms of development be set back from riparian corridors to avoid damage to habitat.	Consistent	The majority of the project design has clustered development away from setbacks for riparian corridors. Additionally, significant riparian corridors and setbacks have been included within dedicated open space preservation.
Policy OSC-1.6: The County shall support the management of wetland and riparian plant communities for passive recreation, groundwater recharge, and wildlife habitats.	Consistent	Aquatic resources on the Guenoc Valley Site would result in a variety of uses from adjacent development for recreational purposes to complete preservation within dedicated open space. The dedicated open space is intentionally contiguous to promote landscape preservation features such as groundwater recharge. The overall design would allow access to certain aquatic habitat, including manmade reservoirs, while preserving significant habitat and allowing for passive enjoyment of sensitive areas.
Policy OSC-1.7: The County shall encourage the planting of native trees, shrubs, and grasslands in order to preserve the visual integrity of the landscape, provide habitat conditions suitable for native vegetation, and ensure that a maximum number and variety of well - adapted plants are maintained.	Consistent	Planting associated with mitigation will occur exclusively with plants native to the Guenoc Valley Site. Operation of the Proposed Project would similarly maximize use of native plant species to increase the visual aesthetic, maintain the natural landscape, and utilize those species that would require minimal maintenance.
Policy OSC-1.9: The County shall require buffer areas between development projects and significant watercourses, riparian vegetation, and wetlands.	Consistent	Avoidance of watercourses, riparian vegetation, and wetlands occurred during the design phase. Construction and development buffers have been included for avoided features. Mitigation and permitting terms have been included to offset impacts in cases where encroachment into riparian and wetland areas occurs.
Policy OSC-1.13: The County shall support the conservation and management of oak woodland communities and their habitats.	Consistent	The Proposed Project maximizes avoidance of oaks through intentional design, incorporation into landscape, development restrictions, and cluster of development. An Oak Mitigation Plan (**Appendix OAK**) consistent with **Policy OSC-1.13** has been prepared for the Proposed Project subject to Lake County approval.
Policy OSC-1.14: Prior to approving a specific plan or project, the County shall require a biological study to be prepared by a qualified biologist for proposed development within areas containing a moderate to high potential for sensitive habitat, sensitive wildlife species, and/or sensitive plant species. As appropriate, the study shall include the following activities: (1) inventory species listed in the CNPS Manual of California Vegetation; (2) inventory species identified by USFWS, DFG, and NMFS; (3) inventory special-status species listed in the CNDDB; and (4) conduct field surveys of the project site by a qualified biologist.	Consistent	A full analysis of biological resources on the Guenoc Valley Site and Middletown Housing Site was completed and is included as **Appendix BRA-Middletown**. Information from CNPS, USFWS, CDFW, NMFS and CNDDB were reviewed and incorporated into the analysis presented within the Environmental Impact Report. This was done consistent with **Policy OSC.-1.14**.

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Policy OSC-1.15: The County shall strive to protect natural resource areas, fish and wildlife habitat areas, scenic areas, open space areas, and parks from encroachment or destruction by incompatible development and invasive species.	Consistent	The Proposed Project would not result in the release or propagation of invasive species. Mitigation includes habitat restoration and removal of invasive species already present.
Policy OSC-1.18: The County shall ensure that lighting in residential areas and along roadways shall be designed to prevent artificial lighting from reflecting into adjacent natural or open space areas.	Consistent	The Guenoc Valley Site's roadways will be designed in a way to prevent lighting from reflecting into Project Site's designated Open Space.
Policy OSC-1.19: The County should incorporate the protection of sensitive habitat as nature areas where recreational facilities are proposed in these habitats.	Consistent	A significant portion of sensitive habitat is retained within designated open space. In areas where sensitive habitat occurs alongside natural recreational opportunities, such as the reservoirs, public signage will be posted to inform guests of the sensitive nature and importance of the habitat. Signage would additionally include measures to prevent degradation of habitat and restrictions on those activities allowable within and near sensitive habitat.
Scenic Resources		
Policy OSC-2.1: In the rural areas of the County (located outside of Community Growth Boundaries) structures built within the immediate foreground view of a scenic roadway should reflect the following guidelines. • Structures should be sited back, to the extent feasible, from the roadway edge a sufficient distance to minimize intrusion upon the natural features and backdrops as viewed from the roadway or adjacent residences. • Structures should be sited to minimize obstruction of views of significant natural features, such as Clear Lake and Mt. Konocti. Increased height should only be allowed when building orientation provides for increased side-setbacks that provide view corridors.	Consistent	The Guenoc Valley Site would be designed to be hidden from major roadways with the structures situated back from the roadways and in a way to not obstruct views of significant natural features.
Policy OSC-2.4: Within the designated scenic corridors, roadway improvements should be constructed in a manner which minimizes roadway width and thus, reduces domination of the view by road surface; and conforms to the natural contours of the land and minimizes extensive grading and removal of roadside vegetation.	Consistent	Roadway improvements for the Guenoc Valley Site would be done in a manner that minimizes roadway width and retains the natural aesthetic by limiting vegetation removal and follow natural contours of the land.
Policy OSC-2.5: Where possible, on-street parking should be prohibited to minimize obstruction of and intrusion upon views from the roadway except at strategically located turn-outs.	Consistent	On-street parking would be minimized to the fullest extent possible and. Additionally, areas of parking shall be screened from view whenever possible, hidden behind trees and vertical screens, including trellises and canopies.

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Policy OSC-2.6: Commercial parking areas within scenic corridors should be designed to provide attractive open areas, which complement and expand scenic views. Special consideration should be given to these parking areas as to their physical location, layout, and landscaping in an effort to make them an asset in the preservation of scenic corridor values.	Consistent	Due to the entire Guenoc Valley Site not being visible by scenic roadways, parking areas would be hidden from scenic roadways.
Policy OSC-2.9: The siting of transmission lines shall avoid interfering with scenic views to the greatest extent possible, taking into account the design and size of the transmission towers, the nature of the landscape, and the placement of the transmission towers in the landscape. New high voltage transmission facilities (115 K.V. lines and above) shall not be sited along foreground views (up to 1/4-1/2 mile) of potential state and county scenic highways (as designated in the state and county scenic highways or designated in the county general plan, or community areas), or major resorts or wineries unless no feasible alternatives exist. In situations where no feasible alternatives exist, undergrounding or other visual mitigation measures shall be imposed.	Consistent	The electrical infrastructure at the Guenoc Valley Site will change from all overhead distribution service to a mix of overhead and primarily underground service, however infrastructure will largely be installed underground in the subdivisions and resort properties. Although the Proposed Project will include the installation of approximately 8 miles of overhead cables and poles to connect the development areas, they will be installed in locations that will avoid interfering with scenic views to the greatest extent possible.
Policy OSC-2.11: Man-made slopes should be revegetated to reflect natural hillside conditions in the surrounding area, to the extent feasible and in accordance with the County's Grading Ordinance.	Consistent	Both the Guenoc valley site and the Middletown Housing Site would comply with the Lake County Grading Ordinance and include revegetation if necessary.
Policy OSC-2.13: County shall require that all outdoor light fixtures including street lighting, externally illuminated signs, advertising displays, and billboards use low-energy, shielded light fixtures which direct light downward (i.e., lighting shall not emit higher than a horizontal level). Where public safety would not be compromised, the County shall encourage the use of low energy lighting for all outdoor light fixtures.	Consistent	The Proposed Project would incorporate lighting that is directed downward and use low energy lighting. Street lighting would be limited to areas where needed for safety.
Policy OSC-2.14: Street lighting should only be utilized where needed to protect public safety.	Consistent	The Proposed Project would incorporate lighting that is directed downward and use low energy lighting. Street lighting would be limited to areas where needed for safety.
Policy OSC-2.16: The County shall require the use of low glare building materials for new buildings constructed within the county.	Consistent	The Off-Site Workforce housing and the Guenoc Valley Site developments would utilize low glare building materials.
Energy Resources		
Policy OSC-5.1: The County shall require the use of energy conservation features and clean alternative energy use in new construction and renovation of existing structures in accordance with state law.	Consistent	Energy use, including all future construction and renovation projects, shall be in accordance with state law, by requiring clean alternative energy use to the greatest extent possible. This would include the development of solar energy to meet the demand of all residential uses within the Guenoc Valley Site, as well as requiring the use of energy efficient lighting and appliances. Additionally, Mitigation Measure 3.1-7 would require commitment to solar energy to meet the demand of all commercial facilities.

General Plan Policy	Consistency Determination	Analysis
Policy OSC-5.2: The County should encourage the planting of shade trees along streets within new residential subdivisions to reduce radiation heating. Use of native species shall be encouraged.	Consistent	The Proposed Project includes a detailed landscape plan which include the planting of shade trees and use of native species to preserve the existing natural and rural character.
Parks and Recreation		
Policy OSC-6.5: The County should encourage private interests to establish new commercial recreation opportunities and to rehabilitate and restore existing older resorts. Such facilities include, but are not limited to destination resorts, lakefront resorts, dance halls, health and athletic clubs, equestrian facilities, and recreational camps.	Consistent	The Proposed Project includes the development of resort amenities including but not limited to an outdoor entertainment area, spa and wellness amenities, sports fields, equestrian areas, a new golf course, camping area and commercial and retail facilities.
Policy OSC-6.7: The County shall support the continued maintenance and improvement of existing recreational facilities and expansion of new recreational opportunities on county, state, and federal lands.	Consistent	Because the Proposed Project does not include the development of park areas, the parkland dedication shortfall is proposed to be made up by the Applicant's in-lieu fee payments to the Lake County Planning Commission pursuant to Chapter 17 of the Lake County Code of Ordinances. These in-lieu fees will be used by the County for the maintenance and improvement of existing recreational facilities and expansion of new recreational opportunities on county, state, and federal lands.
Policy OSC-6.12: The County shall preserve natural open space resources through the concentration of development in existing communities, use of cluster development techniques, maintaining large lot sizes in agricultural areas, avoiding conversion of lands currently used for agricultural production, and limiting development in areas constrained by natural hazards.	Consistent	The Proposed Project incorporates low-impact development techniques and clustered communities. The density of the Proposed Project is low
Policy OSC-6.13: An integrated multi-purpose trail system should be developed that provides access to recreational facilities, as well as offering a recreational experience apart from that available at the neighborhood and community parks.	Consistent	Under the Proposed Project, recreation features, such as trails, docks, beaches, vista points, picnic areas, swimming, boating, and fishing opportunities, would be provided at Upper Bohn Lake. Additionally, a non-vehicular circulation system would be developed to connect all development areas of the project site and natural destinations. Off-road trails traversing more rugged terrain would be developed for use with hiking, horseback, and mountain bike riding.
Policy OSC-6.16: Create trail linkages and loops with other public facilities (such as parks, open spaces, trail systems of other jurisdictions), communities, points of interest, visitor attractions and/or with educational or historical significance.	Consistent	A non-vehicular circulation system would be developed throughout the Guenoc Valley Site. These trails would extend through the open space areas within the site to connect many of the resort planning areas and natural destinations, and will provide recreational walking, running, hiking, biking, and horseback riding opportunities.
Policy OSC-6.18: Create trails of different lengths and terrains to provide a variety of recreational experiences. Allow for different styles of trails (nature, hiking, equestrian, etc.) to stem off of the main system.	Consistent	A non-vehicular circulation system would be developed to connect all development areas of the project site and natural destinations. Off-road trails traversing more rugged terrain would be developed for use with hiking, horseback, and mountain bike riding.
Policy OSC-6.20: Provide lighting, Rest Areas, and Signage to maintain safe trails. Determine the safest areas for trail locations.	Consistent	Under the Proposed Project, off-road trails traversing more rugged terrain would be developed for use with hiking, horseback, and

General Plan Policy	Consistency Determination	Analysis
Encourage local law enforcement agencies to use the trail system as part of their physical training.		mountain bike riding. The onsite emergency response team would be encouraged to utilize the trail system as part of their physical training regime.
Cultural Resources		
Policy OSC-8.3: When planning any development or alteration of a site with identified cultural or archaeological resources, ways of protecting the resources shall be developed and implemented. Development will be permitted in these areas only after a site specific investigation has been conducted pursuant to CEQA to define the extent and value of resource, and mitigation measures proposed for any impacts the development may have on the resource.	Consistent	Investigations have been completed for Phase I development areas and mitigation measures have been developed to both protect known resources and ensure that future phase development areas are investigated in a similar fashion. Mitigation measures include development of an Unanticipated Discoveries Plan which would guide identification of extent and value of resources.
Policy OSC-8.7: The County shall continue to solicit views from the local Native American communities regarding cultural resources to identify locations of importance to Native Americans, including archaeological sites and traditional cultural properties. Coordination with the Native American Heritage Commission should begin at the onset of a particular project. Any changes, modifications, or additions to the Lake County General Plan will require consultation with local Native American representatives prior to adoption, as specified in California Senate Bill (SB) 18.	Consistent	The NAHC has been contacted on three separate occasions, two for the Guenoc Valley Site and once for off-site improvements. The County has initiated SB 18 and AB 52 consultation with multiple Native American tribes and is in active consultation with Middletown Rancheria.
Policy OSC-8.8: The County shall, within its power, maintain confidentiality regarding the locations of archaeological sites in order to preserve and protect these resources from vandalism and the unauthorized removal of artifacts.	Consistent	Cultural resources reports and resource location information have been generally discussed in the EIR, but no record search results, site record forms, or cultural resources maps have been included in publicly accessible documents.
Policy OSC-8.11: The County shall develop standards for monitoring of mitigation measures established for the protection of historical resources prior to development.	Consistent	The EIR includes provisions for construction monitoring in order to protect historical resources.
Policy OSC-8.13: In the event that archaeological/paleontological resources are discovered during ground disturbing activities, the County shall require that grading and construction work within 100 feet of the find shall be suspended until the significance of the features can be determined by a qualified professional archaeologist/paleontologist as appropriate. The County will require that a qualified professional archaeologist/paleontologist make recommendations for measures necessary to protect the find; or to undertake data recovery, excavation, analysis, and curation of archaeological/paleontological materials as appropriate.	Consistent	Mitigation Measure 3.5-2 requires procedures for the discovery of cultural resources consistent with this County policy.
Policy OSC-8.14: Pursuant to CEQA Guidelines (Section 15064.5), if human remains are discovered during project construction, it is necessary to comply with state laws relating to prohibitions on disinterring, disturbing, or removing human remains from any location other than a dedicated cemetery (California Health and Safety Code Section 7050.5). If human remains of Native American origin are discovered during project construction, it is necessary to comply with	Consistent	Mitigation Measure 3.5-4 details the procedure to be followed if Native American burials are uncovered.

General Plan Policy	Consistency Determination	Analysis
State laws relating to the disposition of Native American burials, which fall within the jurisdiction of the Native American Heritage Commission (Public Resources Code Sec. 5097). If any human remains are discovered or recognized in any location on the project site, there shall be no further excavation or disturbance of the site or any area reasonably suspected to overlie adjacent human remains until: A. The Lake County Coroner/Sheriff has been informed and has determined that no investigation of the cause of death is required; and 1. If the coroner determines that the remains are of Native American origin, a. The coroner shall contact the Native American Heritage Commission within 24 hours b. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descendent (MLD) from the deceased Native American. c. The MLD shall have an opportunity to make a recommendation to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98, or B. Pursuant to Section 5097 of the Public resources Code, if the Native American Heritage Commission was unable to identify a descendant or the descendant failed to make a recommendation, or the landowner or his or her authorized representative rejects the recommendation of the descendents and the mediation provided for in subdivision (k) of Section 5097.94, if invoked, fails to provide measures acceptable to the landowner, the landowner or his or her authorized representative shall reinter the human remains and items associated with Native American human remains with appropriate dignity on the property in a location not subject to further and future subsurface disturbance. To protect these sites, the landowner shall do one or more of the following: 1. Record the site with the commission or the appropriate Information Center. 2. Utilize an open-space or conservation zoning designation or easement. 3. Record a document with the county in which the property is located.		

General Plan Policy	Consistency Determination	Analysis
Water Resources (WR) Element		
Groundwater Protection		
Policy WR-1.1: In known groundwater recharge areas, the predominant land use and resource activities should allow for the continued recharge of the groundwater basin and protect groundwater quality. Clustered development should be encouraged to promote open space and maintain infiltration. Regulations may include, but are not limited to, the limitation of structural coverage and impervious surfaces and prohibition of uses with the potential to discharge harmful pollutants, increase erosion, or create other impacts degrading water quality. The County will, wherever feasible, incorporate groundwater recharge strategies into land use practices, project siting and design. The use of permeable surfacing materials shall be strongly encouraged in these areas.	Consistent	The Proposed Project is designed with low impact development and smart growth policies. The resort features low density clustered development which would preserve open space, allowing for groundwater recharge through the percolation of rainwater. Under the Proposed Project, impervious surfaces will be limited to the greatest extent possible.
Water Quality		
Policy WR-2.1: All proposed land use and development plans should be evaluated as to their potential to create surface and groundwater contamination hazards from point and non-point sources. Effects include, but are not limited to: soil erosion; direct discharge of potentially harmful substances; ground leaching from storage of raw materials, petroleum products, or wastes; floating debris by runoff from the site.	Consistent	Under the CWA, the Proposed Project would implement a NPDES permit which would require continual monitoring and enforcing of provisions to control non-point and point source water pollution from surface water and groundwater supplies.
Policy WR-2.2: The County shall continue to monitor and enforce provisions to control non - point source water pollution contained in the United States Environmental Protection Agency NPDES program.	Consistent	Under the CWA, the Proposed Project would implement a NPDES permit which would require continual monitoring and enforcing of provisions to control non-point source water pollution.
Policy WR-2.3: The County shall continue to enforce provisions to control erosion and sediment from construction sites.	Consistent	As a result of implementing a SWPPP and an Aggregate/Concrete Monitoring and Reporting Control Program, issues related to erosion and sediment at construction sites would be less than significant.
Policy WR-2.4: The County shall continue to require the use of feasible and practical best management practices (BMPs) to protect surface water and groundwater from the adverse effects of construction activities and urban runoff.	Consistent	Under the Proposed Project, the implementation of a SWPPP, an Aggregate/Concrete Monitoring and Reporting Control Program, and associated BMPs would be required, resulting in a less than significant effect on surface water and groundwater as a result of construction activities and urban runoff.
Policy WR-2.5: The County shall ensure the design of facilities and management of storm water runoff in a safe and environmentally sustainable manner. This will be accomplished through the proper siting, design and operation and maintenance of storm drainage collection and drainage facilities so as to protect the people, property and environment including the quality of runoff water and receiving water.	Consistent	Under the Proposed Project, a Stormwater Design Report has been prepared to minimize impacts related to stormwater runoff as a result of development, including roadways, residential areas, and commercial areas. Methods include but are not limited to the use of vegetated swales, sediment forebays, bio-retention areas, and self-treating areas.

General Plan Policy	Consistency Determination	Analysis
Water Resource Sustainability		
Policy WR-3.2: The County shall review new development proposals to ensure the intensity and timing of growth will be consistent with the availability of adequate water supplies. Projects must provide evidence of water availability prior breaking ground for construction	Consistent	Under the Proposed Project, off-site groundwater well hydraulic analysis and monitoring as well as a Water Supply Assessment would be required before and during all phases of construction in order to monitor current and future water availability (refer to **Appendix WSA**).
Conservation and Reuse		
Policy WR-5.1: The County shall require the use of water conservation techniques appropriate for new development. Such techniques include, but are not limited to; requiring low flow plumbing fixtures on new construction, the use of high efficiency irrigation systems, use of gray-water for landscaping, the integration of storm water runoff into passive groundwater recharge, the use (when feasible) of reclaimed water resources for reasonable and beneficial use and the use of drought-tolerant vegetation.	Consistent	As part of a project wide measure, new development would be designed to conserve water through the use of drought resistant vegetation and low flow appliances and fixtures. Also state-of-the-art irrigation systems that reduce water consumption including graywater systems and rainwater catchment would be implemented.
Policy WR-5.5: The County shall require the use of water-conserving appliances and fixtures in all new development, as mandated by State law (California Health and Safety Code, Section 17921.3; Title 20, California Code of Regulations, Section 1601(b); and other applicable sections of Title 24 of the California Code of regulations).	Consistent	As part of a project wide measure, new development would be designed to conserve water low flow appliances and fixtures, including low flow plumbing features.
Policy WR-5.8: The County shall take appropriate measures in the issuance of discretionary entitlements and the application of Zoning districts to seek out opportunities to expand the utilization of reclaimed wastewater (tertiary treated and secondary treated) for other reasonable and beneficial uses. Those uses include, but are not limited to: groundwater recharge, irrigation of agricultural lands, irrigation of landscaped areas, geothermal recharge, and environmental restoration and enhancement projects.	Consistent	The Proposed Project incorporates wastewater reclamation for landscape irrigation and other outdoor uses.
Policy WR-5.9: To augment groundwater supplies and to conserve potable water for domestic purposes, the County should seek opportunities to expand the use of reclaimed wastewater for all beneficial uses.	Consistent	Under the Proposed Project, small biological package style treatment systems would be installed at the Maha Farm, Redhill/Renaissance Golf Course, Resort at Trout Flat, Central Back of the House, Equestrian Center, Bohn Ridge Resort, the Spa, On-Site Workforce Housing, and the Camping Area, which would treat and recycle wastewater for future use.
Agricultural Resources (AR) Element		
Agricultural Protection		
Policy AR-1.3: The County shall limit non-agricultural development in the unincorporated portions of the County designated as Primary Agricultural Areas, as follows: • For new land divisions or lot line adjustments, the County shall maintain a minimum parcel size large enough to sustain agricultural use outside of the Community Growth	Consistent	The Proposed Project includes parcel boundaries within Primary Agricultural Areas. The smallest of these parcels is 3.2 acres, which is large enough to sustain agricultural use. Additionally, Mitigation Measure 3.2-2 includes acre-for-acre permanent conservation for development upon Important Farmlands (Prime and Unique Farmlands).

General Plan Policy	Consistency Determination	Analysis
Boundaries. • The County's rules for parcel sizes shall be based on slope, local agricultural conditions, and the need to ensure the viability of agricultural operations. Residential uses in support of agricultural operations are allowed if appropriate buffers from agricultural uses are provided (see Policy AR-1.6, Buffers).		
Policy AR-1.4: With the exception of allowable resort, support commercial uses, agricultural industry, and farmworker housing, non-agricultural development should be directed to appropriate areas within the Community Growth Boundaries and the cities of Clearlake and Lakeport (including areas within adopted spheres of influence).	Consistent	The Guenoc Valley Site will be resort development and the Middletown Housing Site is within a Community Growth Boundary.
Policy AR-1.5: As a condition of approval of a discretionary development permit, relating to property located inside a Primary Agricultural Area or within 1,000 feet of agricultural land or agricultural operations, the County will ensure all property owners and/or applicants are informed of the potential agricultural operations in the area and agricultural conditions in the area and will be required to sign and record a deed notification containing the information in the County's Zoning Ordinance (Section 21-4.18, Notice of Farming Practices) with the deed for the property(ies) involved.	Consistent	All residents within 1,000 feet of agricultural land would sign the Right to Farm form prior to obtaining the property deed.
Policy AR-1.6: To protect current agricultural activities, the County shall require an appropriate buffer between existing agricultural uses and proposed residential dwellings or other inhabited structures in the Primary Agricultural Areas. Buffer design and maintenance will be required based on site conditions, but will incorporate, at a minimum, the following: • Buffers shall be located on the parcel(s) for which a permit or approval is sought. • Buffers shall be sized and physically designed to avoid conflicts between agriculture and non-agricultural uses. The size of the buffer shall be determined on a site-by-site basis taking into account the type of existing agricultural uses, the nature of the proposed development, the natural features of the site, and any other factors that affect the specific situation. A minimum buffer of 100 feet from a property used for commercial agricultural purposes shall be required. • Buffer areas can be incorporated into the adjacent agricultural areas if the new development can purchase a conservation easement from the agricultural entity to restrict operations that may drive a large buffer area (e.g., eliminating spraying on the adjacent area). • In larger buffer areas (such as along the outer edge of a	Consistent with mitigation	The majority of the Primary Agricultural Areas would be within the proposed Agricultural Preserve Combining District, which restricts residential development to one single-family dwelling (**Appendix GVD**). A small portion of Unique Farmland would occur within the Maha Farm residential estate parcels, however, there would be acre-for-acre conservation easements under Mitigation Measure 3.2-2, and the easements would have a 100 foot buffer between residential and agricultural uses.

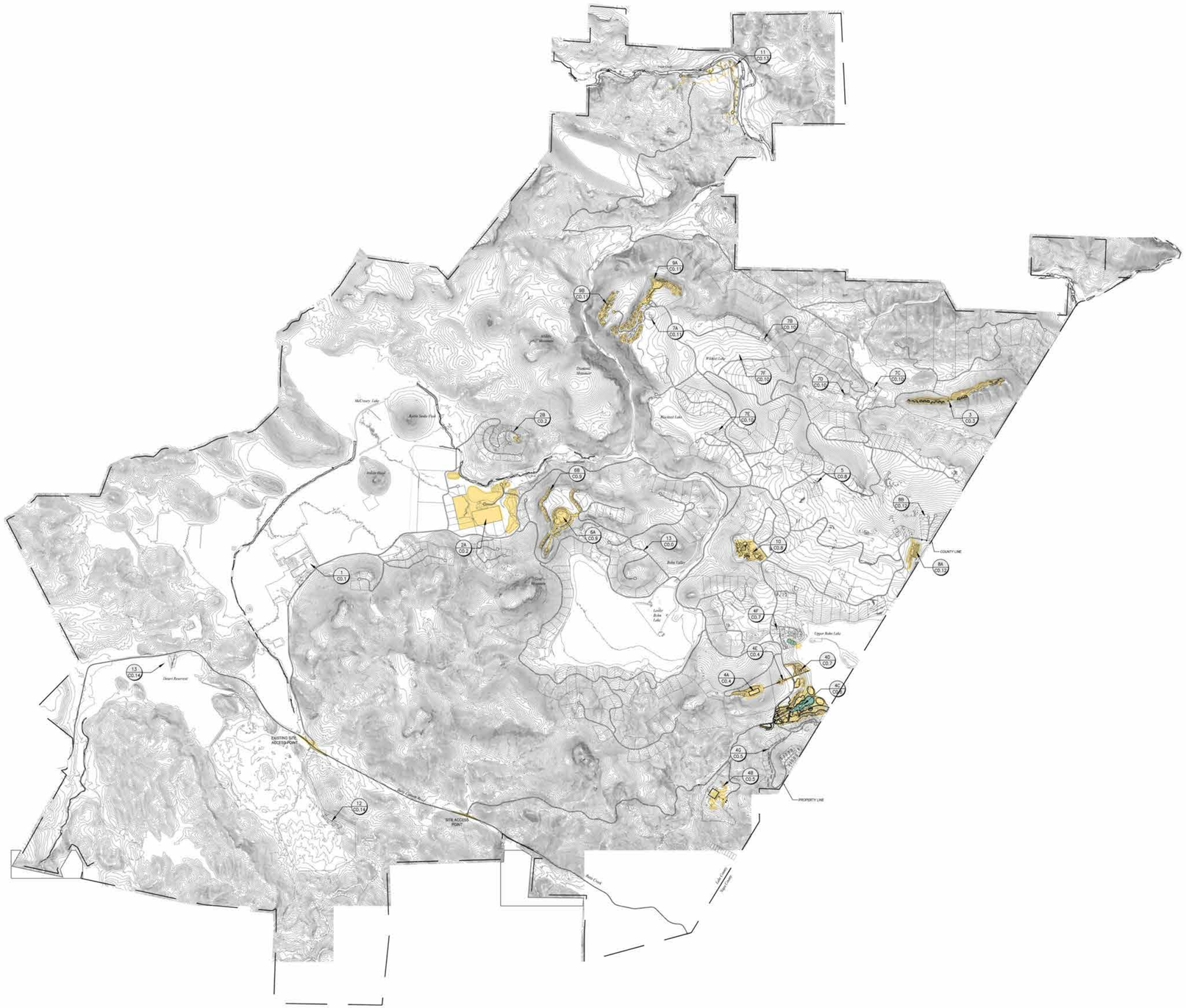
General Plan Policy	Consistency Determination	Analysis
community), appropriate types of land uses for buffers include compatible agriculture, open space and recreational uses such as parks and golf courses, industrial uses, and cemeteries. • The County shall condition projects to ensure the on-going maintenance of buffers. • Buffer restrictions may be removed if agricultural uses on all adjacent parcels have permanently ceased. • Development of a residential unit owned by the agricultural operator on that (or adjacent) property is exempt from the provisions of this policy. • The County will encourage property owners and developers to place new homes on a site to maximize the distance of that unit from adjacent agricultural uses. • The County will ensure that adequate buffers are maintained when a lot line adjustment is requested. • For pre-existing, legally created parcels where the minimum or appropriate buffer can not be provided, the buffer shall be maximized on the site.		
Policy AR-1.7: Extension of services, such as sewer and water lines and roadways, into areas preserved for agriculture use should be avoided. Where necessary, they should be located in public rights-of-way in order to prevent interference with agricultural operations and to provide ease of access for operation and maintenance. Service capacity and length of lines shall be designed to prevent the conversion of agricultural lands into urban/suburban uses.	Consistent	Where feasible, sewer and water lines would be constructed along roadways. Agricultural Preserve Combining District areas would only allow one single-family dwelling.
Policy AR-1.8: The County should discourage the parcelization of land within the designated Primary Agricultural Areas that would divide land into units too small to economically support a viable agricultural operation and which contributes to the transition of agricultural lands to non-agricultural uses.	Consistent	. The Proposed Project includes parcel boundaries within Primary Agricultural Areas, however the smallest of these parcels is 3.2 acres, which is large enough to sustain agricultural use. Additionally, under **Mitigation Measure 3.2-2**, the Proposed Project would require acre for acre permanent conservation, which would require that every acre of Prime Farmland or Unique Farmland converted would result in the same number of acres of equivalent Important Farmland preserved somewhere else on the property or within the vicinity.
Policy AR-1.12: The County shall encourage the use of agricultural and conservation easements to preserve agricultural land.	Consistent	As a result of the implementation of **Mitigation Measure 3.2-2**, the Proposed Project would require acre for acre permanent conservation, which would require that every acre of Prime Farmland or Unique Farmland converted would result in the same number of acres of equivalent Important Farmland preserved somewhere else on the property or within the vicinity.
Agricultural Enhancement		
Policy AR-2.1: The County should continue to support programs of	Consistent	The Proposed Project encourages the economic development of

General Plan Policy	Consistency Determination	Analysis
agricultural technical assistance and should cooperate with public and private groups to promote the economic development of agricultural areas.		agricultural areas by incorporating market gardens, and local businesses in the Maha Farm area
Policy AR-2.3: The County shall encourage the development of agricultural economic zones, promoting the development of agriculturally-related uses such as wineries, olive press facilities, and other agricultural processing facilities, to increase the overall agricultural viability of the County.	Consistent	The Proposed Project includes agro-tourism features such as farm-to-table restaurants and wineries. The Maha Farm area would feature a market for local agricultural products.
Policy AR-2.4: The County shall allow, by discretionary permit in areas designated Primary Agricultural Areas, agriculturally-related uses, including value-added processing facilities, and certain non-agricultural uses. Approval of these and similar uses in areas designated Agriculture shall be subject to the following criteria: a. The use shall provide a needed service to the surrounding agricultural area which cannot be provided more efficiently within urban areas or which requires location in a non-urban area because of unusual site requirements or operational characteristics; b. The operational or physical characteristics of the use shall not have a detrimental impact on water resources or the use or management of surrounding properties within at least one-quarter (1/4) mile radius; c. The activity must be found to support agricultural operations, production, or processing within the County; and Lake County General Plan September 2008 Page 12-10 **d.** For proposed value-added agricultural processing facilities, the evaluation under criteria "a" above, shall consider the service requirements of the use and the capability and capacity of cities and unincorporated communities to provide the required services.	Consistent	The Proposed Project includes resort development that is not able to occur in urban areas and would support agricultural operations
Policy AR-2.8: Within the Primary Agricultural Areas, the County will permit agriculturally- related commercial uses that meet the following criteria: • Uses shall be limited to those that promote agricultural production in the County • All agricultural processing and marketing facilities shall be encouraged to utilize products grown or derived from Lake County. • Direct-market stands shall be allowed in agricultural areas • The use is compatible with existing agricultural uses in the area and does not adversely impact agricultural operations • The use does not require the extension of urban services (sewer and/or water service)	Consistent	The Proposed Project shall feature local agricultural products in the Maha Farms area and will be compatible with surrounding vineyard developments

General Plan Policy	Consistency Determination	Analysis
• No facilities supporting or offering off-road vehicles.		
Agricultural Tourism		
Policy AR-3.1: The County should establish criteria for, and amend the zoning ordinance to allow development of agricultural tourism facilities, as long as the facility is secondary and incidental to the commercial agricultural use on that site and the tourism activity does not negatively impact agricultural operations on adjacent lands, based upon parcel size, proposed use and the parcels ability to provide adequate buffer zones. **1.** Small-Scale Facilities. Facilities may be permissible if they meet the following conditions (in addition to a standard site suitability assessment as part of a normal minor use permit): **a.** The facility is approved subject to maintaining an agriculturally oriented theme **b.** The use is compatible with existing agricultural uses in the area and does not adversely impact neighboring agricultural operations **c.** The use does not require the extension of urban services (sewer and/or water service) **d.** No motorized off-road vehicles for recreational purposes (no use restrictions when used to support agricultural operations) **2.** Large-Scale Facilities. Facilities may be permissible if they meet the following conditions (in addition to a standard site suitability assessment as part of a normal major use permit): **a.** The facility is approved subject to maintaining an agriculturally oriented theme **b.** The use is compatible with existing agricultural uses in the area and does not adversely impact neighboring agricultural operations **c.** The site is accessible from a County or State maintained roadway or highway **d.** No motorized off-road vehicles for recreational purposes (no use restrictions when used to support agricultural operations)	Consistent	The GVD zoning district allows for the development of agricultural tourism facilities consistent with surrounding land uses. Facilities would maintain an agricultural theme, would be accessible by Butts Canyon Road (a state maintained roadway) and would not allow motorized off-road vehicles for recreational purposes.
Source: Lake County, 2008		

APPENDIX GRADING

EARTHWORK PLAN



EARTHWORK VOLUMES: PHASE 1

#	SITE	2D Surface Area (Sf.)	CUT (Cu.Yd.)	FILL (Cu.Yd.)	NET (Cu.Yd.)	% Cut	% Fill
COMMERCIAL DEVELOPMENT QUANTITIES							
1	Back of House	315,530	93,407	4,163	89,244	96	4
2A	Equestrian Grounds	8,044,491	173,661	965,318	(791,657)	15	85
2B	Equestrian Center Lodge & Resort Residential	65,517	3,972	3,988	(16)	50	50
3	Resort at Trout Flat	308,825	53,012	33,508	19,504	61	39
4A	Maha Farms: Sales Center	261,487	19,546	17,419	2,127	53	47
4B	Maha Farms: Barns	134,822	8,324	4,455	3,869	65	35
4C	Maha Farms: Marketplace & Resort	902,052	47,998	84,623	(36,625)	36	64
4D	Maha Farms: Private Club	166,922	20,704	17,252	3,452	55	45
4E	Maha Farms: Winery	54,735	7,121	8,390	(1,269)	46	54
4F	Maha Farms: North Resort Residential	87,473	124	11,781	(11,657)	1	99
4G	Maha Farms: South Resort Residential	251,726	3,201	42,760	(39,559)	7	93
5	Emergency Response Center + Entourage Hotel	57,528	2,784	2,780	4	50	50
6A	Bohn Ridge Resort	163,445	27,843	27,800	43	50	50
6B	Bohn Ridge Resort Residential	279,387	28,211	27,881	330	50	50
7A	Golf Course: Hole 1 Clubhouse	16,240	246	277	(31)	47	53
7B	Golf Course: Hole 9 Clubhouse	23,214	1,305	1,213	92	52	48
7C	Golf Course: Hole 18 Clubhouse	12,164	125	131	(6)	49	51
7D	Golf Course: Maintenance 1	17,754	946	868	78	52	48
7E	Golf Course: Maintenance 2	66,540	3,560	3,647	(87)	49	51
7F	Golf Course	1,169,384	16,358	56,306	(39,948)	23	77
8A	Estate Winery + Cave	141,180	29,009	10,831	18,178	73	27
8B	Estate Winery Residential	53,076	1,167	1,161	6	50	50
9A	Red Hill Resort	358,598	55,206	55,188	18	50	50
9B	Red Hill Resort Residential	344,542	26,429	26,208	221	50	50
10	Spa Resort	281,555	9,328	16,992	(7,664)	35	65
11	Wilderness Camp	55,577	2,370	2,396	(26)	50	50
12	Workforce Housing	101,911	8,202	8,404	(202)	49	51
13	Aerial Access Pad	12,742	161	200	(39)	45	55
OTHER QUANTITIES							
14	Total Roads (Outside of Commercial Zones)	-	793,859	155,509	638,350	84	16
15	Residential Villa Parcels	3,820,000	8,778,360	8,778,360	-	50	50
16	Total Approx. Displaced Fill from Hardscape Sections	3,535,829		(170,928)	170,928	0	100
17	Total Trails	-	145,690	125,700	19,990	54	46
	TOTALS	**21,104,246**	**10,362,229**	**10,324,582**	**37,647**	**50**	**50**

NOTES:

1. Maha Farms: Marketplace & Resort includes the proposed Lagoon Earthwork Quantity, calculated by PCI.
2. Golf Course Earthwork Quantity was calculated by Tom Doak. The fill volume includes imported sand quantities.
3. Excess fill is considered to be within the margin of error, which could be attributed to displaced fill from factors unknown at this time. Some examples of these factors include utility trenching, structural foundations, and unusable soil materials. The goal of the project as a whole is to maintain a balanced earthwork scenario within the site's boundaries, with no offhaul of soil offsite.

0 1000' 2000' 4000' NORTH

SHERWOOD
DESIGN ENGINEERS
2548 Mission Street
San Francisco, CA 94110
www.sherwoodengineers.com

SCALE:
0 1"
Note: If this graphic scale does not equal 1", this sheet has been modified from its original size

NO	DATE	REVISION

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PROJECT NO. 18-016
DATE 07/02/2019
DRAWN AR & CL
DESIGNED MH
CHECKED CA

MAHA GUENOC
LAKE COUNTY
CALIFORNIA

EARTHWORK PLAN

OVERALL EARTHWORK SITE PLAN

Elevations Table			
Number	Color	Min. Elev.	Max. Elev.
1		-100.0	-12.0
2		-12.0	-8.0
3		-8.0	-4.0
4		-4.0	-2.0
5		-2.0	-0.5
6		-0.5	0.5
7		0.5	2.0
8		2.0	4.0
9		4.0	8.0
10		8.0	12.0
11		12.0	100.0

NOTES:

1. SEE OVERALL EARTHWORK SHEET FOR SITE SPECIFIC EARTHWORK QUANTITIES

0 50' 100' 200'

North

SHERWOOD
DESIGN ENGINEERS
2548 Mission Street
San Francisco, CA 94110
www.sherwoodengineers.com

SCALE: 0 1"

Note: If this graphic scale does not equal 1", this sheet has been modified from its original size

NO	DATE	REVISION

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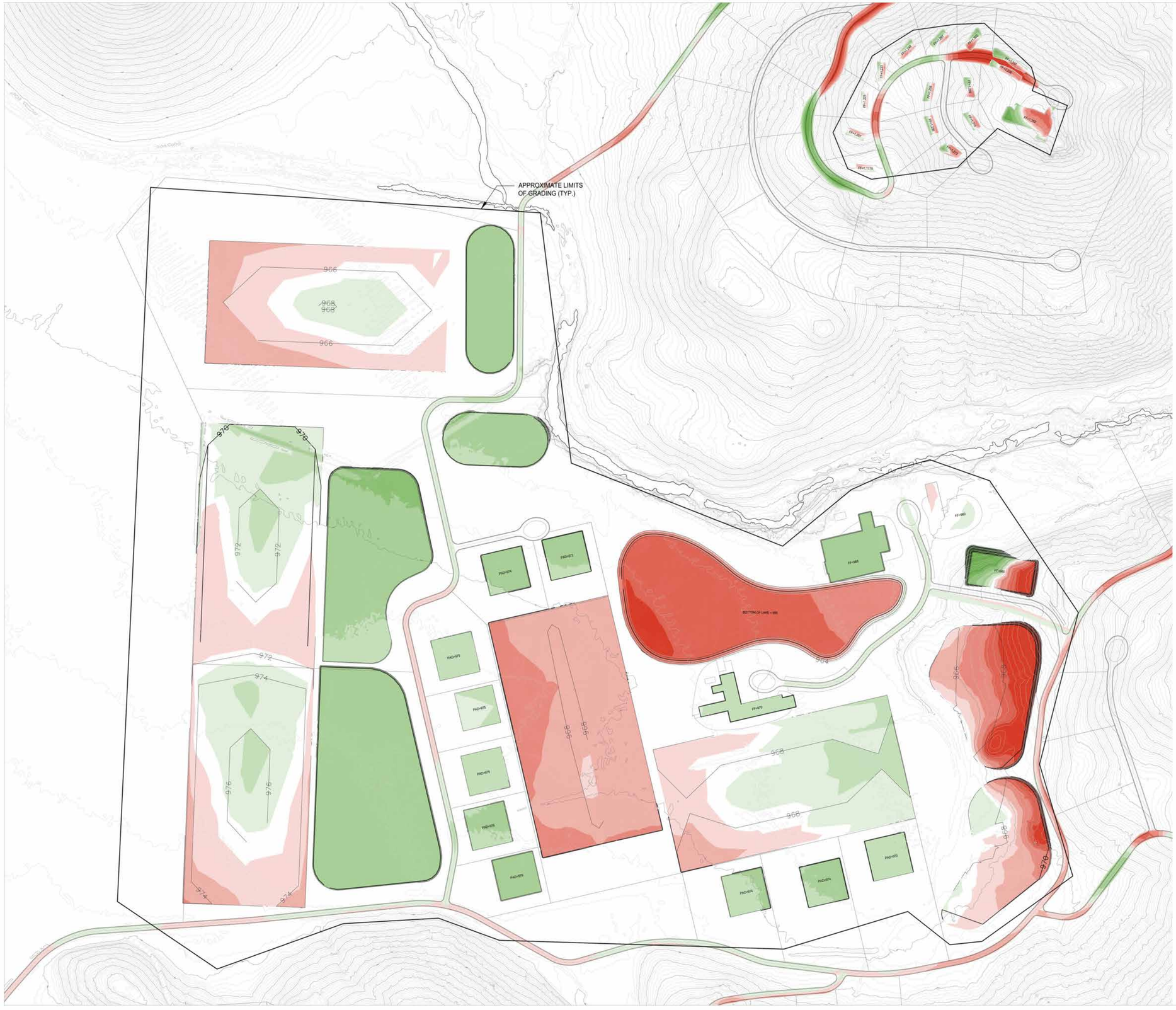
PROJECT NO.	18-016
DATE	07/02/2019
DRAWN	AR & CL
DESIGNED	MH
CHECKED	CA

MAHA GUENOC
LAKE COUNTY
CALIFORNIA

EARTHWORK PLAN

BACK OF HOUSE



Elevations Table			
Number	Color	Min. Elev.	Max. Elev.
1		-100.0	-12.0
2		-12.0	-8.0
3		-8.0	-4.0
4		-4.0	-2.0
5		-2.0	-0.5
6		-0.5	0.5
7		0.5	2.0
8		2.0	4.0
9		4.0	8.0
10		8.0	12.0
11		12.0	100.0

NOTES:

1. SEE OVERALL EARTHWORK SHEET FOR SITE SPECIFIC EARTHWORK QUANTITIES

0 100' 200' 400'

North

SHERWOOD
DESIGN ENGINEERS
2548 Mission Street
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www.sherwoodengineers.com

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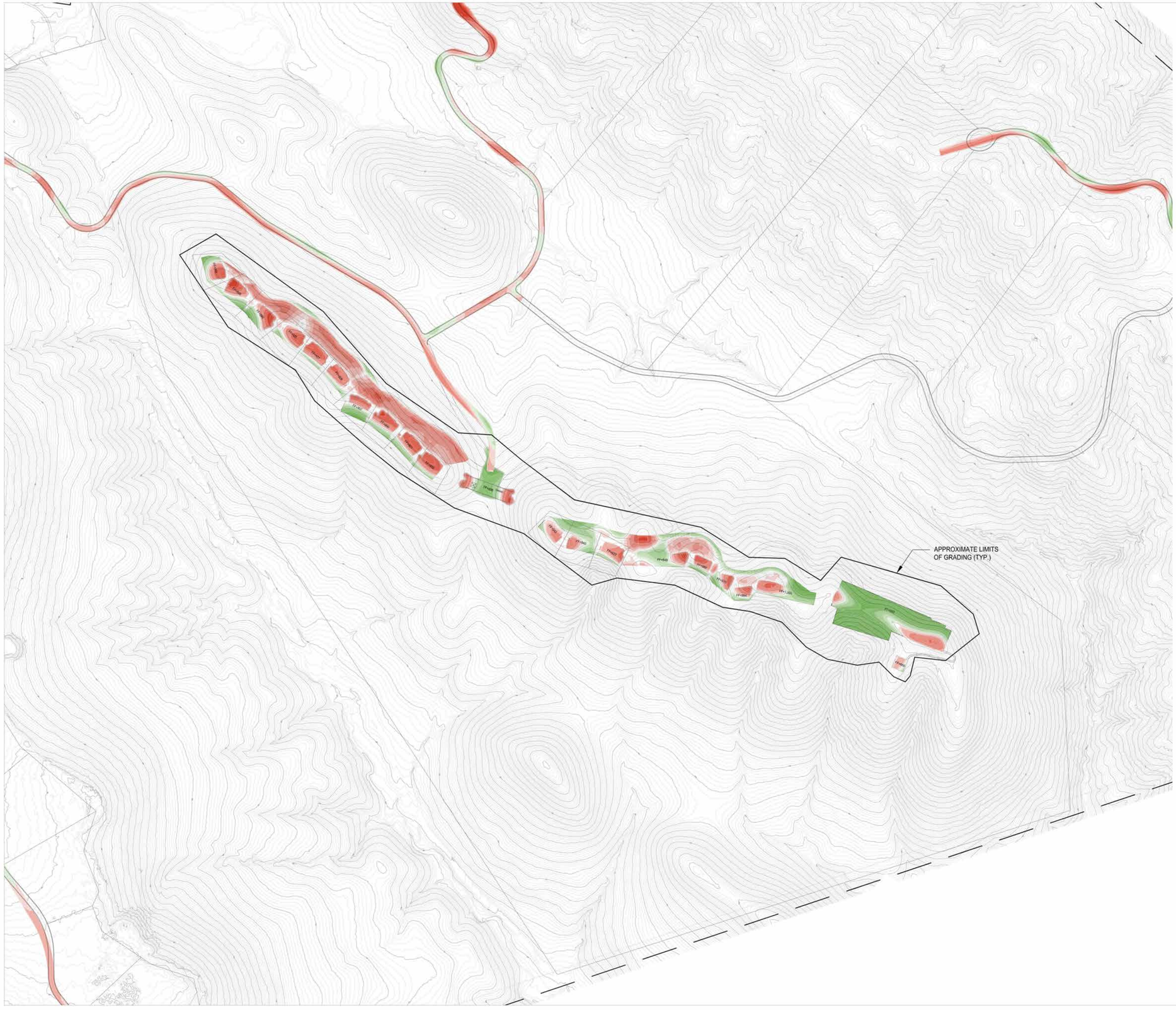
CHECKED	CA

MAHA GUENOC
LAKE COUNTY
CALIFORNIA

EARTHWORK PLAN

EQUESTRIAN CENTER



Elevations Table			
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9		4.0	8.0
10		8.0	12.0
11		12.0	100.0

NOTES:

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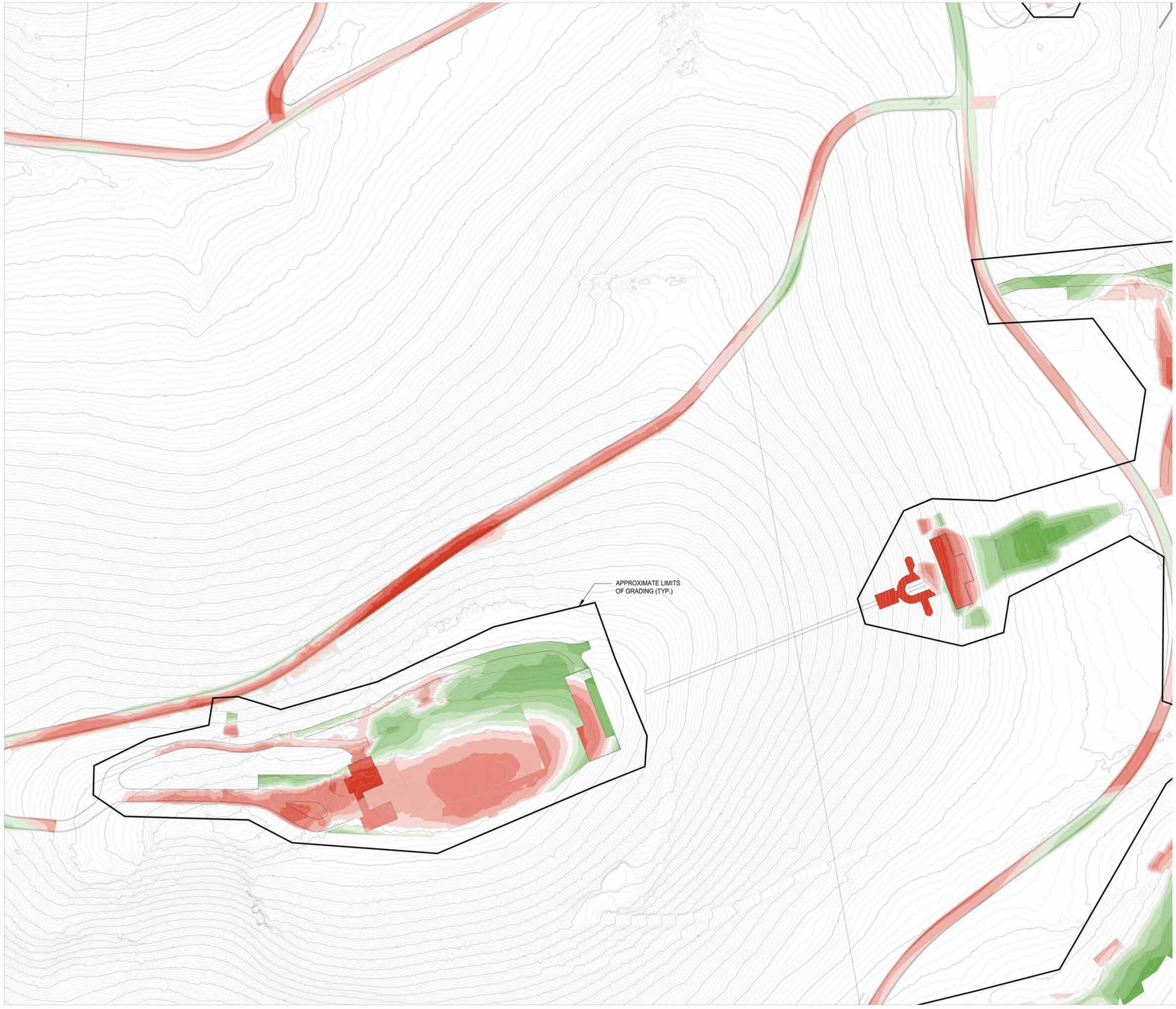
MAHA GUENOC
LAKE COUNTY
CALIFORNIA

EARTHWORK PLAN

KERRY HILL



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9		4.0	8.0
10		8.0	12.0
11		12.0	100.0

NOTES:

1. SEE OVERALL EARTHWORK SHEET FOR SITE SPECIFIC EARTHWORK QUANTITIES

0 50' 100' 200'

North

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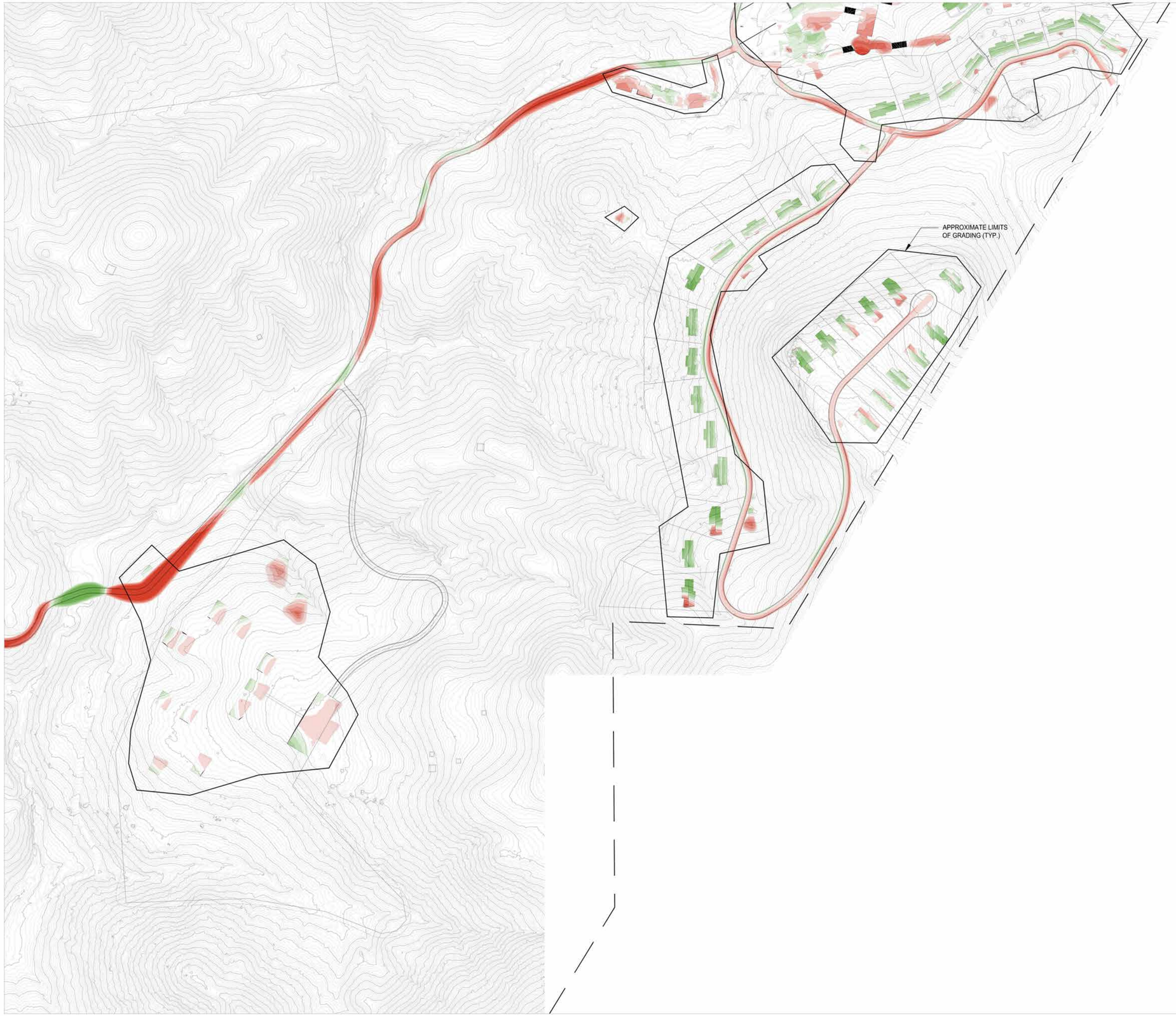
MAHA GUENOC
LAKE COUNTY
CALIFORNIA

EARTHWORK PLAN

MAHA FARMS
SALES CENTER & WINERY



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7		0.5	2.0
8		2.0	4.0
9		4.0	8.0
10		8.0	12.0
11		12.0	100.0

NOTES:

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North

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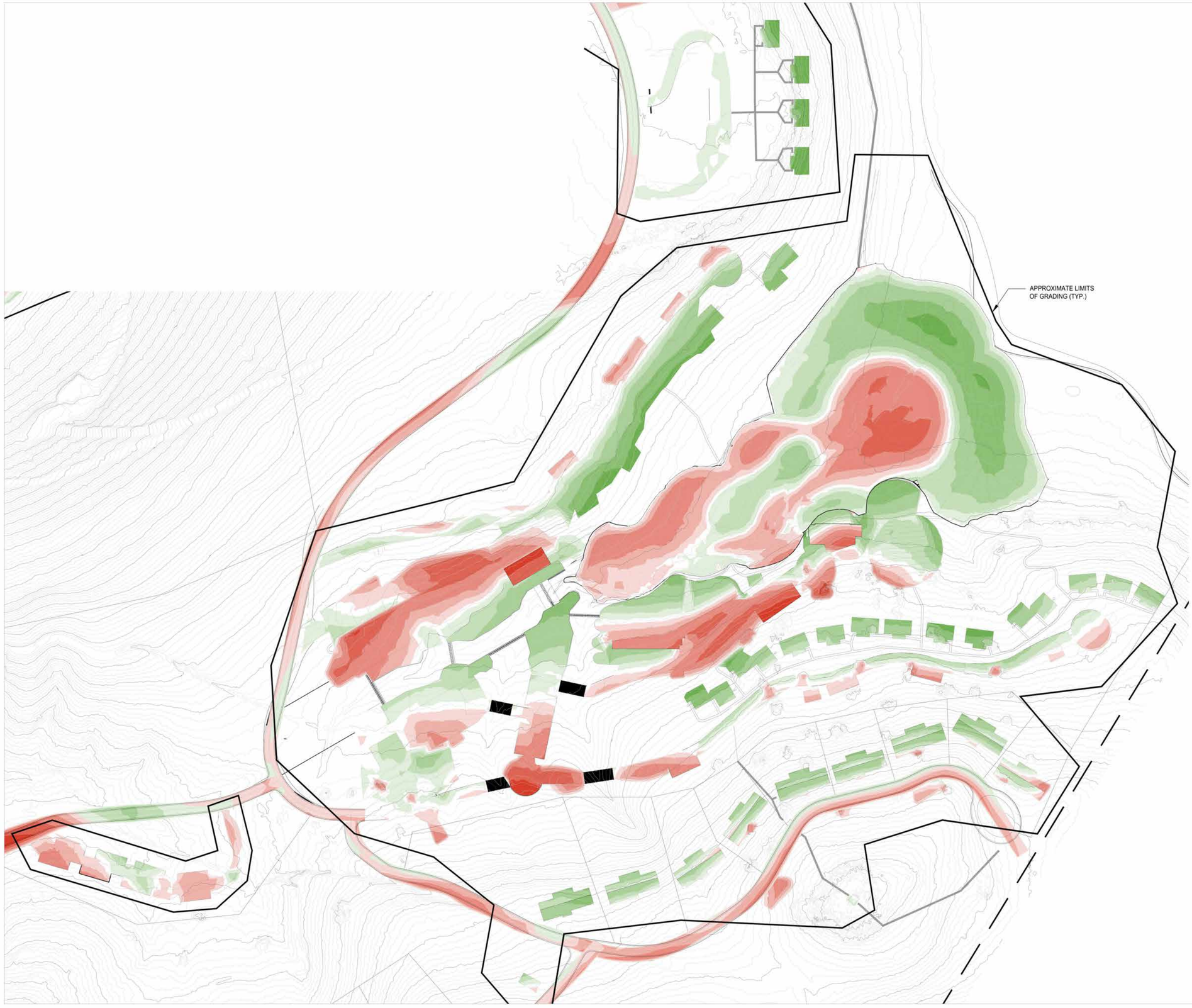
MAHA GUENOC
LAKE COUNTY
CALIFORNIA

EARTHWORK PLAN

MAHA FARMS
BARNS AND SOUTH RESORT



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7		0.5	2.0
8		2.0	4.0
9		4.0	8.0
10		8.0	12.0
11		12.0	100.0

NOTES:

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0 50' 100' 200'

North

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MAHA GUENOC
LAKE COUNTY
CALIFORNIA

EARTHWORK PLAN

MAHA FARMS
MARKETPLACE AND RESORT

Elevations Table			
Number	Color	Min. Elev.	Max. Elev.
1		-100.0	-12.0
2		-12.0	-8.0
3		-8.0	-4.0
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8		2.0	4.0
9		4.0	8.0
10		8.0	12.0
11		12.0	100.0

NOTES:

1. SEE OVERALL EARTHWORK SHEET FOR SITE SPECIFIC EARTHWORK QUANTITIES

0 50' 100' 200'

North

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MAHA GUENOC
LAKE COUNTY
CALIFORNIA

EARTHWORK PLAN

MAHA FARMS
CLUB AND NORTH RESORT

Elevations Table			
Number	Color	Min. Elev.	Max. Elev.
1		-100.0	-12.0
2		-12.0	-8.0
3		-8.0	-4.0
4		-4.0	-2.0
5		-2.0	-0.5
6		-0.5	0.5
7		0.5	2.0
8		2.0	4.0
9		4.0	8.0
10		8.0	12.0
11		12.0	100.0

NOTES:

1. SEE OVERALL EARTHWORK SHEET FOR SITE SPECIFIC EARTHWORK QUANTITIES

0 100' 200' 400' North

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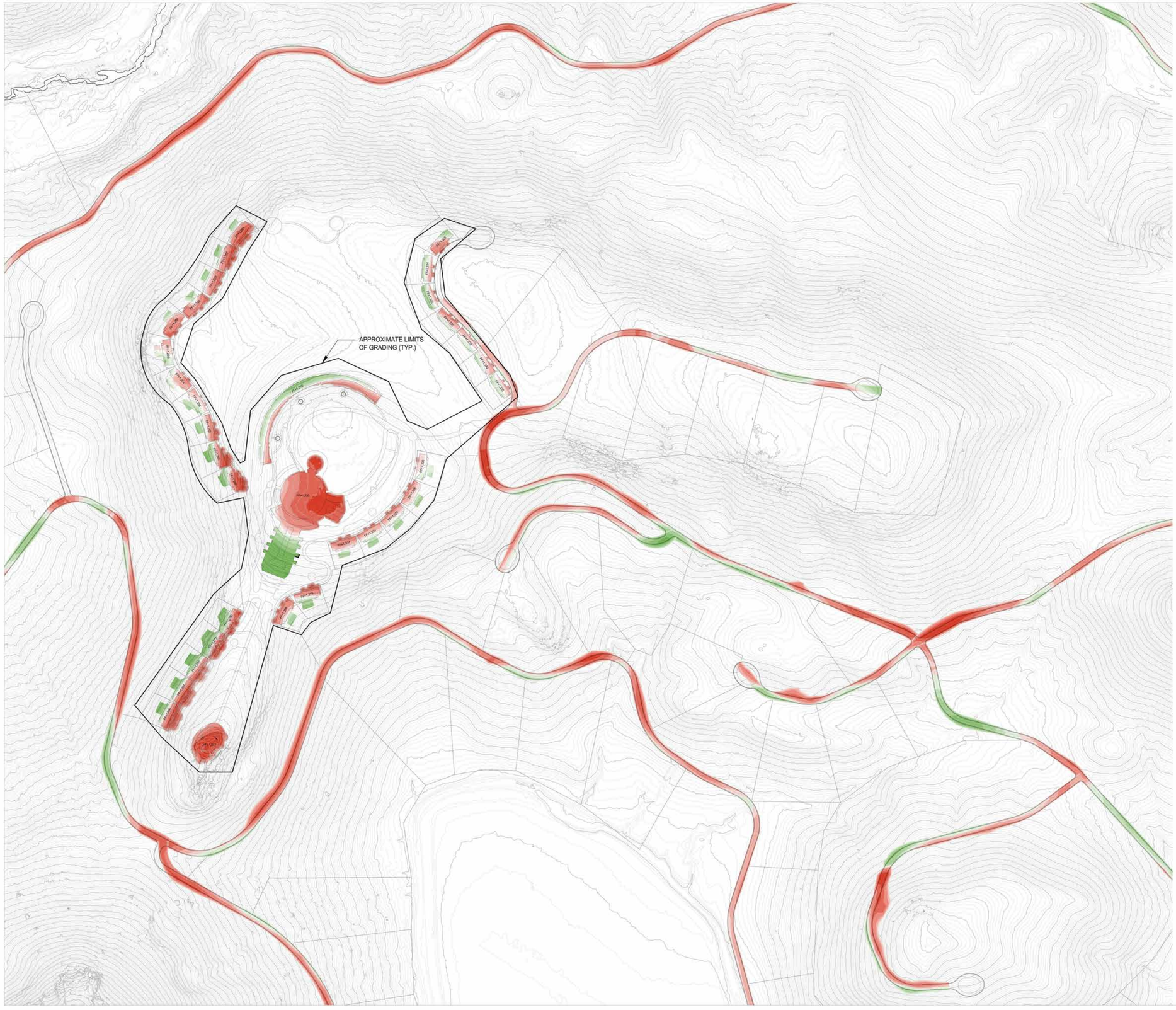
MAHA GUENOC
LAKE COUNTY
CALIFORNIA

EARTHWORK PLAN

SPA & EMERGENCY RESPONSE CENTER



Elevations Table			
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10		8.0	12.0
11		12.0	100.0

NOTES:

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0 100' 200' 400'

North

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MAHA GUENOC
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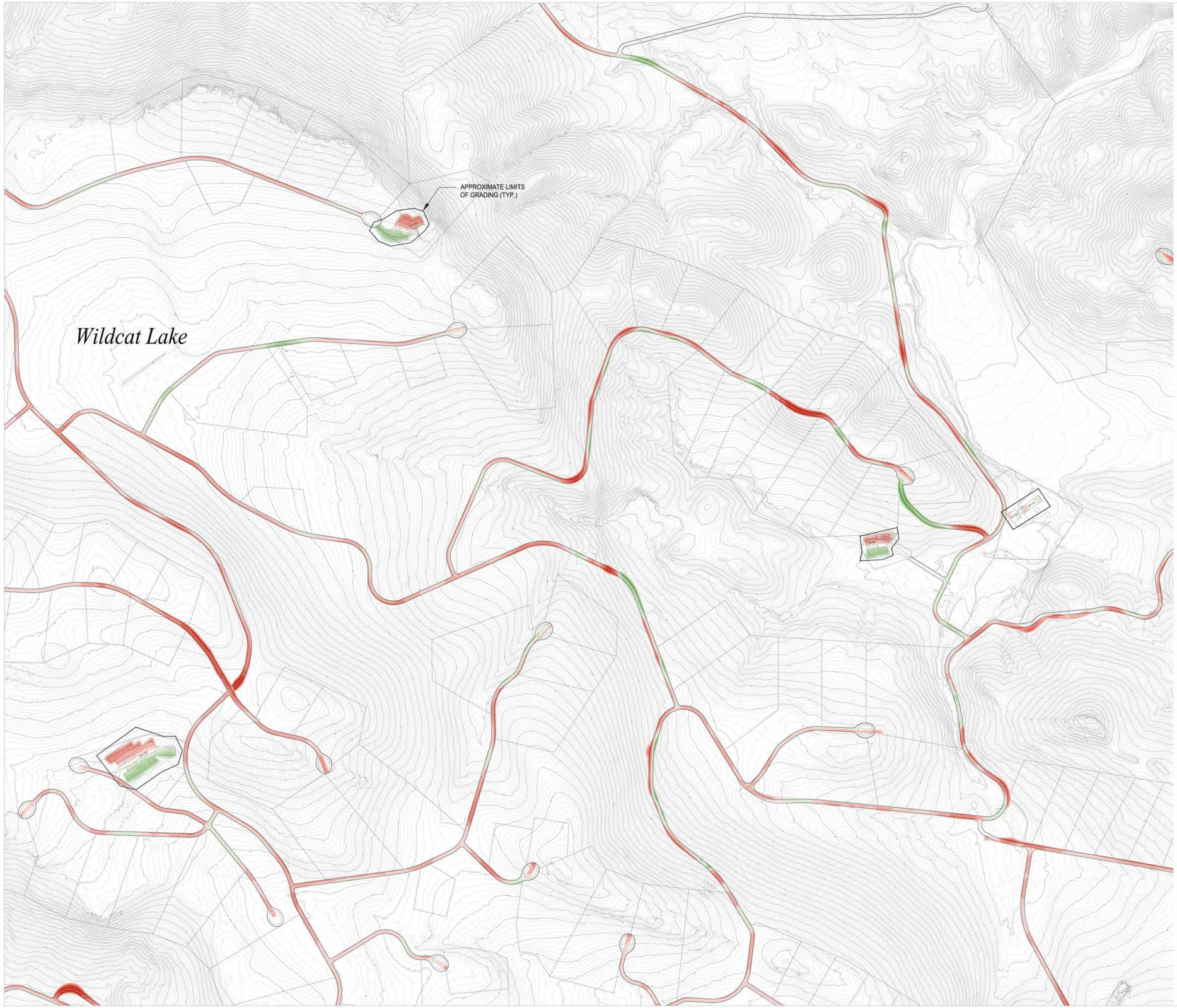
EARTHWORK PLAN

BOHN RIDGE



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10		8.0	12.0
11		12.0	100.0

NOTES:

1. SEE OVERALL EARTHWORK SHEET FOR SITE SPECIFIC EARTHWORK QUANTITIES
2. GOLF COURSE EARTHWORK CALCULATED SEPARATELY, NOT SHOWN ON PLAN

0 150' 300' 600'

North

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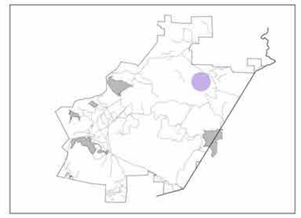
MAHA GUENOC
LAKE COUNTY
CALIFORNIA

EARTHWORK PLAN

GOLF BUILDINGS 1



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9		4.0	8.0
10		8.0	12.0
11		12.0	100.0

NOTES:

1. SEE OVERALL EARTHWORK SHEET FOR SITE SPECIFIC EARTHWORK QUANTITIES
2. GOLF COURSE EARTHWORK CALCULATED SEPARATELY, NOT SHOWN ON PLAN

0 150' 300' 600'

North

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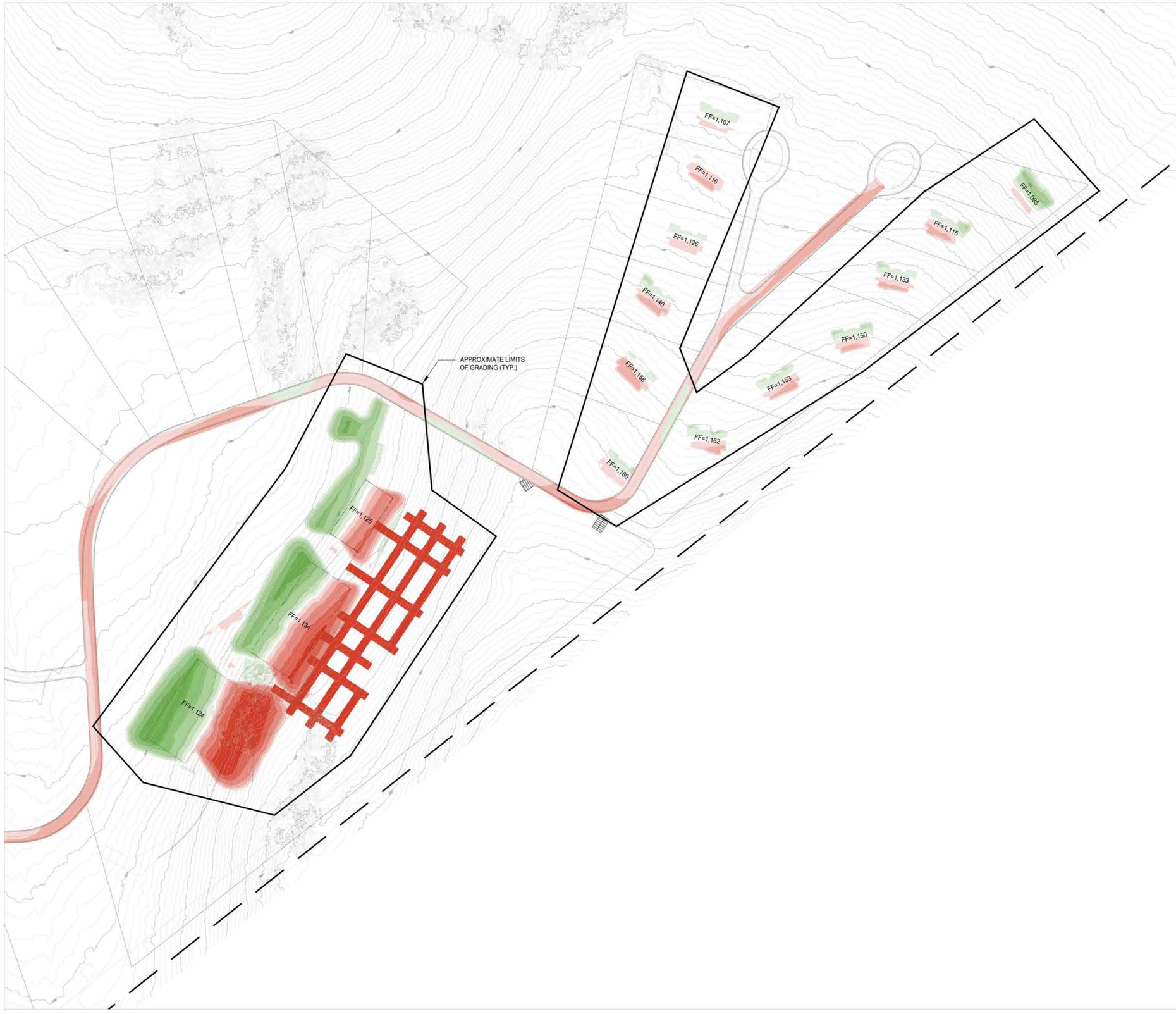
MAHA GUENOC
LAKE COUNTY
CALIFORNIA

EARTHWORK PLAN

RED HILL & GOLF
BUILDINGS 2



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10		8.0	12.0
11		12.0	100.0

NOTES:

1. SEE OVERALL EARTHWORK SHEET FOR SITE SPECIFIC EARTHWORK QUANTITIES

0 50' 100' 200' North

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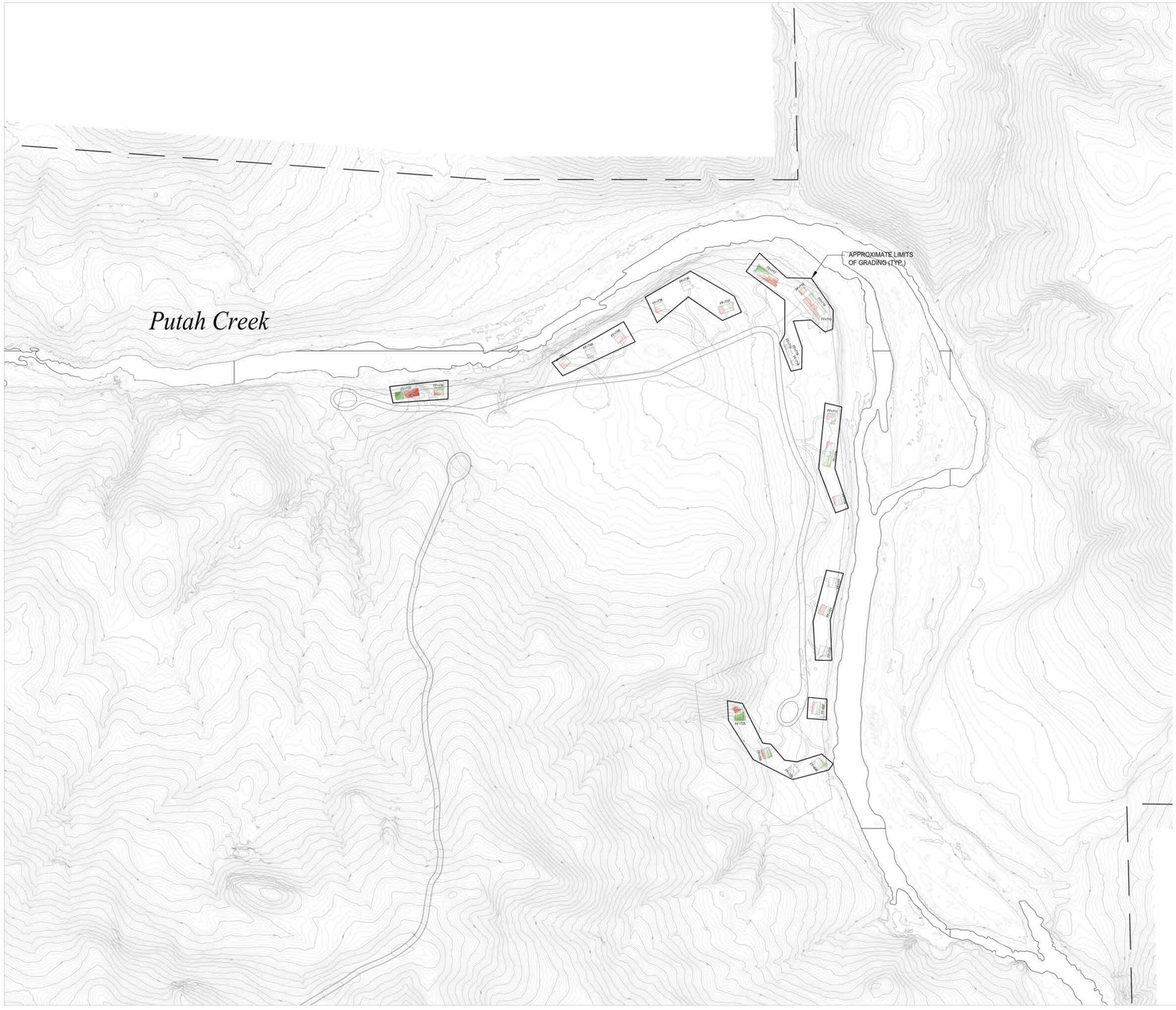
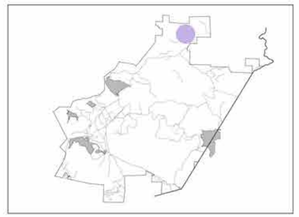
CALIFORNIA

EARTHWORK PLAN

ESTATE WINERY





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10		8.0	12.0
11		12.0	100.0

NOTES:

1. SEE OVERALL EARTHWORK SHEET FOR SITE SPECIFIC EARTHWORK QUANTITIES

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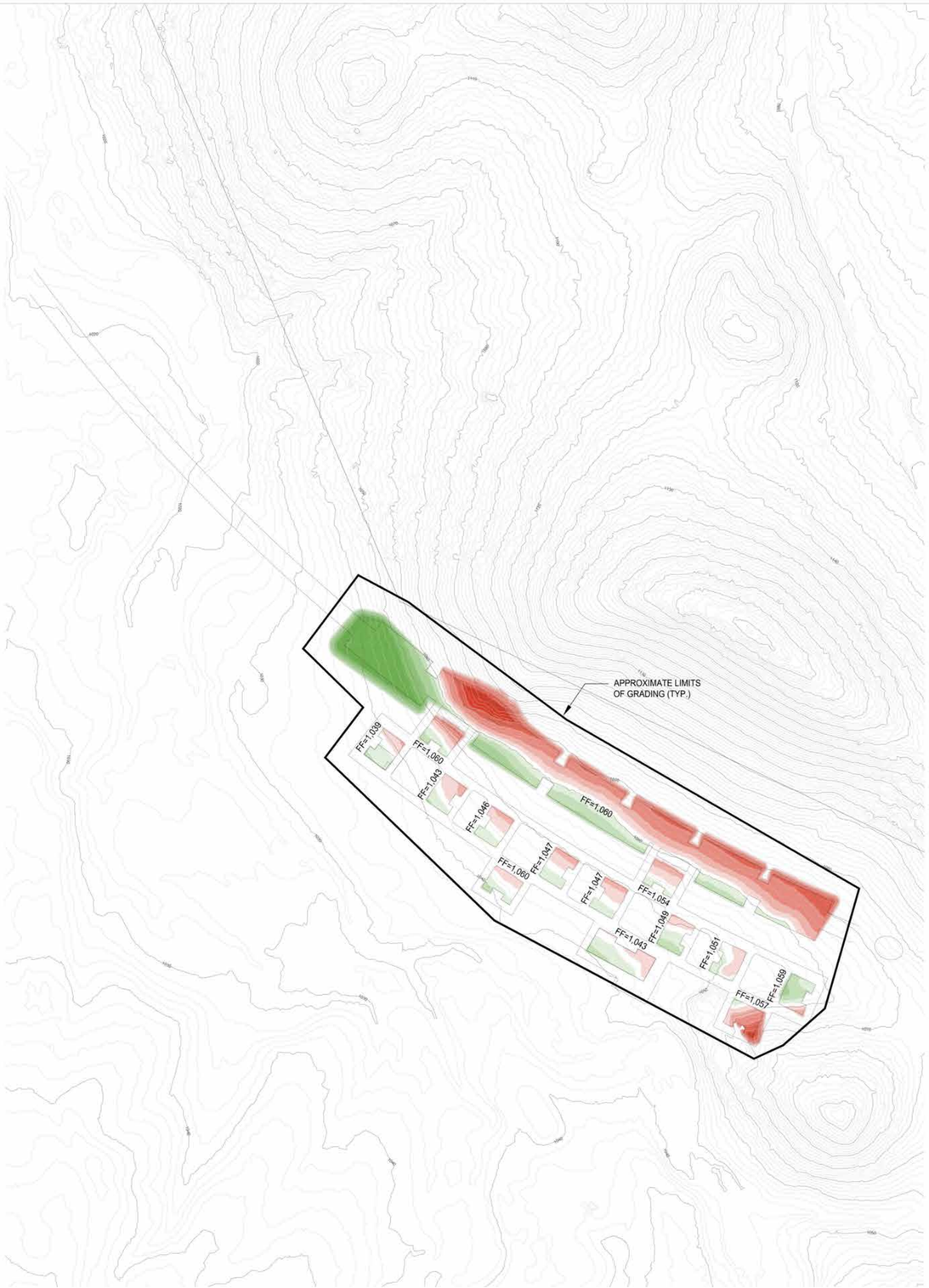
MAHA GUENOC
LAKE COUNTY
CALIFORNIA

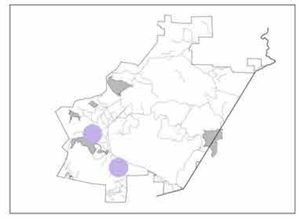
EARTHWORK PLAN

WILDERNESS CAMP

AERIAL SITE ACCESS



WORKFORCE HOUSING



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8		2.0	4.0
9		4.0	8.0
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NOTES:

1. SEE OVERALL EARTHWORK SHEET FOR SITE SPECIFIC EARTHWORK QUANTITIES

0 100' 200' 400'

North

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MAHA GUENOC
LAKE COUNTY
CALIFORNIA

EARTHWORK PLAN

AERIAL SITE ACCESS &
WORKFORCE HOUSING

APPENDIX GVD

PROPOSED GUENOC VALLEY DEVELOPMENT (GVD)
ZONING DISTRICT

ARTICLE 14 REGULATIONS FOR THE GUENOC VALLEY ZONING DISTRICT OR "GVD" DISTRICT

14.1 Purpose: The intent and purposes of the "GVD" are as follows:

(a) Implement the goals, objectives, and policies of the 2008 Lake County General Plan as furthered by the 2010 Middletown Area Plan Special Study Area designation for this site;

(b) Provide development standards to facilitate economical, efficient, and coordinated development for 1) Agricultural, 2) Resort, 3) Residential, 4) Commercial, and 5) managed rural lands;

(c) Allow for the creation of a mixed land use designation to further the goals of the Middletown Area Plan. Include cluster development standards, lot coverage, setbacks, density, and site layouts to encourage smart growth and creative building design and site planning;

(d) Create a mixed use planned development with a low density, agricultural focused luxury destination resort with accessory commercial serving uses including wineries and restaurants, and residences;

(e) Encourage a mix of land uses that supports the resort, compliments the heritage of existing agricultural land uses, and protects natural resources and scenic landscapes;

(f) Encourage innovative land management techniques, ranchland, and grazing practices to protect against wildfire, preserve open space, provide agritourism opportunities, and promote diversified agricultural practices, in conjunction with planned luxury resort and accessory uses, and

(g) Protect agricultural uses, sensitive wetland and riparian habitat areas within the GVD and surrounding open space.

The GVD principal district will include phased development consistent with these development standards.

14.2 Applicability: Applications for "GVD" zoning shall be for a parcel or contiguous parcels of land within the areas designated as "Special Study Area Number 3" in the Middleton Area Plan as adopted in 2010 (and modified___, 2020) and the application process shall be consistent with the rezoning process (Section 21 Article 47).

(a) Amendments to this chapter may be approved by resolution of the Board of Supervisors.

14.3 Conflicts with other County regulations: If any provision of this Chapter conflicts with any provision of any regulation contained in any previously adopted Ordinance of the County, the provisions of this Chapter shall be controlling. Where not addressed, general zoning requirements apply.

14.4 Definitions: For purposes of this chapter, these specific definitions apply:

Guenoc Valley Resort District: referred to herein as "GVD", refers to the district comprising of 16,000 acres within the Guenoc Valley Planned Development Area.

Market Driven Development: development, in terms of the construction timeline, that is driven by the market, sales of property, product, or amenities. After construction of utilities and essential roadway infrastructure, any future development will be dictated by the market and the rate of unit sales.

14.5 Plans required:

(a) A rezoning application shall be accompanied by a general plan of development for the entire parcel(s) unless the rezoning is publicly initiated and implements language included in an approved general or community plan.

(b) A use permit for Specific Plan of Development shall be required for the portion of the parcel(s) to be developed.

(c) General plans and use permits for Specific Plan of Development shall be approved prior to any development.

(d) Ministerial permits such as Building and Health Department permits shall not be issued prior to approval of a use permit or Specific Plan of Development where such conditional approval is required.

14.6 Application procedure for the Use Permit for a Specific Plan of Development: Shall follow the process as outlined in the "PDR" regulations, specifically Section 13.7.

14.6.1 Submittal requirements for development:

(a) An application for development in "GVD" must be accompanied by a Specific Plan of Development for the entire parcel(s) within that phase of development, and in addition include a Fire and Emergency Response Management Plan endorsed by the local fire management authority. The Specific Plan of Development shall be approved by

Use Permit pursuant to Section 21 Article 51 by the Planning Commission;

(b) Uses which are minor additions or alterations to existing uses or structures permitted by the Specific Plan of Development, limited to an increase of twenty (20) percent of the use area or gross floor area shall be subject to first obtaining a minor use permit. Uses which are additions or alterations to existing uses or structures permitted by the Specific Plan of Development greater than twenty (20) percent of the use area or gross floor area shall be subject to first obtaining a major use permit.

(c) Ministerial permits such as Building and Health Department permits shall not be issued prior to approval of use permit for the Specific Plan of Development.

14.6.2 **Uses Permitted**: The following uses are uses permitted within the "GVD" provided that such uses are not inconsistent with an approved General and Specific Plan of Development. Please see the Permitted Use Table.

(a) One (1) single family dwelling which shall be constructed according to the residential construction standards and of Section 10.20 residential accessory uses.

(b) Crop and tree farming and animal husbandry subject to the requirements of Section 9.16.

(c) Agricultural uses including accessory uses and structures, such as barns and stables.

(d) One (1) foster or small family home, family care home, supportive housing, transitional housing or small family care home not to exceed six (6) persons in addition to the resident family. (Ord. No. 3021, 12/16/2014)

(e) Rural recreation including but not limited to camping, hiking, biking horseback riding, all-wheel drive courses, fishing, and hunting for private commercial use.

(f) Temporary events meeting the standards outlined in Article 27.

14.6.3 **Uses Permitted with approval of a zoning permit**: Those uses permitted in the "CR", "PDC", and "PDR" district with a zoning permit as per Table A, Article 27.

14.6.4 Uses Permitted with approval of a General and Specific Plan of Development:

(a) All those uses permitted in the "SR", "R1", R2", "R3", "CR", "PDR", and "PDC".

(b) For projects with a minimum of one hundred (100) dwelling units, all those uses permitted in the "C1" and "C2" district'.

(c) For projects with a minimum of fifty (50) acres and two hundred (200) dwelling units, all those resort commercial uses permitted in the "CR" district.

(d) Recreation facilities, including but not limited to tennis courts, golf course, swimming centers, equestrian games and trails, fitness trails, indoor bowling alleys, all-wheel drive course, boat docks, marinas, playgrounds, and parks.

(e) Community facilities, defined as indoor or outdoor facilities, privately owned but open for public use, in which the chief function is the gathering of persons for entertainment or recreation, including art and culture, group assemblies, outdoor or indoor amplified music, wellness, fitness, social interaction, educational purposes, and may also include within such a community facility with compatible accessory uses such as wineries, restaurants, cafes, sports rental equipment and similar uses.

(f) In addition to the above uses refer to the Primary Uses Table below.

PRIMARY USES WITHIN THE GVD

USES	CHARACTERISTICS
Hotels Units**	Hotel units are attached or detached hotel rooms without kitchens and include normal uses and structures related to the operation of a hotel. The combination of hotel units are spread out between five Tentative Subdivision Maps. The hotel units are spread out between the following clusters: Maha Farm & Sales Center, Bohn Ridge, Trout Flat, Red Hill, Equestrian Center, the tented camping area, and the Entourage Hotel for staff. The total number of units, not to exceed 400 units.
Resort Residential Units**	Attached or detached units with kitchens; fractional or whole ownership intended for sale and subject to GVD Design/Development standards*. The total number of units not to exceed 450 units.
Residential Estate Villas*	Whole ownership units intended for sale and subject to GVD Design/Development standards*. The total number of units not to exceed 1400 units.

Workforce housing	Mixed unit types to accommodate essential employees for the various resorts and commercial uses. Work force housing units are defined as a minimum 400 square foot bedroom and bathroom unit with shared or independent cooking and resting areas, referenced as co- housing unit. Total number not to exceed 500 units.
Outdoor Entertainment	Includes but not limited to outdoor events such as sports events, conference centers, amphitheater, amplified music, etc.
Spa and Wellness Area	Offering wide range of health and beauty services and accompanying amenities such as gym & yoga rooms, restrooms/showers, food services, and treatment rooms.
Equestrian Area	Indoor and outdoor arena, stables, polo club, polo fields, clubhouse, spectator area.
Golf	Returning or non-returning course, clubhouses, storage and service areas, restrooms, café, and the potential to reconstruct the previous golf course.
Tented Camp	Includes semi-permanent tents for high end glamping opportunities and surrounding accessory uses such as outdoor recreational facilities such as but not limited to designated skeet shooting area, hunting, off road courses, fishing, etc.
Commercial & Retail	Includes but not limited to cafes, butcher shop, creamery, florist, fishmonger, art displays, bakery, newsagent or stand, post office, deli, wine store, restaurant(s), accessory retail stores, recording studio, car parking, public restrooms, open air markets, artisan workshops, gardens, pavilions, bowling, theater, educational facilities such as a culinary or farming school, etc.
Agricultural Production Facilities	Wineries, breweries, or distilleries to allow production supported by accessory facilities; two boutique wineries with tasting rooms and accessory uses including caves for barrel storage and commercial kitchens. Diversified agricultural production facilities included but not limited to herbal distillery, fruit dehydrations, jams and jellies production, creamery, aquaponics agriculture, tallow candles, flower arranging, and honey.

Accessory to Livestock and Farm Management	Includes but not limited to barns, equipment storage facilities, fencing, grazing corridors, showcasing areas for demonstrations, etc.
Support Facilities	Centralized shipping/receiving center, staff support services, centralized laundry facility, private entrance, staff parking, restrooms, maintenance and service areas, security, administrative support services and offices.
Fire Station and Emergency Response Center	Fire Station and First Responder center to serve as an Emergency Medical Professional (EMT) station, emergency command center, kitchen, restrooms, service rooms, on-site emergency response vehicle storage, and overnight staff and short term units.
Alternative Energy Production	Alternative energy production and distribution for solar, wind, and geothermal resources.
Float Plane Dock	Allowance for float plane landings, small welcome kiosk, and transportation/valet services.
Helipads	For medical emergencies there will be a heliport landing center to be located next to the emergency response center, additional locations for guest arrivals and departure will be located proximal to the float plane dock and dedicated welcome kiosk, or other designated locations.

*All short-term rentals under 30 days are subject to the payment of Transient Occupancy Tax (TOT).
** Units (Hotel, Resort Residential Units, Residential Estate Villas) are transferable as long as the total units do not exceed the total number of units proposed.

14.7 Performance standards, development standards and design guidelines required. All development and uses within the "GVD" shall be in accordance with approved development standards and design guidelines.

14.8 Performance Standards. All uses permitted by right within this district shall be subject to the performance standards set forth in Article 41.

(a) All uses permitted by use permit within this district shall be subject to the standards set forth in the General and Specific Plan of Development as approved by use permit. Exceptions or alternative standards requested the results must meet the standards as outlined in "PDC" Section 15.27: Alternative performance and development standards (a) - (c).

14.9 Development Standards.

(a) **Utilities & Infrastructure.** Ensure that adequate facilities, including water, sewer, and other facilities are or will be available to serve the proposed development, without effecting the existing public facilities serving surrounding developments.

(b) **Site Design.** A new building or accessory building should be compatible with its surrounding uses. All new construction should relate to the natural attributes of the site including the existing slope and should be positioned to respect existing mature trees and vegetation. The size, mass and height of a structure should be in proportion to the size of the property and should be similar to those nearby.

(i) **Lot size.** Minimum lot size shall be 10,000 square feet, exceptions may be granted in the event architectural concepts incorporate cluster development and yield the allowable density.

(ii) **Lot Coverage.** Site coverage will be in accordance with the approved Design Guidelines but in no case shall be more than fifty percent on parcels over 2 acres in size, except as otherwise provided in an approved plan or permit.

(iii) **Setbacks.** The setbacks are determined by the Specific Plan of Development, in the event there are no setbacks determined, the setback shall be the minimum requirements allowed by the current Fire Code and or the "R1" district.

(iv) **Height.** The maximum height in the "GVD" shall be 40 feet vertical distance measured from the vertical distance from the average level of the highest and lowest point of that portion of the lot covered by the building to the top most point of the roof. Exemptions to the height include architectural elements, mechanical equipment, and other exemptions as are deemed reasonable, necessary, and appropriate pursuant to Section 42.10.

(v) **Density.** Densities in the "GVD" shall not exceed five (5) dwelling units per acre, except where a density bonus is obtained pursuant to Article 27. Staff or temporary construction housing and accessory residences, as defined, shall not be included in the calculation of total dwelling units. Open space, both existing and proposed, that is located within the parcel(s) under consideration shall be included as open space when calculating the project's density. This allows for the adherence to low impact development principles with less disturbed natural resources.

(c) **Circulation & Parking.** A comprehensive vehicular and non-vehicular plan and access shall ensure that internal circulation systems are properly designed to serve the different types of proposed land uses. The circulation

plan along with the with fire and emergency response management plan shall be required to be included with the use permit for the specific plan.

- **Internal access.** All commercial planned development proposals shall ensure that internal circulation systems are properly designed to serve the different types of proposed land uses, accommodate expected traffic flows, provide adequate emergency access to all buildings and structures, and provide for safe and convenient pedestrian access, whether the project is partially or fully implemented.

- **External access.** The Planning Commission shall review development applications to ensure that projected traffic increases resulting from the project, when partially and fully implemented, will not significantly impact connecting streets, roads and existing and proposed land uses outside the project perimeter. The applicant shall propose measures acceptable to the County to reduce significant impacts to existing road networks or land uses outside the development itself.

- **Alternative Methods & Means.** A Minor Use Permit for alternative methods and means shall be requested for an exception to the circulation and parking standards.

Parking requirements. Refer to the table.

PARKING REQUIREMENTS

LAND USE	GVD PARKING RATIOS	NOTES
Residential		
Single-Family	2 spaces/ dwelling unit	Applies to Villa lots only.
Commercial		
Retail Store	<2,000 sf: 1 space / 400 sf >2,000 sf and <5,000 sf.: 1 space / 500 sf >5,000 sf.: 1 space / 650 sf	Assumes 50% of patrons are on site and 50% are from off site. Except when retail is exclusive use of the on-site patrons and / or accessory within another use.
Personal Service (barber, salon, etc.)	1 space / 2 treatment rooms	

Restaurant, Bar, Cocktail Lounge	1 space / 10 seats	
Hotel or similar use	1 space / 2.5 bedrooms, plus 2 for managers office	
Recreational		
Spectator Sport (theater, auditorium, sports arena, etc.)	1 space / 4 fixed seats	
Spa, Health Club, etc.	1 space / 1000 sf	
Public Swimming	1 space / 625 sfof pool area	
Golf Course	1 space / hole	
Commercial Stable	1 space / 5 stalls	
Agricultural		
Agricultural Assembly	1 space / 3,000 sf	
Public Services		
General	1 space / 250 sf	
Support Services		
Back of House, Fire Station, Sales Center, General Support Facilities, or similar uses.	1 space / 500 sf	

NOTES:

*ADA parking spaces shall be at a ratio of 1/40 parking spaces

*Bicycle parking spaces shall be provided at a ratio of 1/15 parking spaces

*or as superseded by California Building Code

All Parking Plans for the GVD shall be approved as part of the Specific Plan of Development (SPOD). When proposing alternative parking strategies, the applicant may submit a transportation/parking equivalency report to waive parking requirements as stated within this Zoning Ordinance. A parking waiver with a transportation demand management plan or alternative circulation plan, such as EV parking stalls that exceed the ratio, utilization of shuttle services, car shares, valet or concierge services, shall be accepted alternatives to these standards as long as accounted for within SPOD for the GVD.

(d) **Covenants, Conditions and Restrictions Required Elements**. The resort shall be subject to covenants, conditions and restrictions (CC&Rs). The Draft CC&R's shall be included for approval by the Planning Commission as part of the Specific Plan of Development approval. The Final CC&Rs shall be subject to the review and approval to form by the Community development Director and the County Attorney, prior to the opening of any unit purchase escrow.

(e) **Owners Association**. An owners association (OA) shall be established to govern the resort and to manage, maintain and operate the shared use areas and shared use facilities of the resort. The OA services shall include, but not be limited to, cleaning, repair and maintenance of all shared use areas and shared use facilities. The CC&Rs shall require that all exterior portions of the resort (including all primary and accessory units, with the exception of the winery, vineyards and pond), including, but not limited to, landscape areas, building exteriors, roadways, parking, recreational and other amenities and improvements shall be maintained and operated in accordance with luxury resort standards.

(f) **Other land uses.** Allow combining districts for agricultural preservation (AP) and resource conservation (RC).

14.10 Agricultural Preserve Combining District.

Purpose: To provide zoning for lands in agriculture preserve and for the conservation and protection of land capable of producing agricultural products. The following regulations shall apply in all "GVD-AP" districts.

Performance standards: All uses permitted within this district shall be subject to the performance standards set forth in Article 41.

Uses permitted:

(a) Agricultural uses, including crop and tree farming, livestock grazing, animal husbandry, apiaries, aviaries, except the uses indicated in Sections 4.4 and 4.5. (Ord. 1749, 7/7/1988)

(b) One (1) single-family dwelling or mobile home subject to Section 4.18 which shall be constructed according to the residential construction standards of Section 10.20.

(c) Agricultural and residential accessory uses and accessory structures.

Minimum lot size: Forty (40) acres.

14.11 Open Space Preserve Combining District.

Purpose: To provide a zoning overlay district to preserve, protect, and enhance private lands for their resource production potential and environmentally sensitive animal and plant habitat, while reducing land use conflicts by limiting uses incompatible with the purposes of this district.

The following regulations shall apply in all "GVD-O" districts.

Performance standards: All uses permitted in the "GVD-O" district shall be subject to the performance standards of Article 41. 24.4

Uses permitted:

(a) Agricultural uses, including native crop and tree farming and livestock grazing;

(b) Management of lands and forests for fuel reduction to reduce the risk of wildland forest fires;

(c) Passive recreation areas and game preserves.

14.12 Design Guidelines shall include the following and be approved along with the Specific Plan of Development.

(a) **Landscape**. The design guidelines shall have a section that governs the landscaping of streets, parks, agricultural, grazing corridors and open spaces, architectural design, signage, lighting, habitat protection measures, and any other requirements necessary to ensure an aesthetically pleasing and livable community consistent with the Specific Plan of Development.

(b) **Building.** The design guidelines shall have a section that governs the building materials, architectural styles, and massing.

14.13 Phasing of development: Phasing of development may be phased if approved as part of the General and/or Specific Plan of Development.

14.14 Adoption of Plans.

(a) Rezonings to "GVD" shall be noticed and heard simultaneously with the adoption of general plans of development. Decisions on the rezoning shall precede action on the general plan of development. Use permits for specific plans of development may be noticed and heard simultaneously with rezonings and general plans of development. Decisions on use permits for specific plans of development shall follow action on the general plan of development. (Ord. No. 1749, 7/7/1988)

(b) General plans of development shall be presented to the Planning

Commission for approval and shall be noticed in the same manner as provided for rezonings. The Commission shall act upon the plans within ninety (90) days from the date that the project's environmental document is certified unless said time period is extended by mutual consent between the Planning Commission and developer. The Planning Commission may approve, conditionally approve or disapprove the general plan of development, and shall promptly report that recommendation to the Board of Supervisors and to the developer.

(c) The general plans of development shall be noticed before the Board of Supervisors in the same manner as provided for rezonings. The Board shall schedule the general plan of development within sixty (60) days of the date of the Planning Commission recommendation. The Board shall act upon the recommendation of the Planning Commission within a reasonable time and may approve, disapprove or modify the general plan of development in any way deemed to be in the best interest of the peace, comfort, health, convenience and general welfare of the County and of the persons residing and working in the area, except that if any modification is recommended which was not previously considered by the Planning Commission, the proposed plans shall be referred back to the Planning Commission for report and recommendation. Failure by the Planning Commission to respond within forty (40) days shall be presumed to indicate concurrence with the Board of Supervisors' recommendations.

(d) Upon final approval by the Board of Supervisors of the general plan of development as presented or as modified, the plans shall be transmitted back to the Planning Commission together with a minute order stating the approval or any modifications finally determined by the Board of Supervisors. 13-15

(e) Upon approval of the general plan of development by the Board of Supervisors, a use permit for a Specific Plan of Development in conformity with the general plan of development may be presented to the Planning Commission for approval; or a use permit for a Specific Plan of Development may be presented concurrently with a General Plan of Development, provided that any approval by the Planning Commission be conditioned so that the use permit for the Specific Plan of Development shall be of no force or effect until approval of the General Plan of Development by the Board of Supervisors, nor until the effective date of any applicable rezoning to "GVD". The use permit for the specific plan shall be noticed, presented, considered and approved in the manner prescribed in Article 51. The Planning Commission may then approve, conditionally approve, disapprove or modify the use permit for the Specific Plan of Development in any manner deemed to be in the best interest of the peace, general welfare of the County and of the persons living or working in the area. (Ord. No. 1749, 7/7/1988) General Plans and use permits for Specific Plans of Development may be amended or extended in the same manner as they are adopted, provided, however, that no use permit for Specific of Development may be amended which also

requires an amendment to the sectional district map or General Plan of Development, until the sectional district map or General Plan are amended.

(f) All "GVD" rezoning, general plans of development, specific plans of development and use permits shall only be approved if found to be consistent with the Lake County General Plan.

14.15 Lapse of Approval: Approval deadline of the entitlements shall be dictated by either the Development Agreement of the Use Permit of the Specific Plan of Development.

APPENDIX IS

INITIAL STUDY

COUNTY OF LAKE
INITIAL STUDY ENVIRONMENTAL CHECKLIST FORM

1. Project title:	Guenoc Valley Mixed-Use Planned Development Project
2. Lead agency name and address:	County of Lake Community Development Department 255 N. Forbes Street Lakeport, CA 95453
3. Contact person and phone number:	Michalyn DelValle, Director Planning Division Phone: 707-263-2221 guenocvalleycomments@lakecountyca.gov
4. Project Sponsor's name and address:	Lotusland Investment Holdings, Inc. One Embarcadero Center Suite 730 San Francisco, CA 94111

5. Project location:

The Proposed Project consists of the development of a master planned mixed-use resort and residential community within the 16,000-acre Guenoc Valley Ranch property (Project Site) in southeast Lake County and off-site workforce co-housing on an approximately 12.75-acre property located in central Middletown (Off-Site Workforce Housing Site). The Project Site is comprised of 49 parcels totaling approximately 16,000 acres in southeast Lake County. The Project Site is generally bounded by Long Valley and Coyote Valley to the west, a U.S. Coast Guard LORAN station military reservation to the northwest, the Cedar Mountains to the north, and the Lake County border to the east. The Project Site is located approximately three miles east of State Route (SR) 29 and 13 miles west of SR 16. Access to the site is provided by SR 29 via Butts Canyon Road to the northwest. Butts Canyon Road bisects the southern portion of the Project Site. Additional location information for the Project Site and Off-Site Workforce Housing Site is provided below:

Project Address:	**Project Site:** 22000 Butts Canyon Road, California 95461 **Off-site Workforce Housing Site:** 21000 Santa Clara Road, California 95461
County:	Lake County
APNs:	**Project Site:** 013-015-28, -29; 013-016-04, -05, -06, -08; 013-019-05, -09; 013-021-05, -06, -09, -10; 013-022-01, -02, -05, -08, -09, -11, -12, -13, -15, -14; 013-023-06, -07, -09, -10, -11, -12, -13, -14, -15; 013-024-10, -12, -28, -29, -30, -33, -34; 013-053-01; 014-004-25; 014-310-06, -07, -08, -09; 014-320-06, -08; 014-330-08, -09; 014-340-04.

Off-site Workforce Housing Site: 014-380-09.

USGS Quad: **Project Site:** 7.5 Minute Quads: Middletown, Jericho Valley, Detert Reservoir, Aetna Springs. T10N R5W Sections: 5, 6, 7, 8, 18, and 19, T10N R6W Sections: Unsectioned Area (Guenoc Land Grant), 1, 2, 11, 12, 13, 14, 15, 22, and 24, T11N R5W Sections: 19, 28, 29, 30, 31, 32, and 33, T11N R6W Sections: 124, 25, 26, 35, and 36.
Off-site Workforce Housing Site: 7.5 Minute Quad: Middletown. T10N R6W and T11N R6W Unsectioned Area (Guenoc Land Grant).

Long./Lat.: **Project Site:** 38°44'41.0" N 122°29'06.2" W.
Off-site Workforce Housing Site: 38°45'23.00" N, 122°36'12.86" W

6. General plan designation: **Project Site:** Agriculture (A), Resource Conservation (RC), Rural Lands (RL), and Rural Residential (RR);
Off-site Workforce Housing Site: Low Density Residential (LDR)

7. Zoning: **Project Site:** Agriculture (A), Rural Lands (RL), and Rural Residential (RR)
Off-site Workforce Housing: Single Family Residential (R1).

8. Description of project:

Proposed Project components are described in the Notice of Preparation and summarized below. The Applicant has requested the following initial entitlements and approvals from the County associated with the Proposed Project, and additional approvals may ultimately be necessary:

- Amendment to the General Plan and Special Study Area map of the Middletown Area Plan to include the area commonly known as the college parcels (GPAP 18-01);
- Zoning Ordinance Amendment to introduce a new zoning district to allow for future uses, Guenoc Valley District ("GVD"), to implement the goals of the Special Study Area, and subsequently rezoning of the Project Site from Rural Lands, Agriculture, Rural Residential, and an Agricultural Protection Zone to GVD (AM 18-04; RZ 18-01);
- Use Permit for the Specific Plan of Development (Master Development Plan) for the first phase (UP 18-01);
- Tentative Subdivision Maps for the first phase (SD 18-01);
- General Plan of Development (GPD 18-01);
- Development Agreement (DA 18-01);
- Environmental Impact Report (EIR 18-01);
- Grading permit for Installation of water line; and
- Tentative Subdivision Map for off-site workforce housing.

Proposed land uses on the Project Site include a destination luxury resort, consisting of five hotels, resort residential uses, single family residential villas/estates, and recreational facilities, as well as commercial centers (i.e. the Farmstead Compound), modified agricultural production and grazing, and associated supporting infrastructure. Proposed outdoor recreational and resort amenities include two wineries, a wellness center and spa, golf course, equestrian facilities, polo grounds, and wilderness camp. At full

build out, the Proposed Project would include up to 400 hotel rooms, 450 resort residential units, 1,400 residential estates, and up to 500 workforce co-housing units. The project also includes the development of support facilities, including a centralized back of house facility, an emergency response center including a fire station, and water supply and wastewater treatment systems. Other undeveloped areas of the Project Site will also continue to be rural lands and will remain in managed grazing which is an integral part of the fire management plan being developed for the site along with an on-site fire station. The Proposed Project does not anticipate expansion of the existing vineyards within the Project Site.

Potable water supply would be provided to the Project Site via multiple deep water supply wells located throughout the Project Site and potentially on nearby properties owned by the Applicant. The Project Site may rely on an existing or new off-site site well located in the Collayomi Valley Aquifer located near the intersection of Butts Canyon and SR 29. In the event the water is used, a water line will be constructed from said property within the Public Utility Easement on Butts Canyon Road or overland within private easements to the Property Site. Wastewater would be collected via a sanitary sewer collection systems and treated on site. Treated wastewater would be distributed and reused on site primarily for landscaping and irrigation to reduce overall project water demand. Low impact development (LID) features are incorporated throughout the project design to provide for treatment, filtration, and retention of stormwater to prevent impacts to surface and groundwater supplies.

Project components on the Project Site would be developed in phases: The first phase would be constructed in the near-term (approximately the next ten years), while future phases would be built out based on market demands after the first phase is complete.

It is anticipated that the employees for the operation of the Proposed Project would primarily be from the local workforce. Due to the limited availability of rental homes and housing stock options near the Project Site, the Proposed Project includes a request to construct 50 housing structures capable of accommodating up to 200 workers on the Off-site Workforce Housing Site. A workforce housing unit is defined as a 400 square foot bedroom and bathroom per worker. Workforce housing is anticipated to be primarily co-living housing structures built-in single-family style residency with potential accessory dwelling units. The off-site workforce housing site is located within a floodplain and therefore may require a zoning change, general plan amendment, and a use permit for developing housing in the floodplain. This site had a previously approved but expired Tentative Map to allow 50 new houses and road and utility improvements, similar to what would be requested under the Proposed Project. Water and wastewater services would be provided through connection to existing municipal systems.

9. Surrounding land uses and setting:

The majority of the Project Site is bound by agricultural uses. Rural residential housing is immediately south and a U.S. Coast Guard LORAN station military reservation is immediately northwest. Upper Bohn Lake to the east is bisected by the Project Site boundary. The Off-site Workforce Housing Site is bound to the south, east, and west by residential and to the north by agricultural uses.

10. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement).

Other approvals from regional and statewide agencies for the Project Proposed may include, but are not limited to:

- Army Corps of Engineers - Clean Water Act Section 404 Permit for fill of wetlands and/or waters of the U.S.
- United States Fish and Wildlife Service Consultation for potential impacts to federally listed species in accordance with the Federal Endangered Species Act
- State Historic Preservation Office – Consultation regarding impacts to historic properties in accordance with Section 106 of the Nation Historic Preservation Act
- Regional Water Quality Control Board – Central Valley Region – 401 Water Quality Certification, National Pollutant Discharge Elimination System (NPDES) discharge permit for stormwater and/or wastewater, and Master Reclamation Permit for Recycled Water
- California Department of Fish and Wildlife – Section 1600 Lake and Streambed Alteration Agreement and consultation related to potential impacts to state listed species and species of concern

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☒ Aesthetics	☒ Agriculture and Forestry Resources	☒ Air Quality
☒ Biological Resources	☒ Cultural Resources	☒ Energy
☒ Geology / Soils	☒ Greenhouse Gas Emissions	☒ Hazards & Hazardous Materials
☒ Hydrology / Water Quality	☒ Land Use / Planning	☐ Mineral Resources
☒ Noise	☒ Population / Housing	☒ Public Services
☒ Recreation	☒ Transportation	☒ Tribal Cultural Resources
☒ Utilities / Service Systems	☒ Wildfire	☒ Mandatory Findings of Significance

DETERMINATION:

On behalf of this initial evaluation:

- ☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☒ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- ☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to the earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Planner's Signature

4/19/19

Date

Byron Turner

Planner's Printed Name

County of Lake

For

EVALUATION OF ENVIRONMENTAL IMPACTS:

Pursuant to Section 15063 of the California Environmental Quality Act Guidelines, a brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the projects outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

I. AESTHETICS	Impact to be Addressed in the EIR	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Except as provided in Public Resources Code Section 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?	☒	☐	☐	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock croppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point).	☒	☐	☐	☐
d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	☒	☐	☐	☐

Questions A, C, and D: The existing visual character of the Project Site can be described as generally undeveloped with views of rolling topography, grasslands, wooded areas, and agriculture. The Proposed Project would result in the development of residences, hotels, a winery, recreational amenities, and associated infrastructure within the Project Site. The primary roadway in the area is Butts Canyon Road which passes through the property. While the development would primarily occur on the interior of the Ranch and would not be visible from Butts Canyon Road, some development could be visible including traffic improvements which could have impacts to aesthetics in the area. Development within this area may alter the visual character of the site and create new sources of nighttime lighting and glare. Additionally, development of offsite improvements, including off-site worker housing in Middletown, could have aesthetic effects. These potential impacts will be addressed in the Aesthetics section of the EIR.

Question B: The Project Site is approximately 4 miles east of State Route 29, an eligible scenic highway[1], but is not visible from the roadway. The Off-Site Housing Site is located approximately 1,500 feet west of State Route 29, however, the 50 housing structures proposed would be similar to the residential land uses surrounding the site. Therefore, the Proposed Project does not have the potential to impact scenic resources within a state scenic highway. This issue will not be addressed in the EIR.

[1] Caltrans. California Scenic Highway Mapping System. Available online at: http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/. Accessed January 2018.

II. AGRICULTURAL RESOURCES	Impact to be Addressed in the EIR	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the Project:				
a) Convert Prime farmland, Unique farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☒	☐	☐	☐
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☒	☐	☐	☐
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☒	☐	☐	☐
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☒	☐	☐	☐
e) Involve other changes in the existing environment, which due to their location or nature, could result in conversion of farmland, to non-agricultural use or conversion of forest land to non-forest use?	☒	☐	☐	☐

Questions A, B, and E: According to the California Department of Conservation's (CDC) Farmland Mapping and Monitoring Program (FMMP), the Project Site contains lands identified as Prime Farmland, Unique Farmland, Farmland of Local Importance, Grazing Land, Other Land, and Urban and Built-Up Land (CDC, 2016); additionally, portions of the Project Site are zoned for Agriculture (A). No land within the Project Site is under a Williamson Act Contract. The Proposed Project will retain most of the existing agricultural operations on the Project Site, including vineyard operations, and would include a grazing plan for future operations and fire management. The Off-site Workforce Housing Site contains lands identified as Farmland of Local Importance and Grazing Land (CDC, 2016), which would be converted to residential uses. A complete analysis of potential impacts to agricultural resources will be included in the Land Use and Agricultural Resources section of the EIR.

Questions C and D: The Project Site contains limited forest land as defined by Public Resources Code section 12220 (g), while the Off-site Workforce Housing Site does not. A complete analysis of potential impacts to forestry resources will be included in the Land Use and Agricultural Resources section of the EIR.

III. AIR QUALITY	Impact to be Addressed in the EIR	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Where applicable, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☒	☐	☐	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☒	☐	☐	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☒	☐	☐	☐
d) Result in other emissions (such as those leading to odors adversely affecting a substantial number of people)?	☒	☐	☐	☐

Questions A-D: Development of the Proposed Project, including the off-site improvements and workforce housing, would result in short-term emissions of air pollutants and fugitive dust during the construction phase, and long-term emissions from operation associated primarily with vehicle traffic. The Lake County Air Basis (LCAB) is designated as unclassified or attainment for all national and State Ambient Air Quality Standards (NAAQS and CAAQS) for Criteria Air Pollutants (CAPs). A complete analysis of potential impacts to air quality will be included in the Air Quality section of the EIR.

IV. BIOLOGICAL RESOURCES	Impact to be Addressed in the EIR	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
b) Have a substantial adverse effect on any riparian habitat or sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☒	☐	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native residents or migratory wildlife corridors or impede the use of native wildlife nursery sites?	☒	☐	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☒	☐	☐	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local regional, or state habitat conservation plan?	☒	☐	☐	☐

Questions A-D: The Project Site contains sensitive woodland, grove, thicket, and grassland habitats as well as emergent ponds, reservoirs, and streams. The Project Site provides habitat for multiple special status plant and animal species. While the Proposed Project has been designed to avoid or minimize impacts to known sensitive biological resources, construction of the Proposed Project will result in habitat loss, and potential impacts to wetlands, riparian areas, and wildlife corridors. The Off-site Workforce Housing Site includes a portion of Dry Creek and associated riparian habitat within the northwestern portion of the site, the remainder of which is primarily non-native grassland. A complete analysis of potential impacts to biological resources resulting from the Proposed Project, including off-site improvements, will be addressed in the Biological Resources section of the EIR.

Question E: Lake County has policies and guidelines to protect biological resources, including oak trees and setbacks for water courses and wetlands. Oak woodland, water courses, and wetlands occur throughout the Project Site. Potential conflicts between these policies and the Proposed Project, including off-site improvements, will be addressed in the Biological Resources section of the EIR.

Questions F: While there is no adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, habitat conservation plans which cover the property, the Water Resources Control Board, in approving the Surface Water Rights on the Ranch, required the creation of an Open Space Plan through the previous EIR done for the Guenoc Ranch Water Rights Modification Project[2]. The Proposed Project includes maintaining 2,675 acres of designated open space on the Project Site consistent with the existing Open Space Plan incorporated into the previous EIR Consistence with the Open Space Plan will be evaluated in the EIR.

V. CULTURAL RESOURCES	Impact to be Addressed in the EIR	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☒	☐	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☒	☐	☐	☐
c) Disturb any human remains, including those interred outside of formal cemeteries?	☒	☐	☐	☐

Questions A-C: A draft Historic Resources Study was prepared for the Project Site in April 2018 that identified several cultural resources within the Project Site. These resources are located in and out of the proposed development footprint. Cultural resources within the development footprint warrant additional investigation. An investigation of potential cultural resources within the Off-site Workforce Housing Site and off-site improvements area will be conducted. Additionally, construction of the Proposed Project, including the off-site improvements and workforce housing, could potentially uncover unknown cultural resources. Potential impacts to cultural resources will be addressed in the Cultural Resources section of the EIR.

[2] State Water Resources Control Board, Division of Water Rights. Final Environmental Impact Report for Guenoc Water Rights Modificaiton Project. Dated March 2009.

VI. ENERGY	Impact to be Addressed in the EIR	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☒	☐	☐	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☒	☐	☐	☐

Questions A and B: Although the Proposed Project includes integrated energy efficiency strategies to reduce project energy demands and potentially will use solar to meet project demand, electricity will also be provided by Pacific Gas and Electric Company. Energy demands of the Proposed Project, including the proposed development on the Project Site and Off-site Workforce Housing Site, may result in significant impacts to energy resources. Potential impacts regarding energy will be addressed in the Energy section of the EIR.

VII. GEOLOGY & SOILS	Impact to be Addressed in the EIR	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
▪ Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map as issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☒	☐	☐	☐
▪ Strong seismic ground shaking?	☒	☐	☐	☐
▪ Seismic-related ground failure, including liquefaction?	☒	☐	☐	☐
▪ Landslides?	☒	☐	☐	☐
b) Result in substantial soil erosion or the loss of topsoil?	☒	☐	☐	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☒	☐	☐	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☒	☐	☐	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of waste water?	☒	☐	☐	☐
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☒	☐	☐	☐

Questions A-E: The Project Site and Off-site Workforce Housing Site are located on the Hunting Creek-Berryessa fault system. Grading activities for the proposed resort and amenities, residential units, and infrastructure, as well as trenching and backfill for utilities placement would be required for development of the Proposed Project. Grading, trenching, backfill activities, and construction of retaining walls would

alter the topography on the Project site and may result in soil erosion impacts. Additionally, the Proposed Project could incorporate a gravel quarry for construction on the Project Site which may reduce truck traffic associated with hauling needed materials from off site. Potential impacts associated with seismic hazards, soil erosion, landslides, and expansive soils will be addressed within the Geology and Soils section of the EIR.

Question F: Unique paleontological or geologic features may be located within the Project Site and Off-site Workforce Housing Site and thus could be impacted by the project. Potential impacts to these resources will be addressed in the Geology and Soils section of the EIR.

VIII. GREENHOUSE GAS EMISSIONS	Impact to be Addressed in the EIR	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☒	☐	☐	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☒	☐	☐	☐

Questions A and B: Construction-related emissions of greenhouse gas (GHG) would result from fuel combustion for heavy-duty diesel and gasoline-powered equipment, portable auxiliary equipment, material delivery trucks, and worker commuter trips. Operational greenhouse gas (GHG) emissions would result from motor vehicle trips generated by the proposed land uses, on-site fuel combustion typical of commercial and residential uses, including space and water heating, landscape maintenance equipment, and fireplaces/stoves, and energy use.

The Proposed Project will incorporate a number of components that will reduce GHG emissions, including energy efficiency strategies, the use of renewable energy resources, and the establishment of onsite and nearby worker housing, which will reduce vehicle miles traveled. The CalEEMod program will be used to estimate GHG emissions from construction and operation of the Proposed Project, including the proposed development on the Project Site and Off-site Workforce Housing Site. The EIR will assess the Proposed Project's potential for impacts associated with GHG emissions in relation to applicable adopted plans, policies, and regulations.

IX. HAZARDS & HAZARDOUS MATERIALS	Impact to be Addressed in the EIR	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☒	☐	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☒	☐	☐	☐
c) Emit hazardous emissions or handles hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☒	☐	☐	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☒	☐	☐	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☒	☐	☐	☐
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	☐	☐	☐	☒

Questions A, B, and D: The Project Site contains two cleanup sites listed on the California Water Board's GeoTracker website, including one active land disposal site and one closed leaking underground storage tank site. There are no cleanup sites listed on the Off-site Workforce Housing Site. However, there are six closed leaking underground storage tank sites within a one mile radius of the project site[3]. Both the Project Site and Off-Site Workforce Housing Site are within the planning area for the Westside Brownfields Coalition Assessment Project by the Westside Sacramento Integrated Regional Water Management Coordinating Committee[4]. An analysis of potential impacts associated with hazards and hazardous materials will be included in the Hazards and Hazardous Materials section of the EIR.

Question C: The Project Site is not within one-quarter mile of an existing or proposed school, but the Off-site Workforce Housing Site is. An analysis of potential impacts to schools from development of the Off-site Workforce housing Site will be included in the Hazards and Hazardous Materials section of the EIR.

Question E: The Mysterious Valley Airport is located approximately 2.75 miles east of the Project Site and 13.7 miles east of the Off-site Workforce Housing Site. The Proposed Project is not located within an airport land use plan or within two miles of a public airport; therefore, this issue will not be addressed in the EIR.

[3] GeoTracker. Available online at: https://geotracker.waterboards.ca.gov. Accessed January 2018.
[4] Westside Brownfields Coalition Assessment Project. Information Available online at http://www.westsideirwmbrownfields.org/. Accessed April 2019.

Question F: Lake County adopted an Emergency Operations Plan (EOP) in May 2018. The Proposed Project, including the off-site improvements, would not impair the implementation of this plan and would be developed consistent with any applicable policies contained therein; therefore, no impacts would occur. This issue will not be addressed further in the EIR.

Question G: The Project Site and Off-site Workforce Housing Site is classified as moderate, high, and very high fire hazard severity by the California Department of Forestry and Fire Protection Fire Hazard Severity Zone map[5]. A Fire Mitigation Plan is being prepared which will outline development standards, sustainable fire prevention techniques, and best practices for the protection and management of the landscape. An analysis of potential exposure of people or structures to a significant risk of loss, injury, or death involving wildland fires will be included in the Wildfire section of the EIR.

X. HYDROLOGY & WATER QUALITY	Impact to be Addressed in the EIR	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☒	☐	☐	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☒	☐	☐	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious services, in a manner that would:				
▪ Result in substantial erosion or siltation on-or off-site	☒	☐	☐	☐
▪ Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site	☒	☐	☐	☐
▪ Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff	☒	☐	☐	☐
▪ Impede or redirect flood flows	☒	☐	☐	☐
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☒	☐	☐	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☒	☐	☐	☐

Questions A, B, and C: Implementation of the Proposed Project would introduce impervious surfaces and alter the existing drainage pattern of the Project Site and Off-site Workforce Housing Site. Additionally, groundwater wells would be established and utilized to meet water supply demands; and on-site wastewater treatment systems would be utilized to treat and dispose of wastewater generated by the development on the Project Site. Therefore, construction activities and operation of the Proposed Project would have the potential to impact surface and ground water quality and supply. Potential impacts associated with hydrology and water quality will be analyzed within the Hydrology and Water Quality section of the EIR.

[5] Cal Fire, 2007. Fire Hazard Severity Zones in State Responsibility Areas. Available online at: http://frap.fire.ca.gov/webdata/maps/statewide/fhszs_map.pdf. Accessed January 2018.

Question D: The Project Site is classified as Zone D by the Federal Emergency Management Agency (FEMA) flood map, which indicates the Project Site has not been analyzed for flood hazard. The Off-site Workforce Housing Site is classified in some areas as Zone AE by the FEMA flood map, which indicates that the areas are subject to inundation by the 1 percent annual chance flood event[6]. The Project Site and Off-site Workforce Housing Site are not within a tsunami hazard zone; however, several bodies of water exist within the Project Site, which could be prone to seiche or mudflow. Potential impacts associated flood hazards, seiche, and mudflow will be analyzed in the Hydrology and Water Quality section of the EIR.

Question E: The Proposed Project, including the proposed development on the Project Site and Off-site Workforce Housing Site, has the potential to conflict with water quality control plans and sustainable ground water management plans. Potential impacts associated with these plans will be analyzed in the Hydrology and Water Quality section of the EIR.

XI. LAND USE & PLANNING	Impact to be Addressed in the EIR	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☒	☐	☐	☐

Question A: The Proposed Project would not divide an established community because the Project Site is located on contiguous land owned wholly by the Applicant and no established communities exist immediately adjacent to the Project Site. The development of workforce housing on the Off-site Workforce Housing Site would not divide an established community because development on the site will be residential, which is consistent with the surrounding community. No further analysis is required.

Question B: The Proposed Project would amend the zoning designation and General Plan land use designations of the Project Site and potentially the Off-Site Workforce Housing Site. The EIR will evaluate the consistency of the Proposed Project with the adopted plans and policies of Lake County, including but not limited to the Middletown Area Plan, General Plan and Zoning Ordinance, and identify any physical environmental impacts that could result from inconsistencies with adopted plans and policies. The EIR will also analyze the project's compatibility with surrounding land uses. The physical change from an undeveloped parcel with natural scenic qualities to a resort/residential development would unavoidably alter the character of the Project Site and introduce potential land use compatibility conflicts with nearby residential uses. These impacts will be discussed in the Land Use and Agricultural Resources section of the EIR.

[6] FEMA, 2005. Available online at: https://msc.fema.gov/portal/search. Accessed January 2018.

XII. MINERAL RESOURCES	Impact to be Addressed in the EIR	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☒	☐
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☒

Question A: According the U.S. Geological Survey (USGS) Mineral Resources Data System (MRDS), there are known mineral resources within the Project Site.[7] These resources include chromium, mercury, and manganese deposits, but none are identified as significant economic deposits or operations. Aggregate resources are described as important in the Middletown Area Plan. Construction aggregate will be used from job-specific borrow sites. However, some aggregate will be re-used from onsite earthmoving activities and thus will not result in the loss of availability of aggregate resources. In addition, the aggregate obtained from the borrow sites will prevent the need to bring in aggregate from other extraction sites in Middletown. Therefore, development of the Proposed Project would not result in a significant loss of availability of a known mineral resource that would be of value to the region and the residents of the state. This issue will not be addressed in the EIR.

Question B: The Project Site and the Off-site Workforce Housing Site are not located near any of the four potential aggregate sources identified by the Middletown Area Plan. The General Plan does not delineate mineral resource recovery sites. The Lake County Aggregate Resources Management Plan identifies areas where mining should be encouraged or prohibited. The plan specifies that miles 9.33 to 13.9 and miles 19.21 to 20.30 of Putah Creek should remain aggregate mining sites. Putah Creek crosses the Project Site approximately from Miles 3 to 6, so the site is located over three miles upstream of the delineated Putah Creek aggregate mining sites. The Off-site Workforce Housing Site is adjacent to Dry Creek. The Aggregate Resources Management Plan indicated that mining may occur in Dry Creek but did not encourage or prohibit it.[8] Therefore, development of the Proposed Project would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan. This issue will not be addressed in the EIR.

[7] USGS, 2011. Mineral Resources Data System. Available online at: https://mrdata.usgs.gov/mrds/. Accessed January 2018.

XIII. NOISE	Impact to be Addressed in the EIR	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☒	☐	☐	☐
b) Generation of excessive groundborne vibration noise levels?	☐	☐	☐	☒
c) For a project located within the vicinity of a private airstrip an airport land use plan or, where such a plan has not been adopted within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☒	☐	☐	☐

Questions A: Development of the Proposed Project, including the off-site workforce housing, would result in a short-term increase in noise during the construction phase and would result in long-term noise increases related to vehicle and air traffic, residential occupancy activities, and use of recreational facilities that may impact sensitive receptors. Additionally, the Proposed Project is asking for extended hours of construction and would introduce noise sensitive receptors on the Project Site and Off-site Workforce Housing Site. The EIR will evaluate the potential impacts on ambient noise levels from construction-related and operation-related noise.

Question B: While construction activities may generate vibration, these effects would be temporary and would not result in damage to nearby structures. The Proposed Project, including the off-site workforce housing, does not propose and land uses or activities that would result in excessive vibration levels. Therefore, effects associated with vibration would be less than significant and will not be addressed within the EIR.

Question C: The Project Site and Off-site Workforce Housing Site are not located near an airport or within an airport land use plan. The nearest airport is Mysterious Valley Airport, located approximately 2.75 miles east of the Project Site. The Proposed Project includes the development of a float plane dock for use by visitors. This may expose people residing and working in the project area to excessive noise levels. The noise impacts associated with operation of the float plane dock will be fully analyzed in the Noise section of the EIR.

XIV. POPULATION & HOUSING	Impact to be Addressed in the EIR	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Induce substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through the extension of roads or other infrastructure)?	☒	☐	☐	☐
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Question A: The Proposed Project, including off-site workforce housing, would result in population growth to the area beyond what was anticipated in the Middletown Area Plan. Potential impacts will be addressed in the Population and Housing section of the EIR.

Question B: The Proposed Project, including off-site workforce housing, would not displace existing housing or substantial numbers of people and therefore would not necessitate the construction of replacement housing. No further analysis is required.

XV. PUBLIC SERVICES	Impact to be Addressed in the EIR	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service rations, response time or other performance objectives for any of the public services:				
a) Fire protection?	☒	☐	☐	☐
b) Police Protection?	☒	☐	☐	☐
c) Schools?	☒	☐	☐	☐
d) Parks?	☒	☐	☐	☐
e) Other public facilities?	☒	☐	☐	☐

Question A-E: The Proposed Project, including off-site workforce housing, would lead to an increase in the population of the project area, which would result in increased demand for public services, including law enforcement, fire protection, schools, and parks. These impacts will be addressed in the Public Services section of the EIR.

XVI. RECREATION	Impact to be Addressed in the EIR	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☒	☐	☐	☐
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☒	☐	☐	☐

Questions A-B: The increase in population as a result of the Proposed Project, including off-site workforce housing, may result in increased use of existing recreational facilities. These impacts will be addressed in the Public Services section of the EIR.

XVII. TRANSPORTATION	Impact to be Addressed in the EIR	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?	☒	☐	☐	☐
b) Would the project conflict of be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☒	☐	☐	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☒	☐	☐	☐
d) Result in inadequate emergency access?	☒	☐	☐	☐

Questions A - D: The Proposed Project, including off-site workforce housing, would introduce additional traffic on roadways and intersections in the project area. The primary roadways providing access to the Project Site and Off-site Workforce Housing Site are SR 29, Highway 175, and Butts Canyon Road. Development of the Proposed Project has the potential to conflict with policies addressing the circulation system and CEQA Guidelines section 15064.3(b). The Proposed Project may also increase hazards and result in inadequate emergency access. Impacts associated with transportation will be addressed in the Transportation section of the EIR. The EIR will address potential impacts to surrounding roadways resulting from the increase in motor vehicle traffic along roadways during construction (short-term, temporary increase) and operations (long-term increase from resort amenities and residences) in relation to County General Plan policies related to level of service standards. Additionally, the Proposed Project's impacts associated with overall vehicle miles traveled (VMT) will be assessed. A Traffic Impact Analysis (TIA) will be prepared for the Proposed Project to determine the potential for adverse effects on traffic circulation, overall vehicle miles traveled, and level of service, and identify appropriate traffic improvements and mitigation measures. The EIR will also evaluate whether construction of the proposed roadways and access intersections would result in any safety impacts based on compliance with County design standards. The EIR will also consider emergency access, pedestrian and bicycle access, and alternative transportation.

XVIII. TRIBAL CULTURAL RESOURCES	Impact to be Addressed in the EIR	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?	☒	☐	☐	☐
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☒	☐	☐	☐

Questions A-B: The Proposed Project, including off-site workforce housing, could potentially adversely affect tribal cultural resources. The County is initiating contact with Native American tribes that are understood to be traditionally, culturally, and/or geographically affiliated with the project area pursuant to the statutory requirements of Senate Bill 18 (SB 18), Assembly Bill 52 (AB 52) (Chapter 532, Statutes of 2014), and Section 21080.3.1 of the California Public Resources Code (PRC). The results of the consultation and any potential impacts will be addressed in the Cultural Resources section of the EIR.

XIX. UTILITIES & SERVICE SYSTEMS	Impact to be Addressed in the EIR	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☒	☐	☐	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?	☒	☐	☐	☐
c) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☒	☐	☐	☐
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☒	☐	☐	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste.	☒	☐	☐	☐

Questions A and **B:** The Proposed Project would require the extension of electrical infrastructure to the Project Site, construction of new utility systems within the Project Site, and potential construction of offsite improvements related to water supply. The development of proposed off-site workforce housing would

involve connections to existing municipal service systems. The EIR will evaluate potential impacts related to provision of all utility services to the Project Site and Off-site Workforce Housing Site. Utility service providers will be contacted to determine if providers have the capacity to serve the Project and to assess potential impacts to providers associated with development of the Proposed Project. The availability of water supply to meet the needs of the Proposed Project will be assessed and a Water Supply Assessment will be prepared in accordance with SB 610. The EIR will evaluate potential impacts associated with construction of any necessary utility improvements.

Question C: The proposed development on the Project Site would utilize septic systems and package treatment plants for treatment of wastewater. Additionally, the temporary construction workforce camp would utilize holding tanks for waste water which would then be trucked to outside water treatment facilities. The Off-Site Housing Site would utilize existing wastewater systems of the community of Middletown. Impacts associated with wastewater systems will be addressed in the Utilities and Service Systems section of the EIR.

Questions D and E: The Proposed Project would implement on-site reduction of solid waste through recycling and composting. Separate refuse collection bins for recyclable waste, compostable waste, and standard waste would be provided. Compostable materials would be disposed of within the Project Site. Refuse would be taken to Eastlake Landfill. Development of both the Project Site and Off-site Workforce Housing Site has the potential to result in impacts from the increased demands related to solid waste disposal. These impacts will be addressed in the Utilities and Service Systems section of the EIR.

XX. WILDFIRE	Impact to be Addressed in the EIR	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
If located in or near state responsibility areas of lands classified as very high fire hazard severity zones, would the project?				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of wildfire?	☒	☐	☐	☐
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☒	☐	☐	☐
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☒	☐	☐	☐

Question A: Lake County adopted an Emergency Operations Plan (EOP) in May 2018[9] and a Local Hazard Mitigation Plan Update in February 2018[10]. The Proposed Project, including off-site workforce

[9] Lake County Emergency Operations Plan Dated May 1, 2018. Available online: http://www.lakesheriff.com/Assets/Sheriff+Site/OES/Updated+Emergency+Operations+Plan.pdf

[10] Lake County Local Hazard Mitigation Plan Update Dated February 2018. Available online: http://www.lakesheriff.com/Assets/Sheriff+Site/OES/2018+Natural+Hazard+Mitigation+Plan.pdf

housing, would not impair the implementation of these plans and would be developed consistent with any applicable policies contained therein; therefore, no impacts would occur. This issue will not be addressed further in the EIR.

Questions B-D: The Project Site is classified as moderate, high, and very high fire hazard severity by the California Department of Forestry and Fire Protection Fire Hazard Severity Zone map. The Off-site Workforce Housing Site is classified as moderate fire hazard severity[11] The Proposed Project has the potential to increase risk of wildfire and require the installation of infrastructure wildfire prevention infrastructure that could have an impact to the environment. A Fire Mitigation Plan is being prepared which will outline development standards, sustainable fire prevention techniques, and best practices for the protection and management of the landscape. Potential impacts related to wildfire will be addressed in the Wildfire section of the EIR.

XXI. MANDATORY FINDINGS OF SIGNIFICANCE	Impact to be Addressed in the EIR	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the substantially potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☒	☐	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probably future projects)?	☒	☐	☐	☐
c) Does the project have environment effects, which will cause substantial adverse effects on human beings, either directly or indirectly?	☒	☐	☐	☐

Questions A-C: The Proposed Project could potentially degrade the quality of the environment, could generate impacts that may be cumulatively considerable, and may have a substantial effect on human beings. These issues will be addressed in the EIR.

[11] Cal Fire, 2019. Fire Hazard Severity Zone Map Web Viewer. Available online at: http://egis.fire.ca.gov/FHSZ/.

APPENDIX NOISE

TRAFFIC NOISE MEMORANDUM

December 3, 2019

Ryan Lee Sawyer
AES
1801 7th Street, Ste 100
Sacramento, CA 95811
rsawyer@analyticalcorp.com

Subject: Traffic Noise Increases – Maha Resort Project – Lake County, CA

Dear Ms. Sawyer:

Saxelby Acoustics has prepared an analysis of traffic noise increases on project-area roadway segments. The intent of this analysis is to provide an assessment of the day/night (L_{dn}) noise level along these segments for comparison to the standards of Lake County and CEQA.

Significance Criteria

CEQA does not define a threshold of "substantial increase" regarding noise exposure. Generally, a noise impact may be considered significant if it would generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance. Lake County Table 8-1 of the General Plan Noise Element establishes a normally acceptable exterior noise level standard of 55 dBA Ldn. Therefore, any increase in traffic which causes noise levels at a sensitive receptor to exceed 55 dBA Ldn, would be significant. Where noise levels already exceed 55 dBA Ldn, a determination of significance is based upon the magnitude of the increase.

The potential increase in traffic noise from the project is a factor in determining significance. Research into the human perception of changes in sound level indicates the following:

- A 3-dB change is barely perceptible,
- A 5-dB change is clearly perceptible, and
- A 10-dB change is perceived as being twice or half as loud.

A limitation of using a single noise level increase value to evaluate noise impacts is that it fails to account for pre-project-noise conditions. **Table 1** is based upon recommendations made by the Federal Interagency Committee on Noise (FICON) to provide guidance in the assessment of changes in ambient noise levels resulting from aircraft operations. The recommendations are based upon studies that relate aircraft noise levels to the percentage of persons highly annoyed by the noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, it has been accepted that they are applicable to all sources of noise described in terms of cumulative noise exposure metrics such as the L_{dn}.

TABLE 1: SIGNIFICANCE OF CHANGES IN NOISE EXPOSURE

Ambient Noise Level Without Project, L_{dn}	Increase Required for Significant Impact
<60 dB	+5.0 dB or more
60-65 dB	+3.0 dB or more
>65 dB	+1.5 dB or more
Source: Federal Interagency Committee on Noise (FICON)	

Based on the **Table 1** data, an increase in the traffic noise level of 3.0 dB or more would be significant where the pre-project noise levels are within 60-65 dB L_{dn}. Extending this concept to higher noise levels, an increase in the traffic noise level of 1.5 dB or more may be significant where the pre-project traffic noise level exceeds 65 dB L_{dn}. The rationale for the **Table 1** criteria is that, as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause annoyance.

Off-Site Traffic Noise Prediction Methodology

To predict noise levels due to traffic, the Federal Highway Administration's Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used. The model is used in conjunction with the Calveno reference noise emission curves, and accounts for vehicle volume and speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the project site. The FHWA Model was developed to predict hourly L_{eq} values for free-flowing traffic conditions. To calculate L_{dn}, average daily traffic (ADT) volume data is adjusted based on the assumed day/night distribution of traffic on the project roadways.

Traffic volumes for existing, baseline, and cumulative conditions without the project were obtained from the project traffic study the form of peak hour intersection movements. The peak hour traffic volumes were compiled into segment volumes and converted into daily traffic volumes using a multiplication factor of 6.7, based upon estimates from the project traffic engineer. Daily project trips were assumed to be five times the peak hour trips, also based upon estimates from the project traffic engineer. Truck usage and vehicle speeds on the local area roadways were estimated from field observations and Caltrans data, where available.

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each project-area roadway segment. This analysis includes assessment of existing, baseline, and cumulative traffic conditions with, and without, the project.

Table 2 summarizes the modeled traffic noise levels at the nearest sensitive receptors along each roadway segment in the Project area under existing conditions with and without the project. **Table 3** summarizes the modeled traffic noise levels at the nearest sensitive receptors along each roadway segment in the Project area under baseline conditions with and without the project. **Table 4** summarizes the modeled traffic noise levels at the nearest sensitive receptors along each roadway segment in the Project area under cumulative conditions with and without the project. **Table 5** summarizes the modeled traffic noise levels at the nearest sensitive receptors along each roadway segment in the Project area under cumulative conditions with and without the Phase 2 project.

Appendix A provides the complete inputs and results of the FHWA traffic modeling.

TABLE 2: PREDICTED TRAFFIC NOISE LEVELS (EXISTING CONDITIONS WITH AND WITHOUT THE PROJECT)

Roadway	Segment	Existing	Existing + Project	Change	Significance Threshold	Significant increase?
		dBA L_{dn}	dBA L_{dn}	dBA L_{dn}		
SR 53	North of SR 29	64.0	64.3	0.3	+3.0 dB	No
SR 29	SR 53 to N. Spruce Grove	63.4	64.1	0.7	+3.0 dB	No
SR 29	N. Spruce Grove to S. Spruce Grove	63.2	63.9	0.7	+3.0 dB	No
SR 29	S. Spruce Grove to Hidden Valley	59.1	59.8	0.7	+5.0 dB	No
SR 29	Hidden Valley to Hartmann	59.1	59.9	0.8	+5.0 dB	No
SR 29	Hartmann to Grange	55.3	55.9	0.6	+5.0 dB	No
SR 29	Grange to Butts Canyon	59.8	60.4	0.6	+5.0 dB	No
SR 29	Butts Canyon to Wardlaw	62.3	62.8	0.5	+3.0 dB	No
SR 29	Wardlaw to Young	60.5	61.0	0.5	+3.0 dB	No
SR 29	Young to Main	62.7	63.2	0.5	+3.0 dB	No
SR 29	Maint to Armstrong	62.4	62.8	0.3	+3.0 dB	No
SR 29	Armstrong to Douglas	62.4	62.8	0.3	+3.0 dB	No
SR 29	Douglas to Callayomi	62.3	62.6	0.3	+3.0 dB	No
SR 29	Callayomi to Lake	65.9	66.3	0.4	+1.5 dB	No
SR 29	Lake to Central Park	59.9	60.2	0.3	+5.0 dB	No
SR 29	South of Central Park	64.5	64.8	0.3	+3.0 dB	No
SR 29	West of SR 53	62.8	63.0	0.2	+3.0 dB	No
Morgan Valley Road	East of SR 53	60.0	60.2	0.2	+3.0 dB	No
N. Spruce Valley Road	East of SR 53	50.6	50.8	0.2	+5.0 dB or > 55 dB	No
S. Spruce Valley Road	East of SR 53	57.1	57.3	0.2	+5.0 dB	No
Hidden Valley Road	East of SR 53	52.9	53.4	0.5	+5.0 dB or > 55 dB	No
Hartmann Road	East of SR 53	56.4	56.4	0.0	+5.0 dB	No
Grange Road	East of SR 53	44.5	44.5	0.0	+5.0 dB or > 55 dB	No
Butts Canyon Road	**SR 29 to Black Oak Hill**	**54.1**	**58.5**	**4.4**	**+5.0 dB or > 55 dB**	**Yes**

Butts Canyon Road	Black Oak Hill to Oat Hill	55.4	59.7	4.3	+5.0 dB	No
Butts Canyon Road	East of Oat Hill	45.6	50.4	4.8	+5.0 dB or > 55 dB	No
SR 175	SR 29 to Santa Clara	58.5	59.2	0.7	+5.0 dB	No
SR 175	West of Santa Clara	61.3	61.9	0.6	+3.0 dB	No
Pope Valley Road	West of Howell Mountain	51.0	52.1	1.1	+5.0 dB or > 55 dB	No
Tubbs Road	South of SR 29	53.5	53.7	0.2	+5.0 dB or > 55 dB	No
Tubbs Road	North of SR 128	59.7	59.8	0.1	+5.0 dB	No

Notes:

1 Where existing noise levels are less than 60 dB an increase of 5 dB would be a significant increase. Additionally, any increase causing noise levels to exceed the County's Normally Acceptable 55 dB Ldn noise level standard at an existing outdoor activity area of a residential use would also be significant. Where existing noise levels exceed 60 dB but are less than 65 dB, an increase of 3 dB or more would be significant. Where existing noise levels exceed 65 dB, an increase of 1.5 dB or more would be significant.

TABLE 3: PREDICTED TRAFFIC NOISE LEVELS (BASELINE CONDITIONS WITH AND WITHOUT THE PROJECT)

Roadway	Segment	Baseline	Baseline + Project	Change	Significance Threshold	Significant increase?
		dBA L_{dn}	dBA L_{dn}	dBA L_{dn}		
SR 53	North of SR 29	64.6	64.9	0.3	+3.0 dB	No
SR 29	SR 53 to N. Spruce Grove	64.8	65.3	0.5	+3.0 dB	No
SR 29	N. Spruce Grove to S. Spruce Grove	64.7	65.2	0.5	+3.0 dB	No
SR 29	S. Spruce Grove to Hidden Valley	60.5	61.0	0.5	+3.0 dB	No
SR 29	Hidden Valley to Hartmann	60.7	61.3	0.6	+3.0 dB	No
SR 29	Hartmann to Grange	56.6	57.1	0.5	+5.0 dB	No
SR 29	Grange to Butts Canyon	61.1	61.6	0.5	+3.0 dB	No
SR 29	Butts Canyon to Wardlaw	63.3	63.7	0.4	+3.0 dB	No
SR 29	Wardlaw to Young	61.5	61.9	0.4	+3.0 dB	No
SR 29	Young to Main	63.7	64.1	0.4	+3.0 dB	No
SR 29	Maint to Armstrong	63.1	63.4	0.3	+3.0 dB	No
SR 29	Armstrong to Douglas	63.1	63.4	0.3	+3.0 dB	No
SR 29	Douglas to Callayomi	63.0	63.3	0.3	+3.0 dB	No
SR 29	Callayomi to Lake	66.6	66.9	0.3	+1.5 dB	No
SR 29	Lake to Central Park	60.6	60.9	0.3	+3.0 dB	No

SR 29	South of Central Park	65.2	65.5	0.3	+1.5 dB	No
SR 29	West of SR 53	63.4	63.6	0.2	+3.0 dB	No
Morgan Valley Road	East of SR 53	60.5	60.6	0.1	+3.0 dB	No
N. Spruce Valley Road	East of SR 53	51.1	51.3	0.2	+5.0 dB or > 55 dB	No
S. Spruce Valley Road	East of SR 53	57.5	57.6	0.1	+5.0 dB	No
Hidden Valley Road	East of SR 53	59.0	59.2	0.2	+5.0 dB	No
Hartmann Road	East of SR 53	56.6	56.6	0.0	+5.0 dB	No
Grange Road	East of SR 53	44.5	44.5	0.0	+5.0 dB or > 55 dB	No
Butts Canyon Road	SR 29 to Black Oak Hill	55.7	59.2	3.5	+5.0 dB	No
Butts Canyon Road	Black Oak Hill to Oat Hill	57.0	60.4	3.4	+5.0 dB	No
Butts Canyon Road	East of Oat Hill	47.4	51.1	3.7	+5.0 dB or > 55 dB	No
SR 175	SR 29 to Santa Clara	59.8	60.3	0.5	+5.0 dB	No
SR 175	West of Santa Clara	63.0	63.5	0.5	+3.0 dB	No
Pope Valley Road	West of Howell Mountain	53.0	53.7	0.7	+5.0 dB or > 55 dB	No
Tubbs Road	South of SR 29	54.0	54.2	0.2	+5.0 dB or > 55 dB	No
Tubbs Road	North of SR 128	60.0	60.1	0.1	+3.0 dB	No

Notes:
1 Where existing noise levels are less than 60 dB an increase of 5 dB would be a significant increase. Additionally, any increase causing noise levels to exceed the County's Normally Acceptable 55 dB Ldn noise level standard at an existing outdoor activity area of a residential use would also be significant. Where existing noise levels exceed 60 dB but are less than 65 dB, an increase of 3 dB or more would be significant. Where existing noise levels exceed 65 dB, an increase of 1.5 dB or more would be significant.

TABLE 4: PREDICTED TRAFFIC NOISE LEVELS (CUMULATIVE CONDITIONS WITH AND WITHOUT THE PROJECT)

Roadway	Segment	Cumulative	Cumulative + Project	Change	Significance Threshold	Significant increase?
		dBA L_{dn}	dBA L_{dn}	dBA L_{dn}		
SR 53	North of SR 29	65.1	65.3	0.2	+1.5 dB	No
SR 29	SR 53 to N. Spruce Grove	65.3	65.7	0.4	+1.5 dB	No
SR 29	N. Spruce Grove to S. Spruce Grove	65.2	65.6	0.4	+1.5 dB	No
SR 29	S. Spruce Grove to Hidden Valley	61.0	61.4	0.4	+3.0 dB	No
SR 29	Hidden Valley to Hartmann	61.2	61.7	0.5	+3.0 dB	No

SR 29	Hartmann to Grange	57.1	57.5	0.4	+5.0 dB	No
SR 29	Grange to Butts Canyon	61.3	61.8	0.5	+3.0 dB	No
SR 29	Butts Canyon to Wardlaw	63.8	64.1	0.3	+3.0 dB	No
SR 29	Wardlaw to Young	62.0	62.3	0.3	+3.0 dB	No
SR 29	Young to Main	64.2	64.6	0.4	+3.0 dB	No
SR 29	Maint to Armstrong	63.6	63.9	0.3	+3.0 dB	No
SR 29	Armstrong to Douglas	63.6	63.9	0.3	+3.0 dB	No
SR 29	Douglas to Callayomi	63.5	63.8	0.3	+3.0 dB	No
SR 29	Callayomi to Lake	67.1	67.4	0.3	+1.5 dB	No
SR 29	Lake to Central Park	61.1	61.4	0.3	+3.0 dB	No
SR 29	South of Central Park	65.7	65.9	0.2	+1.5 dB	No
SR 29	West of SR 53	63.9	64.1	0.2	+3.0 dB	No
Morgan Valley Road	East of SR 53	60.9	61.1	0.2	+3.0 dB	No
N. Spruce Valley Road	East of SR 53	51.6	51.8	0.2	+5.0 dB or > 55 dB	No
S. Spruce Valley Road	East of SR 53	58.0	58.0	0.0	+5.0 dB	No
Hidden Valley Road	East of SR 53	59.5	59.6	0.1	+5.0 dB	No
Hartmann Road	East of SR 53	57.0	57.0	0.0	+5.0 dB	No
Grange Road	East of SR 53	45.0	45.0	0.0	+5.0 dB or > 55 dB	No
Butts Canyon Road	SR 29 to Black Oak Hill	56.2	59.4	3.2	+5.0 dB	No
Butts Canyon Road	Black Oak Hill to Oat Hill	57.5	60.6	3.2	+5.0 dB	No
Butts Canyon Road	East of Oat Hill	47.9	51.3	3.4	+5.0 dB or > 55 dB	No
SR 175	SR 29 to Santa Clara	60.2	60.7	0.5	+3.0 dB	No
SR 175	West of Santa Clara	63.5	63.9	0.4	+3.0 dB	No
Pope Valley Road	West of Howell Mountain	53.5	54.1	0.6	+5.0 dB or > 55 dB	No
Tubbs Road	South of SR 29	54.5	54.7	0.2	+5.0 dB or > 55 dB	No
Tubbs Road	North of SR 128	60.5	60.6	0.1	+3.0 dB	No

Notes:

1 Where existing noise levels are less than 60 dB an increase of 5 dB would be a significant increase. Additionally, any increase causing noise levels to exceed the County's Normally Acceptable 55 dB Ldn noise level standard at an existing outdoor activity area of a residential use would also be significant. Where existing noise levels exceed 60 dB but are less than 65 dB, an increase of 3 dB or more would be significant. Where existing noise levels exceed 65 dB, an increase of 1.5 dB or more would be significant.

TABLE 4: PREDICTED TRAFFIC NOISE LEVELS (CUMULATIVE CONDITIONS WITH AND WITHOUT THE PHASE 2 PROJECT)

Roadway	Segment	Cumulative	Cumulative + Project Phase 2	Change	Significance Threshold	Significant increase?
		dBA L_{dn}	dBA L_{dn}	dBA L_{dn}		
SR 53	North of SR 29	65.1	65.7	0.6	+1.5 dB	No
SR 29	SR 53 to N. Spruce Grove	65.3	66.4	1.1	+1.5 dB	No
SR 29	N. Spruce Grove to S. Spruce Grove	65.2	66.3	1.1	+1.5 dB	No
SR 29	S. Spruce Grove to Hidden Valley	61.0	62.1	1.1	+3.0 dB	No
SR 29	Hidden Valley to Hartmann	61.2	62.4	1.2	+3.0 dB	No
SR 29	Hartmann to Grange	57.1	58.2	1.1	+5.0 dB	No
SR 29	Grange to Butts Canyon	61.3	62.5	1.2	+3.0 dB	No
SR 29	Butts Canyon to Wardlaw	63.8	64.7	0.9	+3.0 dB	No
SR 29	Wardlaw to Young	62.0	62.9	0.9	+3.0 dB	No
SR 29	Young to Main	64.2	65.1	0.9	+3.0 dB	No
SR 29	Maint to Armstrong	63.6	64.3	0.7	+3.0 dB	No
SR 29	Armstrong to Douglas	63.6	64.3	0.7	+3.0 dB	No
SR 29	Douglas to Callayomi	63.5	64.2	0.7	+3.0 dB	No
SR 29	Callayomi to Lake	67.1	67.8	0.7	+1.5 dB	No
SR 29	Lake to Central Park	61.1	61.8	0.7	+3.0 dB	No
SR 29	South of Central Park	65.7	66.3	0.6	+1.5 dB	No
SR 29	West of SR 53	63.9	64.3	0.4	+3.0 dB	No
Morgan Valley Road	East of SR 53	60.9	61.3	0.4	+3.0 dB	No
N. Spruce Valley Road	East of SR 53	51.6	52.1	0.5	+5.0 dB or > 55 dB	No
S. Spruce Valley Road	East of SR 53	58.0	58.2	0.2	+5.0 dB	No
Hidden Valley Road	East of SR 53	59.5	59.8	0.3	+5.0 dB	No
Hartmann Road	East of SR 53	57.0	57.0	0.0	+5.0 dB	No
Grange Road	East of SR 53	45.0	45.0	0.0	+5.0 dB or > 55 dB	No
Butts Canyon Road	**SR 29 to Black Oak Hill**	**56.2**	**62.1**	**5.9**	**+5.0 dB**	**Yes**

Butts Canyon Road	**Black Oak Hill to Oat Hill**	**57.5**	**63.3**	**5.8**	**+5.0 dB**	**Yes**
Butts Canyon Road	**East of Oat Hill**	**47.9**	**54.1**	**6.2**	**+5.0 dB or > 55 dB**	**Yes**
SR 175	SR 29 to Santa Clara	60.2	61.3	1.1	+3.0 dB	No
SR 175	West of Santa Clara	63.5	64.5	1.0	+3.0 dB	No
Pope Valley Road	West of Howell Mountain	53.5	54.7	1.2	+5.0 dB or > 55 dB	No
Tubbs Road	South of SR 29	54.5	55.0	0.5	+5.0 dB or > 55 dB	No
Tubbs Road	North of SR 128	60.5	60.8	0.3	+3.0 dB	No

Notes:

1 Where existing noise levels are less than 60 dB an increase of 5 dB would be a significant increase. Additionally, any increase causing noise levels to exceed the County's Normally Acceptable 55 dB Ldn noise level standard at an existing outdoor activity area of a residential use would also be significant. Where existing noise levels exceed 60 dB but are less than 65 dB, an increase of 3 dB or more would be significant. Where existing noise levels exceed 65 dB, an increase of 1.5 dB or more would be significant.

Conclusions

Based upon the predicted traffic noise increases shown in **Tables 2-5**, the proposed project is predicted to cause increased traffic noise which would exceed the impact thresholds along Butts Canyon Road. Increases along Butts Canyon Road are predicted to be in the range of 4.4-6.2 dBA. In order to reduce this impact, the use of sound walls or quiet pavement would be required. However, sound walls are unlikely to be a practical noise control measure considering that driveway openings would be required for vehicle access. Quiet pavements are typically assumed to provide a 3-5 dBA reduction. Assuming an average 4 dBA reduction, quiet pavement placed along sensitive receptor areas could reduce project noise level increases to 0.4-2.2 dBA. This would reduce traffic noise increases to less than significant.

No other exceedances of the Lake County significant increase thresholds are predicted for any other segments or project alternatives.

Please call or email me if you have any questions regarding this analysis.

Sincerely,

Saxelby Acoustics LLC

Luke Saxelby, INCE Bd. Cert.
Principal Consultant
Board Certified, Institute of Noise Control Engineering

Appendix A-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 191102

Description: Maha Resort - Existing Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Segment	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 70 dBA	65 dBA	60 dBA	Level, dBA
1	SR 53	North of SR 29	10,032	83	0	17	5.9%	1.5%	45	100	0	40	86	185	64.0
2	SR 29	SR 53 to N. Spruce Grove	6,564	83	0	17	2.0%	1.0%	55	100	0	36	78	169	63.4
3	SR 29	N. Spruce Grove to S. Spruce Grove	6,226	83	0	17	2.0%	1.0%	55	100	0	35	76	163	63.2
4	SR 29	S. Spruce Grove to Hidden Valley	6,814	83	0	17	2.0%	1.0%	55	200	0	37	80	173	59.1
5	SR 29	Hidden Valley to Hartmann	6,422	83	0	17	2.0%	1.0%	55	190	0	36	77	166	59.1
6	SR 29	Hartmann to Grange	8,153	83	0	17	2.0%	1.0%	55	400	0	42	90	195	55.3
7	SR 29	Grange to Butts Canyon	8,065	83	0	17	2.0%	1.0%	55	200	0	42	90	193	59.8
8	SR 29	Butts Canyon to Wardlaw	8,335	83	0	17	2.0%	1.0%	45	100	0	30	66	141	62.3
9	SR 29	Wardlaw to Young	7,497	83	0	17	2.0%	1.0%	30	70	0	16	35	75	60.5
10	SR 29	Young to Main	7,524	83	0	17	2.0%	1.0%	30	50	0	16	35	75	62.7
11	SR 29	Maint to Armstrong	7,125	83	0	17	2.0%	1.0%	30	50	0	16	34	73	62.4
12	SR 29	Armstrong to Douglas	7,112	83	0	17	2.0%	1.0%	30	50	0	16	34	72	62.4
13	SR 29	Douglas to Callayomi	6,888	83	0	17	2.0%	1.0%	30	50	0	15	33	71	62.3
14	SR 29	Callayomi to Lake	6,841	83	0	17	2.0%	1.0%	45	50	0	27	58	124	65.9
15	SR 29	Lake to Central Park	6,814	83	0	17	2.0%	1.0%	50	150	0	32	68	147	59.9
16	SR 29	South of Central Park	6,943	83	0	17	2.0%	1.0%	50	75	0	32	69	149	64.5
17	SR 29	West of SR 53	6,206	83	0	17	2.0%	1.0%	50	90	0	30	64	138	62.8
18	Morgan Valley Road	East of SR 53	2,400	88	0	12	1.0%	0.5%	45	50	0	11	23	50	60.0
19	N. Spruce Valley Road	East of SR 53	967	88	0	12	1.0%	0.5%	35	75	0	4	8	18	50.6
20	S. Spruce Valley Road	East of SR 53	2,231	88	0	12	1.0%	0.5%	40	60	0	8	18	39	57.1
21	Hidden Valley Road	East of SR 53	649	88	0	12	1.0%	0.5%	35	40	0	3	6	14	52.9
22	Hartmann Road	East of SR 53	4,421	88	0	12	1.0%	0.5%	45	130	0	16	35	75	56.4
23	Grange Road	East of SR 53	162	88	0	12	1.0%	0.5%	45	90	0	2	4	8	44.5
24	Butts Canyon Road	SR 29 to Black Oak Hill	1,338	88	0	12	1.0%	0.5%	55	120	0	10	22	48	54.1
25	Butts Canyon Road	Black Oak Hill to Oat Hill	1,372	88	0	12	1.0%	0.5%	55	100	0	11	23	49	55.4
26	Butts Canyon Road	East of Oat Hill	1,142	88	0	12	1.0%	0.5%	55	400	0	9	20	44	45.6
27	SR 175	SR 29 to Santa Clara	2,461	88	0	12	9.0%	1.4%	35	60	0	10	22	48	58.5
28	SR 175	West of Santa Clara	2,265	83	0	17	9.0%	1.4%	45	60	0	16	34	73	61.3
29	Pope Valley Road	West of Howell Mountain	1,088	83	0	17	1.0%	0.5%	50	160	0	9	19	40	51.0
30	Tubbs Road	South of SR 29	2,643	88	0	12	1.0%	0.5%	50	175	0	14	30	64	53.5
31	Tubbs Road	North of SR 128	2,224	88	0	12	1.0%	0.5%	50	60	0	12	27	57	59.7

Appendix A-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 191102

Description: Maha Resort - Existing Plus Project Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Segment	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 70 dBA	65 dBA	60 dBA	Level, dBA
1	SR 53	North of SR 29	10,697	83	0	17	5.9%	1.5%	45	100	0	42	89	193	64.3
2	SR 29	SR 53 to N. Spruce Grove	7,654	83	0	17	2.0%	1.0%	55	100	0	40	87	187	64.1
3	SR 29	N. Spruce Grove to S. Spruce Grove	7,366	83	0	17	2.0%	1.0%	55	100	0	39	85	182	63.9
4	SR 29	S. Spruce Grove to Hidden Valley	8,009	83	0	17	2.0%	1.0%	55	200	0	41	89	193	59.8
5	SR 29	Hidden Valley to Hartmann	7,697	83	0	17	2.0%	1.0%	55	190	0	40	87	188	59.9
6	SR 29	Hartmann to Grange	9,428	83	0	17	2.0%	1.0%	55	400	0	46	100	215	55.9
7	SR 29	Grange to Butts Canyon	9,340	83	0	17	2.0%	1.0%	55	200	0	46	99	213	60.4
8	SR 29	Butts Canyon to Wardlaw	9,420	83	0	17	2.0%	1.0%	45	100	0	33	71	153	62.8
9	SR 29	Wardlaw to Young	8,477	83	0	17	2.0%	1.0%	30	70	0	18	38	81	61.0
10	SR 29	Young to Main	8,504	83	0	17	2.0%	1.0%	30	50	0	18	38	82	63.2
11	SR 29	Maint to Armstrong	7,710	83	0	17	2.0%	1.0%	30	50	0	16	35	76	62.8
12	SR 29	Armstrong to Douglas	7,697	83	0	17	2.0%	1.0%	30	50	0	16	35	76	62.8
13	SR 29	Douglas to Callayomi	7,473	83	0	17	2.0%	1.0%	30	50	0	16	35	75	62.6
14	SR 29	Callayomi to Lake	7,401	83	0	17	2.0%	1.0%	45	50	0	28	61	131	66.3
15	SR 29	Lake to Central Park	7,374	83	0	17	2.0%	1.0%	50	150	0	33	72	155	60.2
16	SR 29	South of Central Park	7,473	83	0	17	2.0%	1.0%	50	75	0	34	73	156	64.8
17	SR 29	West of SR 53	6,526	83	0	17	2.0%	1.0%	50	90	0	31	66	143	63.0
18	Morgan Valley Road	East of SR 53	2,505	88	0	12	1.0%	0.5%	45	50	0	11	24	51	60.2
19	N. Spruce Valley Road	East of SR 53	1,017	88	0	12	1.0%	0.5%	35	75	0	4	8	18	50.8
20	S. Spruce Valley Road	East of SR 53	2,286	88	0	12	1.0%	0.5%	40	60	0	8	18	39	57.3
21	Hidden Valley Road	East of SR 53	729	88	0	12	1.0%	0.5%	35	40	0	3	7	15	53.4
22	Hartmann Road	East of SR 53	4,421	88	0	12	1.0%	0.5%	45	130	0	16	35	75	56.4
23	Grange Road	East of SR 53	162	88	0	12	1.0%	0.5%	45	90	0	2	4	8	44.5
24	Butts Canyon Road	SR 29 to Black Oak Hill	3,698	88	0	12	1.0%	0.5%	55	120	0	21	44	95	58.5
25	Butts Canyon Road	Black Oak Hill to Oat Hill	3,732	88	0	12	1.0%	0.5%	55	100	0	21	44	96	59.7
26	Butts Canyon Road	East of Oat Hill	3,502	88	0	12	1.0%	0.5%	55	400	0	20	43	92	50.4
27	SR 175	SR 29 to Santa Clara	2,856	88	0	12	9.0%	1.4%	35	60	0	11	25	53	59.2
28	SR 175	West of Santa Clara	2,640	83	0	17	9.0%	1.4%	45	60	0	17	37	81	61.9
29	Pope Valley Road	West of Howell Mountain	1,383	83	0	17	1.0%	0.5%	50	160	0	10	22	48	52.1
30	Tubbs Road	South of SR 29	2,788	88	0	12	1.0%	0.5%	50	175	0	14	31	67	53.7
31	Tubbs Road	North of SR 128	2,284	88	0	12	1.0%	0.5%	50	60	0	13	27	58	59.8

Appendix A-3

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 191102

Description: Maha Resort - Baseline Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Segment	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 70 dBA	65 dBA	60 dBA	Level, dBA
1	SR 53	North of SR 29	11,634	83	0	17	5.9%	1.5%	45	100	0	44	95	204	64.6
2	SR 29	SR 53 to N. Spruce Grove	9,031	83	0	17	2.0%	1.0%	55	100	0	45	97	209	64.8
3	SR 29	N. Spruce Grove to S. Spruce Grove	8,802	83	0	17	2.0%	1.0%	55	100	0	44	95	205	64.7
4	SR 29	S. Spruce Grove to Hidden Valley	9,518	83	0	17	2.0%	1.0%	55	200	0	47	100	216	60.5
5	SR 29	Hidden Valley to Hartmann	9,227	83	0	17	2.0%	1.0%	55	190	0	46	98	212	60.7
6	SR 29	Hartmann to Grange	11,005	83	0	17	2.0%	1.0%	55	400	0	51	110	238	56.6
7	SR 29	Grange to Butts Canyon	10,850	83	0	17	2.0%	1.0%	55	200	0	51	109	236	61.1
8	SR 29	Butts Canyon to Wardlaw	10,559	83	0	17	2.0%	1.0%	45	100	0	36	77	165	63.3
9	SR 29	Wardlaw to Young	9,491	83	0	17	2.0%	1.0%	30	70	0	19	41	88	61.5
10	SR 29	Young to Main	9,525	83	0	17	2.0%	1.0%	30	50	0	19	41	88	63.7
11	SR 29	Maint to Armstrong	8,396	83	0	17	2.0%	1.0%	30	50	0	17	38	81	63.1
12	SR 29	Armstrong to Douglas	8,369	83	0	17	2.0%	1.0%	30	50	0	17	37	81	63.1
13	SR 29	Douglas to Callayomi	8,139	83	0	17	2.0%	1.0%	30	50	0	17	37	79	63.0
14	SR 29	Callayomi to Lake	8,098	83	0	17	2.0%	1.0%	45	50	0	30	64	139	66.6
15	SR 29	Lake to Central Park	8,065	83	0	17	2.0%	1.0%	50	150	0	35	76	165	60.6
16	SR 29	South of Central Park	8,200	83	0	17	2.0%	1.0%	50	75	0	36	77	166	65.2
17	SR 29	West of SR 53	7,166	83	0	17	2.0%	1.0%	50	90	0	33	71	152	63.4
18	Morgan Valley Road	East of SR 53	2,670	88	0	12	1.0%	0.5%	45	50	0	12	25	54	60.5
19	N. Spruce Valley Road	East of SR 53	1,095	88	0	12	1.0%	0.5%	35	75	0	4	9	19	51.1
20	S. Spruce Valley Road	East of SR 53	2,407	88	0	12	1.0%	0.5%	40	60	0	9	19	41	57.5
21	Hidden Valley Road	East of SR 53	2,650	88	0	12	1.0%	0.5%	35	40	0	7	16	35	59.0
22	Hartmann Road	East of SR 53	4,556	88	0	12	1.0%	0.5%	45	130	0	16	36	77	56.6
23	Grange Road	East of SR 53	162	88	0	12	1.0%	0.5%	45	90	0	2	4	8	44.5
24	Butts Canyon Road	SR 29 to Black Oak Hill	1,947	88	0	12	1.0%	0.5%	55	120	0	13	29	62	55.7
25	Butts Canyon Road	Black Oak Hill to Oat Hill	1,981	88	0	12	1.0%	0.5%	55	100	0	14	29	63	57.0
26	Butts Canyon Road	East of Oat Hill	1,744	88	0	12	1.0%	0.5%	55	400	0	12	27	58	47.4
27	SR 175	SR 29 to Santa Clara	3,265	88	0	12	9.0%	1.4%	35	60	0	12	27	58	59.8
28	SR 175	West of Santa Clara	3,394	83	0	17	9.0%	1.4%	45	60	0	21	44	95	63.0
29	Pope Valley Road	West of Howell Mountain	1,690	83	0	17	1.0%	0.5%	50	160	0	12	25	54	53.0
30	Tubbs Road	South of SR 29	3,015	88	0	12	1.0%	0.5%	50	175	0	15	33	70	54.0
31	Tubbs Road	North of SR 128	2,400	88	0	12	1.0%	0.5%	50	60	0	13	28	60	60.0

Appendix A-4

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 191102

Description: Maha Resort - Baseline Plus Project Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Segment	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 70 dBA	65 dBA	60 dBA	Level, dBA
1	SR 53	North of SR 29	12,299	83	0	17	5.9%	1.5%	45	100	0	46	98	212	64.9
2	SR 29	SR 53 to N. Spruce Grove	10,121	83	0	17	2.0%	1.0%	55	100	0	48	104	225	65.3
3	SR 29	N. Spruce Grove to S. Spruce Grove	9,942	83	0	17	2.0%	1.0%	55	100	0	48	103	222	65.2
4	SR 29	S. Spruce Grove to Hidden Valley	10,713	83	0	17	2.0%	1.0%	55	200	0	50	109	234	61.0
5	SR 29	Hidden Valley to Hartmann	10,502	83	0	17	2.0%	1.0%	55	190	0	50	107	231	61.3
6	SR 29	Hartmann to Grange	12,280	83	0	17	2.0%	1.0%	55	400	0	55	119	256	57.1
7	SR 29	Grange to Butts Canyon	12,125	83	0	17	2.0%	1.0%	55	200	0	55	118	254	61.6
8	SR 29	Butts Canyon to Wardlaw	11,644	83	0	17	2.0%	1.0%	45	100	0	38	82	177	63.7
9	SR 29	Wardlaw to Young	10,471	83	0	17	2.0%	1.0%	30	70	0	20	44	94	61.9
10	SR 29	Young to Main	10,505	83	0	17	2.0%	1.0%	30	50	0	20	44	94	64.1
11	SR 29	Maint to Armstrong	8,981	83	0	17	2.0%	1.0%	30	50	0	18	39	85	63.4
12	SR 29	Armstrong to Douglas	8,954	83	0	17	2.0%	1.0%	30	50	0	18	39	84	63.4
13	SR 29	Douglas to Callayomi	8,724	83	0	17	2.0%	1.0%	30	50	0	18	39	83	63.3
14	SR 29	Callayomi to Lake	8,658	83	0	17	2.0%	1.0%	45	50	0	31	67	145	66.9
15	SR 29	Lake to Central Park	8,625	83	0	17	2.0%	1.0%	50	150	0	37	80	172	60.9
16	SR 29	South of Central Park	8,730	83	0	17	2.0%	1.0%	50	75	0	37	81	174	65.5
17	SR 29	West of SR 53	7,486	83	0	17	2.0%	1.0%	50	90	0	34	73	157	63.6
18	Morgan Valley Road	East of SR 53	2,775	88	0	12	1.0%	0.5%	45	50	0	12	26	55	60.6
19	N. Spruce Valley Road	East of SR 53	1,145	88	0	12	1.0%	0.5%	35	75	0	4	9	20	51.3
20	S. Spruce Valley Road	East of SR 53	2,462	88	0	12	1.0%	0.5%	40	60	0	9	19	41	57.6
21	Hidden Valley Road	East of SR 53	2,730	88	0	12	1.0%	0.5%	35	40	0	8	16	35	59.2
22	Hartmann Road	East of SR 53	4,556	88	0	12	1.0%	0.5%	45	130	0	16	36	77	56.6
23	Grange Road	East of SR 53	162	88	0	12	1.0%	0.5%	45	90	0	2	4	8	44.5
24	Butts Canyon Road	SR 29 to Black Oak Hill	4,307	88	0	12	1.0%	0.5%	55	120	0	23	49	105	59.2
25	Butts Canyon Road	Black Oak Hill to Oat Hill	4,341	88	0	12	1.0%	0.5%	55	100	0	23	49	106	60.4
26	Butts Canyon Road	East of Oat Hill	4,104	88	0	12	1.0%	0.5%	55	400	0	22	47	102	51.1
27	SR 175	SR 29 to Santa Clara	3,660	88	0	12	9.0%	1.4%	35	60	0	13	29	62	60.3
28	SR 175	West of Santa Clara	3,769	83	0	17	9.0%	1.4%	45	60	0	22	48	102	63.5
29	Pope Valley Road	West of Howell Mountain	1,985	83	0	17	1.0%	0.5%	50	160	0	13	28	60	53.7
30	Tubbs Road	South of SR 29	3,160	88	0	12	1.0%	0.5%	50	175	0	16	34	72	54.2
31	Tubbs Road	North of SR 128	2,460	88	0	12	1.0%	0.5%	50	60	0	13	28	61	60.1

Appendix A-5

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 191102

Description: Maha Resort - Cumulative Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Segment	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 70 dBA	65 dBA	60 dBA	Level, dBA
1	SR 53	North of SR 29	13,013	83	0	17	5.9%	1.5%	45	100	0	47	102	220	65.1
2	SR 29	SR 53 to N. Spruce Grove	10,093	83	0	17	2.0%	1.0%	55	100	0	48	104	225	65.3
3	SR 29	N. Spruce Grove to S. Spruce Grove	9,843	83	0	17	2.0%	1.0%	55	100	0	48	103	221	65.2
4	SR 29	S. Spruce Grove to Hidden Valley	10,640	83	0	17	2.0%	1.0%	55	200	0	50	108	233	61.0
5	SR 29	Hidden Valley to Hartmann	10,316	83	0	17	2.0%	1.0%	55	190	0	49	106	228	61.2
6	SR 29	Hartmann to Grange	12,310	83	0	17	2.0%	1.0%	55	400	0	55	119	256	57.1
7	SR 29	Grange to Butts Canyon	11,526	83	0	17	2.0%	1.0%	55	200	0	53	114	245	61.3
8	SR 29	Butts Canyon to Wardlaw	11,810	83	0	17	2.0%	1.0%	45	100	0	38	83	178	63.8
9	SR 29	Wardlaw to Young	10,613	83	0	17	2.0%	1.0%	30	70	0	20	44	95	62.0
10	SR 29	Young to Main	10,647	83	0	17	2.0%	1.0%	30	50	0	20	44	95	64.2
11	SR 29	Maint to Armstrong	9,390	83	0	17	2.0%	1.0%	30	50	0	19	40	87	63.6
12	SR 29	Armstrong to Douglas	9,363	83	0	17	2.0%	1.0%	30	50	0	19	40	87	63.6
13	SR 29	Douglas to Callayomi	9,099	83	0	17	2.0%	1.0%	30	50	0	18	40	85	63.5
14	SR 29	Callayomi to Lake	9,058	83	0	17	2.0%	1.0%	45	50	0	32	69	149	67.1
15	SR 29	Lake to Central Park	9,018	83	0	17	2.0%	1.0%	50	150	0	38	82	177	61.1
16	SR 29	South of Central Park	9,167	83	0	17	2.0%	1.0%	50	75	0	39	83	179	65.7
17	SR 29	West of SR 53	8,017	83	0	17	2.0%	1.0%	50	90	0	35	76	164	63.9
18	Morgan Valley Road	East of SR 53	2,981	88	0	12	1.0%	0.5%	45	50	0	12	27	58	60.9
19	N. Spruce Valley Road	East of SR 53	1,224	88	0	12	1.0%	0.5%	35	75	0	4	10	21	51.6
20	S. Spruce Valley Road	East of SR 53	2,690	88	0	12	1.0%	0.5%	40	60	0	9	20	44	58.0
21	Hidden Valley Road	East of SR 53	2,961	88	0	12	1.0%	0.5%	35	40	0	8	17	37	59.5
22	Hartmann Road	East of SR 53	5,090	88	0	12	1.0%	0.5%	45	130	0	18	38	82	57.0
23	Grange Road	East of SR 53	183	88	0	12	1.0%	0.5%	45	90	0	2	4	9	45.0
24	Butts Canyon Road	SR 29 to Black Oak Hill	2,177	88	0	12	1.0%	0.5%	55	120	0	14	31	67	56.2
25	Butts Canyon Road	Black Oak Hill to Oat Hill	2,211	88	0	12	1.0%	0.5%	55	100	0	15	31	68	57.5
26	Butts Canyon Road	East of Oat Hill	1,947	88	0	12	1.0%	0.5%	55	400	0	13	29	62	47.9
27	SR 175	SR 29 to Santa Clara	3,650	88	0	12	9.0%	1.4%	35	60	0	13	29	62	60.2
28	SR 175	West of Santa Clara	3,792	83	0	17	9.0%	1.4%	45	60	0	22	48	103	63.5
29	Pope Valley Road	West of Howell Mountain	1,893	83	0	17	1.0%	0.5%	50	160	0	13	27	59	53.5
30	Tubbs Road	South of SR 29	3,380	88	0	12	1.0%	0.5%	50	175	0	16	35	76	54.5
31	Tubbs Road	North of SR 128	2,684	88	0	12	1.0%	0.5%	50	60	0	14	30	65	60.5

Appendix A-6

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 191102

Description: Maha Resort - Cumulative Plus Project Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Segment	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 70 dBA	65 dBA	60 dBA	Level, dBA
1	SR 53	North of SR 29	13,678	83	0	17	5.9%	1.5%	45	100	0	49	105	227	65.3
2	SR 29	SR 53 to N. Spruce Grove	11,183	83	0	17	2.0%	1.0%	55	100	0	52	112	241	65.7
3	SR 29	N. Spruce Grove to S. Spruce Grove	10,983	83	0	17	2.0%	1.0%	55	100	0	51	110	238	65.6
4	SR 29	S. Spruce Grove to Hidden Valley	11,835	83	0	17	2.0%	1.0%	55	200	0	54	116	250	61.4
5	SR 29	Hidden Valley to Hartmann	11,591	83	0	17	2.0%	1.0%	55	190	0	53	114	246	61.7
6	SR 29	Hartmann to Grange	13,585	83	0	17	2.0%	1.0%	55	400	0	59	127	274	57.5
7	SR 29	Grange to Butts Canyon	12,801	83	0	17	2.0%	1.0%	55	200	0	57	122	263	61.8
8	SR 29	Butts Canyon to Wardlaw	12,895	83	0	17	2.0%	1.0%	45	100	0	41	88	189	64.1
9	SR 29	Wardlaw to Young	11,593	83	0	17	2.0%	1.0%	30	70	0	22	47	100	62.3
10	SR 29	Young to Main	11,627	83	0	17	2.0%	1.0%	30	50	0	22	47	101	64.6
11	SR 29	Maint to Armstrong	9,975	83	0	17	2.0%	1.0%	30	50	0	20	42	91	63.9
12	SR 29	Armstrong to Douglas	9,948	83	0	17	2.0%	1.0%	30	50	0	20	42	91	63.9
13	SR 29	Douglas to Callayomi	9,684	83	0	17	2.0%	1.0%	30	50	0	19	41	89	63.8
14	SR 29	Callayomi to Lake	9,618	83	0	17	2.0%	1.0%	45	50	0	34	72	156	67.4
15	SR 29	Lake to Central Park	9,578	83	0	17	2.0%	1.0%	50	150	0	40	86	185	61.4
16	SR 29	South of Central Park	9,697	83	0	17	2.0%	1.0%	50	75	0	40	86	186	65.9
17	SR 29	West of SR 53	8,337	83	0	17	2.0%	1.0%	50	90	0	36	78	168	64.1
18	Morgan Valley Road	East of SR 53	3,086	88	0	12	1.0%	0.5%	45	50	0	13	27	59	61.1
19	N. Spruce Valley Road	East of SR 53	1,274	88	0	12	1.0%	0.5%	35	75	0	5	10	21	51.8
20	S. Spruce Valley Road	East of SR 53	2,745	88	0	12	1.0%	0.5%	40	60	0	10	21	44	58.0
21	Hidden Valley Road	East of SR 53	3,041	88	0	12	1.0%	0.5%	35	40	0	8	18	38	59.6
22	Hartmann Road	East of SR 53	5,090	88	0	12	1.0%	0.5%	45	130	0	18	38	82	57.0
23	Grange Road	East of SR 53	183	88	0	12	1.0%	0.5%	45	90	0	2	4	9	45.0
24	Butts Canyon Road	SR 29 to Black Oak Hill	4,537	88	0	12	1.0%	0.5%	55	120	0	24	51	109	59.4
25	Butts Canyon Road	Black Oak Hill to Oat Hill	4,571	88	0	12	1.0%	0.5%	55	100	0	24	51	110	60.6
26	Butts Canyon Road	East of Oat Hill	4,307	88	0	12	1.0%	0.5%	55	400	0	23	49	105	51.3
27	SR 175	SR 29 to Santa Clara	4,045	88	0	12	9.0%	1.4%	35	60	0	14	31	67	60.7
28	SR 175	West of Santa Clara	4,167	83	0	17	9.0%	1.4%	45	60	0	24	51	109	63.9
29	Pope Valley Road	West of Howell Mountain	2,188	83	0	17	1.0%	0.5%	50	160	0	14	30	64	54.1
30	Tubbs Road	South of SR 29	3,525	88	0	12	1.0%	0.5%	50	175	0	17	36	78	54.7
31	Tubbs Road	North of SR 128	2,744	88	0	12	1.0%	0.5%	50	60	0	14	31	66	60.6

Appendix A-7

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 191102

Description: Maha Resort - Cumulative Plus Phase 2 Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Segment	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 70 dBA	65 dBA	60 dBA	Level, dBA
1	SR 53	North of SR 29	14,773	83	0	17	5.9%	1.5%	45	100	0	51	111	239	65.7
2	SR 29	SR 53 to N. Spruce Grove	12,978	83	0	17	2.0%	1.0%	55	100	0	57	123	266	66.4
3	SR 29	N. Spruce Grove to S. Spruce Grove	12,863	83	0	17	2.0%	1.0%	55	100	0	57	123	264	66.3
4	SR 29	S. Spruce Grove to Hidden Valley	13,805	83	0	17	2.0%	1.0%	55	200	0	60	129	277	62.1
5	SR 29	Hidden Valley to Hartmann	13,696	83	0	17	2.0%	1.0%	55	190	0	59	128	275	62.4
6	SR 29	Hartmann to Grange	15,690	83	0	17	2.0%	1.0%	55	400	0	65	140	302	58.2
7	SR 29	Grange to Butts Canyon	14,906	83	0	17	2.0%	1.0%	55	200	0	63	135	291	62.5
8	SR 29	Butts Canyon to Wardlaw	14,690	83	0	17	2.0%	1.0%	45	100	0	44	96	206	64.7
9	SR 29	Wardlaw to Young	13,213	83	0	17	2.0%	1.0%	30	70	0	24	51	110	62.9
10	SR 29	Young to Main	13,247	83	0	17	2.0%	1.0%	30	50	0	24	51	110	65.1
11	SR 29	Maint to Armstrong	10,950	83	0	17	2.0%	1.0%	30	50	0	21	45	97	64.3
12	SR 29	Armstrong to Douglas	10,923	83	0	17	2.0%	1.0%	30	50	0	21	45	96	64.3
13	SR 29	Douglas to Callayomi	10,659	83	0	17	2.0%	1.0%	30	50	0	20	44	95	64.2
14	SR 29	Callayomi to Lake	10,548	83	0	17	2.0%	1.0%	45	50	0	36	77	165	67.8
15	SR 29	Lake to Central Park	10,508	83	0	17	2.0%	1.0%	50	150	0	42	91	196	61.8
16	SR 29	South of Central Park	10,572	83	0	17	2.0%	1.0%	50	75	0	42	92	197	66.3
17	SR 29	West of SR 53	8,862	83	0	17	2.0%	1.0%	50	90	0	38	81	175	64.3
18	Morgan Valley Road	East of SR 53	3,261	88	0	12	1.0%	0.5%	45	50	0	13	28	61	61.3
19	N. Spruce Valley Road	East of SR 53	1,359	88	0	12	1.0%	0.5%	35	75	0	5	10	22	52.1
20	S. Spruce Valley Road	East of SR 53	2,835	88	0	12	1.0%	0.5%	40	60	0	10	21	45	58.2
21	Hidden Valley Road	East of SR 53	3,176	88	0	12	1.0%	0.5%	35	40	0	8	18	39	59.8
22	Hartmann Road	East of SR 53	5,090	88	0	12	1.0%	0.5%	45	130	0	18	38	82	57.0
23	Grange Road	East of SR 53	183	88	0	12	1.0%	0.5%	45	90	0	2	4	9	45.0
24	Butts Canyon Road	SR 29 to Black Oak Hill	8,437	88	0	12	1.0%	0.5%	55	120	0	36	77	165	62.1
25	Butts Canyon Road	Black Oak Hill to Oat Hill	8,471	88	0	12	1.0%	0.5%	55	100	0	36	77	166	63.3
26	Butts Canyon Road	East of Oat Hill	8,207	88	0	12	1.0%	0.5%	55	400	0	35	75	162	54.1
27	SR 175	SR 29 to Santa Clara	4,690	88	0	12	9.0%	1.4%	35	60	0	16	34	74	61.3
28	SR 175	West of Santa Clara	4,777	83	0	17	9.0%	1.4%	45	60	0	26	56	120	64.5
29	Pope Valley Road	West of Howell Mountain	2,668	83	0	17	1.0%	0.5%	50	160	0	16	34	74	54.9
30	Tubbs Road	South of SR 29	3,765	88	0	12	1.0%	0.5%	50	175	0	18	38	81	55.0
31	Tubbs Road	North of SR 128	2,839	88	0	12	1.0%	0.5%	50	60	0	15	31	67	60.8

APPENDIX NOP

NOP COMMENT LETTERS

California
Department of Conservation
Division of Land Resource Protection

Gavin Newsom, Governor
David Bunn, Director

May 8, 2019

VIA EMAIL: GUENOCVALLEYCOMMENTS@LAKECOUNTYCA.GOV
Ms. Michalyn DelValle
Community Development Director
255 N. Forbes Street
Lakeport, CA 95453

Dear Ms. DelValle:

NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE GUENOC VALLEY MIXED-USE PLANNED DEVELOPMENT PROJECT,

The Department of Conservation's (Department) Division of Land Resource Protection (Division) has reviewed the Notice of Preparation of a Draft Environmental Impact Report for the Guenoc Valley Mixed-Use Planned Development Project. The Division monitors farmland conversion on a statewide basis and administers the Williamson Act and other agricultural land conservation programs. We offer the following comments and recommendations with respect to the proposed project's potential impacts on agricultural land and resources.

Project Description

The proposed project consists of the development of a master planned mixed-use resort community within the 16,000-acre Guenoc Valley Ranch property in southeast Lake County. Proposed land uses include a destination luxury resort, consisting of five hotels, resort residential units, single family residential villas/estates and recreational facilities, as well as commercial centers (i.e. the Farmstead Compound), modified agricultural production, and associated supporting infrastructure. Proposed outdoor recreational and resort amenities include two wineries, a wellness center and spa, golf course, equestrian facilities, polo grounds, and wilderness camp.

Other undeveloped areas of the project site will continue to be rural lands and will remain in managed grazing which is an integral part of the fire management plan being developed for the site along with an on-site fire station. Project components would be developed over multiple phases. The first phase would be constructed in the near-term (approximately the next ten years) and would be analyzed in the Draft EIR at a project level. Future phases will be built out based on market demands and the Draft EIR will analyze these on a programmatic level.

Department Comments

The Department recommends the following discussion under the Agricultural Resources section of the Environmental Impact Report:

- Type, amount, and location of farmland conversion resulting directly and indirectly from implementation of the proposed project.
- Impacts on any current and future agricultural operations in the vicinity; e.g., land-use conflicts, increases in land values and taxes, loss of agricultural support infrastructure such as processing facilities, etc.
- Incremental impacts leading to cumulative impacts on agricultural land. This would include impacts from the proposed project, as well as impacts from past, current, and likely future projects.
- Proposed mitigation measure for all impacted agricultural lands within the proposed project area.

Although direct conversion of agricultural land is often an unavoidable impact under CEQA analysis, mitigation measures must be considered. In some cases, the argument is made that mitigation cannot reduce impacts to below the level of significance because agricultural land will still be converted by the project, and therefore, mitigation is not required. However, reduction to a level below significance is not a criterion for mitigation under CEQA. Rather, the criterion is feasible mitigation that lessens a project's impacts.

All mitigation measures that are potentially feasible should be considered. A measure brought to the attention of the Lead Agency should not be left out unless it is infeasible based on its elements. The Department suggests that the County consider the adoption of an agricultural land mitigation program that will effectively mitigate the conversion of agricultural land.

Agricultural Mitigation Program

Agricultural conservation easements are an available mitigation tool that the County should consider. The Department highlights easements as a mitigation tool because of their acceptance and use by lead agencies as an appropriate mitigation measure under CEQA and because they follow an established rationale similar to that of wildlife habitat mitigation.

Programs that establish agricultural conservation easements and in-lieu fees for mitigation banking are most effective at conserving comparable quality agricultural land when the easement requirements or fees are determined concurrent with project approval. Should significant time elapse between initial approval and the applicant's receipt of a building or grading permit, conflict may arise over the agricultural quality or value of the land being converted.

Mitigation via agricultural conservation easements can be implemented by at least two alternative approaches: the outright purchase of easements or the donation of mitigation fees to a local, regional, or statewide organization or agency whose purpose

includes the acquisition and stewardship of agricultural conservation easements. The conversion of agricultural land should be deemed an impact of at least regional significance. Hence, the search for replacement lands should not be limited strictly to lands within the project's surrounding area.

A source that has proven helpful for regional and statewide agricultural mitigation banks is the California Council of Land Trusts. They provide helpful insight into farmland mitigation policies and implementation strategies, including a guidebook with model policies and a model local ordinance. The guidebook can be found at:

http://www.calandtrusts.org/resources/conserving-californias-harvest/

Another source is the Division's California Farmland Conservancy Program (CFCP), which has participated in bringing about conservation easements throughout the State of California involving many California land trusts. Any other feasible mitigation measures should also be considered.

Conclusion

Thank you for giving us the opportunity to comment on the Notice of Preparation of a Draft Environmental Impact Report for the Guenoc Valley Mixed-Use Planned Development Project. Please provide this Department with notices of any future hearing dates as well as any staff reports pertaining to this project. If you have any questions regarding our comments, please contact Farl Grundy, Environmental Planner at (916) 324-7347 or via email at Farl.Grundy@conservation.ca.gov.

Sincerely,

Monique Wilber

Monique Wilber
Conservation Program Support Supervisor

Callayomi County Water District

Mark Roberts

From: Byron Turner
Sent: Tuesday, May 14, 2019 5:04 PM
To: Bibiana Alvarez
Cc: Mark Roberts
Subject: FW: Notice of Preparation of an EIR for the proposed Guenoc Valley Mixed Use-Planned Development
Attachments: Notice of Preparation of an EIR for the proposed Guenoc Valley Mixed Use-Planned Development.pdf

Importance: High

From: John Hamner [mailto:ccwdhamner@att.net]
Sent: Monday, May 13, 2019 12:32 PM
To: Guenocvalleycomments - Email <Guenocvalleycomments@lakecountyca.gov>
Cc: 'Laura Pimentel' <ccwdlaura@att.net>
Subject: RE: Notice of Preparation of an EIR for the proposed Guenoc Valley Mixed Use-Planned Development
Importance: High

Mr. Roberts,

This project topic was placed on the agenda for the May 9, 2019 regular board meeting of the Callayomi County Water District (CCWD) for discussion. The CCWD has no comments on the proposed project on "Section 1 the Guenoc Valley Site". However, we do have comments on section "2.2 Proposed off-site workforce housing site located in Middletown" and all sections associated with Section 2.2.

- Throughout the document there are references to unnamed new water sources. The CCWD is opposed to any new public drinking water wells that may affect the CCWD current and future water sources.

- The State Water Resources Control Board, Drinking Water Division (DDW) oversees all public water systems in California. What is being proposed are new public water systems. The DDW has been promoting public drinking water systems throughout the state to consolidate when possible. The offsite workforce housing site in Middletown would be considered a public water system based on the number of homes/people served. Since this newly proposed public water system is located next to an existing public water system, it is unlikely that this new system would secure the DDW permit required by law to be a public water system. The DDW will most likely recommend that the proposed off-site workforce housing site located in Middletown approach the CCWD regarding connecting to the CCWD public water system.

Assuming that the CCWD would be approached regarding this project, the entity would be required to meet certain requirements.

- The Local Agency Formation Commission (LAFCO) is tasked with ensuring that public entities adhere to state laws regarding municipality expansion. The CCWD would require this "subdivision" to be annexed into the District, at the cost of the developer.

- The CCWD would need to provide the developer with a "Will Serve Letter". This would required that all water system components (pipes, valves, hydrants etc.) installed by the developer meet CCWD standard. It would also

need to be determined if the impact on the CCWD system capacity were impacted by the CCWD engineer. If the capacity impact is determined to be substantial, we could require improvements to our water supply system.

Regards,

John Hamner
General Manager
Callayomi County Water District
707-987-2180

From: Mark Roberts <Mark.Roberts@lakecountyca.gov>
Sent: Tuesday, April 23, 2019 5:50 PM
To: Doug Gearhart <dougg@lcaqmd.net>; elizabethk@lcaqmd.net; Ryan Lewelling <Ryan.Lewelling@lakecountyca.gov>; Richard Ford <Richard.Ford@lakecountyca.gov>; Mary Jane Montana <MaryJane.Montana@lakecountyca.gov>; Kelli Hanlon <Kelli.Hanlon@lakecountyca.gov>; Craig Wetherbee <Craig.Wetherbee@lakecountyca.gov>; Lars Ewing <Lars.Ewing@lakecountyca.gov>; Scott DeLeon <Scott.DeLeon@lakecountyca.gov>; Todd Mansell <Todd.Mansell@lakecountyca.gov>; Gloria Gregore <Gloria.Gregore@lakecountyca.gov>; Brian Martin <Brian.Martin@lakecountyca.gov>; Chris Macedo <Chris.Macedo@lakecountyca.gov>; Lori Baca <Lori.Baca@lakecountyca.gov>; Gordon Haggitt <Gordon.Haggitt@lakecountyca.gov>; Greg Peters <Greg.Peters@lakecountyca.gov>; lmccollough@candswaste.com; David Cowan <David.Cowan@lakecountyca.gov>; Yuliya Osetrova <Yuliya.Osetrova@lakecountyca.gov>; spekaj@dow-associates.com; laketransit@comcast.net; ccwdhamner@att.net; dave.munch@fire.ca.gov; Melissa.M.France@usace.army.mil; Ryan_olah@fws.gov; Kelsey.Vella@wildlife.ca.gov; Leishara.Ward@dot.ca.gov; Christopher.Brooks@dot.ca.gov; nwic@sonoma.edu; ron.parsons@parks.ca.gov; centralvalleysac@waterboards.ca.gov; helpline@arb.ca.gov; R2CEQA@wildlife.ca.gov; DLRP@conservation.ca.gov; Sheri.Miller@waterboards.ca.gov; Sheri.Miller@waterboards.ca.gov; mike.wink@fire.ca.gov; lcfrmbureau@sbcglobal.net; dave.rosenthal@sbcglobal.net; robert@mtkonoctiwines.com; president@redbudaudubon.org; vbrandon@lakelive.info; mathtownhall@gmail.com; bill.solinsky@fire.ca.gov; centralvalleysac@waterboards.ca.gov; nwic@sonoma.edu; Steven Hajik <Steven.Hajik@lakecountyca.gov>; Kelli Hanlon <Kelli.Hanlon@lakecountyca.gov>
Cc: Michalyn DelValle <Michalyn.DelValle@lakecountyca.gov>; Byron Turner <Byron.Turner@lakecountyca.gov>
Subject: Notice of Preparation of an EIR for the proposed Guenoc Valley Mixed Use-Planned Development
Importance: High

Good Afternoon Agencies,

This email is in regards to the Notice of Preparation of an Environmental Impact Report (EIR) for the proposed Guenoc Valley Mixed Use-Planned Development. The above attachment is a detailed Notice of Preparation Packet regarding the proposed use for you to review and provide the necessary comments. Please keep in mind, the commenting period is from April 23, 2019 through May 23, 2019. If you have any questions, please let me know.

Sincerely,

Mark Roberts – Senior Planner

Lake County – Community Development Department
255 N. Forbes Street, Lakeport, CA 95453
County Website: www.lakecountyca.gov
Phone: (707) 263-2221

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David Morrison
Director

RECEIVED

MAY 28 2019

LAKE COUNTY COMMUNITY
DEVELOPMENT DEPT.

May 23, 2019

Michalyn DelValle
Community Development Director
County of Lake
255 N. Forbes Street
Lakeport, CA 95453

RE: **GUENOC VALLEY MIXED-USE PLANNED DEVELOPMENT**
Response to Notice of Preparation

Dear Ms. DelValle:

Thank you for the opportunity to comment on the Notice of Preparation (NOP) for the Environmental Impact Report (EIR) that will be prepared for the Guenoc Valley Mixed-Use Development in southern Lake County. A substantial portion of the project's southeastern boundary is the Lake/Napa County border. The applicant's property holdings also extend into Napa County beyond the project boundary shown in the NOP's site plan. It is unclear from the materials included in the NOP whether any of the existing legal lots lying on the Lake/Napa border span both counties, and whether any of the proposed development will occur within Napa County. Napa County requests additional detail on the scope of the project in order for Napa County to determine our extent of jurisdiction over the project:

1. Please either upload all current application materials to the project's webpage or mail a complete copy, including the proposed tentative map, planned development plans, and civil plans including proposed grading, drainage, and utility improvements including water and sewage systems.

2. Please provide groundwater well locations as noted on pages 10 and 13 of the NOP.

3. Please provide the location and extent of any road/circulation network improvements that may be proposed within Napa County.

4. Please provide the location and extent of any power grid improvements, including the location of alternative energy production facilities noted on page 7 of the NOP such as the off-site solar generate project.

Napa County requests the following items be addressed within the Draft EIR:

1. Project Description

a. General Plan Amendment – Detail the extent of proposed policy and exhibit/map amendments to the Lake County General Plan.
b. The EIR project description and exhibits should identify all improvements and subdivision boundaries occurring within Napa County, and/or describe the degree of setbacks proposed from the Napa County boundary.
c. Off-site Improvements – Provide details on the extent of all off-site improvements that may occur within Napa County.
d. Upper Bohn Reservoir Improvements and Uses – Approximately half of Upper Bohn Reservoir lies within Napa County. Pages 7 and 8 of the NOP project description note several improvements and resort uses intended for the water body. The EIR project description should described the extent of improvements and recreation activities intended to occur within Napa County.
e. Water/Wastewater Systems Improvements – There are several vineyard tracts within Napa County that are owned by the project applicant, and which are generally adjacent to the proposed project. The NOP project description notes that potable water, irrigation water, recycled water, and wastewater systems will be extended throughout the project site. The EIR project description should describe the extent of water and wastewater improvements proposed within Napa County, or if no improvements will occur within Napa County, describe the design features that preclude connectivity with the applicant's Napa County developments.

2. Air Quality – Air Quality modeling and analysis should evaluate changes to air quality within Napa County. Napa County lies within the Bay Area Air Quality Management District (BAAQMD), so the EIR should considered BAAQMD thresholds in addition to Lake County Air Quality Management District Thresholds.

3. Biological Resources – The EIR should consider the project's potential to impact biological resources within Napa County. Napa County's Conservation Regulations (Napa County Code Chapter 18.108) will apply to any improvements or land uses occurring within Napa County. For example, improvements occurring within Napa County's portion of Upper Bohn Reservoir would be subject to these Conservation Regulations. The EIR should evaluate the project potential to impact wildlife movement corridors between Lake and Napa Counties.

4. Cultural and Tribal Resource – There are cultural resource sites within Napa County that are in close proximity to the project. The EIR should evaluate the project's potential to impact these resources.

5. Airport Land Use Compatibility – The EIR should evaluate the frequency and characteristics of overflights occurring within Napa County as a result of the proposed new airport and helipads. The EIR should evaluate the project's potential to result in noise, safety, airspace protection, and overflight impacts within Napa County. The State Aeronautic Act requires Lake County Airport Land Use Commission review of any proposal for a new airport (Public Utilities Code 21661.5). Airport land use compatibility measures within Napa County are under the jurisdiction of the Napa County Airport Land Use Commission.

6. Hydrology and Water Quality – The entire project site lies within stream basins that drain into Napa County to Lake Berryessa. Surface water and ground water modeling should evaluate the project's potential to impact surface and groundwater resources within Napa County, including potential impacts to water quality. Approximately 3.5 miles from the project site is the Berryessa Estates Subdivision which sources potable water from Putah Creek just downstream from its confluence with Butts Creek, both of which drain the project site. The EIR should evaluate the project's potential to impact was quality and quantity at the Berryessa Estates Subdivision.

7. Land Use and Planning – Any project improvements or uses occurring within Napa County, including subdivision of any legal lots of record lying within both Lake and Napa Counties, is subject to the Napa County jurisdiction. For project features within Napa County, the EIR should evaluate the project consistency with all applicable Napa County General Plan land use policies and supporting regulations.

8. Noise – The location of outdoor amphitheater and areas intended for amplified music not shown in the NOP's site plan. The EIR should analyze potential noise impacts to impact sensitive noise receptors in Napa County, including wildlife.

9. Population and Housing – The EIR should evaluate the project's potential to induce housing and other growth within Napa County.

10. Public Services – The EIR should evaluate the project's potential to affect public services provided by Napa County.

11. Transportation – The EIR should evaluate the project's potential to result in significant traffic impacts within Napa County, both in terms of project-specific impacts and the project's contribution to cumulative impacts. With Napa County, the project is likely to result in increases in traffic generation on Butts Canyon Road including the street network within Pope Valley that feeds into Butts Canyon Road, and on State Route 29 including the street network feeding into State Route 29 in the vicinity of Calistoga. Traffic modeling within Napa County should rely on the regionally-compliant Solano-Napa Travel Demand Model.

12. Utilities and Service Systems – The EIR Should evaluate the project's potential to affect utilities within Napa County, including identification of any improvements to utility systems within Napa County. Please identify how natural gas will be provided to the project.

13. Wildfire – The EIR should evaluate the project's potential to impact Napa County's emergency response operations. The Initial Study notes that Lake County's emergency operations and local hazard mitigation plans were recently updated, and finds that the project will not impair implementation of those plans. Given the large scale of this project, and its generally remote location, Napa County urges reconsideration of this conclusion. Both the emergency operations plan and local hazards mitigation plan are likely impacted by a project of this scale at this location. As you aware, significant portions of the subject property burned in the Butts Fire (2018) and the Valley Fire (2014). The scale of the Valley Fire overwhelmed Lake County's emergency response capabilities. Hundreds of Lake County residents were sheltered at the Calistoga Fairgrounds beyond capacity, and resulting in Napa County declaring an emergency in response to the refugee crisis. The fairgrounds would not have been able to handle more refugees had this development already existed.

14. Wildfire - Page 13 of the NOP states that a fire management plan is being developed that will include strategic fire breaks and other management measures. The EIR should address whether any of those measures will be located within Napa County, or result in changes to the physical environment in Napa County.

The intent of these comments is to outline the sufficiency of the environmental review document in identifying and analyzing the possible impacts to Napa County, and the ability Napa County to utilize the document in reviewing and issuing any associated permits necessary for project implementation.

Napa County thanks you for providing an opportunity to review and comment on the NOP, and eventually the Draft EIR. Please add my contact information to the mailing/email list for future noticing on this project. If you should have any questions regarding any of the items listed above, please feel free to contact me at your convenience at 707-299-1354 or john.mcdowell@countyofnapa.org.

Sincerely,

John McDowell

John McDowell
Principal Planner

Cc: Minh Tran, Napa County CEO
David Morrison, Director of Planning, Building and Environmental Services
Steve Lederer, Director of Public Works

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May 21, 2019

State Clearinghouse
State.Clearinghouse@opr.ca.gov
PO Box 3044
Sacramento, CA 95812-3044

CEQA Project: **SCH# 2019049134**
Lead Agency: **County of Lake – Community Development Department**
Project Title: **Guenoc Valley Mixed-Use Planned Development Project**

The Division of Oil, Gas, and Geothermal Resources (Division) oversees the drilling, operation, maintenance, and plugging and abandonment of oil, natural gas, and geothermal wells. Our regulatory program emphasizes the wise development of oil, natural gas, and geothermal resources in the state through sound engineering practices that protect the environment, prevent pollution, and ensure public safety. Northern California is known for its geothermal energy fields, and as such, division staff have reviewed the above referenced documents depicting the proposed project. A Notice of Preparation of an Environmental Impact Report for the proposed Guenoc Valley Mixed-Use Planned Development Project has been submitted to The County of Lake – Community Development Department. The purpose of this project is to develop a master planned mixed-use resort and residential community within the 16,000-acre Guenoc Valley Ranch property. The project requires an amendment to the General Plan and Special Study Area, a Zoning Ordinance amendment, a land use rezoning, Tentative Subdivisions Maps, a General Plan of Development, a Development Agreement, and Environmental Impact Report, Grading permits, and a Tentative Subdivision Map for off-site workforce housing.

Division staff have reviewed the documents describing the proposed project area. Approximately twenty-three known plugged and abandoned shallow geothermal temperature gradient wells are located within the proposed project area. The Well Location Map below shows these plugged and abandoned wells. A final letter was issued indicating these shallow temperature gradient wells were abandoned to standard at that time. As these were shallow temperature gradient wells, a 1" to 1 ½" pipe was installed in the well to measure temperatures. Abandonment included the placing of a surface plug in the well bore and restoration of the well location. The

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twenty-three wells, in no particular order, are referred to as the "**GR" 19, API#: 03390309, "GR" 14, API#: 03390270, "GR" 23, API#: 03390313, "GR" 20, API#: 03390310, "GR" 24, API#: 03390314, "GR" 12, API#: 03390269, "GR" 46, API#: 03390335, "GR" 26, API#: 03390316, "GR" 30, API#: 03390319, "GR" 26, API#: 03390316, "GR" 43, API#: 03390332, "GR" 44, API#: 03390333, "GR" 10, API#: 03390267, "GR" 8, API#: 03390265, "GR" 41, API#: 03390544, "GR" 40, API#: 03390329, "GR" 9, API#: 03390266, "GR" 31, API#: 03390320, "71" 31, API#: 055900708, "GR" 36, API#: 03390325, "GR" 6, API#: 03390264, "GR" 2, API#: 03390262, and "GR" 1, API#03390261.**

The Division has conducted a records and map review within the proposed project boundary but not an on-site evaluation of any known geothermal wells located within the project boundary.

For future reference, you can review geothermal wells located on private and public land at the Division's website: https://www.conservation.ca.gov/dog/geothermal/geosteam.

The local permitting agencies and property owner should be aware of, and fully understand, that significant and potentially dangerous issues may be associated with development near oil and gas, or geothermal wells. These issues are non-exhaustively identified in the following comments and are provided by the Division for consideration by the local permitting agency, in conjunction with the property owner and/or developer, on a parcel-by-parcel or well-by-well basis. As stated above, the Division provides the above well review information solely to facilitate decisions made by the local permitting agency regarding potential development near a geothermal well.

1. If, during the development of this proposed project, **any unknown geothermal well(s) is/are discovered**, the Division should be notified immediately so that the newly-discovered well(s) can be incorporated into the records and investigated. The Division recommends that any wells found during this project, and any pertinent information obtained after the issuance of this letter, be communicated to the appropriate county recorder for inclusion in the title information of the subject real property. This is to ensure that present and future property owners are aware of (1) the wells located on the property, and (2) potentially significant issues associated with any improvements near geothermal wells.
2. No well work may be performed on any low or high temperature geothermal well without written approval from the Division in the form of an appropriate permit. This includes, but is not limited to, mitigating leaking fluids or gas from abandoned wells, modifications to well casings, and/or any other re-abandonment work. (NOTE: The Division regulates the depth of any well below

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final grade (depth below the surface of the ground). Title 14, section 1981 of the California Code of Regulations states that all well casings shall be cut off at least 6 feet below grade. If any well needs to be lowered or raised (i.e. casing cut down or casing riser added) to meet this grade regulation, a permit from the Division is required before work can start.)

Sincerely,

DocuSigned by:
Charlene L Wardlow
-087E7BD5EA114A7...

Charlene L Wardlow
Northern District Deputy

Attachment: Project Map

cc: Mark Roberts
guenocvalleycomments@lakecountyca.gov

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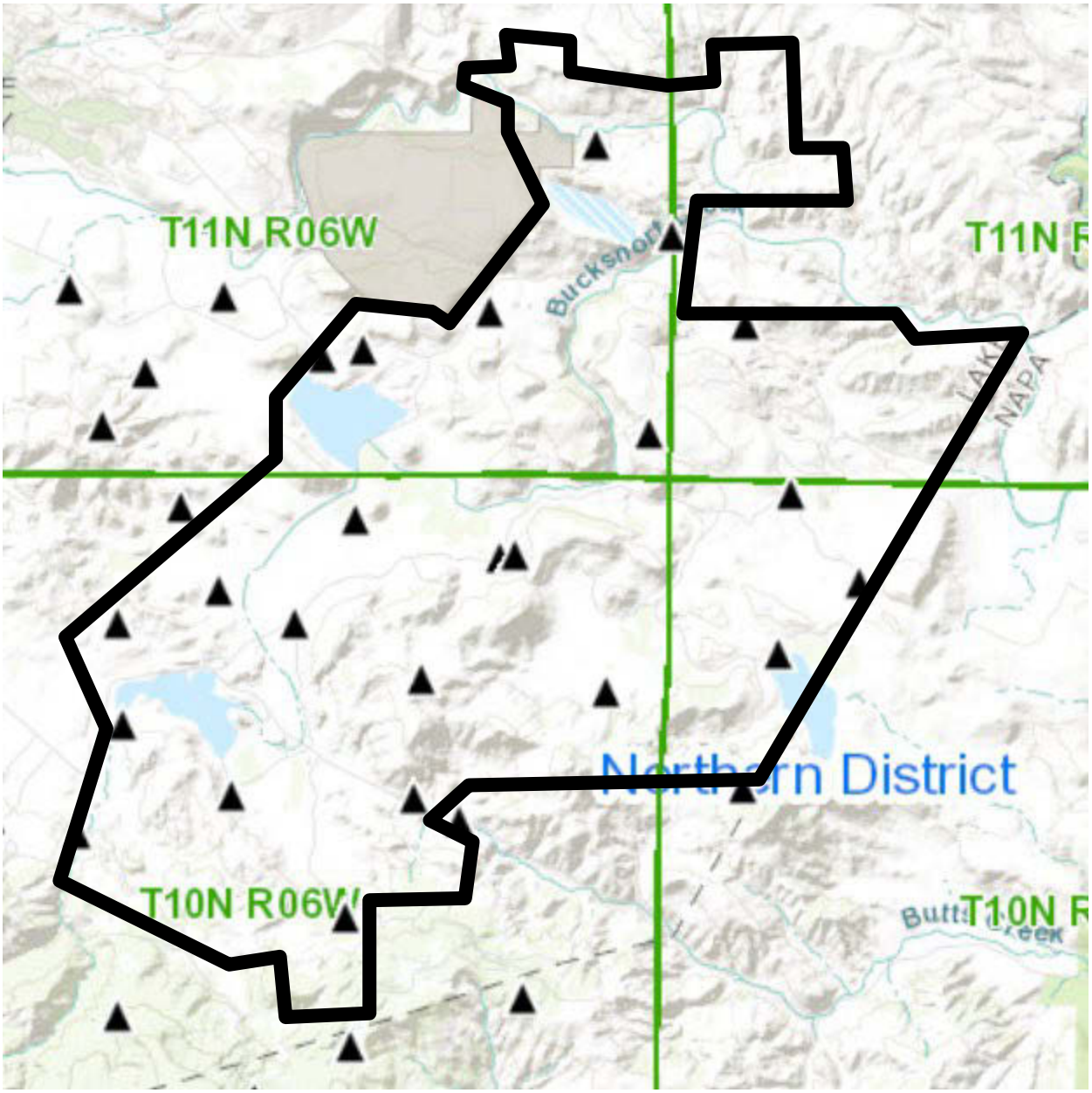
Project Boundaries are approximate.



[sent 05/22/2019, sent from the e-mail Sheri.Miller@waterboards.ca.gov]

The State Water Resources Control Board, Division of Drinking Water offers the following comment regarding the proposed "Guenoc Valley Mixed-Use Planned Development Project:

The proposed project requires a domestic water supply permit from the State Water Board prior to delivering water for public use. As the proposal will create a new public water system, the applicant will need to comply with the California Health and Safety Code which requires the applicant submit a preliminary technical report no later than seven days after submission of an application to the county for a building permit for any water-related improvement. If the report is approved by the State Water Board, the applicant can then apply for a water supply permit. For the preliminary technical report, the applicant will need to communicate with the County's Local Area Formation Commission and request water service from all public water systems within a three-mile radius to determine if water service can be provided from an already existing utility.

https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Permits.html

Sheri Miller, P.E.

Mendocino District Engineer

Division of Drinking Water

State Water Resources Control Board

50 D Street, Suite 200

Santa Rosa, CA 95404

707-576-2734 desk

707-576-2145 office

707-974-8004 cell

Mark Roberts

From: Lori Baca
Sent: Friday, May 17, 2019 4:09 PM
To: Mark Roberts
Subject: RE: Notice of Preparation of an EIR for the proposed Guenoc Valley Mixed Use-Planned Development
Attachments: CapAnalysisPolicy_001.pdf

Mark,

The proposed project site at 22000 Butts Canyon Road is outside any Special District service areas, no impact.

However, the proposed Off-Site Workforce Housing site at 21000 Santa Clara Road/ APN 014-380-09 in Middletown is within our Assessment District 2-2 LACOSAN Middletown Sewer service are. It is within Floodway Fringe and has not been assessed for sewer service.

Projects of four single family dwelling equivalent units or greater will require the submittal of a Capacity Analysis/Hydraulic Model Policy. The analysis is to be prepared by a licensed civil engineer and will be reviewed and approved by the District. Please see the attached Capacity Analysis/Hydraulic Model Policy for your review.

Also, before the issuance of any building permits, Capacity Expansion fees as well as Buy-In fees per single family equivalent will be due and paid to the District. Current fees are listed below:

Buy-In Fee per SFD equivalent is $1,974.70

Capacity Expansion Fee per SFD equivalent is currently $5,229.94

(50% of the Capacity Expansion fee is due for units 720 square feet or less)

The Capacity Expansion Fee increases by the Consumer Price Index at the beginning of every calendar year.

****Connections to LACOSAN will be made in accordance with the rules, regulations, policies, and procedures and ordinances in effect at the time of application****

If you have any questions please do not hesitate to call me.

Lori A. Baca, CTA
Customer Service Coordinator
Lori.Baca@lakecountyca.gov
Office Number (707) 263-0119
Fax (707) 263-3836

COUNTY OF LAKE
SPECIAL DISTRICTS ADMINISTRATION
230 N. Main Street
Lakeport, California 95453
Telephone 707/263-0119
Fax 707/263-3836

Jan Coppinger
Special Districts Administrator

CAPACITY ANALYSIS/HYDRAULIC MODEL POLICY

Special Districts maintains four wastewater treatment facilities and five water systems. Each system is unique so far as when it was constructed, treatment methods and available capacity to serve new development.

The District requires that developers wishing to construct four single-family equivalent units or more, submit a capacity analysis to the District for review. Please note that in the area served by the **Southeast Regional Wastewater and Northwest Regional Treatment Facilities, the number of proposed single-family dwelling equivalent units that require the submittal of an analysis, is twenty.** The analysis is to be prepared by a licensed civil engineer and will examine water distribution, storage and treatment as well as sewer collection, pumping and treatment as is applicable to the project area. The purpose of the analysis is to identify deficiencies, (if any) in the system(s) from the project site to the treatment plant(s).

The developer will be required to reimburse the District for hours billed by Department of Public Works engineering staff and/or the District's engineering consultant for review of the Capacity Analysis. The developer will also be required to mitigate impacts to the collection and/or distribution system(s) specifically attributable to the project and as identified in the approved Capacity Analysis. Once approved, A Capacity Analysis shall remain in effect and valid for a period not to exceed two (2) years, unless an extension is granted by the Administrator.

Please note that for development in the area served by LACOSAN from Lower Lake to Clearlake Park, as well as from Beach Street to Paradise Valley, hydraulic models are available. The developer provides a project description, the information from which is "plugged into" the model and an analysis is provided to the developer for a fee. (revised 7/2/09)

Connections to all District maintained water and/or sewer systems will be made in accordance with the rules, regulations, policies, procedures and ordinances in effect at the time of connection application.

Jan Coppinger — 8-22-18

Special Districts Administrator — Date

s/Mark Dellinger 12/10/03 r 7/27/05 r 8/12/05 r 3/23/10 Res. No. 2010-60 r 5/25/11 r 8/22/18 s/Jan Coppinger.

COUNTY OF LAKE
PUBLIC WORKS DEPARTMENT
Courthouse - 255 N. Forbes Street
Lakeport, California 95453
Telephone 707/263-2341
Fax 707/263/7748

Scott De Leon
Public Works Director

May 17, 2019

Ms. Michalyn DelValle
Community Development Department Director
255 N. Forbes Street
Lakeport, CA 95453

Subject: Notice of Preparation of an Environmental Impact Report for the proposed Guenoc Valley Mixed-Use Planned Development Project

Dear Ms. DelValle,

Thank you for the opportunity to review and comment on the Notice of Preparation for an Environmental Impact Report for the Guenoc Valley Mixed-Use Planned Development Project. The proposed project consists of the development of a master planned mixed-use resort and residential community within the 16,000-acre Guenoc Valley Ranch property near Middletown and an off-site workforce housing in central Middletown. Access to the site is provided by SR 29 via Butts Canyon Road, a County Maintained Road. The off-site workforce housing is provided by SR 175 via Santa Clara Road, also a County Maintained Road.

The Lake County Department of Public Works is a responsible agency on this project and has the following comments:

1. Please include a traffic impact analysis that will show how the proposed project will impact the safety, capacity and maintenance of Butts Canyon Road and Santa Clara Road. There are three short segments along Butts Canyon Road where, due to either horizontal alignment issues and/or lack of adequate recovery areas, the collision rates exceed the average collision rates for similar facilities statewide. Please contact this Department for the specific locations.

2. Consider non-regulatory traffic control measures including roundabouts and other traffic calming measures along Butts Canyon Road at project access points rather than regulatory signs and/or traffic signals.

3. Include a walkability analysis for the off-site workforce housing facility to identify improvements needed for residents of the workforce housing to safely walk or bike to businesses and schools within the Middletown area.

4. In consideration of any future development, no additional surface runoff is allowed to be discharged into county drainage facilities.

5. Improvement plans and a cost estimate prepared by a registered Civil Engineer will be required for construction of any road improvements within the existing County right of way or proposed public right of way. A signed Inspection Agreement and a deposit of 2% of the engineers cost estimate will need to be submitted to the Department of Public Works prior to plan review.

Please continue to keep us informed of this project as it progresses. If you have any questions please do not hesitate to contact me at the number above.

Sincerely,

Scott De Leon, Director

SD:tm

DEPARTMENT OF TRANSPORTATION
DISTRICT 1, P.O. BOX 3700
PHONE (707) 441-4693
FAX (707) 445-6314
TTY 711
www.dot.ca.gov

Making Conservation a California Way of Life.

May 23, 2019

1-LAK-29-6.36
Guenoc Valley Mixed-Use NOP

Ms. Michalyn DelValle, Director
Community Development Department
County of Lake
255 N. Forbes Street
Lakeport, CA 95453

Dear Ms. DelValle:

Thank you for giving us the opportunity to comment on the Notice of Preparation (NOP) of an Environmental Impact Report (EIR) for the proposed Guenoc Valley Mixed-Use Planned Development Project. The proposed development consists of a master planned mixed-use resort and residential community within the 16,000-acre Guenoc Valley Ranch property. The luxury destination resort consists of five hotels with up to 400 rooms/units, and up to 450 fractional ownership units, 1400 residential estate villas, 500 workforce housing units, recreational facilities, agricultural facilities and accessory uses. Workforce housing for employees is proposed to be located off-site at 21000 Santa Clara Road in Middletown. The primary access to the Guenoc Valley Ranch is from State Route 29 via Butts Canyon Road with a secondary access at Grange Road. We have the following comments:

- The Notice of Preparation for the project EIR states that the County will prepare a Traffic Impact Analysis (TIA) for the proposed project, which will address the potential impacts to surrounding roadways and include an evaluation of bicycle travel, pedestrian travel, and emergency access. We request that the TIA include the intersection of State Route 29 with Grange Road, Butts Canyon Road, Wardlaw Street, and State Route 175 among the surrounding roadways analyzed.

- The Traffic Impact Analysis is proposed to include an analysis of "overall Vehicle Miles Traveled" (VMT). If the County has not already established a threshold of significance for VMT, it is unclear whether any impacts can or will be identified. The State has set a target of reducing VMT Statewide by 15%. We recommend that the traffic analysis evaluate VMT per capita for the region (Lake County or Middletown, if data is available) as well as VMT (per capita) generated by the development. If the project does not help to achieve the Statewide goal of a 15% VMT reduction, we recommend that the resort provide mitigation that will help to reduce project VMT. Potential mitigation could include offering a shuttle service for employees and guests, electric vehicle parking for visitors and electric service vehicles, rental or loaner bikes, and robust pedestrian amenities.

- Any work performed within Caltrans right of way, including intersection improvements or surveying and traffic studies, requires an approved Caltrans Encroachment Permit. Prior to permit application submittal, the applicant is required to attend a pre-submittal meeting with the Caltrans Encroachment Permits staff in Ukiah. For more information or to request an encroachment permit, please contact Amber McCall or Jim Shupe at the Ukiah Permits Office at 707-463-4743. For future reference, the Caltrans Encroachment Permit is available online at: <http://www.dot.ca.gov/trafficops/ep/manual.html>.

Feel free to contact Rex Jackman at (707) 445-6412 or myself, at (707) 441-4693 with questions or for further assistance.

Sincerely,

JESSE ROBERTSON
Transportation Planning
District 1 Caltrans

e-copy: Amber McCall, Caltrans Encroachment Permits (Ukiah)
Jim Shupe, Caltrans Encroachment Permits (Ukiah)

Byron Turner

From: Robinson, Talmadge (Tal)@Wildlife <Talmadge.Robinson@Wildlife.ca.gov>
Sent: Monday, May 6, 2019 11:43 AM
To: Guenocvalleycomments - Email
Cc: Wildlife R2 CEQA
Subject: Guenoc Valley Mixed-Use Planned Development Project CEQA Review

Ms. DeValle,

After review of the Initial Study Checklist, my only comment is that I will be the primary contact at CDFW for this project for CEQA review and Lake and Streambed Alteration agreements (until further notice). If you have any questions as the EIR is written or as the project has a need for agreements per Fish and Game Code 1602 et seq., please do not hesitate to contact my office for assistance.

Thanks,

Talmadge (Tal) Robinson, CWB

DEPARTMENT OF FISH AND WILDLIFE
HABITAT CONSERVATION PROGRAM
BUTTE – LAKE – SIERRA
1701 Nimbus Road
Rancho Cordova, CA 95670
(916) 358-4035 (m)
talmadge.robinson@wildlife.ca.gov

RECEIVED

MAY 20 2019

LAKE COUNTY COMMUNITY DEVELOPMENT DEPT.

CALIFORNIA Water Boards

Central Valley Regional Water Quality Control Board

Gavin Newsom
Governor

Jared Blumenfeld
Secretary for
Environmental Protection

16 May 2019

Michalyn DelValle
Lake County
255 North Forbes Street
Lakeport, CA 95453

CERTIFIED MAIL
7017 2620 0001 1359 2264

COMMENTS TO REQUEST FOR REVIEW FOR THE NOTICE OF PREPARATION FOR THE DRAFT ENVIRONMENTAL IMPACT REPORT, GUENOC VALLEY MIXED-USE PLANNED DEVELOPMENT PROJECT, SCH#2019049134, LAKE COUNTY

Pursuant to the State Clearinghouse's 23 April 2019 request, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) has reviewed the *Request for Review for the Notice of Preparation for the Draft Environmental Impact Report* for the Guenoc Valley Mixed-Use Planned Development Project, located in Lake County.

Our agency is delegated with the responsibility of protecting the quality of surface and groundwaters of the state; therefore our comments will address concerns surrounding those issues.

I. Regulatory Setting

Basin Plan

The Central Valley Water Board is required to formulate and adopt Basin Plans for all areas within the Central Valley region under Section 13240 of the Porter-Cologne Water Quality Control Act. Each Basin Plan must contain water quality objectives to ensure the reasonable protection of beneficial uses, as well as a program of implementation for achieving water quality objectives with the Basin Plans. Federal regulations require each state to adopt water quality standards to protect the public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act. In California, the beneficial uses, water quality objectives, and the Antidegradation Policy are the State's water quality standards. Water quality standards are also contained in the National Toxics Rule, 40 CFR Section 131.36, and the California Toxics Rule, 40 CFR Section 131.38.

The Basin Plan is subject to modification as necessary, considering applicable laws, policies, technologies, water quality conditions and priorities. The original Basin Plans were adopted in 1975, and have been updated and revised periodically

as required, using Basin Plan amendments. Once the Central Valley Water Board has adopted a Basin Plan amendment in noticed public hearings, it must be approved by the State Water Resources Control Board (State Water Board), Office of Administrative Law (OAL) and in some cases, the United States Environmental Protection Agency (USEPA). Basin Plan amendments only become effective after they have been approved by the OAL and in some cases, the USEPA. Every three (3) years, a review of the Basin Plan is completed that assesses the appropriateness of existing standards and evaluates and prioritizes Basin Planning issues.

For more information on the *Water Quality Control Plan for the Sacramento and San Joaquin River Basins*, please visit our website:
http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/

Antidegradation Considerations
All wastewater discharges must comply with the Antidegradation Policy (State Water Board Resolution 68-16) and the Antidegradation Implementation Policy contained in the Basin Plan. The Antidegradation Implementation Policy is available on page 74 at:
https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr_201805.pdf

In part it states:

> *Any discharge of waste to high quality waters must apply best practicable treatment or control not only to prevent a condition of pollution or nuisance from occurring, but also to maintain the highest water quality possible consistent with the maximum benefit to the people of the State.*
>
> *This information must be presented as an analysis of the impacts and potential impacts of the discharge on water quality, as measured by background concentrations and applicable water quality objectives.*

The antidegradation analysis is a mandatory element in the National Pollutant Discharge Elimination System and land discharge Waste Discharge Requirements (WDRs) permitting processes. The environmental review document should evaluate potential impacts to both surface and groundwater quality.

II. Permitting Requirements

Construction Storm Water General Permit
Dischargers whose project disturb one or more acres of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction Activities

(Construction General Permit), Construction General Permit Order No. 2009-009-DWQ. Construction activity subject to this permit includes clearing, grading, grubbing, disturbances to the ground, such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP).

For more information on the Construction General Permit, visit the State Water Resources Control Board website at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

Phase I and II Municipal Separate Storm Sewer System (MS4) Permits[1]
The Phase I and II MS4 permits require the Permittees reduce pollutants and runoff flows from new development and redevelopment using Best Management Practices (BMPs) to the maximum extent practicable (MEP). MS4 Permittees have their own development standards, also known as Low Impact Development (LID)/post-construction standards that include a hydromodification component. The MS4 permits also require specific design concepts for LID/post-construction BMPs in the early stages of a project during the entitlement and CEQA process and the development plan review process.

For more information on which Phase I MS4 Permit this project applies to, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/municipal_permits/

For more information on the Phase II MS4 permit and who it applies to, visit the State Water Resources Control Board at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml

Industrial Storm Water General Permit
Storm water discharges associated with industrial sites must comply with the regulations contained in the Industrial Storm Water General Permit Order No. 2014-0057-DWQ.

---

[1] Municipal Permits = The Phase I Municipal Separate Storm Water System (MS4) Permit covers medium sized Municipalities (serving between 100,000 and 250,000 people) and large sized municipalities (serving over 250,000 people). The Phase II MS4 provides coverage for small municipalities, including non-traditional Small MS4s, which include military bases, public campuses, prisons and hospitals.

For more information on the Industrial Storm Water General Permit, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/industrial_general_permits/index.shtml

Clean Water Act Section 404 Permit

If the project will involve the discharge of dredged or fill material in navigable waters or wetlands, a permit pursuant to Section 404 of the Clean Water Act may be needed from the United States Army Corps of Engineers (USACE). If a Section 404 permit is required by the USACE, the Central Valley Water Board will review the permit application to ensure that discharge will not violate water quality standards. If the project requires surface water drainage realignment, the applicant is advised to contact the Department of Fish and Game for information on Streambed Alteration Permit requirements.

If you have any questions regarding the Clean Water Act Section 404 permits, please contact the Regulatory Division of the Sacramento District of USACE at (916) 557-5250.

Clean Water Act Section 401 Permit – Water Quality Certification

If an USACE permit (e.g., Non-Reporting Nationwide Permit, Nationwide Permit, Letter of Permission, Individual Permit, Regional General Permit, Programmatic General Permit), or any other federal permit (e.g., Section 10 of the Rivers and Harbors Act or Section 9 from the United States Coast Guard), is required for this project due to the disturbance of waters of the United States (such as streams and wetlands), then a Water Quality Certification must be obtained from the Central Valley Water Board prior to initiation of project activities. There are no waivers for 401 Water Quality Certifications.

For more information on the Water Quality Certification, visit the Central Valley Water Board website at:
https://www.waterboards.ca.gov/centralvalley/water_issues/water_quality_certification/

Waste Discharge Requirements – Discharges to Waters of the State

If USACE determines that only non-jurisdictional waters of the State (i.e., "non-federal" waters of the State) are present in the proposed project area, the proposed project may require a Waste Discharge Requirement (WDR) permit to be issued by Central Valley Water Board. Under the California Porter-Cologne Water Quality Control Act, discharges to all waters of the State, including all wetlands and other waters of the State including, but not limited to, isolated wetlands, are subject to State regulation.

For more information on the Waste Discharges to Surface Water NPDES Program and WDR processes, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/water_issues/waste_to_surface_water/

Waste Discharge Requirements – Discharges to Land
Pursuant to the State Board's Onsite Wastewater Treatment Systems Policy, the regulation of the septic system may be regulated under the local agency's management program.

For more information on waste discharges to land, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/waste_to_land/index.shtml

Dewatering Permit
If the proposed project includes construction or groundwater dewatering to be discharged to land, the proponent may apply for coverage under State Water Board General Water Quality Order (Low Risk General Order) 2003-0003 or the Central Valley Water Board's Waiver of Report of Waste Discharge and Waste Discharge Requirements (Low Risk Waiver) R5-2013-0145. Small temporary construction dewatering projects are projects that discharge groundwater to land from excavation activities or dewatering of underground utility vaults. Dischargers seeking coverage under the General Order or Waiver must file a Notice of Intent with the Central Valley Water Board prior to beginning discharge.

For more information regarding the Low Risk General Order and the application process, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2003/wqo/wqo2003-0003.pdf

For more information regarding the Low Risk Waiver and the application process, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/waivers/r5-2013-0145_res.pdf

Regulatory Compliance for Commercially Irrigated Agriculture
If the property will be used for commercial irrigated agricultural, the discharger will be required to obtain regulatory coverage under the Irrigated Lands Regulatory Program.
There are two options to comply:

1. **Obtain Coverage Under a Coalition Group.** Join the local Coalition Group that supports land owners with the implementation of the Irrigated Lands Regulatory Program. The Coalition Group conducts water quality monitoring

and reporting to the Central Valley Water Board on behalf of its growers. The Coalition Groups charge an annual membership fee, which varies by Coalition Group. To find the Coalition Group in your area, visit the Central Valley Water Board's website at: https://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/regulatory_information/for_growers/coalition_groups/ or contact water board staff at (916) 464-4611 or via email at IrrLands@waterboards.ca.gov.

2. **Obtain Coverage Under the General Waste Discharge Requirements for Individual Growers, General Order R5-2013-0100**. Dischargers not participating in a third-party group (Coalition) are regulated individually. Depending on the specific site conditions, growers may be required to monitor runoff from their property, install monitoring wells, and submit a notice of intent, farm plan, and other action plans regarding their actions to comply with their General Order. Yearly costs would include State administrative fees (for example, annual fees for farm sizes from 11-100 acres are currently $1,277 + $8.53/Acre); the cost to prepare annual monitoring reports; and water quality monitoring costs. To enroll as an Individual Discharger under the Irrigated Lands Regulatory Program, call the Central Valley Water Board phone line at (916) 464-4611 or e-mail board staff at IrrLands@waterboards.ca.gov.

Limited Threat General NPDES Permit

If the proposed project includes construction dewatering and it is necessary to discharge the groundwater to waters of the United States, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. Dewatering discharges are typically considered a low or limited threat to water quality and may be covered under the General Order for *Limited Threat Discharges to Surface Water* (Limited Threat General Order). A complete Notice of Intent must be submitted to the Central Valley Water Board to obtain coverage under the Limited Threat General Order.

For more information regarding the Limited Threat General Order and the application process, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2016-0076-01.pdf

NPDES Permit

If the proposed project discharges waste that could affect the quality of surface waters of the State, other than into a community sewer system, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. A complete Report of Waste Discharge must be submitted with the Central Valley Water Board to obtain a NPDES Permit.

For more information regarding the NPDES Permit and the application process, visit the Central Valley Water Board website at:
https://www.waterboards.ca.gov/centralvalley/help/permit/

If you have questions regarding these comments, please contact me at (916) 464-4812 or Jordan.Hensley@waterboards.ca.gov.

Jordan Hensley
Environmental Scientist

cc: State Clearinghouse unit, Governor's Office of Planning and Research, Sacramento

LAFCO Comment 6/19/19

COUNTY OF LAKE
COMMUNITY DEVELOPMENT DEPARTMENT
Planning Division
Courthouse - 255 N. Forbes Street
Lakeport, California 95453
Telephone 707/263-2221 FAX 707/263-2225

DISTRIBUTION DATE: June 4, 2019

REQUEST FOR REVIEW FOR SUFFICIENCY

- @ AG. COMMISSIONER
- @ AIR QUALITY MGMT
- ☒ ARMY CORPS
- ☒ ASSESSOR
- ☒ BLM
- @ BUILDING DIVISION
- @ CAL FIRE
- @ CALTRANS
- @ FIRE DIST: South Lake
- @ CRWQCB
- @ CA FISH & WILDLIFE
- @ DPW ROADS

- @ ENVIRONMENTAL HEALTH DEPARTMENT

- ☐ NATIVE AM. HERITAGE
- ☐ NRCS
- ☐ OFFICE OF EDUCATION
- ☒ PG&E
- ☒ PUBLIC SERVICES
- @ SHERIFF
- @ SONOMA STATE
- @ SPECIAL DISTRICTS
- ☒ STATE DEPT. HEALTH
- @ SURVEYOR
- @ TAX COLLECTOR
- ☒ COUNTY OF NAPA

- @ **TRIBES:**
- @ Big Valley Rancheria
- @ Cache Creek
- @ Cortina Rancheria
- @ Elem Colony
- @ Koi Nation
- @ Middletown Rancheria
- @ Robinson Rancheria
- @ Scotts Valley Band of Pomo
- @ Upper Lake Habematolel
- @ WATER RESOURCES
- ☒ OTHERS
  LAKE COUNTY TRANSIT
  USFW

  REDBUD AUDOBON
  X LAFCO
  CA DEPT OF CONSERVATION
  MATH

FROM: Byron Turner, Principal Planner

REQUEST: Guenoc Valley Mixed Use Project, including:

- Amendment to the General Plan and Special Study Area map of the Middletown Area Plan to include the area commonly known as the college parcels (GPAP 18-01);
- Zoning Ordinance Amendment to introduce a new zoning district to allow for future uses, Guenoc Valley District ("GVD"), to implement the goals of the Special Study Area, and subsequently rezoning of the Project Site from Rural Lands, Agriculture, Rural Residential, and an Agricultural Protection Zone to GVD (AM 18-04; RZ 18-01);
- Use Permit for the Specific Plan of Development (Master Development Plan) for the first phase (UP 18-01);
- Tentative Subdivision Maps for the first phase (SD 18-01);
- General Plan of Development (GPD 18-01);
- Development Agreement (DA 18-01);
- Environmental Impact Report (EIR 18-01);
- Grading permit for Installation of water line; and
- Tentative Subdivision Map for off-site workforce housing.

APPLICANT/OWNER: Lotusland Investment Holdings

APNs: Various – see attached

LOCATION: Butts Canyon Road

ZONING:	Various
GENERAL PLAN:	Various
FLOOD ZONE:	Portion
PROPOSAL:	See Below

Description of the type of requested permit:

The Proposed Project consists of the development of a master planned mixed-use resort and residential community within the 16,000-acre Guenoc Valley Ranch property (Project Site) in southeast Lake County and off-site workforce co-housing on an approximately 12.75-acre property located in central Middletown (Off-Site Workforce Housing Site). The Project Site is comprised of 49 parcels totaling approximately 16,000 acres in southeast Lake County. The Project Site is generally bounded by Long Valley and Coyote Valley to the west, a U.S. Coast Guard LORAN station military reservation to the northwest, the Cedar Mountains to the north, and the Lake County border to the east. The Project Site is located approximately three miles east of State Route (SR) 29 and 13 miles west of SR 16. Access to the site is provided by SR 29 via Butts Canyon Road to the northwest. Butts Canyon Road bisects the southern portion of the Project Site. The project proposal consists of multiple resort properties with 175 Hotel rooms, 144 Resort Residential units, and 381 Residential Villas, along with 98 on-site workforce housing units and an additional 50 short-term stay units.

Please find project materials at the following location:
http://www.lakecountyca.gov/Government/Directory/Community_Development/Planning/GuenocValley.htm

Located at the above website are the following documents:

- Specific Plan of Development (SPOD), including complete project description and detailed site maps
- Draft Zoning Ordinance for the Guenoc Valley Zoning District (GVD)
- Existing and Proposed Land Use Designations
- List of Project Parcels

An Initial Study has been prepared for the project, in compliance with the California Environmental Quality Act. An EIR is currently being written. Please advise us if additional information is needed, which permits are required from your agency (if any), and of your environmental concerns. Additionally, please advise if your agency recommends any modifications to the project that would reduce potential environmental impacts. Due to the provisions of state law, it is essential that we receive your comments as soon as possible but in no case later than **June 20, 2019** Please email your comments to Byron Turner at Byron.Turner@lakecountyca.gov or mail them to the address listed in the letterhead above. Additionally, please contact Byron if you need hard-copies of the site plans or subdivision maps.

COMMENTS: I have reviewed the Initial Study and related Dox and would like to know if the RWQCB and SWRCB will require a new public agency to be formed for Water and Wastewater services. If so, LAFCo will become a responsible agency. Normally for projects of this size a "Community Services District "or "Public Utility District" would be formed for public water and wastewater. Perhaps a "County Service Area" could be formed for Water and "LACOSAN" could provide the Wastewater Services. I find it very unusual that no public agency is mentioned anywhere for these services. At a minimum, the EIR should acknowledge that LAFCo may become a responsible agency should any public entity be formed to serve the development. So in the purposes of the EIR section, LAFCo should be mentioned for the formation of service districts and the EIR will be used for the

formation of or annexation to any special district. I believe the answer to my question as to whether or not a public agency is to be formed would be evaluated and determined in the environmental document and would therefore be required as a mitigation measure. Please email LAFCo a copy of the draft environmental document once completed.

As a footnote, Lake County has a Countywide CSA for Road Mainenance and the project is in the South Lake County Fire Protection District for fire and EMS. A concern would be the development may be located in a high fire hazard area.

Let me know if I can help with any service provision issues.

NAME John Benoit, LAFCo DATE 6-19-2019

Dedicated to preserving Lake County's natural resources through education, cooperation, and preservation.

May 28, 2019

Ms. Michalyn DelValle, Director
Community Development
County of Lake
255 N. Forbes St.
Lakeport, CA 95453

Subject: Notice of Preparation of an Environmental Impact Report for the proposed Guenoc Valley Mixed Use Planned Development Project

Dear Ms. DelValle,

Thank you for the opportunity to provide input on the subject project. I apologize for the tardiness of these comments.

The proposed Guenoc Valley Project is within a major wildlife corridor connecting public and protected lands with the Mayacamas Mountains and the Berryessa Snow Mountain National Monument. The Project is within the corridor between Mt. St. Helena and the National Monument, probably the most important corridor between the Mayacamas Mountains and National Monument south of the Mendocino National Forest. The proposed development has the potential to disrupt this important connectivity.

The Mayacamas to Berryessa Landscape Connectivity Network (M2B) coordinated by the Pepperwood Reserve mapped structural and riparian connectivity. Attached is some basic information on M2B. The proposed development appears to disrupt at least two of the structural linkages. More information, including technical reports can be found on M2B by searching for "Mayacamas to Berryessa" on the databasin.org website or by contacting the Pepperwood Foundation. The link is:

https://databasin.org/galleries/8fd96e4df2f04896ae4234f5d50cf997

The Nature Conservancy (TNC) appears to have similar findings with their Omniscape Connectivity mapping, which identifies wildlife connectivity through the Guenoc properties. The results of their mapping may be viewed at:

Officers
President: Valerie Nixon
Vice Pres.: William Lincoln
Treasurer: John Stierna
Secretary: Erica Lundquist

Directors
Catherine Koehler
Roberta Lyons
Merry Jo Velasquez

Executive Director
Thomas Smythe

Operations
Anne Martin

Outreach
Melissa Kinsel

PO Box 1017
Lakeport, CA 95453
707.262.0707

LCLT@LakeCountyLandTrust.org
www.LakeCountyLandTrust.org

http://tnc.maps.arcgis.com/apps/webappviewer/index.html?id=3cbb9454372e43ffac44b9dda07b5551

The impacts of the proposed project on wildlife connectivity and wildlife corridors should be evaluated during the preparation of the Environmental Impact Report or the Guenoc Valley Mixed-Use Planned Development Project.

If you have any questions, please contact me.

Sincerely,

Thomas R. Smythe
Executive Director

Pepperwood PRESERVE

Protecting Habitat Corridors for Climate Adaptation

Mayacamas to Berryessa Landscape Connectivity Network (M2B)

The Mayacamas to Berryessa Landscape Connectivity Network (M2B) is a public-private collaboration between land trusts, open space and park districts, State and Federal land managers, and ecology researchers committed to assessing the landscape-level conservation needs of Northern California's Inner Coast Ranges. The goal is to co-create practical conservation strategies for addressing biodiversity and watershed health while protecting resiliency of these habitats in the face of climate change, drought and fire. Pepperwood serves as the team's backbone organization and facilitated team activities including habitat mapping, landscape linkage analyses, and climate threat assessments to build a habitat connectivity roadmap across Sonoma, Napa and Lake Counties. This landscape-level vision spans from the Mayacamas Mountains to the new Snow Mountain-Berryessa National Monument and identified priority locations for habitat corridor projects. The site-specific habitat corridor reports generated by the M2B network identify specific parcels for conservation and the resulting climate adaptation benefits. The resulting data products can be used by network partnership to support funding and implementation needs for corridor protection and enhancement.

Why habitat connectivity? Keeping landscapes connected via habitat linkages or corridors is the most frequently recommended approach to maintain ecosystem resilience in the face of climate change as it provides an "escape route" for plants and animals to relocate when their habitats are no longer viable due to climate or other changes. Linking also allows resources to pass between habitats that are increasingly confined by human development.

Approach: The M2B Network relies on the collaboration of diverse stakeholders to both acknowledge and anticipate the environmental needs of this region. Network scientists and land managers are developing habitat corridor plans based on the following assessments.

- Identification of potential habitat linkages based on terrestrial and riparian connectivity of natural habitats between existing protected areas
- Quantification of habitat corridor climate benefits by estimating the ability of species to escape rising temperatures via movement corridors, based on state-of-the art, high- resolution climate projections
- Generation of maps to compare the vulnerability of specific sites to fire, drought, and other environmental concerns with their contribution to the overall ecological health of the region, which will help guide priorities for land and easement acquisition and habitat restoration

Communications and Outreach: The M2B network created a standardized vocabulary for communicating key science concepts to public and private landowners about the climate adaptation value of keeping natural and working landscapes connected. This vocabulary and basic messaging materials will support a consistent outreach effort via diverse partners across the region, including local Resource Conservation Districts and extension agents.

Key Research Findings: The M2B network relies upon scientific research to design and implement habitat assessment tools. A technical *M2B Methodology Report* (Gray et al. 2018) describes the innovative scientific methods supporting our work, and is supplemented by six site-specific habitat corridor reports that illustrate how terrestrial, riparian, and climate connectivity can be used – in combination or independently – to identify locations of conservation value that provide connectivity benefits today and under scenarios of landscape change. Among our major findings was the importance of accounting for seasonality in Mediterranean climates with a coastal influence. Because the effects of climate change will likely differ by season and location, it is important to consider

the seasonal needs of wildlife across the landscape when planning for connectivity. Our research is integrated into a database that is shared by partners and visible to the public via Data Basin (databasin.org)

Key Conservation & Land Management Findings: By directly involving stakeholders in the modeling process and evaluation of results, we ensure that users can use the data and maps we have acquired to inform actionable local and regional strategies. The combination of high-resolution landscape permeability and climate datasets provides local decision-makers with flexible science-based tools for exploring, planning, and implementing habitat connectivity pathways. In the M2B region, parcel-scale acquisition and stewardship will be advanced primarily by private land trusts and public open space districts in concert with State and Federal land management agencies.

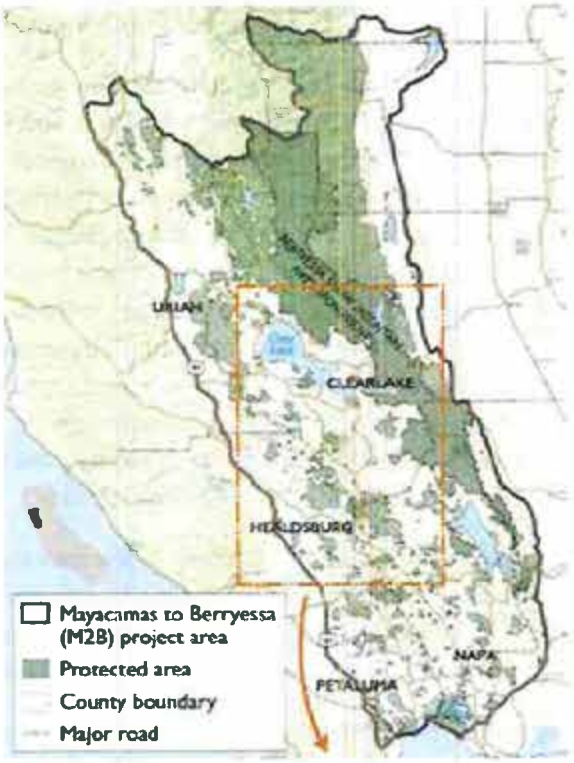
A Model for California and Beyond: Successful climate change adaptation requires building social and physical landscape linkage networks and cultivating a shared understanding of how land use and climate change will influence future connectivity. Our analytical results are designed to be scalable and reproducible throughout California. The formation of the M2B network provides a documented model for empowering local agencies and organizations to work effectively, and in a coordinated fashion, to achieve landscape-level conservation objectives.

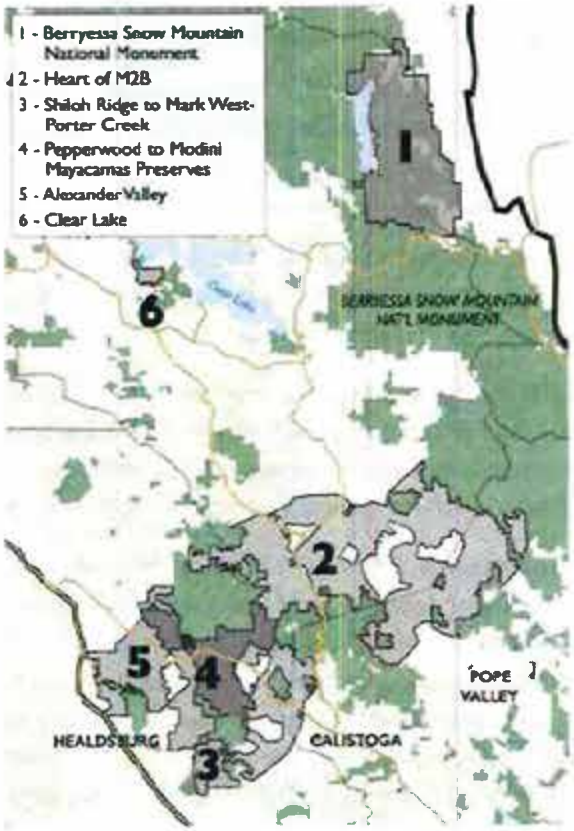
The Mayacamas to Berryessa Steering Committee includes representation of ten leadership agencies, including Audubon Canyon Ranch, Blue Ridge Berryessa Natural Area Partnership, California Department of Fish and Wildlife, Lake County Land Trust, Land Trust of Napa County, McLaughlin Reserve, Sonoma County Agriculture + Open Space District, Sonoma County Regional Parks, Sonoma Land Trust, and the United States Bureau of Land Management.

Project support for *Building Habitat Connectivity for Climate Adaptation: Mayacamas to Berryessa Connectivity Network (M2B)* provided by the California Landscape Conservation Partnership, F16AC00574.

Contact Dr. Lisa Micheli at Pepperwood Foundation: lmicheli@pepperwoopreserve.org
https://www.pepperwoodpreserve.org/

Map of the M2B project area overlaid with protected areas (green) and Berryessa Snow Mountain National Monument (hatched). A detailed map of the focal corridor region (orange) is below.





Six local corridor projects within the M2B project area identified as priority locations for climate connectivity resilience. Overlapping regions are dark gray, and the Heart of M2B corridor is hatched

RECEIVED

MAY 16 2019

LAKE COUNTY COMMUNITY DEVELOPMENT DEPT.

COUNTY OF LAKE PUBLIC SCOPING MEETING

Guenoc Valley Mixed-Use Planned Development Project Environmental Impact Report

COMMENT FORM

(Comments Due by 5:00 PM on May 23, 2019)

Scoping meeting locations: County of Lake Board of Supervisors Chambers - 255 N. Forbes Street, Lakeport, CA and Middletown Community Room, Middletown Library - 21256 Washington Street, Middletown, CA

I would like the following topics, issues, and/or concerns to be covered in the Environmental Impact Report:

I would like to make the following statement: The location of the optional offsite well is one that will impact the Middletown Aquifer - is approximately 2 miles from a Geothermal Waste Site that has contaminents in the ground water. This plume is 75 acres - most outside the Fenced area. There is a plume headed toward Middletown approx 2000' long 300' wide & 30-50 feet deep. The proposed well will create a cone of depression that will draw water to try & fill the depression then piped to another aquifer that already has its level of water will create a push. So the depression will create a pull & pumping will create a push of->

(If you need additional room, please use reverse side)

Name: Lynn Dicht-Daems Phone Number: (707) 355-4747

Affiliation: Middletown Community Member

Address: PO Box 150, Middletown, CA 95461-0150

E-mail address: pinkywink05@gmail.com

Would you like your name to be added to the mailing list for this project? If you are on the mailing list you will receive notification of public meetings and notice of publication of environmental documents.

X YES ___ NO

NOTE: Please give this comment to meeting attendant or mail to the County of Lake, Community Development Department: c/o Byron Turner, Principal Planner, 225 N. Forbes Street, Lakeport, CA 95453. On the envelope, please include your name, return address, and the caption: Scoping Comment, Guenoc Valley EIR

water. Like a circulating pump. This leads to the very real possibility of moving the plume down toward private wells. Then eventually in the Middletown aquifer. The waste is more than drilling mud, although that is what is documented. The owners of that site prior to being closed, were accepting waste that should have been trucked to Benecia hazardous waste site. There are people who live here that worked there during the time & people who were impacted by contact with this waste.

To those making the decison as to whether to accept the location of this optional well, are you willing to take ~~[illegible]~~ responsibility that your decision if it is to accept this option could negatively impact the health & wellbeing of our community. Also, ask yourself if you would be comfortable having Yourself or a loved one live down from a plume of contaminants that has the real possibility of moving because of the volume of water that would be pulled out.

[sent May 21st, 2019]

To whom this may concern:

After reading the proposed EIR for the Guenoc Valley Development Project, I have deep reservations that the report does not address the Dark Skies Initiative in Lake County. Especially in light of the Board of Supervisors' approval of the Dark Sky Proclamation last November; this issue needs to be considered as part of the EIR. This development may be an overall plus for Lake County, but only if care is taken to have as little impact on the environment as possible, and maintain the night beauty we all hold valuable. Mitigation measures to alleviate light pollution should be taken to keep the light down at night such as: the use of downward facing lighting fixtures, dark-sky friendly light bulbs, limit night sky traffic, and an absolute minimal night lighting when all is closed for the evening etc.

Being able to see the stars at night is a big part of what makes Lake County so unique!

Thank you for the opportunity to be heard on this issue, and I hope my concerns are seriously addressed.

Sincerely,

Julie Kreis

Citizen of Lake County since 1978

[sent 05-21-2019, from the e-mail melissakinsel7@gmail.com]

Dear Michalyn,

In reading the proposed EIR for the Guenoc Valley Development Project, I am concerned that the report does not address the Dark Skies Initiative in Lake County. Especially in light of the Board of Supervisors' approval of the Dark Sky Proclamation last November, this issue needs to be considered as part of the EIR. I think the development will be an overall plus for Lake County, but only if care is taken to have as little impact on the environment as possible. Mitigation measures to alleviate light pollution should be taken to keep the light down at night, use downward facing lighting fixtures, dark-sky friendly light bulbs, limit night sky traffic, etc.

Being able to see the stars at night is a big part of makes Lake County so special!

I appreciate the opportunity to be heard on this issue.

Best,

Melissa Kinsel

707.287.7908

[sent 05-21-2019, from the e-mail 4val944@gmail.com]

Dear Michalyn,

Please include Dark Sky criteria in the permits for the Guenoc Development. Lake County has some of the most beautiful dark sky in the state. Our Board of Supervisor recognized it's value last November. In allowing for progress we must consider the intrinsic value of why so many of us love it here.

Thank you,

Val Meyer Nixon

Kelseyville

--

Val Meyer Nixon

[sent 05-22-2019, sent from the e-mail liskaplan@gmail.com]

Dear Michalyn,

I am concerned that the EIR on the Guenoc Development does not adequately address our Dark Skies proclamation for Lake County which was Board of Supervisor approved last November. this should be considered as part of the EIR.

While economic development is important to Lake County, it should have the least possible impact on the natural environment which is our most important asset and attraction. Let's carefully mitigate and limit the impact on our dark skies.

Thank you,

Lisa Kaplan
www.LisaKaplanArt.com
Art / Education / Digital Media and Design
Tel: 707-987-9095
Cell: 707-295-6663

Mark Roberts

From: JoAnn <shylila@cluemail.com>
Sent: Tuesday, May 21, 2019 5:28 PM
To: Guenocvalleycomments - Email
Subject: Comment on Guenoc Development

> Dear Michalyn,
>
> In reading the proposed EIR for the Guenoc Valley Development Project, I am concerned that the report does not address the Dark Skies Initiative in Lake County. Especially in light of the Board of Supervisors' approval of the Dark Sky Proclamation last November, this issue needs to be considered as part of the EIR. I think the development will be an overall plus for Lake County, but only if care is taken to have as little impact on the environment as possible. Mitigation measures to alleviate light pollution should be taken to keep the light down at night, use downward facing lighting fixtures, dark-sky friendly light bulbs, limit night sky traffic, etc.
>
> Being able to see the stars at night is a big part of what makes Lake County so special!
>
> I appreciate the opportunity to be heard on this issue.
>
> Kindly,

JoAnn Saccato

Sierra Club Lake Group

PO Box 415 Lower Lake, CA 95457

May 23, 2019

Michalyn DelValle
Community Development Department
Planning Division
255 N. Forbes Street
Lakeport, CA 95453
via email: guenocvalleycomments@lakecountyca.gov

RE: Scoping comments, Guenoc Valley Mixed-Use Planned Development Project

Dear Ms. DelValle:

Lake Group appreciates this opportunity to engage in discussion about the environmental impacts of this major project from the beginning. We have been involved in previous applications for development in this area for a number of years, including the 2008 Langtry Farms golf course (an application that the Sierra Club supported), and were also engaged in the Middletown Area Plan process.

Obviously a project of this magnitude has the enormous potential to impact Lake County both positively and negatively. It's therefore particularly important that all effects be subject to stringent evaluation, and every effort made to predict possible consequences. In general, we agree with the conclusions of the Initial Study regarding the scope of work needed, and will wait to comment on specific impacts and proposed mitigations when that analysis is made available in the Draft Environmental Impact Report (DEIR).

We do however have several concerns that seem worth mentioning at this time.

Land Use and Planning. The Middletown Area Plan (MAP) MAP devotes particular attention to the Guenoc Valley, which it designates as a Special Study Area with "up to 800" residential units. In contrast, the current application calls for 1400 residential units (1900 in Appendix C). We question the desirability of approving such a dramatic increase in density, not only because of direct impacts on the site, but also because of possible precedents that could affect other parts of the county. At a very minimum, compelling justification for disregarding the standards of the Area Plan should be required before considering such a variance.

In principle, we support the proposal to include workforce housing in the project, both on site and in Middletown, but question the appropriateness of constructing "co-living" facilities in 400 square-foot bedroom and bath units with "shared cooking and resting areas" rather that traditional multi-unit apartments or single family residents. To the best of our knowledge, this kind of living arrangement doesn't correspond with any residential category in either the MAP or Lake County General Plan.

The proposal to analyze the first phases of the project (covering the next 10 years) at the project level, and the remainder at the program level is fraught with problems unless the distinction between the two is made crystal clear, and the program/project analysis kept

separate to the greatest extend possible. with this approach, to succeed has to very clearly distinguish between the two categories.

Recreation. Table 1, 3.5 refers to the construction of a new golf course and also the possibility of reconstructing the existing course, which was damaged in the 2015 Valley Fire. We strongly recommend that the decision about whether to have one course or two be made as quickly as possible, and the analysis be conducted accordingly.

Table 1, 3.6 mentions a 45-acre "wilderness" area which will contain "semi permanent tents" and "off road courses." The word "wilderness" has a specific meaning in state and federal law, a meaning that doesn't allow any sort of permanent or semi-permanent structure. Although this designation doesn't apply to private lands and landholders are at liberty to call their properties anything they please, we recommend that confusion be avoided by choosing different nomenclature such as "natural recreation area" or something similar.

The project site is adjacent to BLM lands in the Berryessa Snow Mountain National Monument. It would be to the benefit of developers, hotel guests, residents and the general public to explore the possibility of collaborative recreational use.

Energy. We commend the proposal to set aside 50 acres for alternative energy production, but wonder why this part of the project can't be integrated into construction generally, by systematic installation of rooftop solar generating facilities on residences and commercial property? Inclusion of solar generation into parking lot shade structures could also do a lot to offset the project's energy consumption.

Open Space It is proposed to designate 2675 acres as permanent open space, but it's not clear what kinds of uses will be allowed in these areas. Will they include various recreational functions (eg golf course and equestrian areas?) or maintained kept as natural habitat? How are current and proposed vineyard areas calculated, and "managed grazing" areas?

Traffic. Both construction and operations are certain to have major impacts on traffic which are almost certain to extend beyond the immediate vicinity of Middletown and likely to be significant on the stretch of Highway 29 that crosses Mt St Helena. This segment appears to be at or near carrying capacity already, especially during commute hours.

The Sierra Club also concurs with the Redbud Audubon Society about the necessity of addressing both climate change and wildlife connectivity in the upcoming EIR.

Please keep us advised of any future opportunities to participate in the dialog about this project.

Sincerely,

Victoria Brandon
Conservation Chair, Sierra Club Lake Group

Redbud Audubon Society, Inc.

POB 5780 Clearlake, CA

RECEIVED

MAY 20 2019

LAKE COUNTY COMMUNITY
DEVELOPMENT DEPT

May 20, 2019

Lake County community Development Department
255 North Forbes Street
Lakeport, CA 95453

Attn: Mark Roberts, Senior Planner

As Conservation Chair for the Redbud Audubon Society I'm requesting issues to be addressed in the Environmental Impact Report (EIR) that is being prepared for the Guenoc Valley Mixed Use-Planned Development.

Issues that need to be addressed along with those already mentioned in the scoping document include Habitat Corridors to ensure wildlife habitat connectivity. This issue is becoming a major concern as more of our wildlands are being fenced and developed. Habitat connectivity for wildlife passage is a must to consider in this scoping document. This will require establishing a data base of current wildlife passages.

At the scoping meeting held on May 15 it was discussed that the residential units will be on 5 acres parcels. This is one of the worst scenarios for development to ensure habitat connectivity. Numerous fenced off five acre parcels will block wildlife passage and simply leaving it up to the residents to encourage wildlife is not adequate. Many people do not want deer in their yards. More clustered housing with larger areas of open space makes more sense. This sounds like a development of high end ranchettes which is not a conservation friendly approach to development. I'm wondering if you are familiar with the work of Christopher Duerksen who has written several books on creating Nature-friendly communities. I'm a little surprised that after seven years of work planners are still looking at ranchette style development. The developer is asking residents of Lake County to accept the creation of a new town; if we are to do so, every effort must be made to create a nature-friendly community.

I did not see any mention of Night Sky friendly development. As you know, our Lake County Board of Supervisors recently approved a Resolution in support of lighting ordinances consistent with Dark Sky Certification as a Dark Sky Community for the county. Please address this in the EIR.

Another issue is climate change. What energy use will be required and carbon dioxide releases occur not only in the building and maintaining of this project, but its continued existence. If the EIR is to go out many years, the review of Climate Change is a must; especially considering that new laws and requirements may be established as time goes on. I was at the May 15 meeting so I learned that solar energy is part of the plan, but I still want the specific issue of climate change addressed.

I have a question about the use of animals for vegetation control. This sounds like a great idea and of course is better that herbicides, but how much thought has been given to the care of these herds of animals when it comes to predators? How will the coyotes, cougars and bobcats be kept from attacking the sheep and goats? Also, grazing animals pretty much eat anything, not just what we want them to eat. Has a survey of Native California Bunch grasses been conducted? It seems that much of this territory would be conducive to this type of vegetation.

Requiring only 2,000 plus acres of guaranteed open space is a small requirement for a total acreage of 16,000 acres. Please review this as well.

Sincerely
Roberta Lyons
Conservation Chair, Redbud Audubon Society

Please continue to send all communication to: roberta.lyons@att.net.

Mark Roberts

From: Martha Mincer <mmincer@ptd.net> on behalf of martha@lcrai.org
Sent: Tuesday, May 21, 2019 2:40 PM
To: Guenocvalleycomments - Email
Cc: abby; alicia; amber; anni; conni; gillian; kim; martha; meg; tamsen
Subject: Comment on Guenoc Development

Dear Michalyn,

As with many of the people I have talked to, we at *Lake County Rural Arts Initiative* are also concerned that the EIR for the Guenoc Valley Development Project does not address the Dark Skies Initiative in Lake County. It is becoming, and will continue to become, a unique attraction for our county. There are "best practices" to mitigate light pollution that I'm sure can be found and applied.

As you may know, LCRAI is working to make/support Lake County an *art destination* that can accelerate our economic success while also preserving what we love about the county. Our hope is that all the developments will engage in supporting our genuine and amazing LC arts & culture (as it also supports their tourism or relocation goals too) as well as our other attractions like Dark Skies. Has any discussion/planning happened with the Guenoc Valley project as to this topic?

Please let me know....
Thank you

Martha

Martha Mincer
LC RAI Board Member
570 903 5011
www.lcrai.org

Middletown Rancheria
Tribal Historic Preservation Department
P.O. Box 1035
Middletown, CA 95461

May 23, 2019 Via Electronic Mail

Ms. Michalyn DelValle, Director
County of Lake
Community Development Department
255 N. Forbes Street
Lakeport, CA 95453
Via Email: Michalyn.Delvalle@lakecountyca.gov

Subject: Notice of Preperation of an Environmental Impact Report for the proposed Guenoc Valley Mixed-Use Planned Development Project
MTR THPD File No. 19-04-023

Dear Ms. DelValle:

The Middletown Rancheria ("Tribe") is in receipt of your notification dated April 23, 2019 regarding the above referenced matter. The Project site and its surrounding landscape have since time immemorial been considered a site of cultural, historical, and religious significance for the Tribe. The Tribe is aware of and concerned about significant cultural and sacred resources that, while known to the Tribe, may not be properly identified through record and survey searches. Moreover, the potential for cumulative impacts to tribal cultural resources must be adequately assessed.

Due to the high likelihood of disturbing tribal cultural resources which include, but is not limited to, Native American human remains, funerary objects, items or artifacts, sites, features, places, landscapes or objects with cultural values to the Tribe, during the Project, the Middletown Rancheria is requesting to be an active participant in all aspects of the Project and development of the Environmental Impact Report (EIR).

We request that all notices and documents be mailed or personally delivered to the Tribe with an electronic copy provided, as early as possible to allow the Tribe adequate time to provide information and to facilitate meaningful consultation to ensure protection and mitigation of tribal cultural resources.

This correspondence is without prejudice to any rights and remedies of the Tribe, all of which are expressly reserved.

We appreciate your time and consideration on this matter. Please contact as soon as possible to discuss next steps.

Thank you.

Larry Longee, Jr.
THPO Director
llongee@middletownrancheria.com
Cell: (707) 230-1031

CC: Tribal Council
Project File No. 19-04-023

YOCHA DEHE
CULTURAL RESOURCES

May 9, 2019

County of Lake
Community Development Dept.
Attn: Michalyn DelValle, Director
255 N. Forbes Street
Lakeport, CA 95453

RE: Guenoc Valley Mixed-Use Planned Development

Dear Ms. DelValle:

Thank you for your project notification letter dated, April 23, 2019, regarding cultural information on or near the proposed Guenoc Valley Mixed-Use Planned Development, Lake County. We appreciate your effort to contact us.

The Cultural Resources Department has reviewed the project and concluded that it is not within the aboriginal territories of the Yocha Dehe Wintun Nation. Therefore, we respectively decline any comment on this project. However based on the information provided, please defer correspondence to the following:

Middletown Rancheria
Attn: Larry Longee, THPO
PO Box 1035
Middletown, CA 95461

Please refer to identification number YD – 04232019-04 in any future correspondence with Yocha Dehe Wintun Nation concerning this project.

Thank you for providing us with this notice and the opportunity to comment.

Sincerely,

Isaac Bojorquez
Interim Director of Cultural Resources

RECEIVED
MAY 17 2019
LAKE COUNTY COMMUNITY
DEVELOPMENT DEPT.

Yocha Dehe Wintun Nation
PO Box 18 Brooks, California 95606 p) 530.796.3400 f) 530.796.2143 www.yochadehe.org

From: Mary Camp
To: Mark Roberts
Subject: RE: Notice of Preparation of an EIR for the proposed Guenoc Valley Mixed Use-Planned Development
Date: Wednesday, April 24, 2019 2:34:26 PM

Redwood Valley thanks you for the notice. We would defer to any review, comments or concerns from Middletown Rancheria. This is a very large project and needs to be carefully studied.

From: Mark Roberts [mailto:Mark.Roberts@lakecountyca.gov]
Sent: Wednesday, April 24, 2019 12:03 PM
To: nahc@nahc.ca.gov; cww281@gmail.com; env.tech.elem@gmail.com; a.garcia@elemindiancolony.org; kkarolaepa@gmail.com; aarroyosr@hpultribe-nsn.gov; lrosas@hpultribe-nsn.gov; kn@koination.com; tc@middletownrancheria.com; jsimon@middletownrancheria.com; THPDNotices@middletownrancheria.com; btorres@middletownrancheria.com; speterson@middletownrancheria.com; admin@rvrpomo.net; drogers@robinsonrancheria.org; terre.logsdon@sv-nsn.gov; thomas.jordan@sv-nsn.gov; lbill@yochadehe-nsn.gov; rrouse@yochadehe-nsn.gov; jkinter@yochadehe-nsn.gov; aroberts@yochadehe-nsn.gov
Cc: Byron Turner <Byron.Turner@lakecountyca.gov>; Michalyn DelValle <Michalyn.DelValle@lakecountyca.gov>
Subject: Notice of Preparation of an EIR for the proposed Guenoc Valley Mixed Use-Planned Development
Importance: High

Hello Tribal Members,

This email is in regards to the Notice of Preparation of an Environmental Impact Report (EIR) for the proposed Guenoc Valley Mixed Use-Planned Development. The above attachment is a detailed Notice of Preparation Packet regarding the proposed use for you to review and provide the necessary comments. Please keep in mind, the commenting period is from April 23, 2019 through May 23, 2019. Please disregard the previous email sent on April 23, 2019 and use the above attachments when reviewing and commenting on the proposed project. We look forward to hearing from you. If you have any questions, please let me know.

Sincerely,

Mark Roberts – Senior Planner

Lake County – Community Development Department
255 N. Forbes Street, Lakeport, CA 95453
County Website: www.lakecountyca.gov
Phone: (707) 263-2221

From: Mark Roberts
Sent: Tuesday, April 23, 2019 5:53 PM
To: 'nahc@nahc.ca.gov' <nahc@nahc.ca.gov>; 'cww281@gmail.com' <cww281@gmail.com>; 'env.tech.elem@gmail.com' <env.tech.elem@gmail.com>; 'a.garcia@elemindiancolony.org' <a.garcia@elemindiancolony.org>; 'kkarolaepa@gmail.com' <kkarolaepa@gmail.com>; 'aarroyosr@hpultribe-nsn.gov' <aarroyosr@hpultribe-nsn.gov>; 'lrosas@hpultribe-nsn.gov' <lrosas@hpultribe-nsn.gov>; 'kn@koination.com' <kn@koination.com>; 'tc@middletownrancheria.com' <tc@middletownrancheria.com>; 'jsimon@middletownrancheria.com' <jsimon@middletownrancheria.com>; 'THPDNotices@middletownrancheria.com' <THPDNotices@middletownrancheria.com>; 'btorres@middletownrancheria.com' <btorres@middletownrancheria.com>; 'speterson@middletownrancheria.com' <speterson@middletownrancheria.com>; 'admin@rvrpomo.net' <admin@rvrpomo.net>; 'drogers@robinsonrancheria.org' <drogers@robinsonrancheria.org>; 'terre.logsdon@sv-nsn.gov' <terre.logsdon@sv-nsn.gov>; 'thomas.jordan@sv-nsn.gov' <thomas.jordan@sv-nsn.gov>; 'lbill@yochadehe-nsn.gov' <lbill@yochadehe-nsn.gov>; 'rrouse@yochadehe-nsn.gov' <rrouse@yochadehe-nsn.gov>; 'jkinter@yochadehe-nsn.gov' <jkinter@yochadehe-nsn.gov>; 'aroberts@yochadehe-nsn.gov' <aroberts@yochadehe-nsn.gov>
Cc: Michalyn DelValle <Michalyn.DelValle@lakecountyca.gov>; Byron Turner <Byron.Turner@lakecountyca.gov>
Subject: Notice of Preparation of an EIR for the proposed Guenoc Valley Mixed Use-Planned Development
Importance: High

Hello Tribal Members,

This email is in regards to the Notice of Preparation of an Environmental Impact Report (EIR) for the proposed Guenoc Valley Mixed Use-Planned Development. The above attachment is a detailed Notice of Preparation Packet regarding the proposed use for you to review and provide the necessary comments. Please keep in mind, the commenting period is from April 23, 2019 through May 23, 2019. If you have any questions, please let me know.

Sincerely,

Mark Roberts – Senior Planner

Lake County – Community Development Department
255 N. Forbes Street, Lakeport, CA 95453
County Website: www.lakecountyca.gov
Phone: (707) 263-2221

APPENDIX OAK

OAK MITIGATION PLAN

OAK MITIGATION PLAN

GUENOC VALLEY SITE

FEBRUARY 2020

PREPARED BY:

Analytical Environmental Services
1801 7th Street, Suite 100
Sacramento, CA 95811
(916) 447-3479
www.analyticalcorp.com

OAK MITIGATION PLAN

GUENOC VALLEY SITE

FEBRUARY 2020

PREPARED BY:

Analytical Environmental Services
1801 7th Street, Suite 100
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(916) 447-3479
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Attachment A MAHA Guenoc Valley Oak Preservation Plan

1.0 INTRODUCTION

The Guenoc Valley District (GVD) is a proposed rezoning and planned development project located in southern Lake County within an approximately 16,000-acre boundary (Guenoc Valley Site), (**Figure 1** and **Figure 2**). The first phase of planned development includes luxury resorts and a master-planned residential community to be sited in clusters (Phase 1). The GVD incorporates low impact designs that prioritize large residential parcels with low density and clustered development, preserving surrounding open space and agricultural cultivation. The plan to develop a portion of the GVD will be accompanied by this Oak Mitigation Plan.

This Oak Mitigation Plan (Plan) addresses development for both Phase 1, which is under project-level environmental review, as well development of future phases, which are under programmatic-level review in the same EIR (Proposed Project). This Plan addresses the impacts to oaks resulting from the Proposed Project as analyzed in the EIR, defines specific impacts in the Phase One development, and outlines a system of impact identification and mitigation that can be applied consistently to all phases of development. Therefore, mitigation measures applied in Phase One as they relate to oaks will also apply to future phases.

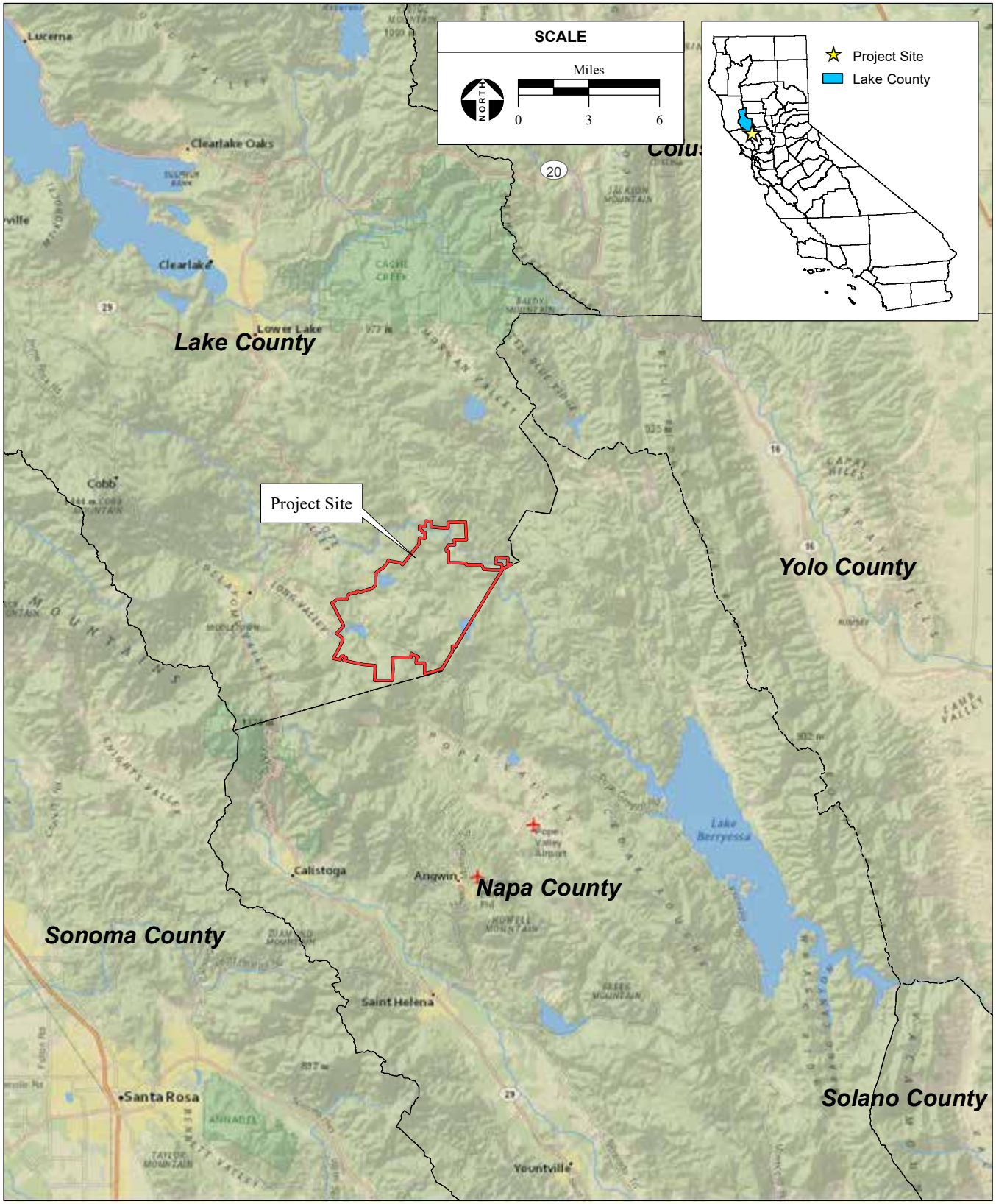
A portion of the Guenoc Valley Ranch was evaluated for environmental impacts related to planned water diversion and use of surface water for land conversion to vineyard. The appropriation and use of water and conversion of land to vineyard was approved by the State Water Board based on an EIR completed in March of 2009 (AES, 2009; FEIR). Development of these approved acreages is still in progress. An Oak Tree Replacement Plan was completed in September of 2008 to mitigate for impacts to oaks within the Places of Use (POUs), where surface water was approved for use, identified in the 2009 FEIR (AES, 2008). The previous Oak Mitigation Plan continues to apply to the development of vineyards and use of water approved under the 2009 EIR.

1.1 PROJECT LOCATION

The Guenoc Valley Site is located approximately three miles east of the town of Middletown and is accessible via Butts Canyon Road (**Figure 1** and **Figure 2**). Long Valley and Coyote Valley occur to the west of the Ranch, and the Cedars Mountains occur to the north. Terrain varies from areas of level valley to areas of steep, rocky terrain. Several vegetative communities exist within the Ranch including; agriculture, annual grassland, oak woodland, pine-oak woodland, cypress forest, mixed conifer forest, and chaparral. Aquatic habitats include ephemeral drainages, perennial streams, seasonal wetlands, groundwater seeps, freshwater marsh, and manmade ponds and reservoirs. Climate of the area consists of hot dry summers and cool, moist winters. Annual precipitation averages approximately 44.1 inches, with zero to insignificant snowfall (WRCC, 2016).

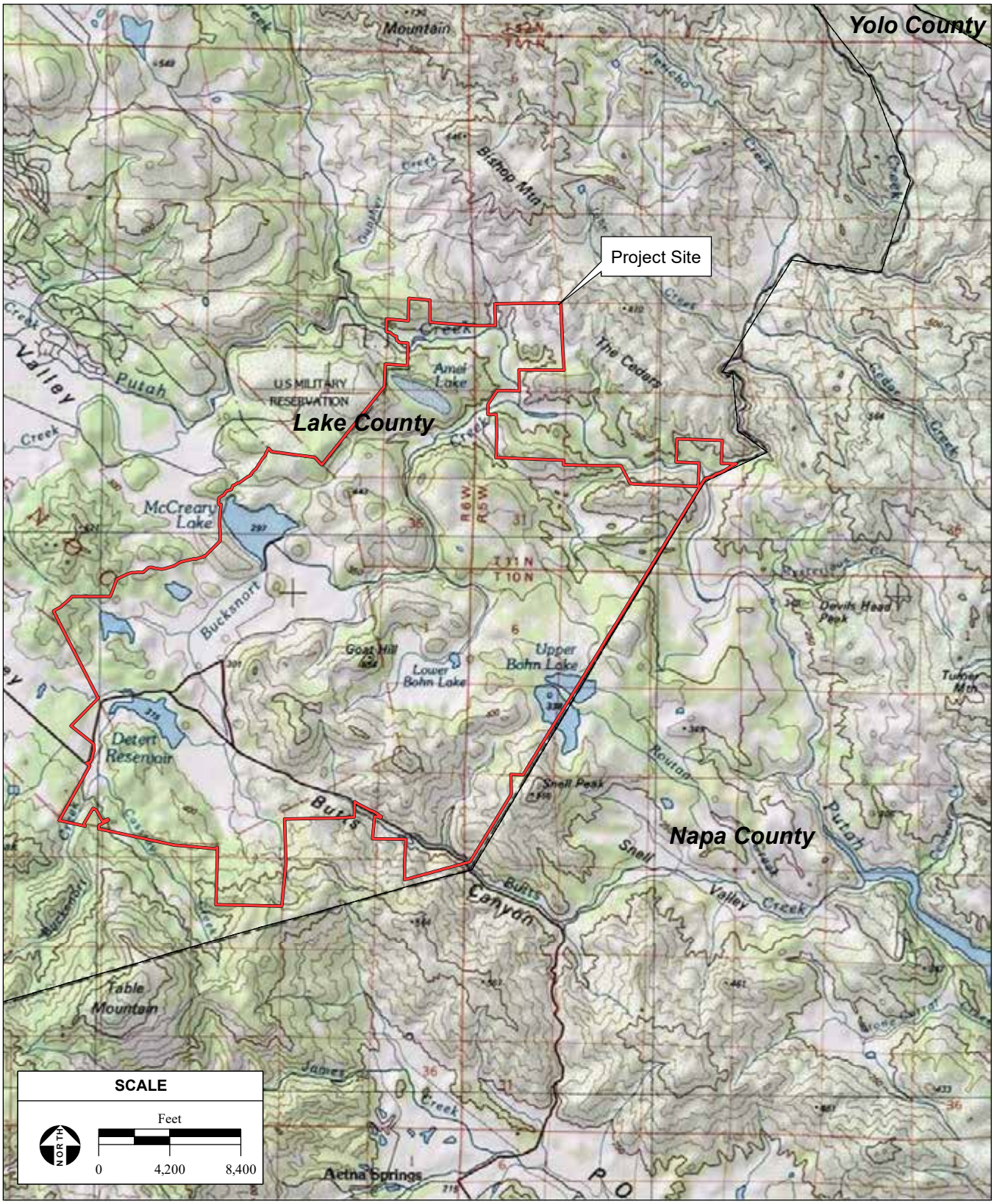
1.2 EXISTING USES

The current land uses within the Guenoc Valley Site are a mixture of agriculture, recreation, and open space. These land uses utilize existing water rights, which allow for irrigated pastures, dry land grazing and open space, vineyards, golf courses, and water bodies (reservoirs). The main reservoirs on the Guenoc Valley Site and connected reservoirs provide approximately 10,390 acre feet of water storage. The agricultural activities include cattle and sheep grazing and vineyards.



SOURCE: NatGeo 2017; AES, 2/18/2020

Figure 1
Regional Location



SOURCE: "Middletown, CA" & "Jericho Valley, CA" & "Knoxville, CA" & "Detert Reservoir, CA" & "Aetna Springs, CA" & "Walter Springs, CA" USGS 7.5 Minute Topographic Quadrangles; T10N R5W & T10N R6W & T11N R5W & T11N R6W; Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, and Unsectiond Areas of Middletown, Jericho Valley, Detert Reservoir, and Aetna Springs, Mt. Diablo Baseline & Meridian;
ESRI 2019; AES, 2/18/2020

Figure 2
Site and Vicinity

The Guenoc Valley Site is currently farmed with 990 acres of vineyards, and an additional 970 acres of vineyard is anticipated and allowed pursuant to previous entitlements. The entitlement for water appropriation for use in vineyard irrigation, and the cultivation of land to vineyard was authorized by the Division of Water Rights following the Guenoc Ranch Water Rights Final EIR (AES, 2009). No additional vineyard area is proposed with the GVD or Phase 1, and approximately 1,700 acres of previously-approved vineyard will be placed under an Agricultural Preserve Combing Zoning district. Impacts to oaks resulting from the planting of the existing and expanded vineyards were mitigated for through provisions in the 2009 Water Rights FEIR (AES, 2009).

1.3 PROJECT DESCRIPTION

Development plans for Phase 1 are comprised of multiple resort communities including residential parcels, boutique hotels, an equestrian center, golf course, and other recreational attractions and associated roadways and supporting facilities. The Phase 1 would result in the development of the following six resort communities described in the Specific Plan of Development (SPOD; MAHA, 2019):

1. Equestrian Center Community - This community includes a clubhouse, stables, paddocks, manmade lake, and several riding arenas and polo fields. Residential parcels will also be located within this community.
2. Maha Farm Community - This community is designed around the existing agricultural history of the Ranch by establishing residential parcels with potential for vineyard or other agricultural development. Maha Farms also includes sales centers, a hotel, wineries, barns, and other supporting infrastructure.
3. Red Hills Estates Community - This community includes the Red Hill hotel, residential parcels, and an 18-hole golf course with clubhouse.
4. Bohn Ridge Resort Community - This community consists of the Bohn Ridge hotel and surrounding residential parcels.
5. Spa Community - This community consists of a few residential parcels, a walking path, and the main spa building.
6. Resort at Trout Flat Community - This community includes residential parcels, resort cottages, and a hotel.
7. Camping Area: This area includes semi-permanent tent structures to provide short-term guests with high-end “glamping” recreational opportunities that are set back from the larger resort communities.

These communities plus supporting infrastructure and workforce housing are included within the Proposed Project. Phase 1 of the Proposed Project will result in multiple hotels, resort residential units near hotels, residential estate villa units, short term staff hotel rooms, campsites, and workforce housing units (i.e. bedrooms). Future phases and the approval of the GVD anticipates up additional hotel units, resort residential units, residential estate units, and additional supporting workforce housing units/bedrooms. A map outlining the different resort communities shown with identified oak habitat impacts is presented in **Attachment A**. Future phases of development are anticipated to include additional hotel units, resort residential units, residential estate units, and supporting workforce housing units. All phases and all aspects of development will occur entirely within Lake County.

2.0 IMPACTS TO OAKS

Oak woodland habitat is a unique component of California's natural heritage. Oak trees serve several important ecological functions including temperature moderation, reduction of soil erosion, facilitation of nutrient cycling, and maintenance of water quality. Oak woodlands also have inherent aesthetic value, are a characteristic feature of the state, and have cultural significance to Native Americans. In addition, oak woodlands provide essential habitat and/or food for many wildlife species including insects, invertebrates, amphibians, reptiles, birds, and mammals.

2.1 IMPACT MINIMIZATION MEASURES

Minimization measures are included as part of the project design where possible in order to minimize oak impacts. Minimization measures include maximum avoidance of oak woodland and individual oaks, maximum avoidance of sensitive habitat that supports oaks and oak dispersal, and incorporation of oaks into landscape design.

Following the sale of a residential lot, a development plan for that lot will follow the general outline described below:

- Residential lots larger than two acres that are entirely within oak woodland habitat will be restricted to a one-acre maximum buildable area. This buildable area is designed to provide footprint size and location guidance to avoid impacts to oaks within residential lots.
- For residential lots in which a significant impact to canopy cover is unavoidable, the impact will be analyzed for the grading, driveways, and building areas, not to exceed 1.5 acres. Mitigation for this type of impact will occur through recordation of same-species oak woodland in long term preservation prior to the issuance of building or grading permits.
- For impacts in which cover is sparse, or significant woodland impacts can be avoided, an exact tree removal and size inventory will be required prior to a building or grading permit. The mitigation will include transplanting, compensatory planting, and/or enhancement as described below.
- These methods will be applied to residential lots developed as a result of either Phase 1 or future phases of development.

In addition to the general impact minimization measures, development of commercial lots has followed the general outline below:

- The footprint of development was reduced to only that area required for the function and design of a commercial lot.
- Placement of structures maximized avoidance oak woodlands.
- Individual oaks will be preserved or transplanted through intentional landscaping or design.
- For commercial lots in which a significant impact to canopy cover is anticipated, the impact will be analyzed for as the greatest maximum potential impact and mitigated through oak woodland preservation prior to impacts.
- For impacts in which cover is sparse, or significant woodland impacts can be avoided, an exact tree count and size inventory will be required followed by mitigation through transplanting, compensatory planting, and/or enhancement as described below.

2.2 OAK IMPACTS BY HABITAT TYPES

Approximately 4,278.2 acres of the Guenoc Valley Site has been identified as oak woodland, with an additional 1,238.7 acres of oak savannah, and 174.9 acres of mixed-oak woodland. **Table 1** provides a summary breakdown of oak habitats impacted by Phase 1.

Infrastructure impacts were calculated based on linear impact features such as roadways along with a thirty-foot grading buffer on each side. Acreages were calculated for illustrative purposes to show the scale of potential impacts. Because of the ability to design around specific oak trees, roadway impacts will be addressed on a tree-by-tree basis. Maximum potential impacts for residential lots are based on the 1.5-acre allowable development area set by the GVD for a given parcel and a 1.0-acre lot development restriction on a parcel that lies entirely within oak woodland habitat, which will be recorded with the parcel's final map. Maximum potential impacts for commercial lots are based on the maximum development footprint as proposed in the Specific Plan of Development (SPOD) for the intended use of the lot positioned to minimize potential impacts to oaks and includes the building footprint as well as the grading extent area.

Vegetative cover in oak savanna habitat is typically dominated by non-native annual grasses with interspersed individual oaks. An Oak savanna is approximately 60% or less total canopy cover and with less than 2/3 of the canopies touching (WRA, 2020a; WRA 2020b). Oak savanna impacts described in **Table 1** are based on the total acreage of oak savanna rather than representative acreage based on percent cover of oaks. Similar to roadway impacts, because of the low density of trees and the ability to avoid them, oak savanna impacts will be measured on a tree-by-tree basis for the purpose of mitigation.

TABLE 1
OAK HABITAT TYPES AND POTENTIAL PHASE 1 IMPACTS BY ACREAGE

Habitat Type	Acres on Guenoc Valley Site	Maximum Roadway Impacts	Maximum Residential Impacts	Maximum Commercial Impacts	Maximum Potential Impacts
Interior Live Oak Woodland	756.5	19.0	31.0	22.0	72.0
Valley Oak Woodland	49.3	1.0	0.0	1.0	2.0
Blue Oak Woodland	3,472.4	91.0	97.0	69.0	257.0
Mixed Oak Woodland	174.9	0.0	0.0	0.0	0.0
Total Oak Woodland	**4,453.1**	**111.0**	**128.0**	**92.0**	**331.0**
Blue Oak Savanna	1,238.7	50.0	52.0	44.0	146.0
Total	**5,691.8**	**161.0**	**180.0**	**136.0**	**477.0**
Source: WRA, 2020a; WRA 2020b; **Attachment A**					

Oak Woodland

The project site contains interior live oak woodland, valley oak woodland, blue oak woodland, and mixed oak woodland. This habitat type was identified in a Biological Resource Analysis performed by WRA Inc. (BRA; WRA, 2019). Oak habitat identified was overlaid on a georeferenced map of the Phase One development in order to determine potential impacts. Identification of oak woodland impacts from future development phases will be performed in a similar fashion. A maximum of approximately 220 acres (**Table 1**) of oak woodland habitat has the potential to be impacted by residential and commercial development. Potential impacts from future development will be assessed in a similar fashion. Roadway impacts of approximately 111 acres of oak woodland along 7.5 miles of roadway will be

defined through tree counts as specified in detail in **Section 3.0** as impacts to individual oaks may be avoided.

Blue Oak Savanna

The project site includes 1,215 acres of blue oak savannah where oak trees occur, but in lower density than in oak woodlands. This habitat type was identified by areas of low-density oak presence interspersed within a grasslands-type setting that was verified through aerial imagery, biological surveys, and GIS mapping overlaid with the development footprint. Specifically, an oak savanna is identified as 60% or less total canopy cover and with less than 2/3 of the canopies touching (WRA, 2020a; WRA, 2020b). Identification of oak savannah impacts from future development phases will be performed in a similar fashion. The Proposed Project has the potential to impact up to 96 acres of oak savanna within commercial and residential development as well as approximately 50 acres of oak savanna along 4.5 miles of roadway. However, the majority of this habitat type is dominated by herbaceous cover and the impacts to individual oaks may be avoided. Therefore, impacts to oak savanna will be defined through tree counts as specified in **Section 3.0**.

Mixed Oak Woodland

The project site includes 175 acres of mixed oak woodland. Mixed oak woodland is comprised of multiple co-dominate oak species and, in some cases, non-oak species. This habitat type was identified by areas with mixed oak species interspersed within a larger canopy co-dominated by other tree species. Mixed oak habitat mapping was verified through aerial imagery, biological surveys, and GIS mapping overlaid with the development footprint. There are no anticipated impacts to mixed oak woodland during Phase 1 of construction. Potential impacts from future development will be assessed in a similar fashion. Depending on the canopy cover of sensitive oaks within mixed oak woodlands, potential impacts may be measured based on acreage or on a tree-by-tree basis.

Oaks Occurring Outside of Mapped Oak Habitat

Because of the continuous nature of habitat types on the Ranch, it is likely that the Proposed Project will result in impacts to individual oak trees present within habitat types for which they are not a dominant species. Individual oaks, specifically blue oaks, have occasionally been observed on the project site within other habitat types such as foothill pine woodland. While an acreage cannot be assigned to oaks potentially occurring throughout the project site, these impacts are to be mitigated for on a tree-by-tree basis as defined in **Section 3.0**.

3.0 PROPOSED OAK MITIGATION PLAN

3.1 MITIGATION GOALS AND OBJECTIVES

Oak habitat on site will be avoided to the maximum extent possible to preserve the aesthetic, ecological, and cultural benefits provided by oaks. Acreages calculated in **Table 1** are based on the reduced impacts as a result of avoidance measures outlined in **Section 2.1**.

The goal of this Plan is to replace the function and value of impacted oak habitat as a result of the Proposed Project. The impacts from the Proposed Project will be fully mitigated in compliance with the 2009 Water Rights EIR, 2008 Oak Tree Replacement Plan, and Lake County General Plan. Success metrics will be utilized to meet mitigation criteria and ensure long-term success of the oak mitigation. Proposed mitigation is comprised of protecting existing oak woodlands as possible and creating or enhancing habitat in suitable locations. These mitigation methods are described in detail below.

3.2 OAK MITIGATION RECOMMENDATIONS BY IMPACT TYPE

As described in **Section 2.1**, the Proposed Project has the potential to impact oak woodland, oak savanna, and individual oak trees. Impacts to these habitat types can be further described by the level of impact. Therefore, mitigation is best determined through an analysis of the habitat types and the level of impact. **Table 2** provides a mitigation matrix summary following the methods described below.

Impacts to Oak Woodland with Significant Loss of Canopy Cover

While impact minimization measures have been incorporated as part of the Proposed Project (**Section 2.1**), the Proposed Project has the potential to impact oak woodland such that a significant loss of canopy cover may occur. In this circumstance, suitable mitigation will occur through preservation of in-kind habitat at a ratio of 1.5 acres preserved to 1 acre of impacts. These methods apply to residential and commercial lot development for which a qualified biologist has determined that a significant loss of cover has occurred. This method of mitigation is suitable for Phase One and future phases of development.

Impacts to Oak Woodland without Significant Loss of Canopy Cover

Due to impact minimization measures presented in **Section 2.1**, the Proposed Project will likely have impacts on individual oak trees within oak woodland habitat such that the overall character and quality of the habitat is not significantly impacted. Consistent with the Biological Resources Assessment of the Guenoc Valley Site, impacts that result in a reduction in woodland canopy cover to 60 percent or less and less than 2/3 of the canopies touching would be considered conversion of habitat from oak woodland to oak savanna. In circumstances where removal of trees does not convert oak woodland to oak savanna, the following mitigation is recommended:

- For oaks removed with a diameter at breast height (dbh) between 3 inches and 15 inches, full transplant or replanting at a 2:1 ratio as detailed in **Section 4.0**.
- For oaks removed with a diameter at breast height of 15 inches or greater, transplantation or replanting at a 5:1 ratio as detailed in **Section 4.0**.
- For oaks that are transplanted, they will be monitored for the success of transplanting as described under **Section 5.0** and replaced via replanting ratios described above should the transplanting fail.
- Locations of removed oaks will be documented such that oaks removed within a POU will result in compensatory plantings within POU consistent with the 2009 Water Rights EIR. The Phase I of the GVD proposes approximately 32 acres of potential impact to oaks within the POU, which will be mitigated in accordance with the 2009 Water Rights EIR requirement for like compensation within POU. In addition to this existing requirement, the 32 acres will also comply with this 2020 GVD Oak Mitigation plan as described in the below table with a preservation of similar oak woodland at a ratio of preservation of 1.5 acres to 1.0 acres of impact, which may occur outside of the previously defined POU, but within the Guenoc Valley Site.

These methods apply to oaks impacted by infrastructure and fire-protection vegetation management. These methods also apply to residential and commercial lot development for which a qualified biologist has determined that a significant loss of cover has not occurred. This method of mitigation is suitable for Phase 1 and future phases of development.

TABLE 2
SUMMARY MATRIX OF RECOMMENDED OAK MITIGATION

Habitat Type	Habitat Impact Type	Mitigation Recommended
Interior Live Oak Woodland	Significant loss of oak canopy cover	Preservation of interior live oak woodland at a 1.5:1 ratio
	No significant loss of canopy cover	Exact tree count followed by replanting interior live oak at the following ratios: ▪ 2:1 for dbh 3”-15” ▪ 5:1 for dbh < 15” Transplanted trees that fail are subject to these replanting ratios.
Valley Oak Woodland	Significant loss of oak canopy cover	Preservation of valley oak woodland at a 1.5:1 ratio
	No significant loss of canopy cover	Exact tree count followed by replanting of valley oak at the following ratios: ▪ 2:1 for dbh 3”-15” ▪ 5:1 for dbh < 15” Transplanted trees that fail are subject to these replanting ratios.
Blue Oak Woodland	Significant loss of oak canopy cover	Preservation of blue oak woodland at a 1.5:1 ratio
	No significant loss of canopy cover	Exact tree count followed by replanting of blue oak at the following ratios: ▪ 2:1 for dbh 3”-15” ▪ 5:1 for dbh < 15” Transplanted trees that fail are subject to these replanting ratios.
Mixed Oak Woodland	Significant loss of oak canopy cover	Preservation of mixed oak woodland at a 1.5:1 ratio
	No significant loss of canopy cover	Exact tree count followed by replanting mixed oak at the following ratios: ▪ 2:1 for dbh 3”-15” ▪ 5:1 for dbh < 15” Transplanted trees that fail are subject to these replanting ratios.
Blue Oak Savanna	Any impact	Exact tree count followed by replanting blue oak at the following ratios: ▪ 2:1 for dbh 3”-15” ▪ 5:1 for dbh < 15” Transplanted trees that fail are subject to these replanting ratios.
Individual Oak	Any impact	Exact tree count followed by replanting in-kind oak at the following ratios: ▪ 2:1 for dbh 3”-15” ▪ 5:1 for dbh < 15” Transplanted trees that fail are subject to these replanting ratios.

Impacts to Oak Savanna

Impacts to oak savanna will be handled in the same manner as impacts to oak woodland without significant loss of canopy cover. This method of mitigation is suitable for Phase One and future phases of development.

Impacts to Individual Oaks

Impacts to oaks that occur outside of habitat mapped as oak woodland or oak savanna will be handled in the same manner as impacts to oak woodland without significant loss of canopy cover. This method of mitigation is suitable for Phase One and future phases of development.

4.0 OAK MITIGATION

Detailed tree counts will be maintained as necessary in order to ensure full mitigation within the appropriate area of the Guenoc Valley Site.

4.1 OAK WOODLAND PRESERVATION

A significant portion of oak woodland within the development area is avoided through residential development restriction or project design. The area of potential oak woodland preservation was identified based on the type and quality of habitat impacted by the Proposed Project. **Attachment A** shows potential oak impacts resulting from Phase 1 and illustrates the existing and proposed preservation areas under Phase 1. Of the oak preservation presented in **Attachment A**, a total of 464 acres are preserved within Lake County and located within the POU pursuant to the 2009 Guenoc Valley Water Rights FEIR (AES, 2009). In addition to the 464 acres of oak woodlands required to be preserved within Lake County and located within the POU, 853 acres of oak woodlands are in long term preservation within the Preserved Open Space Area, which will be in long-term management, for a total of 1,317 acres of existing preserved oak woodlands. Additionally, based on a preservation ratio of 1.5 acres to 1 acre impacted, additional acres of oak woodland would be preserved through restrictions on residential lot development and avoidance of woodland within commercial lots. The total area of existing and proposed oak preservation within the Guenoc Valley Site following Phase 1 development would be 1,633 acres. **Table 3** shows a summary of proposed oak preservation areas related to Phase 1 impacts.

TABLE 3
PHASE 1 MAXIMUM OAK WOODLAND PRESERVATION REQUIREMENTS FOLLOWING IMPACT MINIMIZATION

Habitat Type	Maximum Acres of Significant Cover Loss	Maximum Acres Required for 1.5:1 Preservation
Interior Live Oak	53	80
Valley Oak	1	1.5
Blue Oak	166	249
Mixed Oak	0	0
Total	**220**	**331**

Acres of oak woodland preservation will be protected prior to the issuance of a building or grading permit of a commercial property or the recordation of the final map prior to the sale of a residential parcel. This Oak Mitigation Plan will serve as an agreement between the property-holder of the Guenoc Valley Site and Lake County, restricting future development on the identified oak woodland preservation areas. Any future modification of such preservation areas would require additional identification of oak preservation such that acreage of preserved oak woodland by species is not lost. Since these

conservation areas will be filed as a deed restriction and recorded as a development restriction on the title, a formal conservation easement filed with Lake County is not necessary.

4.2 OAK TREE PLANTING

Because exact tree counts are dependent upon final development plans, this section serves to outline a method for determining suitable oak planting locations. Suitable oak habitat replacement or preservation should be of similar quality to support successful oak establishment.

Additionally, locations for mitigation plantings should consider practicality of planting and maintenance based on the location. Oaks may be planted in suitable habitat where oaks to not substantially occur, or where cover is low. These locations also considered surrounding land use and targeted those areas most likely to be preserved throughout all phases of development. Potential locations were selected for plantings based on suitable supporting habitat, continuity of the landscape, and other metrics that would increase the success and functionality of mitigation plantings. Selection also considered the accessibility of the location for the purpose of planting, maintenance, and monitoring. Habitat of similar quality and practicality for mitigation plantings may be utilized.

A qualified biologist will confirm the tree removal count and the required number of compensatory plantings for a development area. Tree counts and planting locations will be carefully documented in order to ensure compliance with this Plan. Oak plantings will be initiated no later than the suitable planting season following oak removal for which a parcel or area of development has been impacted. Oak seedlings will be planted with the intent of replacing not only the trees themselves, but restoring the functionality of the habitat impacted by the Proposed Project.

Source and Size of Mitigation Plantings

Oak planting required for mitigation may be obtained from a variety of sources. An on-site nursery currently produces seedlings from acorns collected on site and could be used to provide for a portion of plantings. Direct plantings of acorns and seedlings collected on site may also occur. Each individual oak planting, whether it be sourced from the nursery or planted directly, will count as one individual for the sake of tree replacement mitigation ratios, and subject to the monitoring requirements outlined in **Section 5.0**. Should needs exceed the on-site production of acorns and seedlings, locally sourced nurseries within 200 miles of the project site may be used to provide seedlings.

Transplanting of Oak Trees

When possible, transplanting of trees removed during development will also be used in oak woodland creation areas. Due to the value of mature trees, preferential selection for transplanting should be given to those trees with a dbh equal to or greater than 15" when possible. If the tree planned to be removed is successfully transplanted, then there is no additional required mitigation. Transplanted trees will be monitored as outlined in **Section 5.0**. Should a transplanted tree fail, replanting as outlined in **Section 2.2** will occur. The following outlines the methods used for transplanting of oaks previously performed on the Guenoc Valley Site to be used for oaks transplanted through construction of the Proposed Project:

- Select tree to be salvaged / transplanted;
- Evaluated current health of selected tree taking into consideration age, vigor, presence of sickness, fungus, pest/disease;

- Evaluate the type and conditions of the soil where the tree is growing (sandy, rocky, clay, etc.). Root pruning and transplant methods will vary based on these conditions;
- Evaluate labor and machinery available to transplant. Size of root ball, root-pruning methodology and system of containerization will vary based on these variables;
- Determine root ball dimensions based on size of tree, conditions of soil, and target final weight of root ball/tree;
- Initiate exploratory digging around root ball perimeter. This exploratory dig will reveal extent of lateral root system and soil profile;
- Once root ball perimeter is determined and marked, initial digging is initiated around all or a portion of the root ball;
- Depending on the species and its root system, often main lateral roots are left intact to a) minimize shock to the tree and b) to maintain tree stability, so it does not fall down;
- Ideally perform initial root ball digging during the dormant season;
- Once the first stage of root ball digging is complete, the ball is wrapped tightly in heavy duty black plastic, or a layer of burlap followed by then black plastic. The purpose of this is to retain humidity within the root ball while reducing direct sunlight on the exposed roots;
- Depending on the tree species, the tree will often be left for a matter of months or even up to a year following the initial root prune. The purpose of this is to allow the tree to recover from the shock of root pruning prior to cutting main lateral roots and lifting the tree;
- During this rest period the tree is regularly monitored for overall health and to ensure adequate moisture, etc.;
- The following stage involves gradual cutting of lateral roots, finalized shaping of the root ball and in many cases, construction of a box or container around the root ball. Very heavy trees will often be lifted from this box;
- Once the tree is containerized, the tree is ready to be lifted. Ideally this will occur during or just prior to a dormant season (typically fall or winter), although this is not always possible;
- Lifting / transplant methods vary from species to species and are also dependent on soil type, proximity of tree to final planting location, and the type of machinery being used to transplant. In the case of blue oaks, a large articulating forklift is used to lift the tree from the bottom of the box. The tree is then transported by the articulating forklift to its designated staging area or final planting location., and
- Following tree extraction and relocation, the tree hole is backfilled, and erosion control measures are implemented.

Planting Specifications

There are several methods to increase the success of direct acorn plantings. The following specifications are to be followed for the collection and direct plantings of acorns:

- Collection of acorns for planting should occur within the same year that tree planting would occur. Acorns are ready to pick from trees when the acorn cap can be easily separated from the acorn without tearing the seed coat.
- If unable to plant acorns immediately, acorn caps should be removed, and acorns will be stored under cool moist conditions until ready to be planted.
- Three to four acorns will be planted two to four inches deep on their side approximately three inches apart in order to maximize the germination success of at least one seedling.
- Organic mulch may be applied after planting, extending to a three to four-foot radius, and to a height of two to three inches over the top of the soil. Water following the planting.

The following planting specifications will be followed to increase the success rate for seedlings and transplanted trees:

- Should needs exceed the production capabilities of the on-site nursery, seedlings are to be sourced from a nursery that is growing trees from locally sourced acorns.
- Organic mulch will be applied after planting, extending to a three to four-foot radius and to a height of two to three inches over the top of the soil. Water following planting.
- Seedlings planted from starter pots are to be planted in holes dug slightly deeper than pot height and twice the width. Holes should be dug by hand when possible with smooth edges loosened to promote root growth.
- Any trees that are staked should be done so such that the straps are loose enough to allow for natural bending and movement of the tree while being tight enough to protect the tree from structurally damaging movements such as high-wind storms. Stakes should be removed following successful establishment.

Oak woodland planting areas should be planted with irregular spacing and clumps of trees to reflect the natural and aesthetic qualities of the existing oak woodlands.

Methods of Irrigation

Irrigation methods will vary based on the locations of the planting sites within the mitigation areas. Some planting sites may not need supplemental irrigation if there is a sufficient source of groundwater. If tree planting takes place during the rainy season, supplemental irrigation is not anticipated to be necessary during the first year. Irrigation methods for mitigation areas planted in the dry season will likely include the installation of temporary drip irrigation systems. Tree plantings will be irrigated in the absence of enough groundwater during the dry season in their first two years of growth in order to promote seedling survival. The plantings should not need to be irrigated during the wet season.

Planting Schedule

Acorn and seedling planting will be conducted between the months November and December, pending availability of seedlings or acorns. Planting during the fall will facilitate establishment of the planted acorns and seedlings during the rainy season. Plantings should begin no later than the first suitable planting season following oak tree removal for the Proposed Project.

Seedling Protection

In areas that have issues with herbivory, seedlings or acorn planting sites will be provided with adequate protection from damage to increase survival rates. These protections usually consist of tree shelters, or small wire mesh cages covering the seedling to reduce the likelihood that deer or other herbivores will consume the young trees. Mesh should be of an appropriate size to prevent entrapment of songbirds.

4.3 Oak Habitat Enhancement

These areas may be used for tree-by-tree mitigation or restoration activities and will follow the specific planting instructions above. Oak habitat enhancement may occur in areas of oak savannah and pine-oak woodland but may include the enhancement of other mixed-oak habitat.

4.4 MITIGATION AREA MAINTENANCE

Maintenance of the mitigation areas will consist of weed removal, removal of trash and litter, inspection of tree shelters and wire mesh, fencing (as needed), irrigation systems, tree stakes, and inspection for evidence of vandalism or other uses conflicting with the goals of this Plan.

Weed Control

Three primary techniques are available for weed control maintenance activities in the oak planting areas: mowing, hand weeding, and herbicide application. Mowing and/or hand weeding are the preferred methods of weed control. If herbicides are used, they will be applied only by licensed personnel in strict accordance with the manufacturer's regulations. No herbicide should contact the leaves or stems of the oak trees. Herbicide use will be as restricted as possible; spot applications are preferred, and extreme care should be taken when applying herbicides in the vicinity of open water, wetlands, existing native vegetation, and revegetation plantings. No weed control is necessary in the oak preservation areas.

Removal of Trash and Litter

Trash and litter, which may blow into the mitigation areas, will be removed periodically. Any trash observed within the mitigation areas during the monitoring visits will be reported and/or removed.

Other Inspections

Planting equipment such as tree shelters, wire mesh, fencing, irrigation systems, or tree stakes if used, will be inspected during quarterly monitoring visits by a qualified biologist described in **Section 5.0** below. Instructions to correct any defects will be included in the biological monitoring reports. Evidence of any uses conflicting with the goals of this tree mitigation plan will be included in the monitoring reports.

Maintenance Schedule

The oak planting mitigation sites will be visited by the Ranch staff at least twice monthly during the first six months to assess the effectiveness of the irrigation system (if applicable) and to inspect any tree shelters, wire mesh, fencing, or tree stakes used. Quarterly visits, as described in **Section 4.3**, will also ensure that plantings and irrigation are functioning as designed. These quarterly visits will be performed by a qualified biologist throughout the remainder of the three-year monitoring period, described further in **Section 5.0** below.

5.0 MONITORING PLAN

5.1 DATA COLLECTION

Mitigation sites will be inspected by a qualified biologist or certified arborist for three years after planting. Monitoring site visits will involve assessing the status of the replacement plantings, determining the need for irrigation, identifying weeds for removal, and assessing the overall integrity and success of the mitigation sites.

Monitoring reports will, at a minimum, include the following metrics of successful oak establishment: survival rates, overall health, dbh of mitigation plantings, and the status of competing woody vegetation. Criteria described below will apply to both Phase 1 and future phases of development.

5.2 SUCCESS CRITERIA

Oak Preservation Areas

The oak preservation areas do not have success criteria. Because the oak preservation areas are ecologically functional oak woodlands, these areas need only to be protected from future development in order to offset the impacts to oak woodlands elsewhere on the property.

Oak Habitat Planting Areas

The oak replanting mitigation will be considered successful when, after three years, the tree plantings have achieved an 80 percent success rate. If additional plantings are necessary to increase the total plantings to meet the 80 percent survival rate, these seedlings will be monitored for a full 3 years to ensure success of those additional plantings. A high level of replanting success is anticipated with the use of protective measures, along with placement of the plantings in appropriate habitat.

Oak Habitat Enhancement Areas

Oak woodland enhancement areas are deemed successful when, after three years, the tree plantings have achieved an 80 percent success rate. If additional plantings are necessary to increase the total plantings to meet the 80 percent survival rate, these seedlings will be monitored for a full 3 years to ensure success of those additional plantings. A high level of replanting success is anticipated with the use of protective measures, along with placement of the plantings in appropriate habitat.

5.3 REPORTING

A qualified biologist or certified arborist will inspect the site during planting to ensure that it is completed in compliance with this plan and to create a baseline of the locations for future inspections. Due to the size of the property, the projected development timeline, and the associated mitigation plan, restoration areas may be broken into Mitigation Units. Each Mitigation Unit will be mapped with an approximate tree count and submitted to Lake County immediately following mitigation plantings. A total of three annual reports will be completed for each Mitigation Unit, with additional reports as necessary until all success criteria are met. Annual reports will include the quarterly report along with an analysis on the projected success of mitigation and any adaptive management recommendations.

The first annual inspection will occur approximately one year after installation and will include a report documenting the results of the monitoring efforts. Annual reports will be submitted to the Lake County within six months of the monitoring event for a total of three years, starting the year following the initial planting. This reporting scheme will be followed such that all mitigation plantings on the Ranch associated with Phase 1 and future phases of development receive a full three years of mitigation monitoring in order to reach success criteria, with additional mitigation and monitoring as needed to meet success criteria. Should adaptive management recommendations and supplemental plantings occur, the annual report will include the notice of new plantings needed to replace failed trees, along with documentation (summary data and photos) to illustrate the condition and location of plantings. The report should include the success of natural revegetation, establishment, survival, and height of replacement tree plantings, and the status of the oak improvement area's competing woody vegetation.

5.4 SCHEDULE

Oak plantings may occur during the appropriate planting season prior to the development of the Proposed Project and must be initiated no more than one planting season following tree removal. The

first annual monitoring of the mitigation sites will be conducted the year following the initial planting, with a total of three yearly monitoring reports.

5.5 Adaptive Management

If trees planted in the mitigation areas are deemed to be performing poorly, a contingency plan may be submitted to Lake County requesting modifications to this Plan. Modifications may only be requested related to the location and management of mitigation plantings and will not result in the reduction of plantings or success criteria described herein.

6.0 COMPLETION OF MITIGATION

Once the minimum three-year monitoring period is completed and success criteria met for all mitigations, Lake County will be informed that the mitigation requirements have been completed. A qualified biologist will prepare the Notice of Completion of mitigation activities and will include the final annual report for each mitigation unit detailing the achievement of success criteria. Therefore, completion of mitigation activities will include the following reports and documentation:

- Mapping submitted to and approved by Lake County detailing all oak woodland preservation locations;
- Mapping submitted to and approved by Lake County detailing potential oak planting locations;
- Maps submitted to Lake County detailing Mitigation Units as they are designated;
- A minimum total of three annual reports for each Mitigation Unit submitted to Lake County;
    - The first annual report will document the specific planting details such as location of plantings, species, number of trees, and other important tracking information.
    - Additional annual reports may be necessary if additional supplemental plantings occur.
    - A request may be sent to Lake County to amend mitigation planting location(s) and monitoring activities based on tree performance and subject to County approval.
- A Notice of Completion of mitigation activities submitted to Lake County; and
- A final site visit with the County, if requested by the County.

Lake County may require a site visit to confirm that the success criteria have been met and that the required mitigation has been completed. The landowner will retain the oak mitigation areas and will not use them in a way that significantly degrades the ecological value of the mitigation area without notice to and approval by the County. With prior notification, the property may be periodically inspected by the County to ensure compliance with this Plan.

6.1 Assurance of Mitigation Permanence

This document will serve as an assurance that the mitigation measures will be performed as described. Any future development of this property within Lake County will be bound to this agreement. Future development on the Ranch in Lake County occupied by oak trees, specifically the areas of oak replanting and oak woodland preservation covered in this document, will require consent from Lake County. The landowner agrees to the mitigation and reporting requirements described in **Sections 3.0**, **4.0**, and **5.0**, and acknowledges that the completion of the mitigation described in **Section 6.0** does not permit the cutting or development of the oak mitigation areas.

Further development or cutting of oaks on this property beyond the Phase 1 and future phases of development plans outlined here would require consent from Lake County and consistency with this

Oak Mitigation Plan. Future development plans would be contingent on the continued protection and upkeep of the oak preservation and oak replanting areas. The applicant consents to not implement any activity on the property that may result in an impact to oak woodland habitat or is inconsistent with this Plan without first consulting with the County. Therefore, modification of development plans not specifically authorized by this Plan will occur only with the understanding and required approvals by Lake County.

7.0 REFERENCES

Analytical Environmental Services (AES). 2008. *Langtry Farms Water Rights Modification Project Oak Tree Replacement Plan*.

Analytical Environmental Services (AES). 2009. *Guenoc Water Rights Modification Project Final Environmental Impact Report*.

Lake County. 2008. *Lake County General Plan*. Available online at: http://www.co.lake.ca.us/Page3939.aspx. Accessed June 2019.

MAHA Developments. 2019. Specific Plan of Development for the MAHA resort at Guenoc Valley.

Western Regional Climate Center (WRCC). 2016. Middletown, CA: Period of Record Monthly Climate Summary. Available online at: https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca5598. Accessed June 2019.

WRA, Inc. (WRA), 2020a. Biological Resources Assessment for MAHA Resort and Guenoc Valley Development, Phase 1 Lake County, California.

WRA, Inc. (WRA), 2020b. Biological Resources Assessment for MAHA Resort and Guenoc Valley Development, Phase 2 and Open Space Lake County, California.

ATTACHMENT A

MAHA GUENOC VALLEY OAK PRESERVATION PLAN

MAHA GUENOC VALLEY

OAK PRESERVATION PLAN

FEBRUARY 18, 2020

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OVERALL ESTIMATES

EXISTING OAK WOODLAND COVERAGE

COMMUNITIES	BLUE OAK WOODLAND	BLUE OAK SAVANNA	INTERIOR LIVE OAK	VALLEY OAK WOODLAND	MIXED OAK WOODLAND	TOTAL
EXISTING OAK WOODLAND COVERAGE (PG 2)	**3,452 AC**	**1,215 AC**	**753 AC**	**50 AC**	**175 AC**	**5,645 AC**

TOTAL PROJECT SITE AREA: 16,000 AC

OAK WOODLANDS IMPACT AND PRESERVATION

	OAK WOODLANDS GREATEST POTENTIAL IMPACT*	OAK WOODLANDS AREA RATIO PRESERVATION
PROPOSED ROADWAY DEVELOPMENT (PG 3)		
ROADWAYS	12 MI	—
	12 MI	
PROPOSED PROJECT (PG 3 & 4)		
VILLA & RESORT RESIDENTIAL PARCELS	128 AC	489 AC
COMMERCIAL & FACILITY PARCELS	92 AC	118 AC
RURAL LANDSCAPES	0 AC	188 AC
DESIGNATED OPEN SPACE	0 AC	868 AC
TOTAL	**220 AC**	**1,663 AC****

*Oak woodlands impacted by roadway development and Blue Oak Savanna impacted within parcels will be mitigated with tree-by-tree replacement ratios as described in the Oak Mitigation Plan. Tree-by-tree replacement areas will be identified on an ongoing and as-needed basis and are not reflected in the "Project Area Ratio Preservation of Oak Woodlands" plan on page 4.

**Please note this figure is higher than the 1,633 overall oak preservation figure as reported in the Oak Mitigation Plan, as it includes the combination of preservation to both Blue Oak Savanna and Oak Woodland communities.

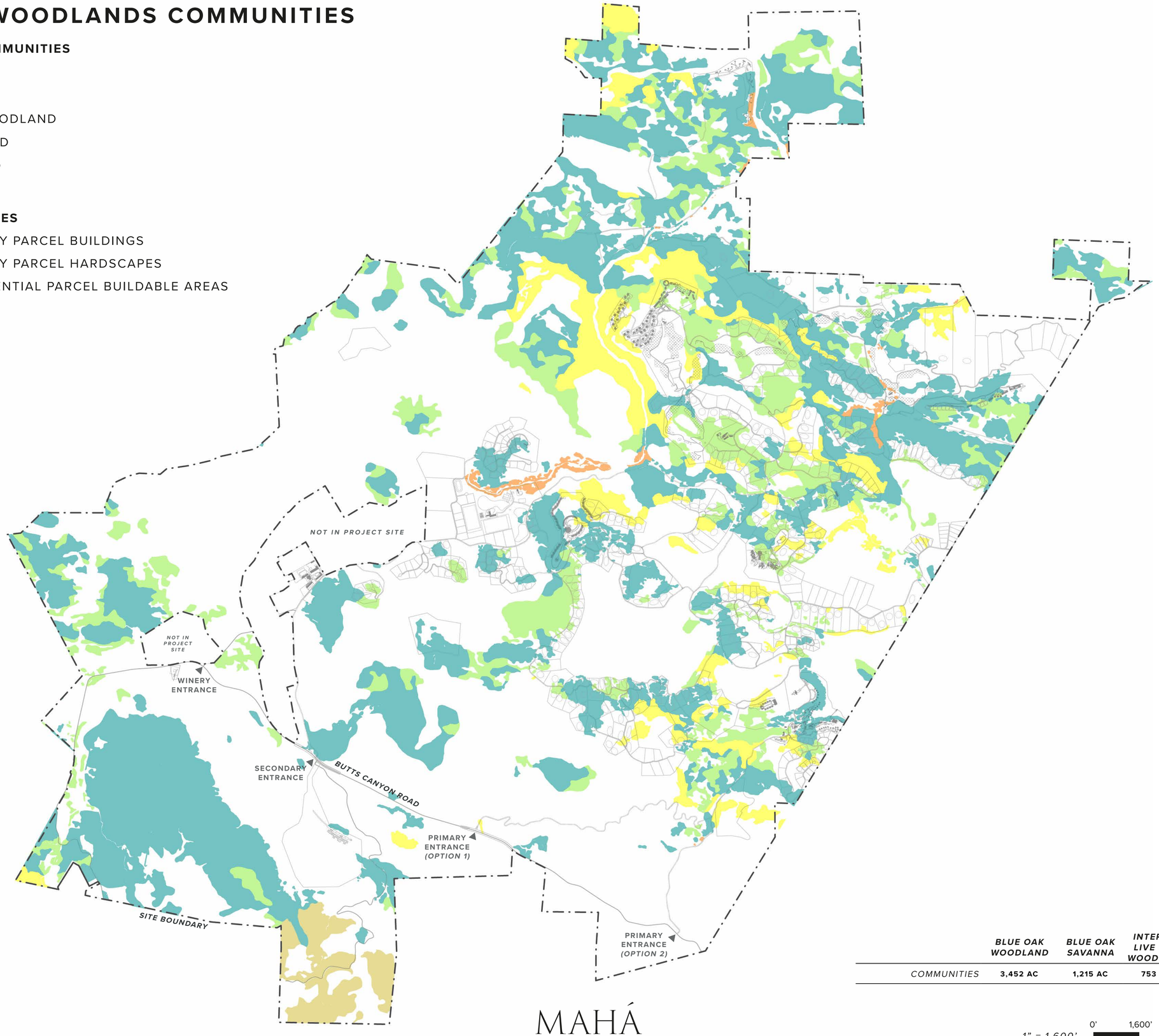
EXISTING OAK WOODLANDS COMMUNITIES

OAK WOODLANDS COMMUNITIES

- BLUE OAK WOODLAND
- BLUE OAK SAVANNA
- INTERIOR LIVE OAK WOODLAND
- VALLEY OAK WOODLAND
- MIXED OAK WOODLAND

DEVELOPMENT FEATURES

- COMMERCIAL & FACILITY PARCEL BUILDINGS
- COMMERCIAL & FACILITY PARCEL HARDSCAPES
- VILLA & RESORT RESIDENTIAL PARCEL BUILDABLE AREAS
- GOLF COURSE
- ROADWAYS
- PARCELS
- PROPERTY BOUNDARY



	BLUE OAK WOODLAND	BLUE OAK SAVANNA	INTERIOR LIVE OAK WOODLAND	VALLEY OAK WOODLAND	MIXED OAK WOODLAND	TOTAL
COMMUNITIES	3,452 AC	1,215 AC	753 AC	50 AC	175 AC	5,645 AC

1" = 1,600' 0' 1,600' 3,200' 6,400'

PROJECT IMPACTS TO OAK WOODLANDS

OAK WOODLANDS GREATEST POTENTIAL IMPACT IN PROPOSED PARCELS

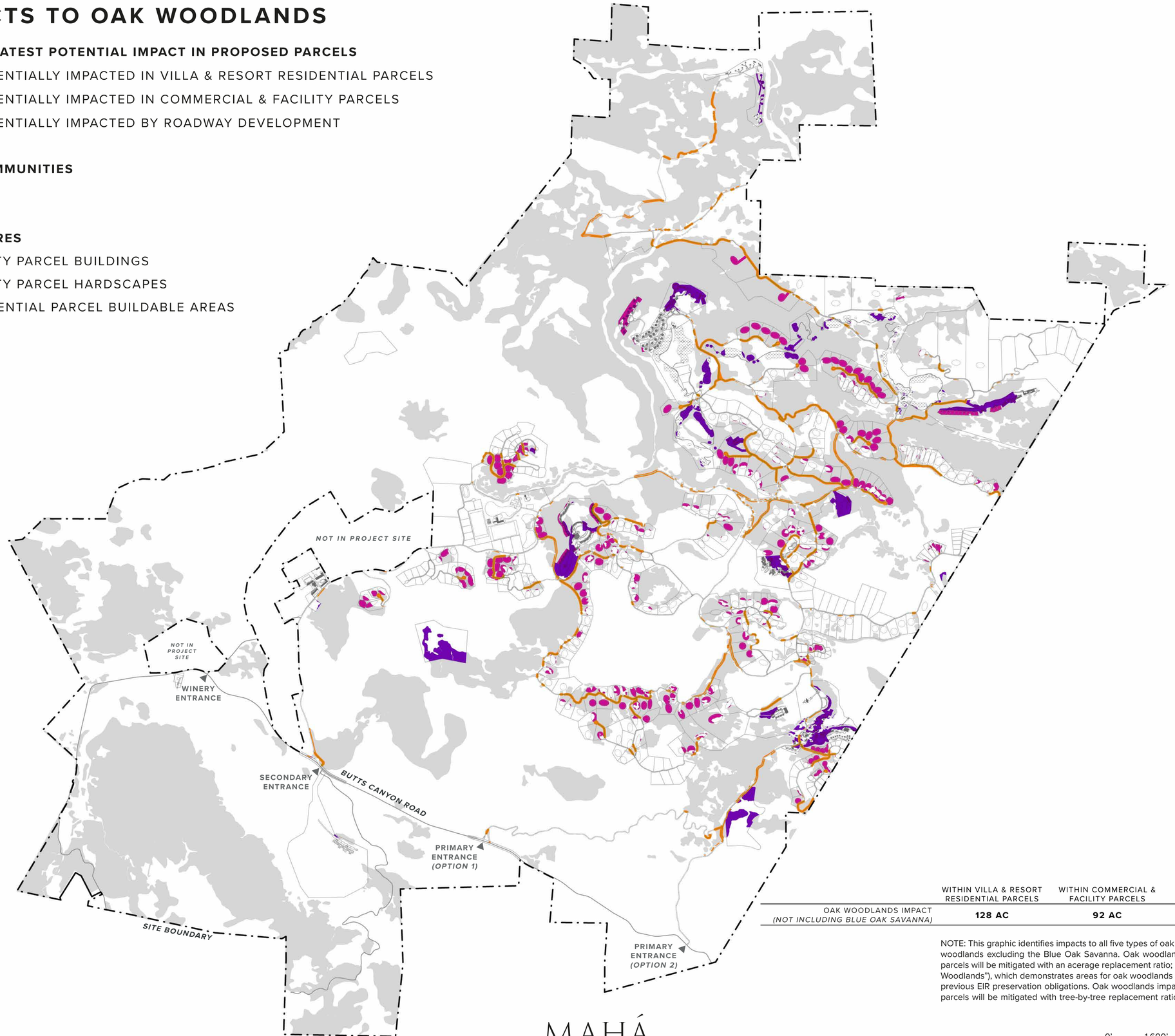
- OAK WOODLANDS POTENTIALLY IMPACTED IN VILLA & RESORT RESIDENTIAL PARCELS
- OAK WOODLANDS POTENTIALLY IMPACTED IN COMMERCIAL & FACILITY PARCELS
- OAK WOODLANDS POTENTIALLY IMPACTED BY ROADWAY DEVELOPMENT

OAK WOODLANDS COMMUNITIES

- OAK WOODLANDS

DEVELOPMENT FEATURES

- COMMERCIAL & FACILITY PARCEL BUILDINGS
- COMMERCIAL & FACILITY PARCEL HARDSCAPES
- VILLA & RESORT RESIDENTIAL PARCEL BUILDABLE AREAS
- GOLF COURSE
- ROADWAYS
- PARCELS
- PROPERTY BOUNDARY



	WITHIN VILLA & RESORT RESIDENTIAL PARCELS	WITHIN COMMERCIAL & FACILITY PARCELS	PARCEL IMPACT TOTAL	BY ROADWAY DEVELOPMENT
OAK WOODLANDS IMPACT *(NOT INCLUDING BLUE OAK SAVANNA)*	**128 AC**	**92 AC**	**220 AC**	**12 MI**

NOTE: This graphic identifies impacts to all five types of oak woodlands, while the table summarizes impacts to the oak woodlands excluding the Blue Oak Savanna. Oak woodlands (not including the Blue Oak Savanna) impacted within parcels will be mitigated with an acerage replacement ratio; please see page 4 (“Project Area Preservation Ratio of Oak Woodlands”), which demonstrates areas for oak woodlands preservation to mitigate for these impacts and to also fulfill previous EIR preservation obligations. Oak woodlands impacted by roadways and Blue Oak Savanna impacted within parcels will be mitigated with tree-by-tree replacement ratios; tree-by-tree replacement areas will be identified on an

1” = 1,600’

0’ 1,600’ 3,200’ 6,400’

PROJECT AREA RATIO PRESERVATION OF OAK WOODLANDS

EXISTING OAK WOODLANDS PRESERVATION

- DEED-RESTRICTED OAK WOODLANDS IN VILLA & RESORT RESIDENTIAL PARCELS
- DEED-RESTRICTED OAK WOODLANDS IN COMMERCIAL & FACILITY PARCELS
- DEED-RESTRICTED OAK WOODLANDS IN DESIGNATED OPEN SPACE
- DEED-RESTRICTED OAK WOODLANDS IN RURAL LANDSCAPES

PROPOSED OAK WOODLANDS PRESERVATION

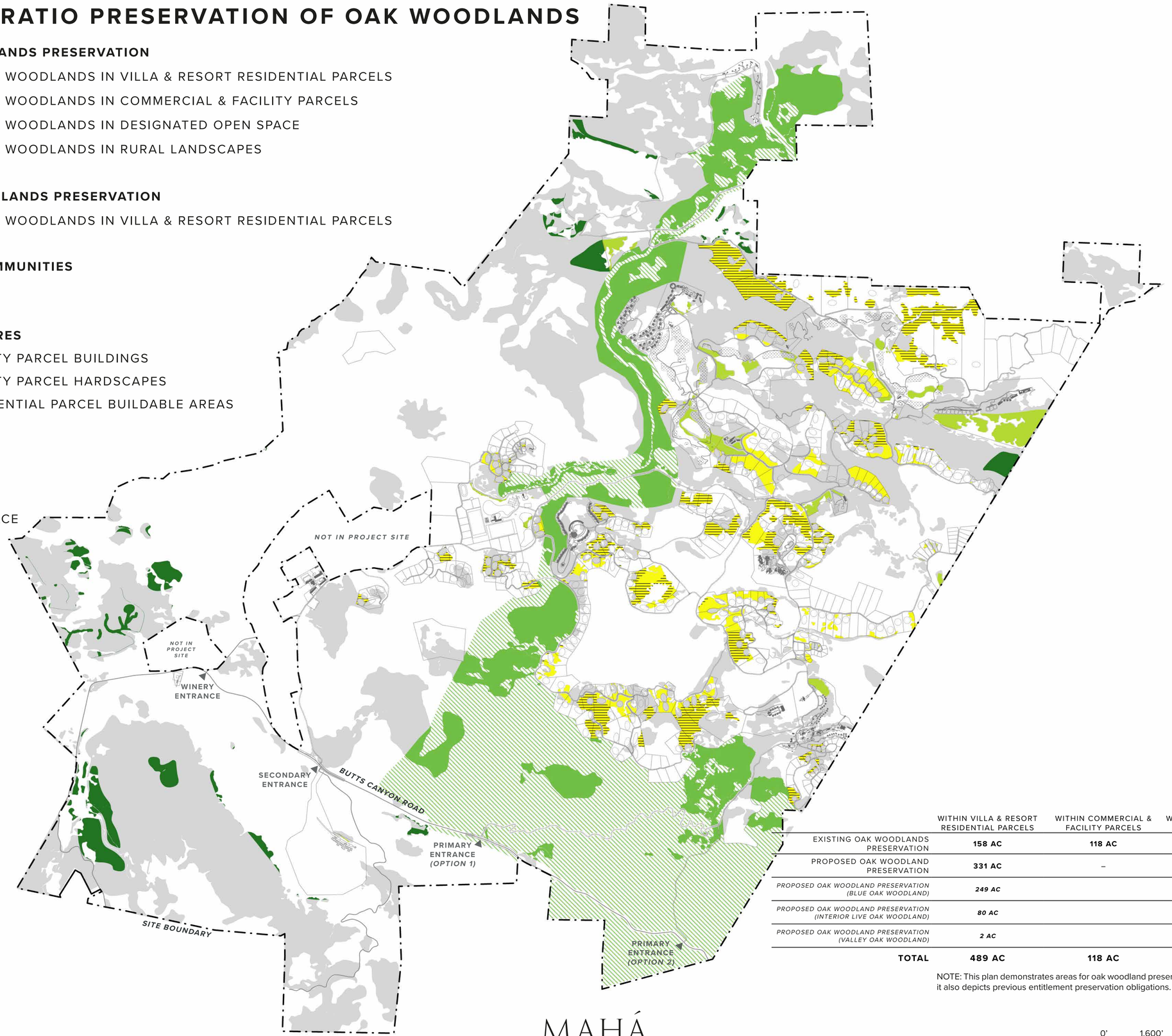
- DEED-RESTRICTED OAK WOODLANDS IN VILLA & RESORT RESIDENTIAL PARCELS

OAK WOODLANDS COMMUNITIES

- OAK WOODLANDS

DEVELOPMENT FEATURES

- COMMERCIAL & FACILITY PARCEL BUILDINGS
- COMMERCIAL & FACILITY PARCEL HARDSCAPES
- VILLA & RESORT RESIDENTIAL PARCEL BUILDABLE AREAS
- GOLF COURSE
- ROADWAYS
- PARCELS
- PROPERTY BOUNDARY
- DESIGNATED OPEN SPACE



	WITHIN VILLA & RESORT RESIDENTIAL PARCELS	WITHIN COMMERCIAL & FACILITY PARCELS	WITHIN DESIGNATED OPEN SPACE	WITHIN RURAL LANDSCAPE	TOTAL
EXISTING OAK WOODLANDS PRESERVATION	**158 AC**	**118 AC**	**868 AC**	**188 AC**	**1,332 AC**
PROPOSED OAK WOODLAND PRESERVATION	**331 AC**	–	–	–	**331 AC**
PROPOSED OAK WOODLAND PRESERVATION (BLUE OAK WOODLAND)	***249 AC***				***249 AC***
PROPOSED OAK WOODLAND PRESERVATION (INTERIOR LIVE OAK WOODLAND)	***80 AC***				***80 AC***
PROPOSED OAK WOODLAND PRESERVATION (VALLEY OAK WOODLAND)	***2 AC***				***2 AC***
TOTAL	**489 AC**	**118 AC**	**868 AC**	**188 AC**	**1,663 AC**

NOTE: This plan demonstrates areas for oak woodland preservation to mitigate for impacts to oak woodlands, in addition it also depicts previous entitlement preservation obligations. Please see the Oak Mitigation Plan for further information.

1" = 1,600'

0' 1,600' 3,200' 6,400'

MAHÁ

GUENOC VALLEY

APPENDIX OSPP

AMENDMENT TO OPEN SPACE PRESERVATION PLAN

AMENDMENT TO OPEN SPACE PRESERVATION PLAN

GUENOC VALLEY RANCH

FEBRUARY 2020

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AMENDMENT TO OPEN SPACE PRESERVATION PLAN

GUENOC VALLEY RANCH

FEBRUARY 2020

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1.0 INTRODUCTION

The 2008 Open Space Preservation Plan (2008 OSP) addressed impacts related to the 2009 Water Rights Modification Project within the 24,000-acre Guenoc Valley Ranch (Ranch) (**Figure 1** and **Figure 2**). The Guenoc Valley District (GVD) is a proposed rezoning and planned development project located within the approximately 16,000-acre boundary portion of the Ranch exclusively within Lake County (Guenoc Valley Site). The first phase of development includes luxury resorts and a master-planned residential community to be sited in clusters (Phase 1), and future phases of development would result in similar design within the GVD (Proposed Project). The GVD incorporates low impact designs that prioritize large residential parcels with low density and clustered development, preserving surrounding open space and agricultural cultivation.

This amendment to the 2008 OSP addresses the portion of the Proposed Project that impacts the Open Space Preservation Area. This amendment identifies methods of alternate preservation of acreage, and presents an analysis on habitat quality and sensitivity to ensure that proposed preservation areas satisfy the goals outlined in **Section 2.1**.

1.1 PROJECT LOCATION

The Ranch is located at the border of Lake County and Napa County, CA (**Figure 1** and **Figure 2**). The Study Area consists of the area of impact that falls within the Phase 1 development footprint of the Ranch. Long Valley and Coyote Valley occur to the west of the Ranch, and the Cedar Mountains occur to the north. Terrain varies from areas of level valley to areas of steep, rocky terrain. Several vegetative communities occur within the Ranch including agriculture, annual grassland, oak woodland, pine-oak woodland, cypress forest, mixed conifer forest, and chaparral. Aquatic habitats include ephemeral drainages, perennial streams, seasonal wetlands, groundwater seeps, freshwater marsh, and manmade ponds and reservoirs. Climate of the area consists of hot dry summers and cool, moist winters. Annual precipitation averages approximately 44.1 inches, with zero to insignificant snowfall (WRCC, 2016).

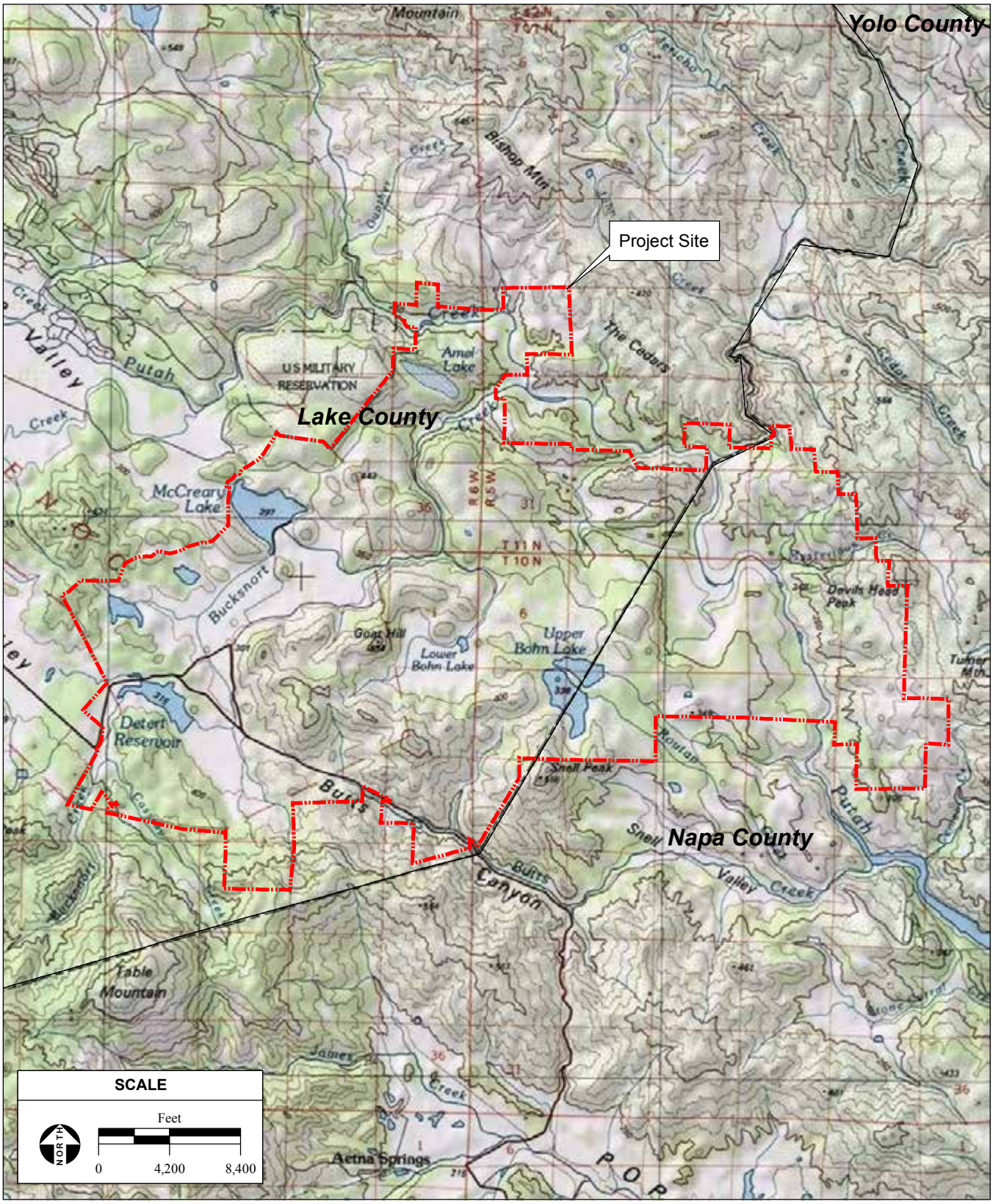
1.2 PROJECT DESCRIPTION

Development plans for Phase 1 of the Proposed Project are comprised of multiple resort communities including residential plots, hotels, an equestrian center, golf course, and other recreational attractions and associated roadways and supporting facilities. The Proposed Project would result in the development of seven resort communities described in the Specific Plan of Development (SPOD; MAHA, 2019), further summarized below.

1. Bohn Ridge Resort Community: This community consists of the Bohn Ridge hotel and surrounding residential parcels.
2. Equestrian Center Community: This community includes a clubhouse, stables, paddocks, manmade lake, and several riding arenas and polo fields. Residential parcels will also be located within this community.
3. Maha Farm Community: This community is designed around the existing agricultural history of the Ranch by establishing residential parcels with potential for vineyard or other agricultural development. Maha Farms also includes sales centers, a hotel, wineries, barns, and other supporting infrastructure.
4. Red Hills Estates Community: This community includes the Red Hill hotel, residential parcels, and an 18-hole golf course with clubhouse.

SOURCE: NatGeo 2017; AES, 7/30/2019

Figure 1
Regional Location



SOURCE: "Middletown, CA" & "Jericho Valley, CA" & "Knoxville, CA" & "Detert Reservoir, CA" & "Aetna Springs, CA" & "Walter Springs, CA" USGS 7.5 Minute Topographic Quadrangles; T10N R5W & T10N R6W & T11N R5W & T11N R6W; Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, and Unsectiond Areas of Middletown, Jericho Valley, Detert Reservoir, and Aetna Springs, Mt. Diablo Baseline & Meridian;
ESRI 2019; AES, 11/19/2019

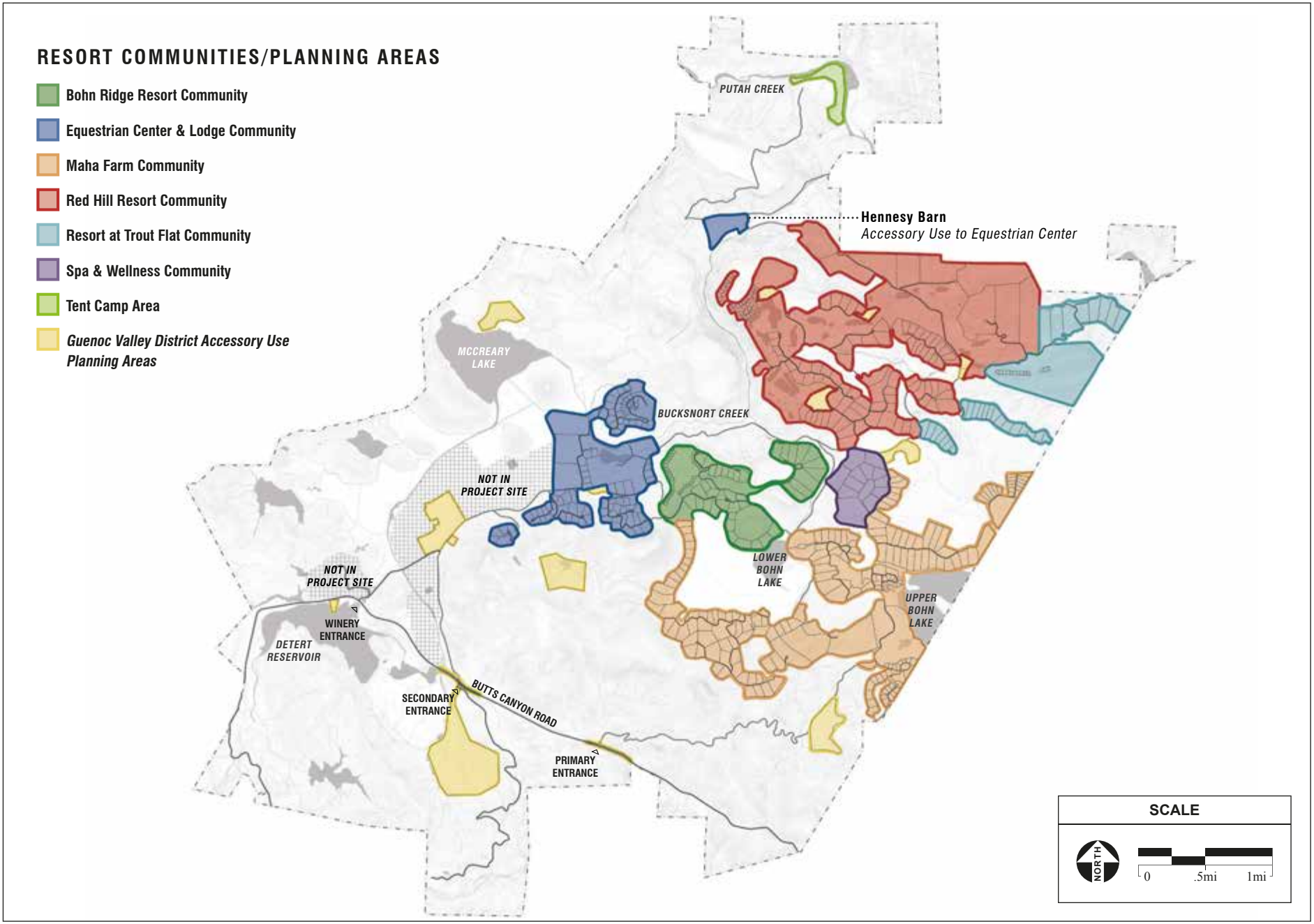
Figure 2
Site and Vicinity

5. Spa Community: This community consists of a few residential parcels, a walking path, and the main spa building.
6. Resort at Trout Flat Community: This community includes residential parcels, resort cottages, and a hotel.
7. Camping Area: This area includes semi-permanent tent structures to provide short-term guests with high-end "glamping" recreational opportunities that are set back from the larger resort communities.

These communities plus supporting infrastructure and workforce housing are included within the Proposed Project. A map outlining the different resort communities within the project site is included in **Figure 3**. Phase 1 of the Proposed Project will result in multiple hotels, resort residential units adjacent to hotels, residential estate villa units, and workforce housing units. Future phases of development are anticipated to include additional hotel units, resort residential units, residential estate units, and additional supporting workforce housing units. Phase 1 and future phases of development will occur within Lake County.

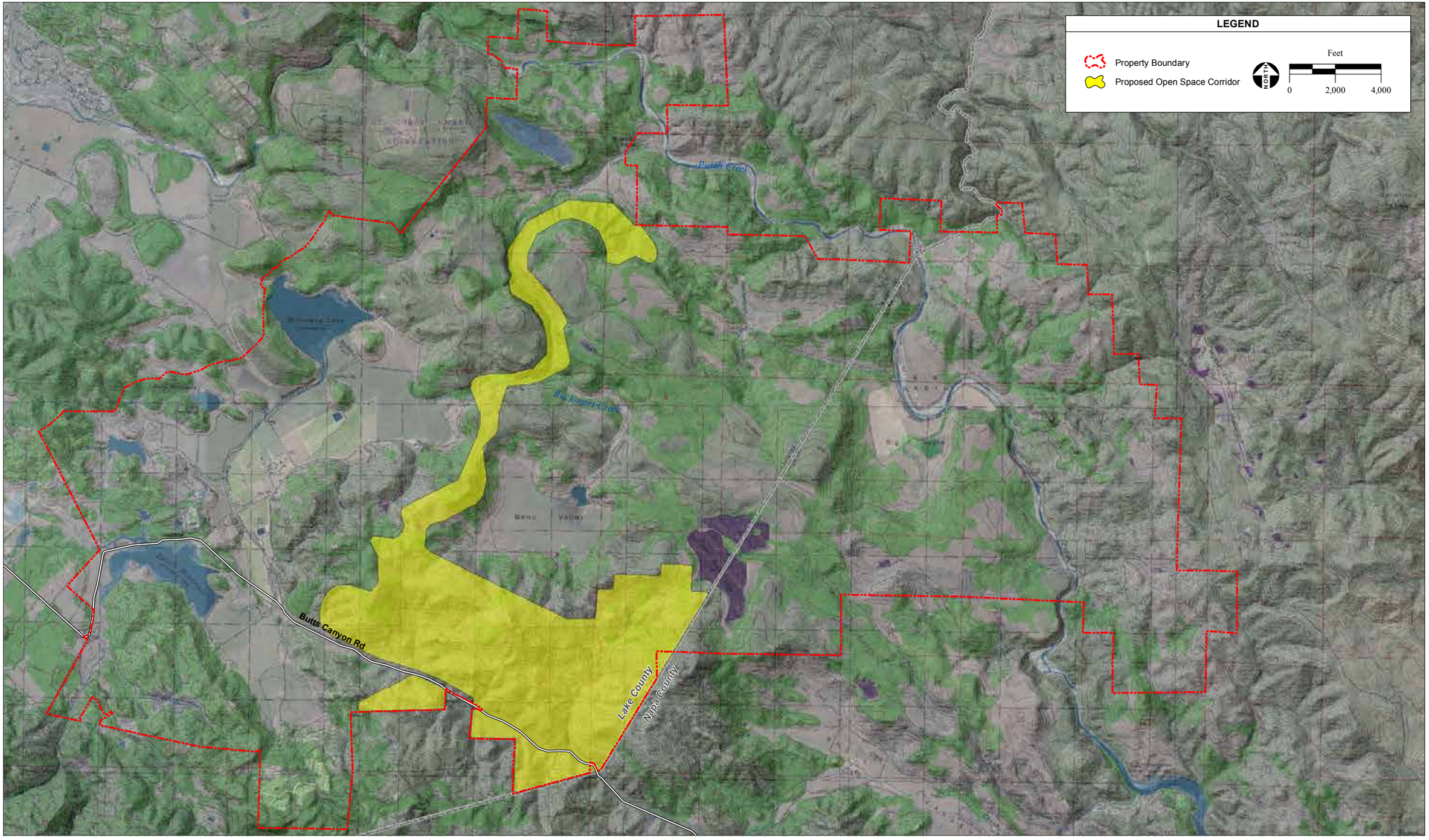
1.3 PROJECT IMPACTS

Open space and contiguous habitat provide important ecological services to plants and wildlife. Dedicated open space allows for plant and animal dispersion, conservation of ecosystem services, and preservation of high-quality habitat. **Table 1** provides a summary of potential project impacts to the existing OSPP area. The existing open space preservation area is outlined in **Figure 4**. Impacts were calculated based on where proposed development areas overlapped with the existing Open Space shown in **Figure 4**.



SOURCE: SWA Group, 10/2019; AES, 11/15/2019

Figure 3
Proposed Project Development Area



SOURCE: Hanson Engineering, 2008; DigitalGlobe aerial photograph, 2007; "Aetna Springs, CA", "Detert Reservoir, CA", "Jericho Valley, CA", "Middletown, CA", USGS 7.5 Minute Topographic Quadrangles
Unsectioned Area "Guenoc"; Sections 2, 3, 4, 5, 6, 7, 8, 9, 10, & 11, T 10N, R 5W; Sections 1, 2, 12, 14, 15, 22, & 23, T 10N, R 6W; Sections 19, 27, 28, 29, 30, 31, 32, 33, 34, & 35, T 11N, R 5W; Sections 24, 25, 26, 35, & 36, T 11N, R 6W; Mt Diablo Baseline and Meridian; AES, 11/18/2019

Figure 4
Existing Open Space Plan

TABLE 1
HABITAT SUMMARY OF OPEN SPACE PRESERVATION AREAS

Habitat Type	Acreage within 2008 OSP	Acreage within proposed OSPP	Change in Acreage
Blue oak savanna	157.11	185.08	27.97
Blue oak woodland	370.49	348.68	-21.81
Brewer willow thickets	2.73	2.73	0.00
California Yerba Santa scrub	3.18	3.18	0.00
Chamise chaparral	79.05	63.57	-15.48
Deer weed scrub	17.85	17.34	-0.51
Developed	23.68	17.77	-5.91
Foothill pine woodland	581.28	624.67	43.39
Interior live oak woodland	198.96	189.80	-9.16
Leather oak chaparral	1040.45	972.29	-68.15
Non-native annual grasslands	143.54	173.96	30.42
Purple needlegrass grasslands	0.32	0.32	0.00
Rock outcrop	6.30	9.49	3.19
Valley oak woodland	13.44	23.22	9.78
White alder grove	6.75	10.55	3.80
Whiteleaf manzanita chaparral	33.05	19.60	-13.46
Wetlands	32.46	47.00	14.54
Streams	40.66	63.13	22.48
Reservoirs	33.05	1.52	-31.53

1.4 IMPACT MINIMIZATION MEASURES

Because of the ecological and aesthetic significance of open and contiguous habitat, avoidance measures are included where feasible in the project design to minimize impacts to wildlife movement and areas with high densities of sensitive vegetation. These minimization measures include provisions for setbacks along riparian corridors and wetland habitat, buffers around identified special-status plants, maximized avoidance of sensitive habitat types, and construction best management practices. Residential lots will each be subject to biological surveys and a development plan that follows the general outline below:

- Each lot will be evaluated and assigned a maximum 1.5-acre buildable area. This includes restrictions on total lot development areas and/or locations of allowable development within a lot.
- Through the new GVD zoning ordinance, residential lots will be allowed a maximum development footprint. The remainder of the lot that falls outside of a residential lot's development footprint will be non-dedicated open space. Fencing will be minimized.
- All lots are subject to Landscape Improvement Zones for fire management practices.
- Each lot will be evaluated for impacts to oak trees and will be subject to deed restrictions regarding proper avoidance and/ or mitigation for impacts to oaks. This provision maximizes habitat quality of non-dedicated open space by promoting preservation of valuable oak habitat within each lot.

- These methods will be applied to residential lots developed in any phase of development. In addition to the impact minimization and mindful lot development standards listed above, the following practices will also allow for dedicated areas of open space to occur throughout development:
- For fire management purposes, two-lane roads will be maintained with a buffer from the shoulder of open space subject to vegetation management.
- Resort communities have been clustered to reduce the overall development footprint and increase the amount of non-dedicated open space throughout the Ranch.
- The Proposed Project does not result in the development of land within the Napa County portion of the Ranch.
- Avoidance of natural corridors such as creek setbacks outside of designated open space will be maximized.

Incorporation of the above practices will preserve not only a single large and contiguous core of acreage, but also numerous patches of deed-restricted and undesignated open space scattered throughout the Ranch. These impact minimization measures will be implemented for all phases of development. By doing so, this OSPP amendment provides a significant land dedication through the development in perpetuity, as well as a patchwork of open habitat to further maintain the aesthetics and functionality of the environment. This network of dedications further protects sensitive vegetation, provides additional refugia for wildlife, and provides developmental relief for ecosystem functions such as groundwater recharge.

2.0 EXISTING OPEN SPACE PRESERVATION PLAN

2.1 GOALS AND OBJECTIVES

A map showing the existing open space preservation area on the Ranch is shown in **Figure 4**. The existing Open Space Preservation Plan was designed to prioritize the protection of sensitive biotic communities and habitats for special-status species, establish viable movement corridors for animals and plant dispersal, and promote overall natural biodiversity on the Ranch. General goals of the 2008 OSP and this Plan are defined by the following metrics:

- Conserve high biodiversity by protecting a diversity of biotic communities and preferentially conserve sensitive biotic communities in the OSPP areas;
- Conserve habitats known or likely to be occupied by threatened and endangered species in OSPP areas;
- Conserve viable wildlife movement areas through terrestrial and riparian corridors across the Ranch, thereby maintaining connections to the regional landscape for the long-term health of OSPP areas;
- Preclude the degradation of the existing natural resources in the designated OSPP areas; and
- Develop site-specific adaptive management plans to monitor and manage significant threats (e.g., detrimental exotic species invasions, illegal dumping) that degrade the habitat quality of the OSPP areas relative to their baseline status.

The 2009 Water Rights EIR resulted in 2,765 acres of mitigated POU within the Ranch. This required a 2,765-acre open space preservation area to be established (**Figure 4**). The open space area was not designed as a functional wildlife corridor, but as a continuous open space that captured portions of existing natural corridors. While the open space area is not defined as a wildlife corridor, its continuity

through the Ranch may allow for wildlife movement through and within the Ranch. **Section 2.3** lists those activities that are permissible within dedicated open space.

2.2 Existing Open Space Preservation Location

At the time of the approval of the 2009 FEIR water rights application, a total of 2,765 acres of potential designated open space were identified in the 2008 OSP (**Figure 4**). Acreage was identified at a 1:1 impact ratio, and bisects the Lake County portion of the Ranch in a net northeasterly direction. The existing open space preservation area was selected based on biological surveys that identified serpentine soils, rare plant communities, riparian habitat, and other biologically significant features within the Ranch.

The existing open space area begins on a large piece of land at the Lake County/Napa County border, directly north and adjacent to Butts Canyon Road. The open space area then runs as a strip of open space northeasterly until reaching Bucksnort Creek. The open space then follows Bucksnort Creek until the northern extent of the property. The majority (94.0 percent) of the existing open space area is retained in the proposed open space area.

2.3 Adaptive Management Provisions

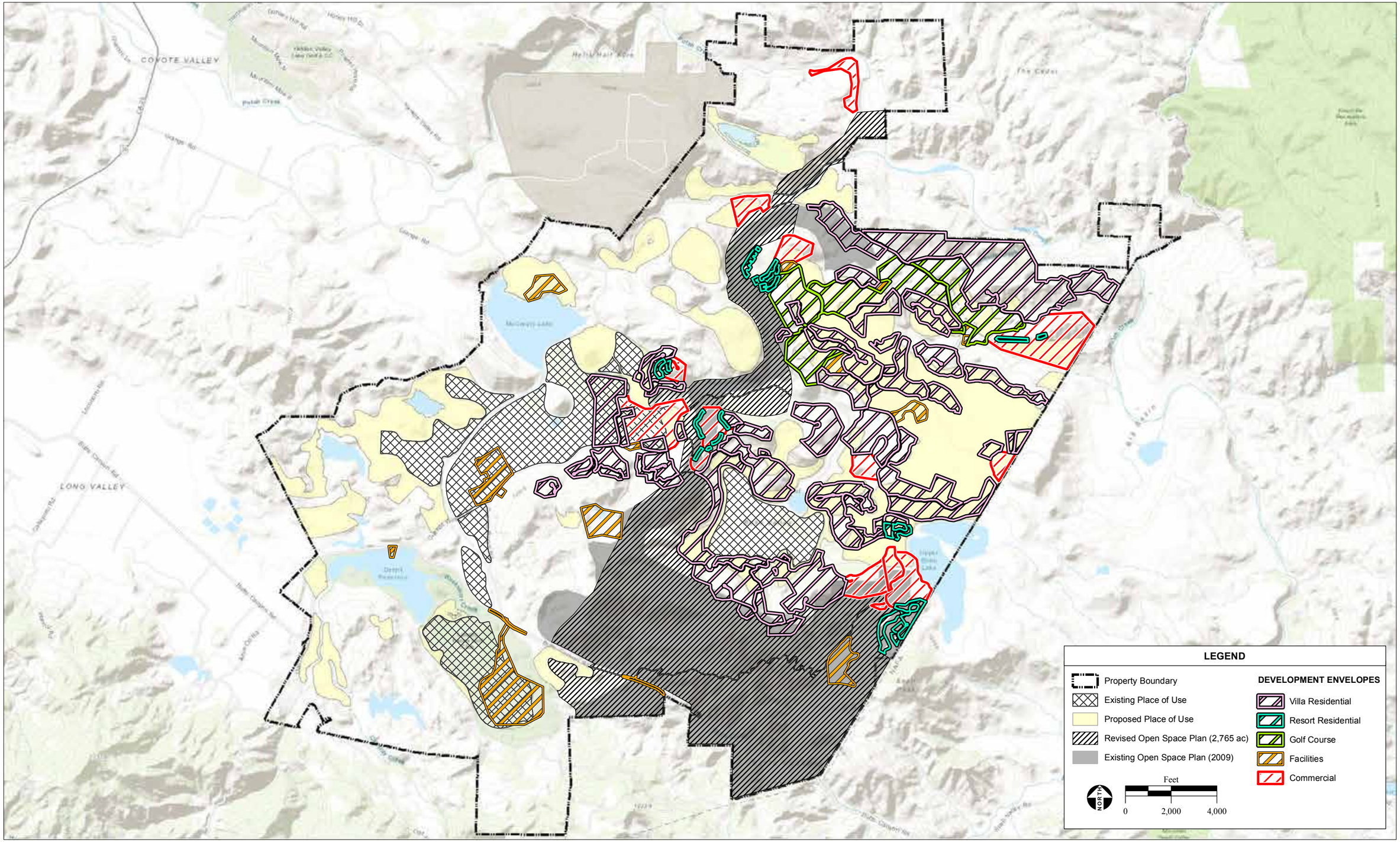
The following approved activities occur under the 2008 OSP and are also considered allowable through this Plan:

- The maintenance, repair, replacement, expansion, and use of existing groundwater wells and other irrigation improvements within the Open Space Preservation area, and the construction of new water sources, including the drilling of additional wells and the construction or siting of water storage improvements, fixtures, and pipelines for water and utilities;
- The construction, maintenance, repair, and use of roads within the Open Space Preservation area; and
- Ongoing grazing or other currently approved agricultural operations or existing recreational uses including hunting and fishing.

The 2008 OSP and this Plan additionally allow for modifications of the boundaries presented in **Figure 4** for approved activities on the Ranch, provided that acreage removed from the existing open space be replaced contiguous to the remaining open space at a 1:1 ratio such that the goals and objectives of the 2008 OSP remain fulfilled. Should the EIR for the Proposed Project described in **Section 1.2** be approved, the following outlines a proposed modified open space that retains the required acreage and replaces impacted acreage in compliance with the 2008 OSP.

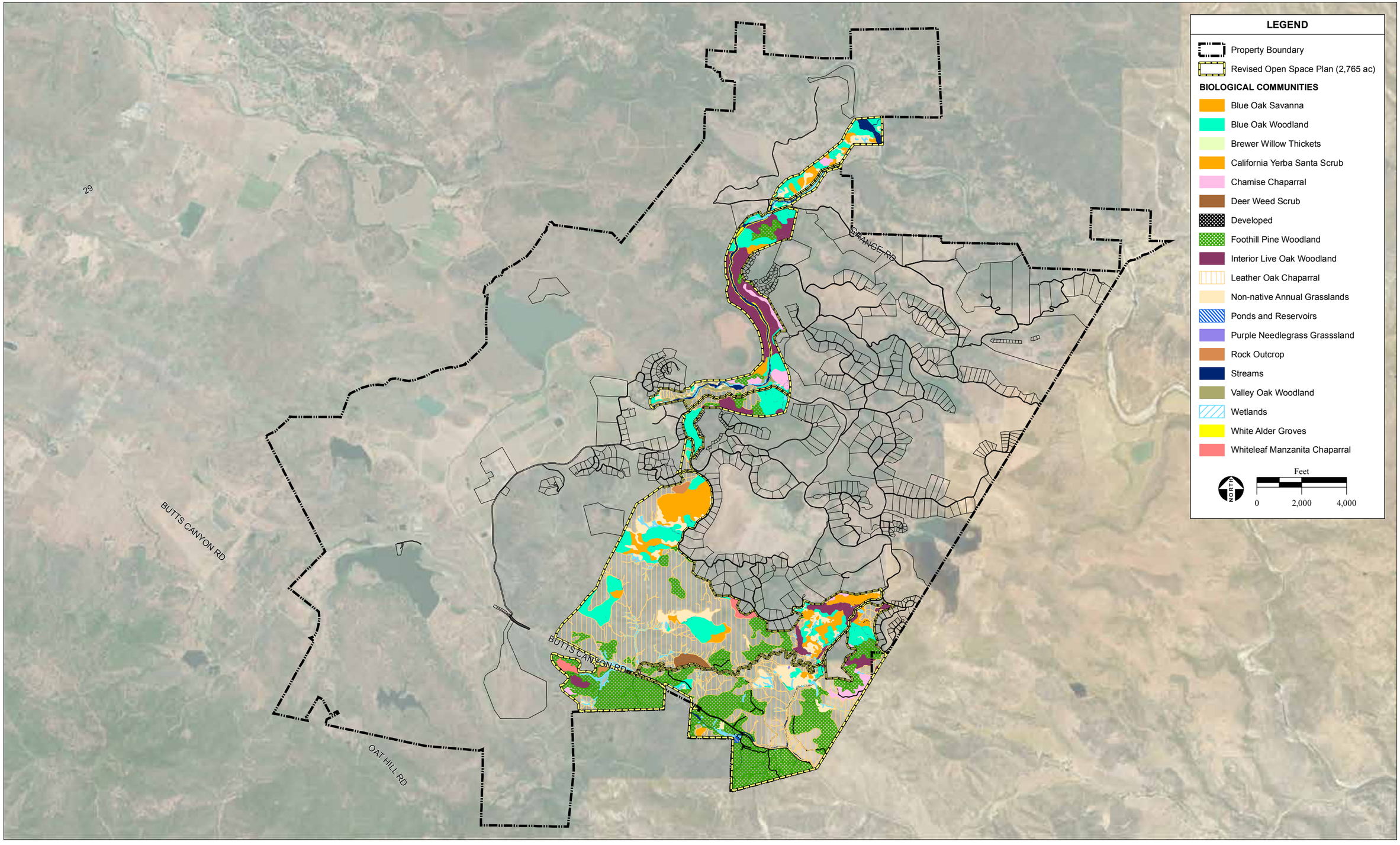
3.0 PROPOSED OPEN SPACE PRESERVATION AMENDMENT

Development of the Proposed Project would impact areas of open space as described in the 2008 OSP (**Table 1**). A map showing the proposed open space preservation area compared with the existing open space preservation area is shown in **Figure 5**. The development area of the Proposed Project and the POU on the Ranch are also included to illustrate those areas not eligible for inclusion within the open space preservation area. A habitat map of those features captured by the proposed open space is included as **Figure 6**. Lot lines of the Proposed Project are included within **Figure 6**. The following outlines the quality and characteristics of habitat selected for preservation as it relates to the OSPP goals.



SOURCE: WRA, Inc., 2009, 2019; AES, 11/18/2019

Figure 5
Revised Open Space Preservation Area



SOURCE: WRA, Inc., 2009, 2019; DigitalGlobe Aerial Photograph, 6/8/2018; AES, 11/19/2019

Figure 6
Habitat Types Within Open Space Preservation Area

3.1 ACREAGE SUBJECT TO REPLACEMENT FROM OPEN SPACE

Development of the Proposed Project would result in the removal of approximately 165 acres from the existing open space area. Removal of open space is the result of conflicts with lot lines; impacts to open space from covered activities such as road construction; and the preferential removal of well-represented habitat within existing open space in exchange for habitat of greater quality, functionality, or of lacking representation within the open space. While residential lots Residential lots range from 2-20 acres with a 1.5 acre maximum building envelop per residential lot. Impacts to the existing Open Space Preservation Area are defined as those areas where lot lines overlap with the existing Open Space Preservation Area. Habitat types present within this impacted and are presented in **Table 2** and consist of blue oak woodland, chamise chaparral, deer weed scrub, interior live oak woodland, leather oak chaparral, whiteleaf manzanita chaparral, and ponds and reservoirs. Removal of these acres does not result in the complete removal of special-status plants, sensitive habitat, or natural corridors included in the original open space plan. Developed habitat (roadways) does not count towards the 2,765 acre requirement.

TABLE 2
HABITAT SUMMARY OF ACREAGE TO BE REMOVED FROM OPEN SPACE

Habitat Type	Acreage Removed from Open Space
Blue oak woodland	21.81
Chamise chaparral	15.48
Deer weed scrub	0.51
Developed	5.91
Interior live oak woodland	9.16
Leather oak chaparral	68.15
Whiteleaf manzanita chaparral	13.46
Ponds and reservoirs	31.53

3.2 ACREAGE SUBJECT TO INCLUSION INTO OPEN SPACE

In order to offset the 165 acres of impacted open space, newly designated open space has been proposed and identified in **Figure 5** and **Figure 6**. Habitat types present within this area are described in **Table 3** and include blue oak savanna, foothill pine woodland, non-native annual grasslands, rock outcrop, valley oak woodland, white alder grove, wetlands, and streams. Inclusion of this acreage would result in 2,765 acres within the designated open space preservation area.

TABLE 3
HABITAT SUMMARY OF ACREAGE TO BE ADDED IN OPEN SPACE

Habitat Type	Acreage Added to Open Space
Blue oak savanna	27.97
Foothill pine woodland	43.39
Non-native annual grasslands	30.42
Rock outcrop	3.19
Valley oak woodland	9.78
White alder grove	3.80
Wetlands	14.54
Streams	22.48

Section 3.2.1 through **Section 3.2.4** describe in detail the qualifying characteristics that make this acreage suitable for inclusion in the OSPP. Habitat was selected to satisfy the goals and requirements outlined in **Section 2.1**. A large portion of the inclusion runs along the northeastern extent of Bucksnort Creek, a perennial stream that is a tributary to Putah Creek. The secondary inclusion of habitat into the open space plan widens and smooths the strips of land that connect the southern extent of open space up to Bucksnort Creek and other stretches along Bucksnort Creek where additional surveys have revealed sensitive habitat or special-status plants. **Figure 7** shows representative site photographs of the open space preservation area.

Preservation of Contiguous Core Habitat

The main goal of this OSPP amendment is to set aside a core of connected habitat that provides environmental benefits such as plant and wildlife dispersal and refugia. The 2008 OSP defines this large block of habitat as a "core" that protects dispersal and interactions between species from the disturbances of potential development. While the open space is not by definition a wildlife corridor and is not intended to function as such, it does provide a continuous passageway through the development.

The proposed acreage of open space preservation includes the portion of Bucksnort Creek and associated habitat from the existing open space plan through to the northern property boundary. The original OSPP included much of Bucksnort Creek due to the dispersal value offered by riparian passageways, but did not include this natural corridor to its fullest extent (**Figure 4**). By incorporating additional portions of Bucksnort Creek, the modified open space provides a more complete and continuous corridor that captures the full value of this natural passageway. Additional benefits of this core preservation include increased opportunity for species recovery, an undisturbed scenic vista, and ecosystem functions such as groundwater recharge that require larger areas of dedicated undisturbed space.

PHOTO 1: Representative photo of valley oak woodland to be preserved in the Open Space.

PHOTO 2: Riparian corridor along Bucksnort Creek.

PHOTO 3: Narrow-anthered brodiaea (CNPS Rank 1B.2) within open space.

PHOTO 4: Greene's narrow-leaved daisy (CNPS Rank 1B.2) within open space.

SOURCE: AES, 11/19/19

Figure 7
Representative Open Space Photos

Conservation of Special-Status Plants

Acreage proposed for inclusion in the open space preservation area targets known locations of special-status plants identified in the 2009 EIR, as well as from biological surveys conducted since the approval of the 2008 OSP (WRA, 2019a; WRA, 2019b; WRA, 2019c). Information provided by recent biological surveys has allowed for greater inclusion of special-status plants within the OSPP. A total of nine special-status plants have been observed on the Ranch: Colusa layia *(Layia septentrionalis*), Green jewelflower (*Streptanthus hesperidis*), Greene's narrow-leaved daisy (*Erigeron greenei*), Keck's checkerbloom (*Sidalcea keckii*), Konocti Manzanita (*Arctostaphylos manzanita ssp. elegans*), Lake County western flax (*Hesperolinon didymocarpum*), Narrow-anthered brodiaea (*Brodiaea leptandra*), Three peaks jewelflower (*Streptanthus morrisonii ssp. elatus*), and Two carpellate western flax (*Hesperolinon bicarpellatum*).

The proposed boundaries of the open space preservation area includes representation of seven special-status plant species that have been identified on the Ranch. Of these plants, one was not included in the original open space preservation area: federally endangered Keck's checkerbloom. **Table 4** outlines special-status plants that occur within the existing and proposed open space preservation area. In addition to the inclusion of additional special-status plants, the proposed open space preservation area expands the overall acreage of known special-status plant locations included within open space. Those special-status plants not included within proposed open space occur on a portion of the Ranch offset from the Proposed Project and the existing open space preservation area.

TABLE 4
SPECIAL STATUS PLANTS WITHIN OPEN SPACE MODIFICATION

Special Status Plant	Status	Presence within 2008 OSP	Presence within Proposed OSPP
Colusa layia	CNPS 1B.2	Yes	Yes
Green jewelflower	CNPS 1B.2	Yes	Yes
Greene's narrow-leaved daisy	CNPS 1B.2	Yes	Yes
Keck's checkerbloom	Federal Endangered, CNPS 1B.1	No	Yes
Konocti Manzanita	CNPS 1B.3	No	No
Lake County western flax	State Endangered, CNPS 1B.2	Yes	Yes
Narrow-anthered brodiaea	CNPS 1B.2	Yes	Yes
Three peaks jewelflower	CNPS 1B.2	No	No
Two carpellate western flax	CNPS 1B.2	Yes	Yes

CNPS Rank 1B – Plants Rare, Threatened, or Endangered in California and Elsewhere
CNPS Rank 2B – Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere

Threat Rank 0.1 – Seriously Threatened in California
Threat Rank 0.2 – Fairly Threatened in California
Threat Rank 0.3 – Not Very Threatened in California

Preservation of Sensitive Habitat

Habitats that are considered sensitive are also considered priority preservation areas in the 2008 OSP. In the proposed open space preservation area, special attention was given to the nearby sensitive habitats that were not included in the original open space area. The proposed open space preservation area includes a significant increase in valley oak woodland inclusion. Valley oak woodland is a CNPS state rank "vulnerable" vegetation alliance and CDFW state rank "Vulnerable-Sensitive." The Ranch contains areas of valley oaks that are long-lived and mature, therefore, this habitat is considered a priority for preservation.

Adjacent high-quality habitat suitable for valley and other oak planting is included in the proposed open space to provide suitable habitat restoration areas should individual oak trees be impacted elsewhere on the Ranch. Oak woodlands within the open space preservation area may also be considered oak woodland preservation areas for the sake of mitigating for the Proposed Project's impacts to oaks. This provides additional assurances that those oak woodland areas are preserved in perpetuity. Inclusions to the open space preservation area include sensitive habitat types such as those with serpentine soils, rare plant areas, and riparian corridors. This includes an increase in represented wetlands and stream habitat, as well as associated riparian vegetation such as white alder groves.

Inclusion of High-quality Habitat

Protection of high-quality habitat increases biodiversity and improves ecosystem stability through a native, undisturbed environment. Biological surveys around Bucksnort Creek and other areas proposed for inclusion into open space have identified active nests, special-status plants and animals, and potential habitat for additional species not observed during surveys (WRA, 2019a; WRA, 2019b; WRA, 2019c). Addition of these areas maximizes the environmental and aesthetic benefits of the open space preservation area.

In addition to those areas already recognized as high-quality habitat, areas of adjacent habitat lacking sensitive vegetation or special-status plants have been included for the purposed of habitat restoration. The Proposed Project will require mitigation for impacts to sensitive habitat types and special-status plants. Habitat included within the open space preservation area represents an ideal location for habitat restoration efforts. This is due to the assurance of preservation within the open space, and the opportunity to increase the overall continuity and functionality of previously identified high-quality habitat.

4.0 OPEN SPACE AREA MAINTENANCE AND MONITORING

While the majority of the open space preservation area would remain largely undisturbed, specific maintenance activities are permitted to occur within the open space area beyond approved activities outlined in **Section 2.3**, including habitat restoration and mitigation and monitoring actions related to the Proposed Project. Fire damage incurred on the Ranch in the Valley Fire of 2015 emphasized the need to monitor and maintain vegetation against a changing fire regime. It is anticipated that grazing will be utilized, as included under the 2008 OSP and this OSPP amendment. No specific maintenance or monitoring activities are required through this plan.

5.0 ASSURANCE OF OPEN SPACE PRESERVATION

This document provides assurances that the designated open space as described here within shall be preserved in perpetuity. This OSPP shall be filed with the California Water Resources Board, as proof of

the changes made to the OSP included in the 2009 Water Right EIR. This OSPP will also be submitted to Lake County for approval. Approval of this document and maps presented herein shall serve as a binding agreement between the Ranch and Lake County.

Any future impacts for approved activities within the designated open space will be subject to additional mitigation in the form of preservation of acreage at a 1:1 ratio to impacts such that the goals outlined in this Plan are still achieved, and only with Lake County approval.

6.0 REFERENCES

Analytical Environmental Services (AES), 2008. Langtry Farms Water Rights Modification Open Space Preservation Plan.

Analytical Environmental Services (AES), 2009. Guenoc Water Rights Modification Project Final Environmental Impact Report.

Lake County, 2008. Lake County General Plan. Available online at: http://www.co.lake.ca.us/-Page3939.aspx. Accessed June 2019.

MAHA Developments, 2019. Specific Plan of Development (SPOD) for the MAHA resort at Guenoc Valley.

Western Regional Climate Center (WRCC), 2016. Middletown, CA: Period of Record Monthly Climate Summary. Available online at: https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca5598. Accessed June 2019.

WRA, Inc. (WRA), 2020a. Biological Resources Assessment for MAHA Resort and Guenoc Valley Development, Phase 1 Lake County, California.

WRA, Inc. (WRA), 2020b. Biological Resources Assessment for MAHA Resort and Guenoc Valley Development, Phase 2 and Open Space Lake County, California.

WRA, Inc. (WRA), 2020c. Aquatic Resources Delineation Report for MAHA Resort and Guenoc Valley Development, Phase 1 Lake County, California.

APPENDIX SCA

MIDDLETOWN SEWER CAPACITY ANALYSIS

21000 SANTA CLARA ROAD SUBDIVISION

SANITARY SEWER IMPACT ANALYSIS

DECEMBER 2019

INTRODUCTION

This study was conducted to determine the current capacity of the sewer system downstream of the proposed development as well as the proposed sewer impact from the 21000 Santa Clara Road Development. The existing downstream system is composed of two (2) pump stations and 6" and 8" gravity trunk lines.

EXISTING AND PROPOSED CONDITIONS

The existing site located at 21000 Santa Clara Road is composed of undeveloped land and has no discharge to the adjacent sewer system. There is a pump station (PS #2) located at the north east corner of the property. On the eastern edge of the property and 8" PVC sewer line (Line 1) runs from south to north, discharging into PS #2. On the north edge of the property is a 6" PVC line (Line 7) which runs from west to east, discharging into PS #2. East of the property there is an additional sewer line (Line 3), which is also 8" PVC and discharges into PS #2. PS #2 discharges in to 6" PVC force main, which runs to the west and into Pump Station #3 (PS #3), which discharges into another force main and runs to the treatment plant.

The proposed development at 21000 Santa Clara Road will have 50 new single-family units. All of these units will discharge into Line 1, the 8" sewer line which runs on the east side of the property. These 50 units will connect through two (2) new manholes along the 8" line, each of which will have half of the developments proposed discharge.

See attached maps for the "Existing Sewer Network" and the "Proposed Subdivision Utilities".

Design Analysis

Existing flows entering PS#2 and PS #3 for Dry weather flow are distributed per the following tables (Existing Dry Weather Distribution Tables). This table shows the lines discharging into the pump station, what estimated dry weather flows each pipe carries, and what percent of the flow to each pump station the pipe contributes: (See tables on next page)

Following the table are a series of calculations using Manning's Equation to determine the pipe capacity and the Hazen-Williams equations, in conjunction with system design information, to determine the pump flow rates. Previously collected record data for the pump station run times was also used to determine the existing system demands.

Existing Dry Weather Distribution Tables

		# ESD_1	gal/day_2	ft^3/day	% of PS#2	% of PS#3
Lines to PS#2	**Line #1**	113	23,730	3,172	19.32%	16.92%
	Line #3	468	98,280	13,138	80.00%	70.06%
	Line #7	4	840	112	0.68%	0.60%
Line to PS#3	**Line #8**	83	17,430	2,330		12.43%

Total PS #2	585	122,850	16,423
Total PS #3	668	140,280	18,753

Notes:
1 - From 2006 LACOSAN records, drawings, and aerial photography
2 - 210 gpd per ESD from LACOSAN standards

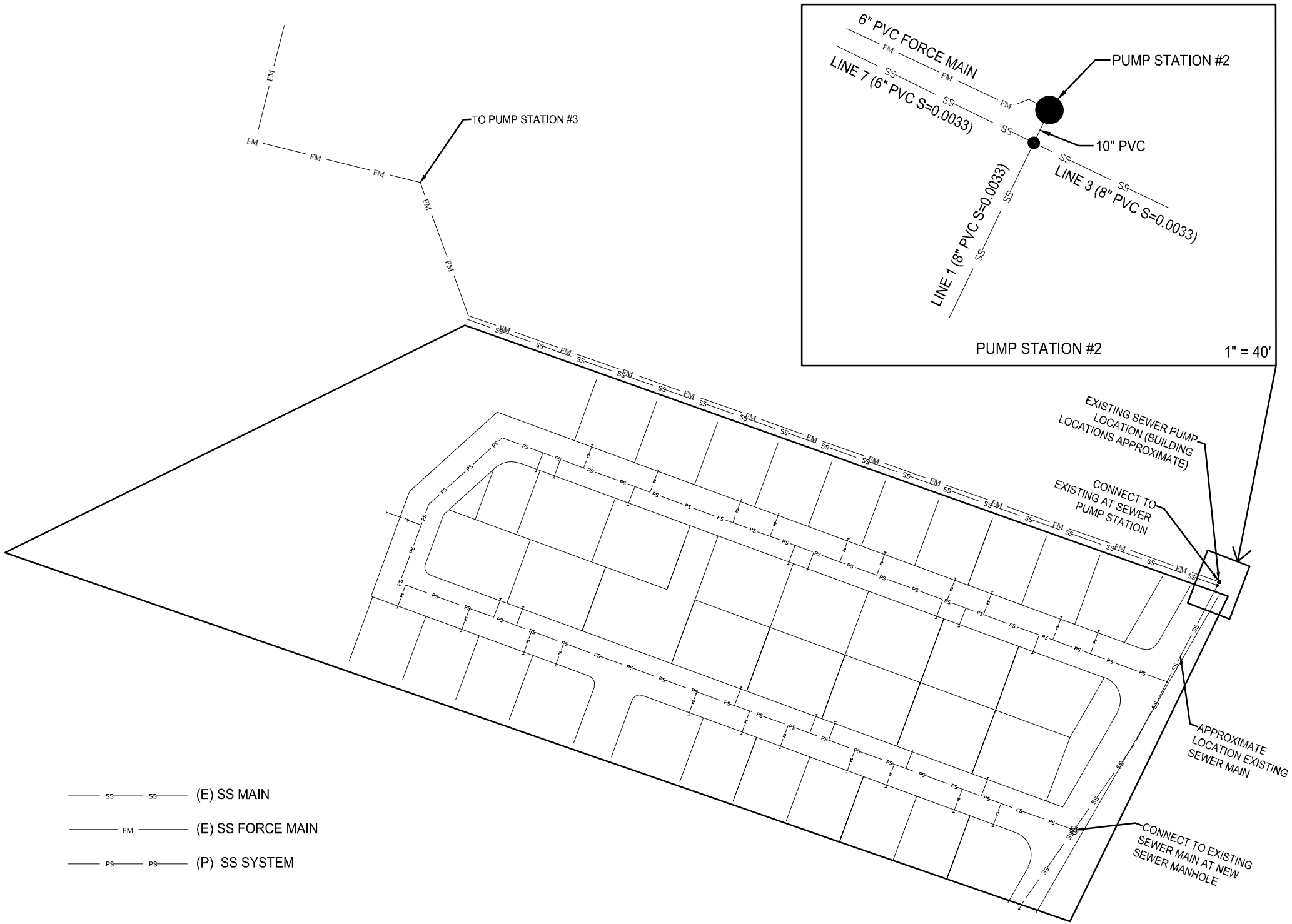
Proposed Additional Dry Weather Flow from Development

	# ESD_1	gal/day_2	ft^3/day	% of PS#2	% of PS#3
New Flow to Line #1	50	10,500	1,404	8.55%	7.49%

Proposed Dry Weather Flow post Development

		# ESD_1	gal/day_2	ft^3/day	% of PS#2	% of PS#3
Lines to PS#2	**Line #1**	163	34,230	4,576	25.67%	22.70%
	Line #3	468	98,280	13,138	73.70%	65.18%
	Line #7	4	840	112	0.63%	0.56%
Line to PS#3	**Line #8**	83	17,430	2,330		11.56%

Total PS #2	635	133,350	17,826
Total PS #3	718	150,780	20,156



SANTA CLARA DEVELOPMENT

1" = 150'

NORTH

Santa Clara Development
Legend
Middletown
Google Earth
© 2018 Google
N
4000 ft

EXISTING DEMANDS ON SYSTEM

Dry-Weather
6/6/06 – 6/11/06

Pump Station #2

Pump 1 - 8.2hrs / 5 days = 1.64hrs/day
Pump 2 - 8.4hrs / 5 days = 1.68hrs/day

Existing Usage – 3.32hrs / 24hrs = **13.83%**

Pump Station #3

Pump 1 – 9.8hrs / 5 days = 1.96hrs/day
Pump 2 – 8.9hrs / 5 days = 1.78hrs/day

Existing Usage - 3.74hrs / 24hrs = **15.58%**

Wet-Weather
10yr Event (12/30/06 – 1/3/06)

Pump Station #2

Pump 1 - 29hrs / 4 days = 7.25hrs/day
Pump 2 - 33hrs / 4 days = 8.25hrs/day

Existing Usage @ 10yr event - 15.5hrs / 24hrs = **64.58%**

Pump Station #3

Pump 1 – 26.9hrs / 4 days = 6.73hrs/day
Pump 2 – 27.9hrs / 4 days = 6.98hrs/day

Existing Usage @ 10yr event – 13.71hrs / 24hrs = **57.13%**

PUMP PERFORMANCE

Hazen-Williams Friction Loss Equation (Solved for Friction Loss)

Variables

Q = Quantity (cfs)
V = Velocity (ft/s)
D = Pipe Diameter (ft)
A = Pipe Area (ft)
L = Pipe Length (ft)
C = Hazen-Williams Coefficient (from table below)
Z1 – Z2 = Elevation Difference (ft)
g = Acceleration due to gravity (32.174 ft/s^2)
k = Unit conversion factor (1.318 for English units)
K_m = Minor Loss Coefficient (from table below)
h_f = Major (friction) Loss (ft)
h_m = Minor Loss (ft)

Equations

$$h_f = L\left[\frac{V}{k\,C\left(\frac{4}{D}\right)^{0.63}}\right]^{1\,/\,0.54} \qquad h_m = K_m\,\frac{V^2}{2g} \qquad Q = VA \qquad A = \frac{\pi}{4}D^2$$

Pump Station #2

Q = 1.1898 ft^3/s
V = 6.0594ft/s
D = 0.5ft
A = 0.1963ft^2
L = 1726ft
C = 145(PVC)
Z1 - Z2 = 6.55ft
K_m = 7.05
h_f = 32.73ft
h_m = 4.02ft

Pump Station #3

Q = 1.4009 ft^3/s
V = 4.0128ft/s
D = 0.6667ft
A = 0.3491ft^2
L = 10783ft
C = 145(PVC)
Z1 - Z2 = 57ft
K_m = 8.1
h_f = 68.15ft
h_m = 2.03ft

Table of Hazen-Williams Coefficients

Material	C	Material	C
Asbestos Cement	140	Copper	130-140
Brass	130-140	Galvanized iron	120
Brick sewer	100	Glass	140
Cast-Iron:		Lead	130-140
New, unlined	130	Plastic	140-150
10 yr. old	107-113	*Steel:*	
20 yr. old	89-100	Coal-tar enamel lined	145-150
30 yr. old	75-90	New unlined	140-150
40 yr. old	64-83	Riveted	110
Concrete/Concrete-lined:			
Steel forms	140	Tin	130
Wooden forms	120	Vitrif. clay (good condition)	110-140
Centrifugally spun	135	Wood stave (avg. condition)	120

Table of Minor Loss Coefficients (Km is unit-less)

Fitting	**Km**	**Fitting**	**Km**
Valves:		*Elbows:*	
Globe, fully open	10	Regular 90°, flanged	0.3
Angle, fully open	2	Regular 90°, threaded	1.5
Gate, fully open	0.15	Long radius 90°, flanged	0.2
Gate 1/4 closed	0.26	Long radius 90°, threaded	0.7
Gate, 1/2 closed	2.1	Long radius 45°, threaded	0.2
Gate, 3/4 closed	17	Regular 45°, threaded	0.4
Swing check, forward flow	2		
Swing check, backward flow	infinity	*Tees:*	
		Line flow, flanged	0.2
180° return bends:		Line flow, threaded	0.9
Flanged	0.2	Branch flow, flanged	1.0
Threaded	1.5	Branch flow, threaded	2.0
Pipe Entrance (Reservoir to Pipe):		*Pipe Exit (Pipe to Reservoir)*	
Square Connection	0.5	Square Connection	1.0
Rounded Connection	0.2	Rounded Connection	1.0
Re-entrant (pipe juts into tank)	1.0	Re-entrant (pipe juts into tank)	1.0

#2

PERFORMANCE CURVE

PRODUCT	CP3127.180
TYPE	MT
DATE	2002-02-04
PROJECT	
CURVE NO	63-432-00-3730
ISSUE	3

	1/1-LOAD	3/4-LOAD	1/2-LOAD
MOTOR COS PHI	0.89	0.87	0.81
MOTOR EFFICIENCY	83.5 %	85.0 %	84.5 %
GEAR EFFICIENCY	---	---	---

MOTOR SHAFT POWER	10	hp
STARTING CURRENT	64	A
RATED CURRENT	13	A
RATED SPEED	1735	rpm
TOT.MOM.OF INERTIA	---	
NO. OF BLADES	1	

IMPELLER DIAMETER: 229 mm

MOTORTYPE	STATOR	REV
21-12-4AL	12YSER	10

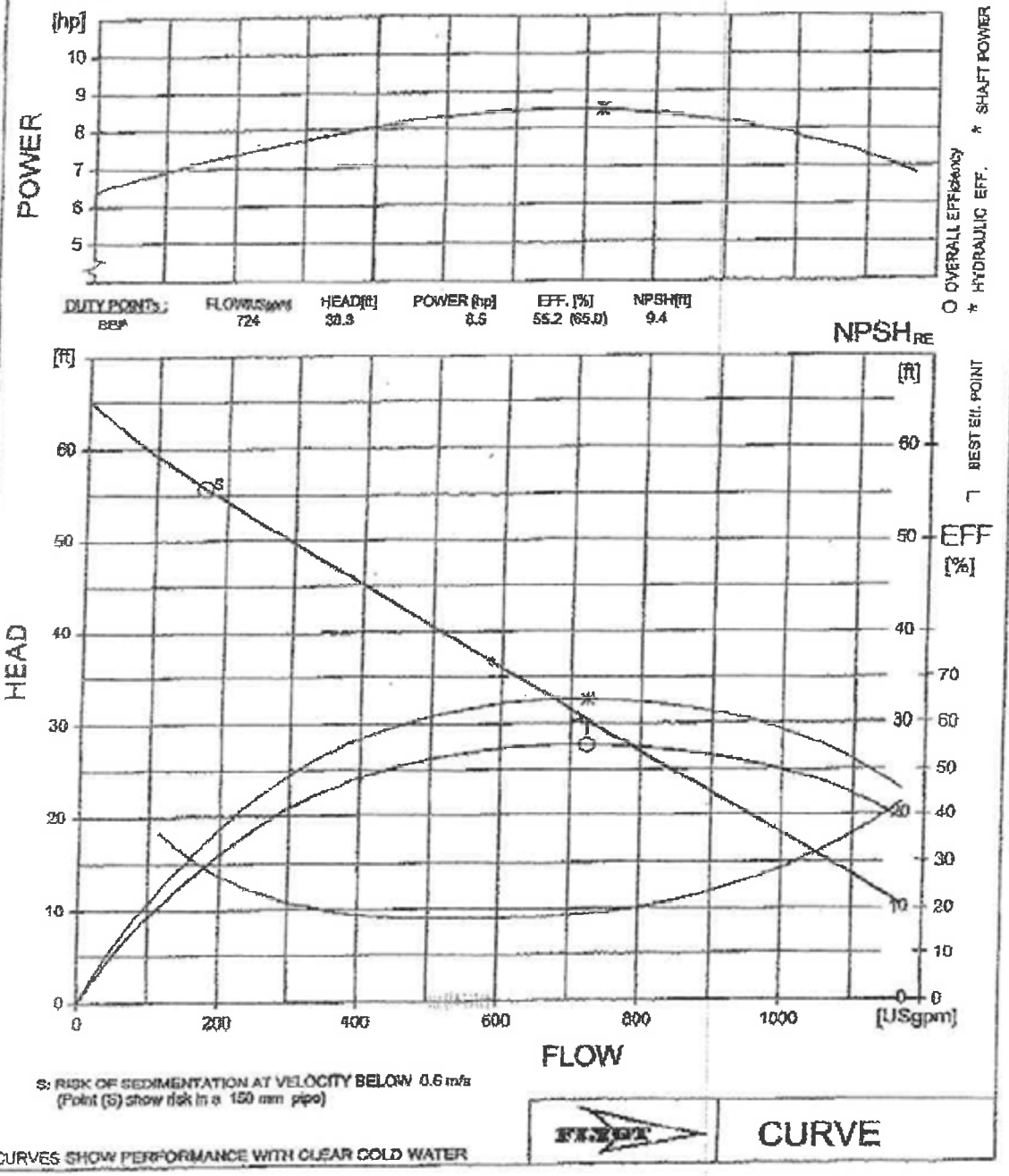
FREQ.	PHASES	VOLTAGE	POLES
60 Hz	3	460 V	4

GEARTYPE: --- RATIO: ---

COMMENTS: DISCH. CONN. DIAM 150 MM

INLET/OUTLET: -/150 mm

IMP. THROUGHLET: 87 mm



S: RISK OF SEDIMENTATION AT VELOCITY BELOW 0.6 m/s (Point (S) show risk in a 150 mm pipe)

CURVES SHOW PERFORMANCE WITH CLEAR COLD WATER

FLYGT CURVE

12/29/2005 09:25

#3

PERFORMANCE CURVE

PRODUCT	CP3201.180
TYPE	HT
CURVE NO	63-452-00-5350
ISSUE	3
DATE	2002-02-04
PROJECT	
IMPELLER DIAMETER	330 mm
MOTOR TYPE	27-26-4AA
STATOR	37YSER
REV	10
FREQ.	60 Hz
PHASES	3
VOLTAGE	460 V
POLES	4
GEARTYPE	—
RATIO	—

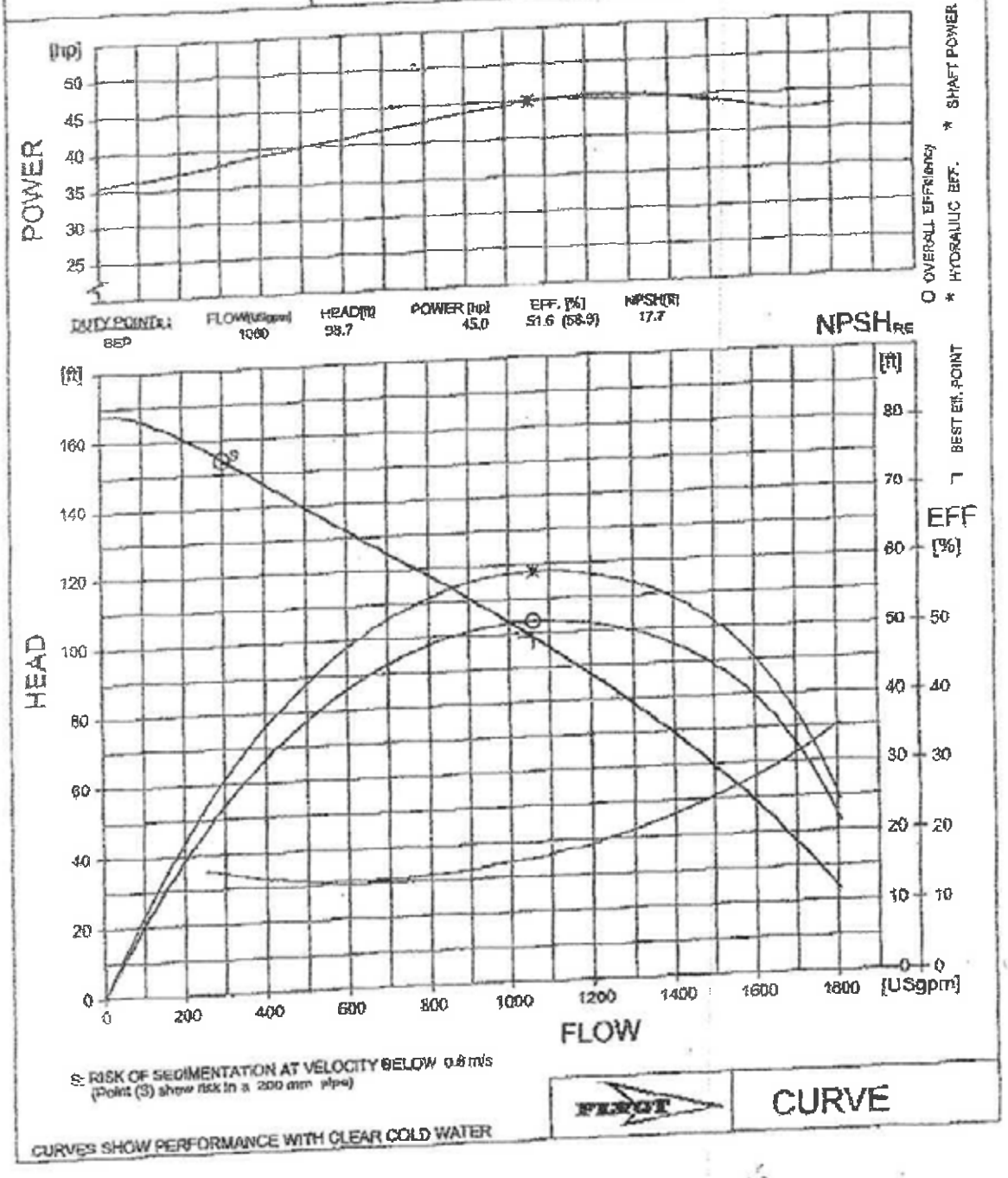
	1/1-LOAD	3/4-LOAD	1/2-LOAD
MOTOR COS PHI	0.89	0.86	0.80
MOTOR EFFICIENCY	87.5 %	87.5 %	86.0 %
GEAR EFFICIENCY	—	—	—

COMMENTS

INLET/OUTLET: -/150 mm

IMP. THROUGHLET: 77 mm

MOTOR SHAFT POWER	47	hp
STARTING CURRENT	375	A
RATED CURRENT	57	A
RATED SPEED	1755	rpm
TOT.MOM.OF INERTIA	0.58	kgm2
NO. OF BLADES	1	



CAPACITY OF GRAVITY LINES CONTRIBUTING TO PUMP STATION #2

Manning's Equation (Solved for Velocity)

Variables

Q = Quantity (cfs)
V = Velocity (ft/s)
A = Area ft^2
K = Conversion Factor for English Units
n = Manning's Coefficient (From Table)
P = Wetted Perimeter (ft)
S = Slope (EGL ft/ft)

Equations

$$Q = VA \qquad V = \frac{k}{n}\left(\frac{A}{P}\right)^{2/3} S^{1/2}$$

Line 1

Q = 0.8227cfs
V = 2.3567 ft/s
A = 0.3491 ft^2
K = 1.49
n = 0.011
P = 2.0945 ft
S = 0.0033 ft/ft

Line 3

Q = 0.8227cfs
V = 2.3567 ft/s
A = 0.3491 ft^2
K = 1.49
n = 0.011
P = 2.0945 ft
S = 0.0033 ft/ft

Line 7

Q = 0.3819cfs
V = 1.9453 ft/s
A = 0.1963 ft^2
K = 1.49
n = 0.011
P = 1.5708 ft
S = 0.0033 ft/ft

Table of Manning's Coefficients

Material	Manning n	Material	Manning n
Natural Streams		*Excavated Earth Channels*	
Clean and Straight	0.030	Clean	0.022
Major Rivers	0.035	Gravelly	0.025
Sluggish with Deep Pools	0.040	Weedy	0.030
		Stony, Cobbles	0.035
Metals		*Floodplains*	
Brass	0.011	Pasture, Farmland	0.035
Cast Iron	0.013	Light Brush	0.050
Smooth Steel	0.012	Heavy Brush	0.075
Corrugated Metal	0.022	Trees	0.15
Non-Metals			
Glass	0.010	Finished Concrete	0.012
Clay Tile	0.014	Unfinished Concrete	0.014
Brickwork	0.015	Gravel	0.029
Asphalt	0.016	Earth	0.025
Masonry	0.025	Planed Wood	0.012
		Un-planed Wood	0.013
Corrugated Polyethylene (PE) with smooth inner walls [a,b]			0.009-0.015
Corrugated Polyethylene (PE) with corrugated inner walls [c]			0.018-0.025
Polyvinyl Chloride (PVC) with smooth inner walls [d,e]			0.009-0.011

References

Footnotes refer to Manning n table above. .

[a] Barfuss, Steven and J. Paul Tullis. Friction factor test on high density polyethylene pipe. Hydraulics Report No. 208. Utah Water Research Laboratory, Utah State University. Logan, Utah. 1988.

[c] Barfuss, Steven and J. Paul Tullis. Friction factor test on high density polyethylene pipe. Hydraulics Report No. 208. Utah Water Research Laboratory, Utah State University. Logan, Utah. 1994.

[e] Bishop, R.R. and R.W. Jeppson. Hydraulic characteristics of PVC sewer pipe in sanitary sewers. Utah State University. Logan, Utah. September 1975.

[d] Neale, L.C. and R.E. Price. Flow characteristics of PVC sewer pipe. Journal of the Sanitary Engineering Division, Div. Proc 90SA3, ASCE. pp. 109-129. 1964.

[b] Tullis, J. Paul, R.K. Watkins, and S. L. Barfuss. Innovative new drainage pipe. Proceedings of the International Conference on Pipeline Design and Installation, ASCE. March 25-27, 1990.

Existing Flows to PS#2

Existing flows below are derived using the pump performance rate and number of hours operated during both dry weather and wet weather (10-year storm) conditions.

Existing Dry Weather Flow to Pump Station #2

(1.1898 ft3/s)(3.32 hours) = 14,222 ft3/day

Capacity – 3.32hr/24hr = 13.8% capacity

Existing Wet Weather Flow to Pump Station #2

(1.1898 ft3/s)(15.5 hours) = 66,390 ft3/day

Capacity – 15.5hr/24hr = 64.6% capacity

Existing Flows to Line 1

Line 1 – Dry Weather is 19.3% of Total Pumped

Daily flow = 0.193 x 14,222 ft3/day x 1 day = 2,747 ft3

Average Flow = 2,747 ft3 / 86,400 sec = 0.0318 ft3/s

Peak Flow = 2.8 x 0.0318 ft3/s = 0.089 ft3/s

Total Capacity = 0.8227 ft3/s

Pipe @ 10.8% capacity

Line 1 – Wet Weather is apx. 46% of total flow pumped (per previous analysis of sewer system)

Daily flow = 0.4671 x 66,390 ft3/day x 1 day = 31,010 ft3

Average Flow = 31,010 ft3 / 86,400 sec = 0.3589 ft3/s

Peak Flow = 1.5 x 0.3589 ft3/s = 0.5384 ft3/s

Total Capacity = 0.8227 ft3/s

Pipe @ 65.4% capacity

Conclusion

The existing sewer system including gravity mains, pump station, and force mains have the capacity to support the proposed project. See below for a summary of the proposed impacts to the existing system on a flow rate and percentage of capacity basis.

Line #1

New Flow is 50 residential units @ 210 gpd each = 1,404 ft3/day

Average Flow = 0.0163 ft3/sec

Peak Flow = 2.8 x 0.0163 = 0.0455 ft3/sec

Additional 5.5% of capacity due to development

After development the pipe will be at:

18.0% of capacity during dry weather

70.9% of capacity during 10-year storm event

Line #3, #7, and #8 will not be affected by this project.

Pump Station #2

New Flow is 50 residential units @ 210 gpd each = 1,404 ft3/day

1,404 ft3 / 1.1898 ft3/s = 1,180 sec

1,180 sec / 86,400 sec = 1.36%

New flow is 1.36% of pump station capacity

Pump Station will be:

@ 15.16% of capacity during dry weather flows

@ 66.0% of capacity during 10-year storm events

Pump Station #3

New Flow is 50 residential units @ 210 gpd each = 1,404 ft3/day

1,404 ft3 / 1.401 ft3/s = 1,002 sec

1,002 sec / 86,400 sec = 1.16%

New flow is 1.16% of pump station capacity

Pump Station will be:

@ 16.74% of capacity during dry weather flows

@ 58.29% of capacity during 10-year storm events

APPENDIX SPOD

SPECIFIC PLAN OF DEVELOPMENT FOR PHASE 1

MAHÁ

GUENOC VALLEY

SPECIFIC PLAN OF DEVELOPMENT

FOR THE MAHA RESORT AT GUENOC VALLEY

PREPARED FOR THE COUNTY OF LAKE COMMUNITY DEVELOPMENT DEPARTMENT

ORIGINAL SUBMISSION : JUNE 1, 2019
MINOR REVISIONS : NOVEMBER 1, 2019

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NOVEMBER 1, 2019 UPDATES

Please note that the Specific Plan of Development (SPOD) outlines land-use intensity and density. The following pages include lot layouts, roads, and infrastructure that may change in response to the environmental review process: 11–15, 22, 28, 30, 31, 34, 36–39, 41, 43–45, 47, 50–57, 59–62, 65–67, 70, 73, 74, 77, 78, 81, 82, 85, 86, 88, 90, 92, 96, 98, 101–107, 111–113, 115–119, 121–125, 132–137, 139–143, 146, and 156.

Please refer to the Tentative Subdivision Maps for the final lot layouts, roads, and infrastructure.

The following pages were updated from the June 2019 submission as part of the October 2019 Change Memo submission:

- **PG 30 – FARMING ACTIVITIES AT MAHA FARM**
- **PG 31 – FARMING ACTIVITIES** FARM BARN LAND USE FLOOR PLANS
- **PG 44 – MAHA FARM** DETAILED CLUSTER MAP
- **PG 45 – MAHA FARM** MAHA FARM VILLAGE [A] LAND USE FLOOR PLANS
- **PG 47 – MAHA FARM** MAHA FARM HOTEL [B] LAND USE FLOOR PLANS
- **PG 50 – MAHA FARM** SALES CENTER AT THE HILLTOP LODGE [C] LAND USE FLOOR PLANS
- **PG 51 – MAHA FARM** WINERY AT MAHA FARM [D] LAND USE FLOOR PLANS
- **PG 52 – MAHA FARM** MAHA FARM RESIDENTS CLUB LAND USE FLOOR PLANS
- **PG 53 – MAHA FARM** MAHA FARM SPECIAL EVENTS [E] LAND USE FLOOR PLANS
- **PG 54 – MAHA FARM** RESORT RESIDENTIAL SOUTH LAND USE FLOOR PLANS
- **PG 55 – MAHA FARM** RESORT RESIDENTIAL NORTH LAND USE FLOOR PLANS
- **PG 56 – MAHA FARM** ESTATE WINERY LAND USE FLOOR PLANS
- **PG 57 – MAHA FARM** MAHA FARM GARDEN LAND USE FLOOR PLANS
- **PG 92 – EMERGENCY CENTER & SHORT TERM STAY** LAND USE FLOOR PLAN
- **PG 93 – EMERGENCY CENTER & SHORT TERM STAY** ELEVATIONS

SECTION 1 INTRODUCTION

SECTION 1 INTRODUCTION

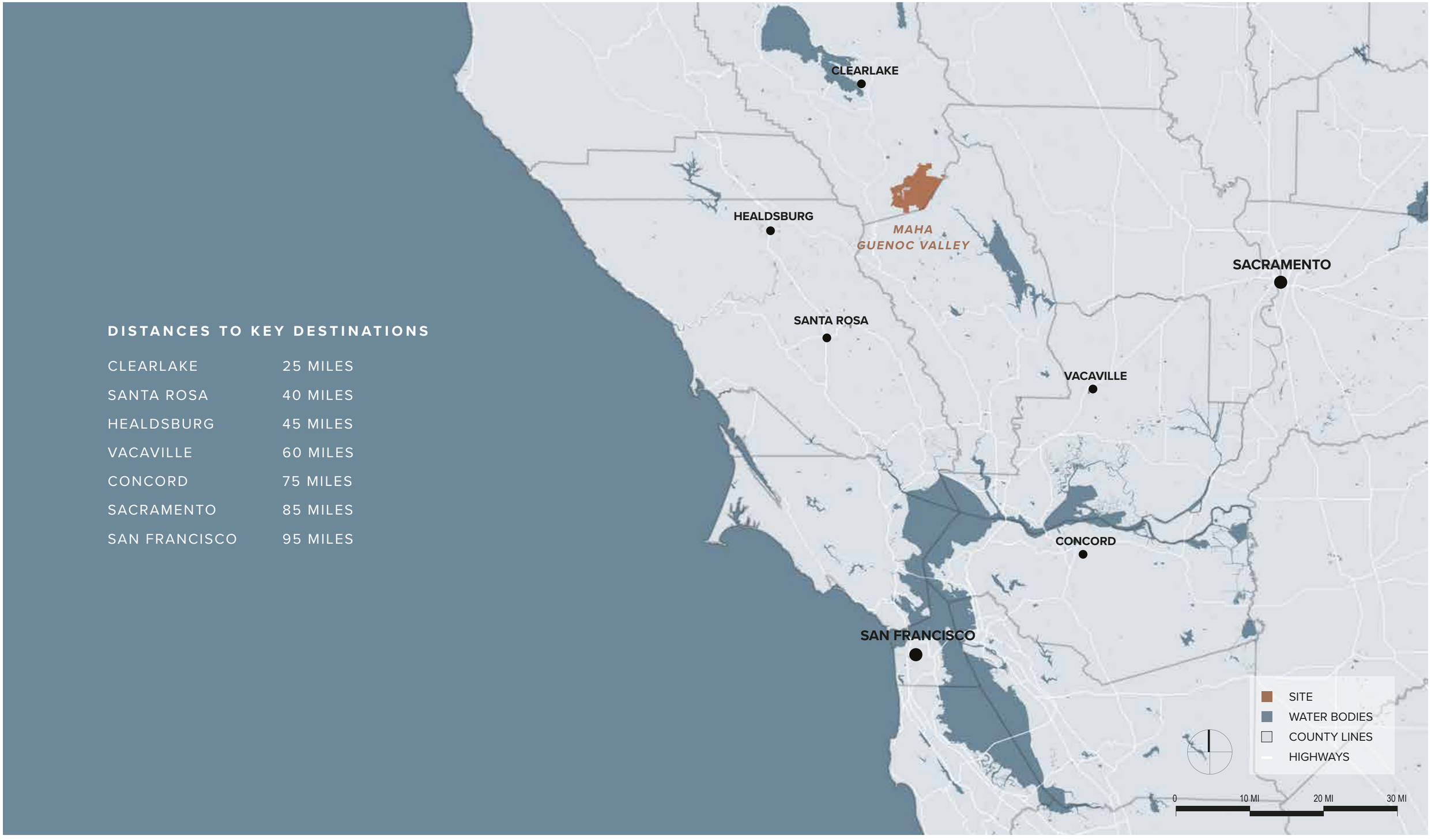
SITE CONTEXT

The main project site, currently consisting of 49 assessor's parcels totaling approximately 16,000 acres within Guenoc Valley, is located three miles southeast of Middletown on the southeast border of Lake County, bordering Yolo and Napa Counties to the south and east, with primary access along Butts Canyon Road. The Guenoc Ranch remains one of the largest privately owned properties in the state of California. It is bordered by Hidden Valley Lake community, to the northwest, which is undergoing continued development.

Guenoc Valley is a small inland valley set on an alluvial fan, isolated from surrounding areas by rocky ridges and volcanic rock. As part of the inner coastal range of Northern California, the site is characterized by uniquely varied topography, with rolling hills, oak woodlands, irrigated vineyards, grazing corridors, open space, and meadows. Ground elevation ranges from 62 to 950 feet above sea level. The average rainfall is 35 inches a year, slightly less than neighboring Middletown, with slightly greater seasonal temperatures, and generally less severe fog.

An existing loop road currently provides access from Guenoc Road, which intersects Butts Canyon Road across from the Detert Reservoir. The project anticipates continued utilization of the existing loop road, with a new intersection to be located approximately just over one mile from the existing intersection to the Langtry Winery.

PROJECT SITE LOCATION



DISTANCES TO KEY DESTINATIONS

CLEARLAKE	25 MILES
SANTA ROSA	40 MILES
HEALDSBURG	45 MILES
VACAVILLE	60 MILES
CONCORD	75 MILES
SACRAMENTO	85 MILES
SAN FRANCISCO	95 MILES

PROJECT BACKGROUND

Current ownership, under the management of Lotusland Investment Holdings, Inc., has approached the County of Lake with a development proposal in alignment with the objectives of the Middletown Area Plan Special Study Area. The intention of the developers is to transform the property into a twenty-first century rural idyll, combining state-of-the-art hospitality and recreational facilities set in the timeless beauty of the land. The vision of the Maha Resort at Guenoc Valley is a destination resort of unparalleled luxury, featuring internationally acclaimed architect-designed boutique hotels with products and amenities from local artisans and farms, providing a luxurious experience within the scope of a master-planned mixed-use development.

Maha reflects the area's local stewardship, historic retreat culture and longstanding agricultural traditions. The proposed development features low-impact development as well as smart growth techniques in order to preserve the legacy and identity of the ranch for future generations. The master plan will incorporate land management practices that support open space preservation with an integrative animal husbandry element along with fuel reduction management.

To fulfill our vision of a world-renowned brand offering a luxurious experience in an iconic natural setting, the project demands uncompromising excellence in all regards. This extends into planning, plans for construction, operations and maintenance, as presented in the following submittals for your review.

LAKE COUNTY APPROVAL PROCESS

The project is entirely within the jurisdiction of the County of Lake. The approval process includes an Environmental Impact Report (EIR) pursuant to the California Environmental Quality Act (CEQA).

The project requests the following entitlements: 1) General Plan Amendment; 2) adoption of a new zoning classification: Guenoc Valley Mixed Use Planned Development District (GVD); 3) Use Permit to allow a Specific Plan of Development (SPOD); 4) General Plan of Development; 5) Development Agreement, and 6) Tentative Subdivision Maps.

EXISTING LAND USE POLICIES & PROPOSED ENTITLEMENTS

The project adheres to the framework of the existing Lake County land use policies and goals as defined by the General Plan and it also meets the objectives of the specific plan for this area as defined by the Middletown Area Plan. As directed by the Area Plan, the Guenoc Ranch will be rezoned to accommodate planned resort development. The planned development will be designed as mixed-use, comprising resort, resort commercial, residential, and agriculture as previously anticipated in the Area Plan.

The approval process for the proposed entitlements includes multiple public meetings and hearings before the Planning Commission before seeking ultimate approval by the Board of Supervisors. The new zoning designation, Guenoc Valley District (GVD), includes proposed development standards outlined in the draft zoning ordinance section. These are consistent with the County's existing Commercial and Residential Planned Development zoning designations as requested by the Area Plan. The proposed entitlements utilize the Planned Development process for the long term growth of the Maha Resort at Guenoc Valley. This recognizes efficient land utilization and preservation of open space in conjunction with fire-safe measures already required by the County Fire Safe Regulations. It also includes additional measures that Maha Resort proposes in the Emergency Action and Fire Management Plan.

Currently, the Property is zoned Agricultural and Rural Lands. The Middletown Area Plan, which furthers the intentions of the General Plan, highlights this district as an appropriate site for a mixed-use planned development. To bring the property into conformity with the mixed-use resort-centric development of the Middletown Area Plan, and by extension the General Plan, a rezoning is required. The County currently has three zoning designations allowing mixed-use development: Commercial Resort, Planned Development Residential, and Planned Development Commercial. Due to the intermingling of resort, commercial, and residential uses; no single existing zoning designation is appropriate for the property. Therefore, GVD is a blend of all three zoning practices.

EXECUTIVE SUMMARY

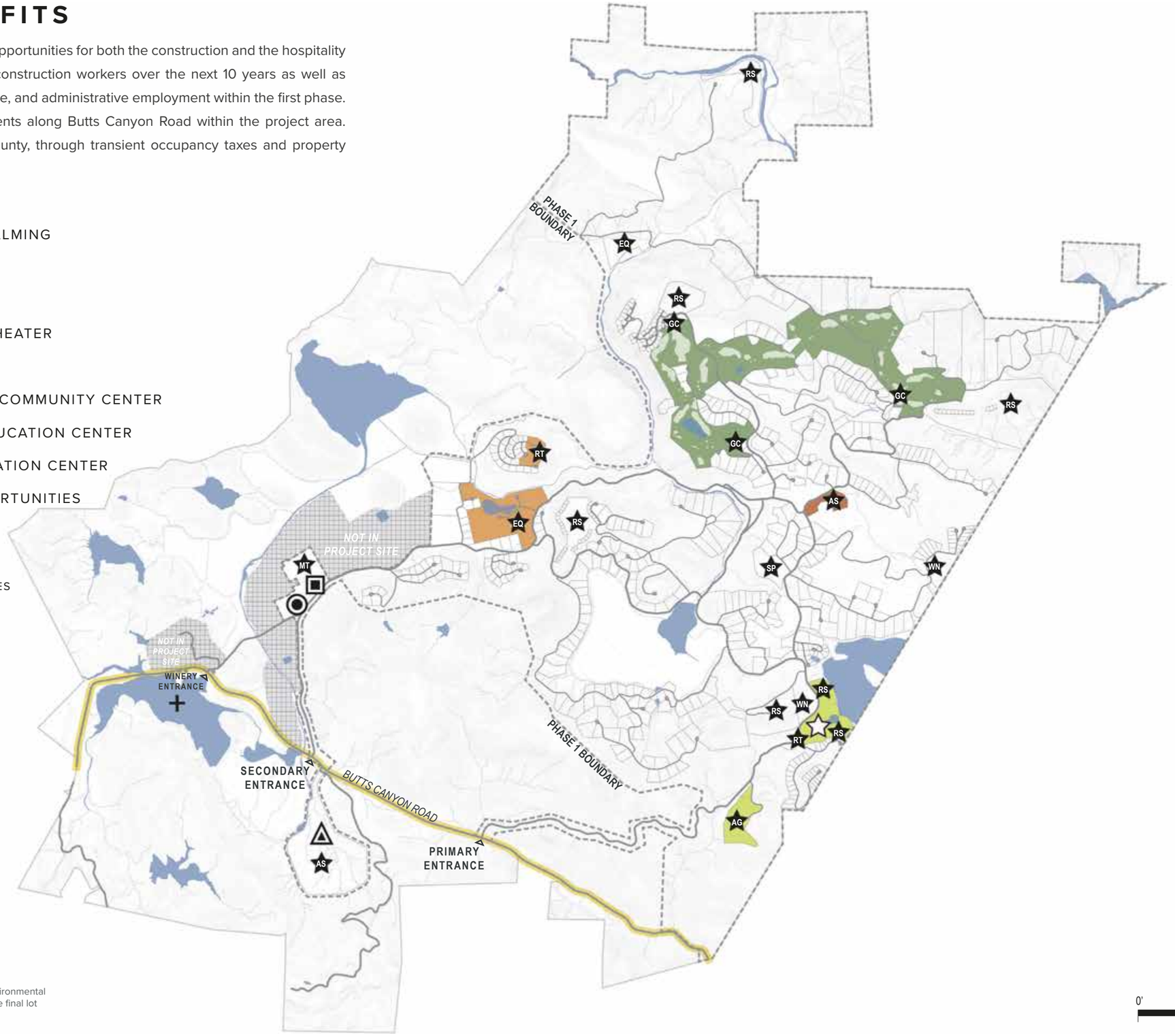
This Specific Plan of Development details the first and primary phase of the Maha Resort at Guenoc Valley. Inspired by the landscape and heritage of this extraordinary property the proposal incorporates low impact sustainable development and smart growth techniques with a commitment to preserving the legacy and identity of the ranch for future generations. The PROJECT is organized into individual resort communities, defined by low impact designs that prioritize low density and clustered development, preserving surrounding open space and agricultural cultivation. These resort communities are situated within the natural landscapes to minimize construction impacts and connect guests seamlessly with the land. The PROJECT proposes diversified agricultural production to include gardens, culinary education, farmers markets, and agricultural retail sales and opportunities for local artisans and business. The vision of the Maha Resort champions the commitment to on-site production and self-reliance as a pillar of its excellence in design, impact, and narrative as evident in the sustainability efforts and community benefits.

COMMUNITY BENEFITS

This project provides employment training and opportunities for both the construction and the hospitality industries. It anticipates relying on over 500 construction workers over the next 10 years as well as 300, year round, full time hospitality, maintenance, and administrative employment within the first phase. The project will also result in traffic improvements along Butts Canyon Road within the project area. Furthermore, increased tax revenue for the County, through transient occupancy taxes and property taxes, will directly benefit the community.

- AERIAL TRANSPORTATION ACCESS
- BUTTS CANYON ROAD TRAFFIC CALMING
- EMERGENCY RESPONSE CENTER
- EQUESTRIAN CENTER
- FARMER'S MARKET & OUTDOOR THEATER
- GOLF COURSE
- ON-SITE WORKFORCE HOUSING & COMMUNITY CENTER
- CONSTRUCTION EMPLOYMENT EDUCATION CENTER
- HOSPITALITY EMPLOYMENT EDUCATION CENTER
- LOCAL ARTISAN & SUPPLIER OPPORTUNITIES
  SUPPORTING LOCAL BUSINESSES
- EMPLOYMENT OPPORTUNITIES

AG AGRICULTURE
AS ADMINISTRATION & SUPPORT SERVICES
EQ EQUESTRIAN
GC GOLF COURSE
MT MAINTENANCE
RS RESORT
RT RESTAURANT
WN WINERY
SP SPA



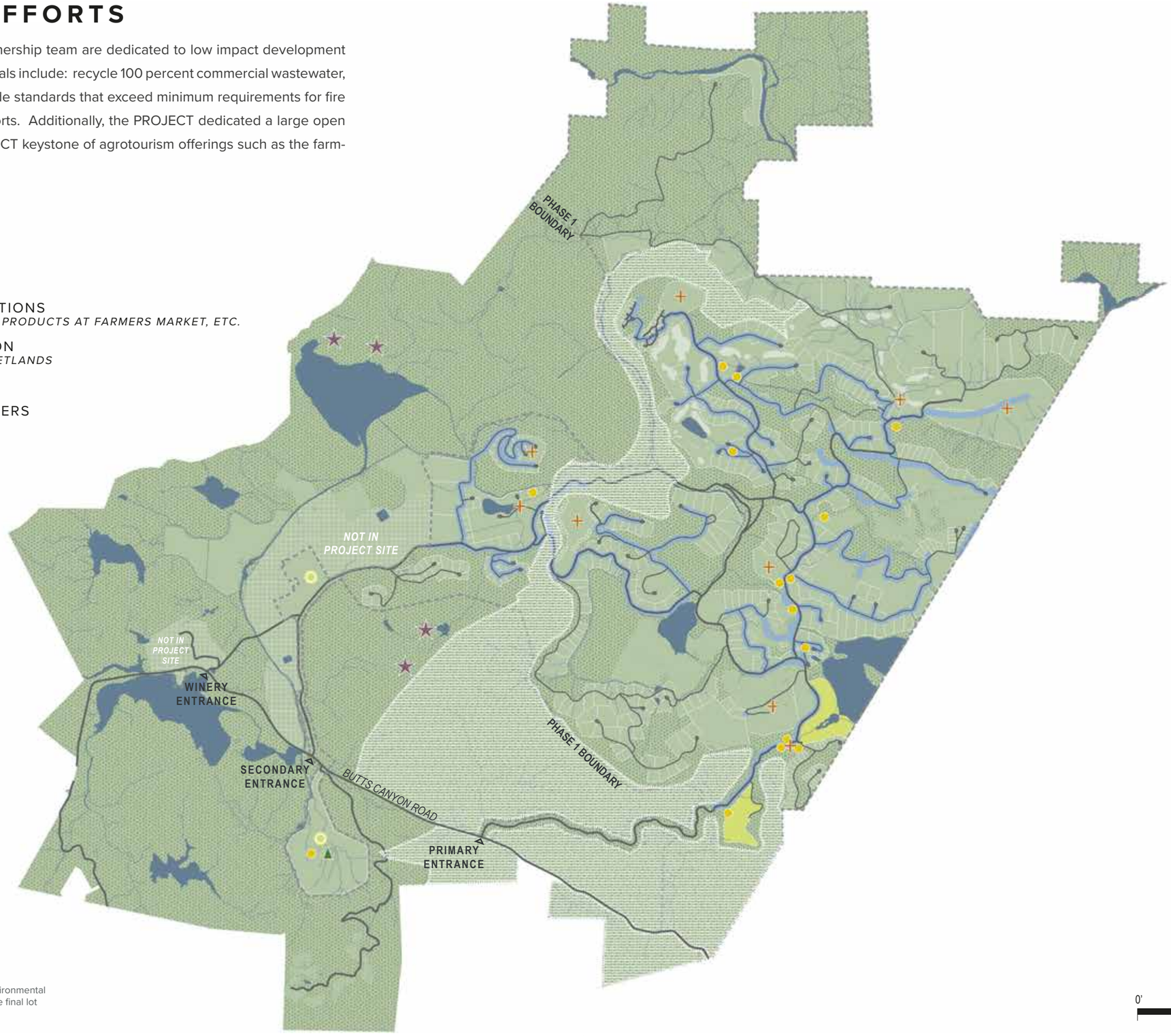
NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

0' 1800' 3600' 7200'

SUSTAINABILITY EFFORTS

The Maha Guenoc Valley development and ownership team are dedicated to low impact development existing with the natural landscape. PROJECT goals include: recycle 100 percent commercial wastewater, zero net electrical energy, propose building code standards that exceed minimum requirements for fire resiliency, installation of electric car charging ports. Additionally, the PROJECT dedicated a large open space area, native plant nursery, and the PROJECT keystone of agrotourism offerings such as the farm-to-table experience.

- DEDICATED OPEN SPACE
  NO DEVELOPMENT ALLOWED
- FIRE RESILIENT LANDSCAPE
- GRAZING & ANIMAL HUSBANDRY
- DIVERSIFIED AGRICULTURE OPERATIONS
  GARDENS, ORCHARDS, LOCALLY SOURCED PRODUCTS AT FARMERS MARKET, ETC.
- RIPARIAN & WETLAND RESTORATION
  LAKES, PONDS, CREEKS, STREAMS, AND WETLANDS
- RECYCLED WATER DISTRIBUTION
- WASTEWATER RECLAMATION CENTERS
- COMPOST & RECYCLING CENTERS
- EV CHARGING STATIONS
- SOLAR FIELDS
  TOTAL: 40 ACRES
  RESULT: ZERO NET ELECTRIC ENERGY
- NATIVE NURSERY



0' 1800' 3600' 7200'

NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

LOW-IMPACT DESIGN

Each resort community will include a mixture of hotel Units, Resort Residential, and Residential Villas. The clustering of development reduces the sprawl of the development and results in consolidated hubs for the guest to enjoy while preserving the rural landscape and agricultural qualities of the Property. Both the Resort Residential and the Residential Villas are intended for subdivision. This results in a very low density, an average of 0.1 unit per acre, with the average lot size of 5 acres with portions of each lot in conservation, which is similar to surrounding rural residential context. Roadways and typical buildings are accurately scaled in the site plan below to demonstrate the low-impact design.

RESIDENTIAL UNITS PER ACRE IN RESORT COMMUNITIES

0.18 BOHN RIDGE RESORT COMMUNITY

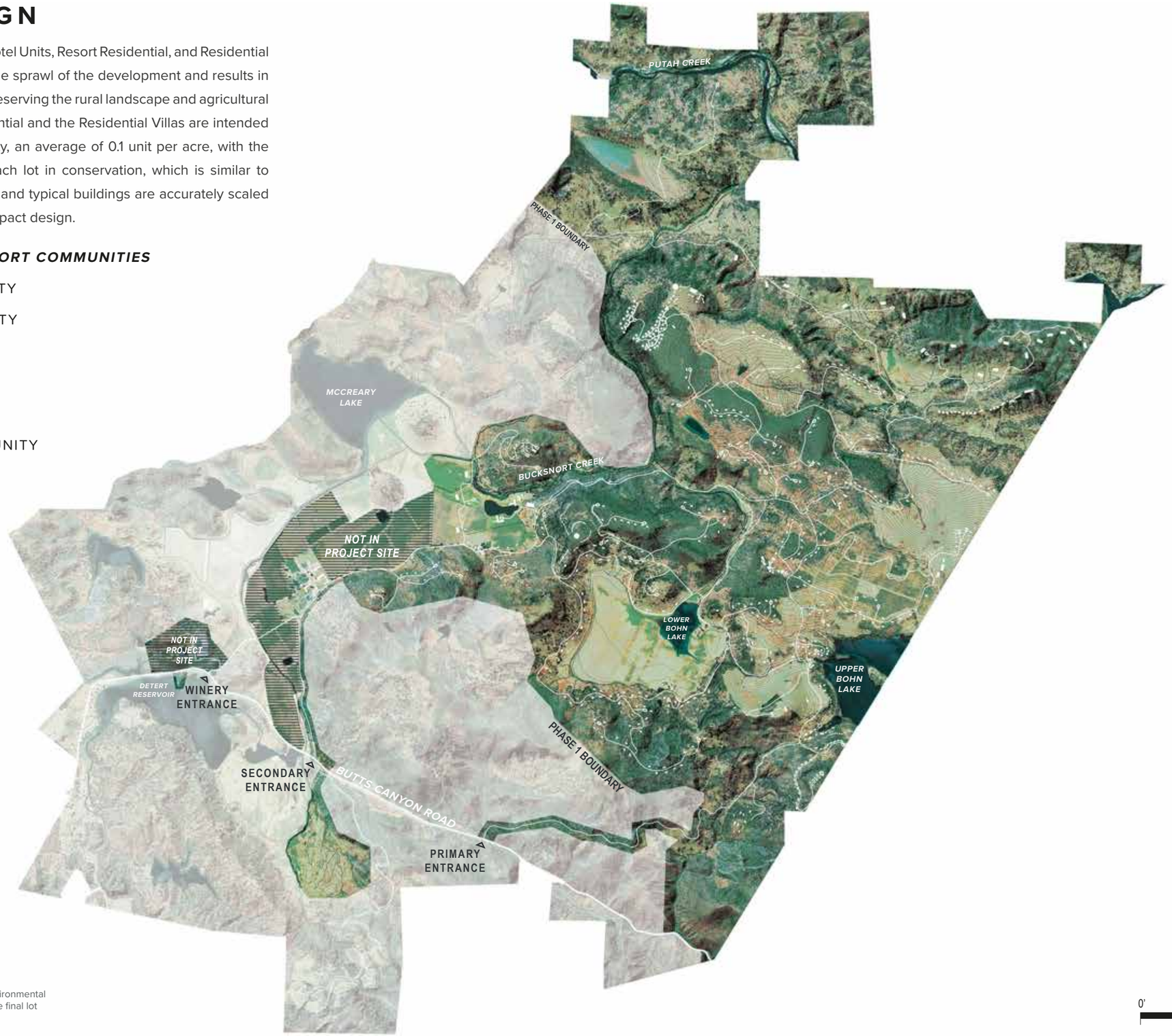
0.14 EQUESTRIAN CENTER COMMUNITY

0.12 MAHA FARM COMMUNITY

0.18 RED HILL ESTATES COMMUNITY

0.12 SPA COMMUNITY

0.03 RESORT AT TROUT FLAT COMMUNITY



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RESORT COMMUNITIES

Although the site boundary determines the extent of Maha Guenoc Valley project, a majority of development will occur within a series of resort communities. These resort communities—as defined by the boundaries shown below—include a series of amenities and structures all designed by the same architect. Each resort community will include a signature boutique hotel accompanied by a series of residential properties. These hotels, resorts, and resort communities will be further described in Section 3: Architecture and Land Use Plans.

	HOTEL UNITS	RESORT RESIDENTIAL UNITS	RESIDENTIAL ESTATES
BOHN RIDGE RESORT COMMUNITY	31	30	38
EQUESTRIAN CENTER COMMUNITY	6	12	74
MAHA FARM COMMUNITY	48	49	139
RED HILL ESTATES COMMUNITY	50	40	88
SPA COMMUNITY	0	0	11
RESORT AT TROUT FLAT COMMUNITY	20	13	31
TOTAL	**155**	**144**	**381**

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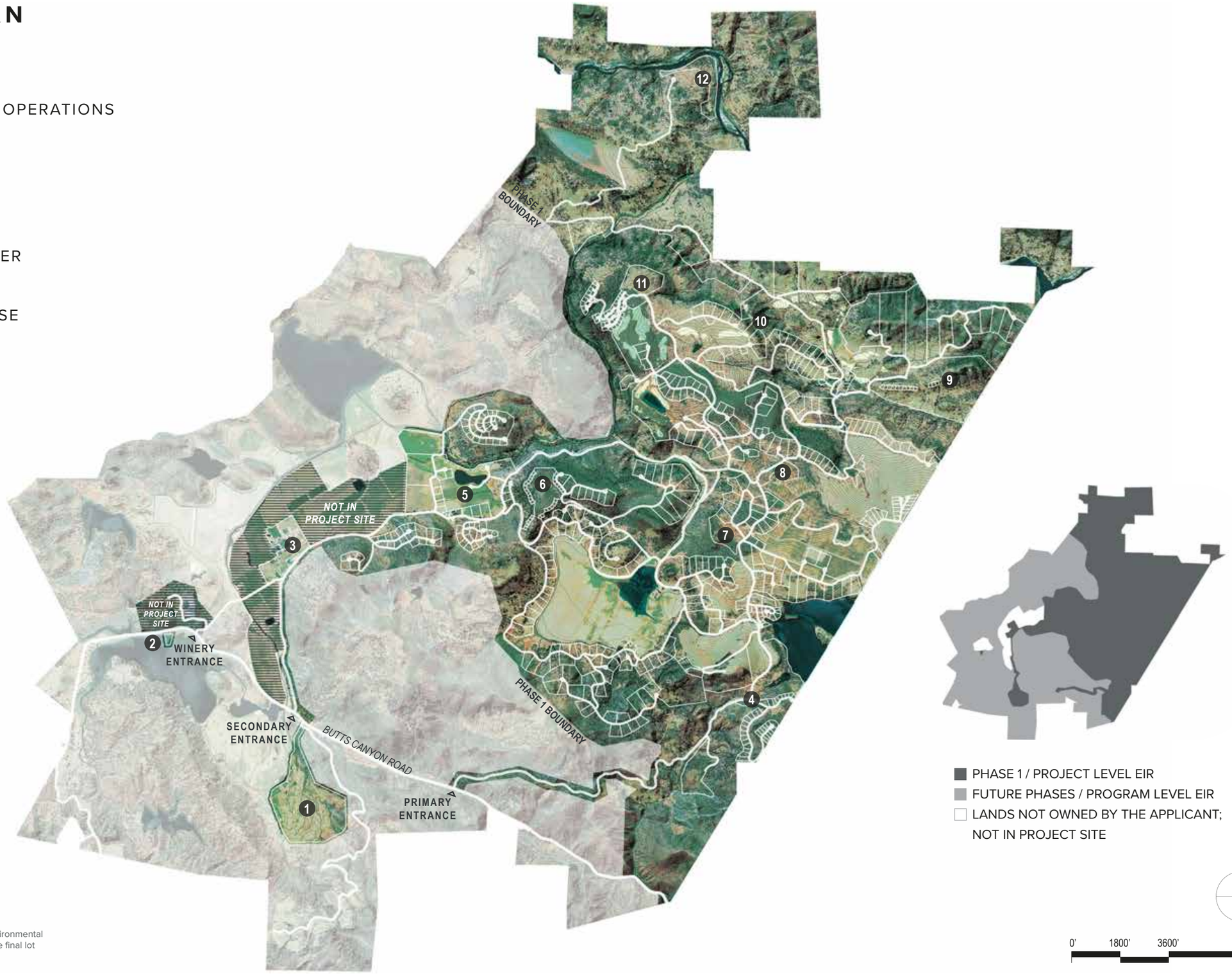
PROJECT SITE PLAN

1 WORKFORCE HOUSING
2 AERIAL SITE ACCESS
3 CENTRAL BACK-OF-HOUSE OPERATIONS
4 MAHA FARM
5 EQUESTRIAN CENTER
6 BOHN RIDGE RESORT
7 SPA
8 SUPPORT SERVICES CLUSTER
9 RESORT AT TROUT FLAT
10 RENAISSANCE GOLF COURSE
11 RED HILL ESTATES
12 TENTED CAMP AREA



PHASE 1 / PROJECT LEVEL EIR
FUTURE PHASES / PROGRAM LEVEL EIR
LANDS NOT OWNED BY THE APPLICANT; NOT IN PROJECT SITE

0' 1800' 3600' 7200'

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ENVIRONMENTAL REVIEW

ENVIRONMENTAL REVIEW

The General Plan Amendment, and Area Plan Special Study Area No.3 map amendment, propose the GVD district. The project entitlements will be subject to both a program-level and project-level Environmental Impact Report (“EIR”), administered under the direction of the County of Lake; the project-level analysis will address the first phase of the Maha Resort, with subsequent phases of the project analyzed at a programmatic level.

The unique size, scale, and distinctiveness of the project will have a significant beneficial impact on the local community. Considering the multiple natural disasters in the last three years, the project we are proposing should offer many welcome benefits to the County (see the Community Benefit Map). Contributions to the County’s economy include new housing, workforce options, expansion of tourism, agriculture, and an overall increase in community pride. This project will include farm-to-table experiences, outdoor and indoor recreational uses, expansion of agricultural uses, workforce housing, open space preservation, and new jobs. Environmentally, this project also includes exceptional landscape management, proactive fire mitigation planning, and commitments to on-site renewable water reuse and potential renewable energy generation.

SECTION 2 LANDSCAPE

GUENOC VALLEY LANDSCAPE

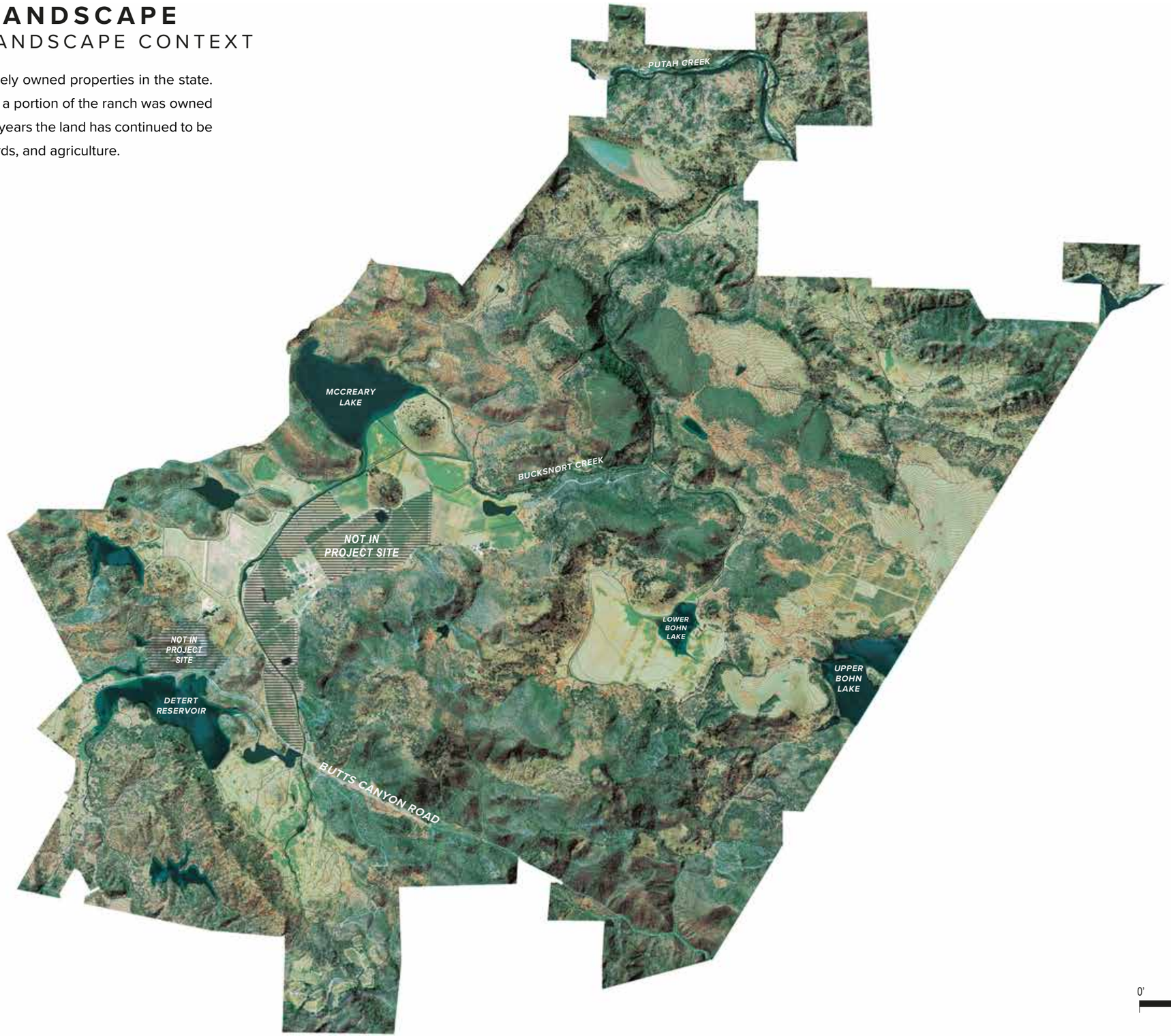
The project, currently consisting of 49 assessor's parcels totaling approximately 16,000 acres within Guenoc Valley, is located three miles southeast of Middletown on the southeast border of Lake County, bordering Yolo and Napa Counties to the south and east, with primary access along Butts Canyon Road. The Guenoc Ranch remains one of the largest privately owned properties in the state of California. The Hidden Valley Lake community, to the northwest, is undergoing continued development.

Guenoc Valley is a small inland valley set on an alluvial fan, isolated from surrounding areas by rocky ridges and volcanic rock. As part of the inner coastal range of Northern California, the site is characterized by uniquely varied topography, with rolling hills, oak woodlands, irrigated vineyards, grazing corridors, open space, and meadows. Ground elevation ranges from 62 to 950 feet above sea level. The average rainfall is 35 inches a year, slightly less than neighboring Middletown, with slightly greater seasonal temperatures, and generally less severe fog.

An existing loop road currently provides access from Guenoc Road, which intersects Butts Canyon Road across from the Detert Reservoir. The project anticipates continued utilization of the existing loop road, with a new intersection to be located approximately just over 1 mile from the existing intersection to the Langtry Winery.

GUENOC VALLEY LANDSCAPE
EXISTING & HISTORIC LANDSCAPE CONTEXT

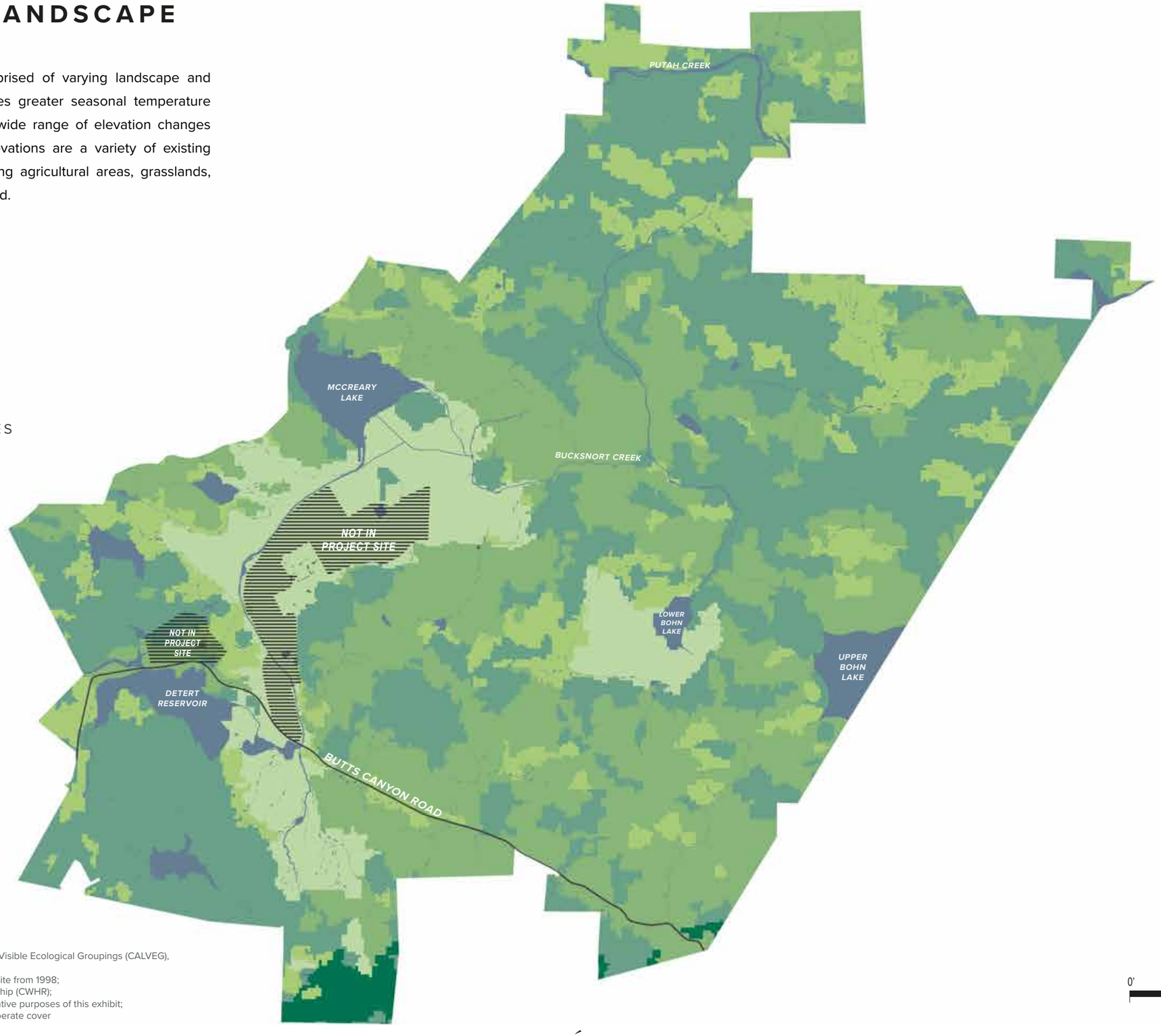
Guenoc Ranch remains one of the largest privately owned properties in the state. The property first came to public attention when a portion of the ranch was owned by the British Actress, Lillie Langtry. Through the years the land has continued to be utilized for outdoor recreational pursuits, vineyards, and agriculture.



GUENOC VALLEY LANDSCAPE
VEGETATION TYPES

Guenoc Valley, a small inland valley, is comprised of varying landscape and vegetation characteristics. The site experiences greater seasonal temperature extremes than neighboring areas, and has a wide range of elevation changes throughout the property. At these varying elevations are a variety of existing vegetation vegetation types and uses, including agricultural areas, grasslands, chaparral, oak woodlands, and general forestland.

- AGRICULTURE
- GRASSLANDS
- CHAPARRAL
- OAK WOODLANDS
- GENERAL FORESTLANDS
- WATER
- BARREN LAND AND ROCK PILES



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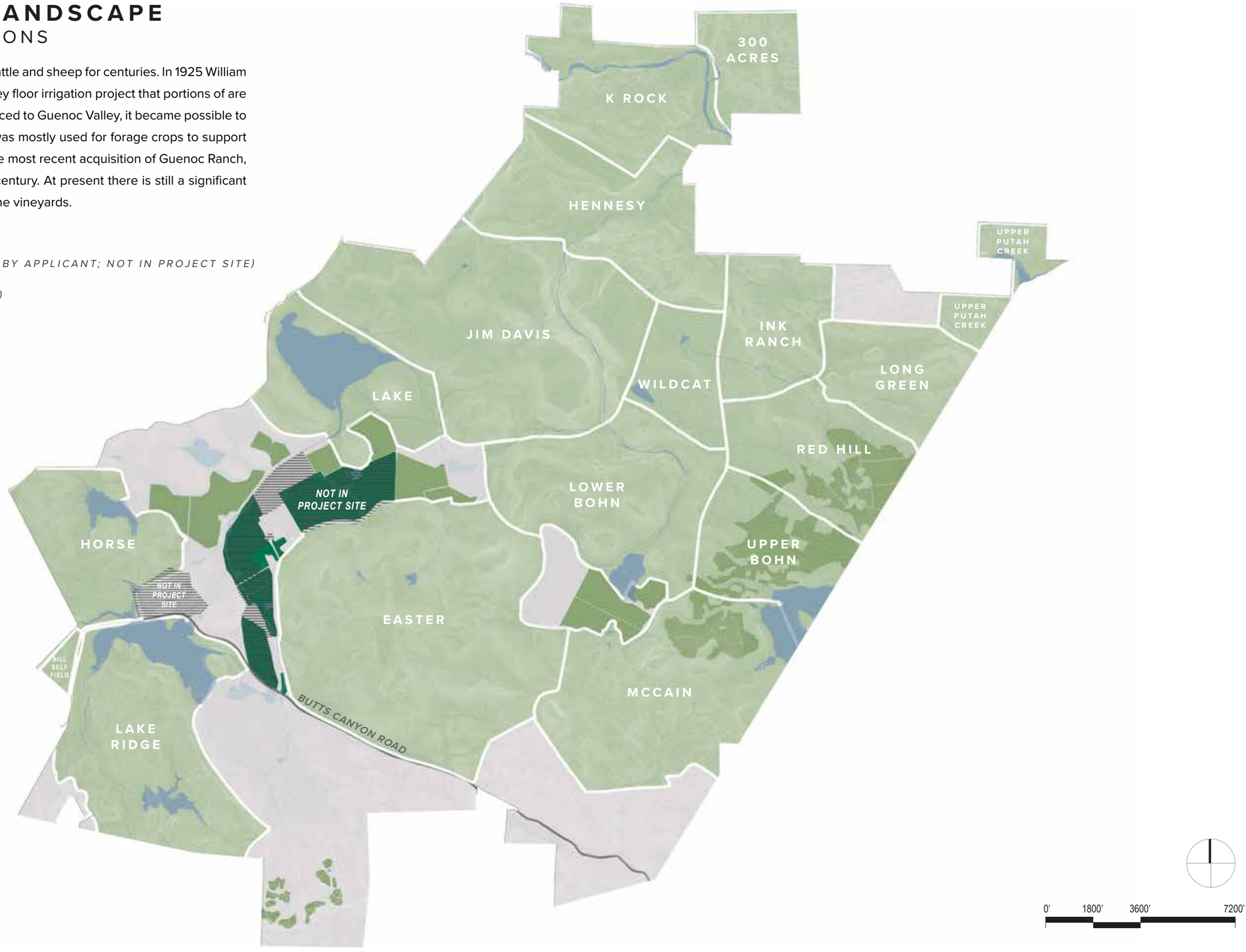
SOURCE
U.S. Forest Service, Classification and Assessment with LANDSAT of Visible Ecological Groupings (CALVEG),
EVeg Mid Region 5 North Coast Mid, January 18, 2018;
data source information ranges from the year 1998 to 2015; data for site from 1998;
data source crosswalked with the California Wildlife Habitat Relationship (CWHR);
CWHR categories simplified to the above seven categories for illustrative purposes of this exhibit;
a detailed survey of existing vegetation will be submitted under a seperate cover

GUENOC VALLEY LANDSCAPE
AGRICULTURAL OPERATIONS

Historically Guenoc Valley has been grazed by cattle and sheep for centuries. In 1925 William F. Detert built Detert Reservoir and started a valley floor irrigation project that portions of are still being used today. After irrigation was introduced to Guenoc Valley, it became possible to grow more agricultural crops, but the property was mostly used for forage crops to support the existing grazing operations. At the time of the most recent acquisition of Guenoc Ranch, the property had been farmed for more than a century. At present there is still a significant cattle and sheep operation in conjunction with the vineyards.

- LANGTRY VINEYARDS
- FOLEY VINEYARDS *(NOT OWNED BY APPLICANT; NOT IN PROJECT SITE)*
- PASTURES *(PASTURE NAME NOTED)*

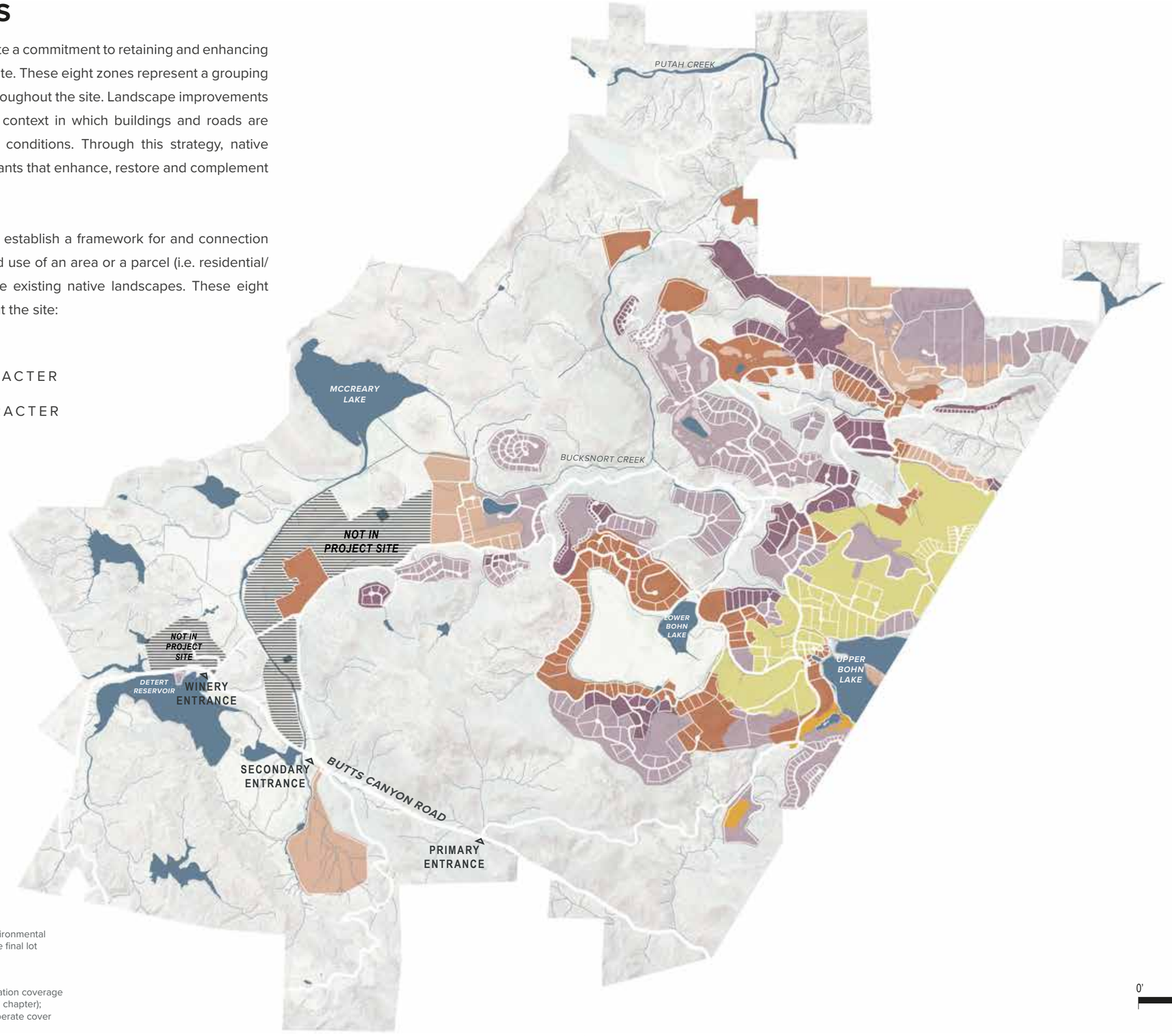


LANDSCAPE ZONES

The eight proposed landscape zones demonstrate a commitment to retaining and enhancing the existing landscape patterns throughout the site. These eight zones represent a grouping of a majority of landscape communities found throughout the site. Landscape improvements will exhibit a ‘light-touch’ approach, creating a context in which buildings and roads are closely integrated with the present landscape conditions. Through this strategy, native landscapes will be supplemented by adaptive plants that enhance, restore and complement the existing site character.

These proposed landscape zones are intended establish a framework for and connection between the landscape character of an intended use of an area or a parcel (i.e. residential/ commercial development or recreation) and the existing native landscapes. These eight zones will guide landscape strategies throughout the site:

- WOODLAND CHARACTER
- CHAPARRAL WOODLAND CHARACTER
- GRASSLAND WOODLAND CHARACTER
- GRASSLAND CHARACTER
- VINEYARDS CHARACTER
- FARMLAND CHARACTER
- WATERSIDE CHARACTER
- RURAL LANDSCAPES & RECREATION AREAS



NOTE
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SOURCE
Landscape zones concept based on public sources of existing vegetation coverage (see “Vegetation Types” exhibit with the “Guneoc Valley Landscapes” chapter); a detailed survey of existing vegetation will be submitted under a seperate cover

LANDSCAPE ZONES DESCRIPTIONS

WOODLAND CHARACTER

These areas are dominated by dense groves of oak woodlands, including the Blue Oak and the Valley Oak. Any landscape improvements within this zone will be limited to areas directly adjacent to buildings and roadways within low-impact residential and commercial development. Every effort will be made to enhance and emulate the existing woodland condition and preserve oaks during the development process, as these trees will be essential the residential and resort character throughout this zone.

CHAPARRAL WOODLAND CHARACTER

The Chaparral Woodland zone is characterized by often dense growth of chaparral species and scattered oak, pine and other trees. Seasonally varied, the large shrub species include Toyon, manzanita, chemise, grasses and other species. This vegetative community has been impacted by fire in the recent past and requires particular attention to manage, restore and maintain in a healthy, beautiful state.

GRASSLAND WOODLAND CHARACTER

The Grassland Woodland Zone, as its name suggests, consists of an understory of grasses and wildflowers under varied tree canopies. Historically grazing has been, and will continue to be instrumental in maintaining this landscape character throughout large portions of the Guenoc Valley site. The Grassland Woodland association will be the predominant approach and character for landscape improvements along roadways and residential development areas.

GRASSLAND CHARACTER

The Grassland Zone, naturally occurs in several portions of the site both south and north of Butts Canyon Road. Grasslands are characterized by a variety of native and non-native grasses and wildflowers with limited tree and chaparral cover. Landscape development within the Grassland zone will emphasize use of drought-tolerant native grasses, wildflowers and limited tree planting. Grasslands outside of development areas will continue to be managed for grazing.

VINEYARDS CHARACTER

Wine grape vineyards have been and will continue to provide an important and dominant landscape use and character for Guenoc Valley. The working vineyards will provide a strong visual connection to the site's history and a basis for an agricultural/agrarian landscape expression characterized by windrows, tree-lined roadways, special fencing and planting of vineyard perimeters. The irrigated vineyards also play an important role in providing irrigated and managed landscape, a key component minimizing fire risk.

FARMLAND CHARACTER

Productive farmlands are an important landscape character initially located at the Maha Farm, and will provide substantial food and fiber sources for guests, residents, and the local community. The farmlands will be intensively managed and include vegetable gardens, orchards, herbs, flowers, animal products and fiber sources. To the extent feasible, edible plantings will be extended beyond the large garden and orchards to guest patios, roadway plantings or other appropriate areas to create an integrated productive landscape experience.

WATERSIDE CHARACTER

Areas identified as Waterside Character include existing lakes, streams, seasonal drainages, and wetlands,. Development within and adjacent to waterside areas will include riparian plantings appropriate for the seasonal changes of water levels and flows that will transition to the adjacent landscape character in the uplands.

RURAL LANDSCAPES & RECREATION AREAS

The majority of the site will be maintained in a natural, rural state, supporting continued grazing and limited recreation uses such as hiking, horseback riding or similar uses. Except for the vineyards and farmland character zones, all other landscape types occur throughout this zone.

LANDSCAPE ZONES COMMON EXISTING PLANTS

Each Landscape Zone includes a variety of existing plant species, both native and non-native, with some overlap between zones, examples shown here. New development or restoration within any single zone will include a carefully selected list of existing species including grasses, shrubs and trees to distinguish the area and to provide a framework for new landscapes.

- N CALIFORNIA NATIVE
- WOODLAND
- CHAPARRAL WOODLAND
- GRASSLAND WOODLAND
- GRASSLAND
- VINEYARDS
- FARMLAND
- WATERSIDE
- RURAL LANDSCAPES & RECREATION AREAS

N

PURPLE NEEDLE GRASS | Nassella (Stipa) pulchra

N

CALIFORNIA OAT GRASS | Dantonia californica

WILD OATS | Avena (barbata, fatua)

N

HARDSTEM BULRUSH | Schoenoplectus acutus

PETITE SIRAH | Vitis vinifera

N

COFFEEBERRY | Rhamnus california

N

SUGAR BUSH | Prunus ilicifolia

N

MANZANITA | Arctostaphyllos spp.

N

BLUE OAK | Quercus douglassii

N

VALLEY OAK | Quercus lobata

N

CANYON LIVE OAK | Quercus chrysolepis

LANDSCAPE ZONES ADDITIONAL COMPLEMENTARY PLANTS

Within each zone, new landscaping will include a special palette of existing plants, supplemented by a specialized list of complementary plant species, examples show here. The intent is to give each area a distinctive character that is based on the existing vegetative association found in the zone, supplemented with other plantings that provide richness, seasonal variation, special character or habitat value.

- N CALIFORNIA NATIVE
- WOODLAND
- CHAPARRAL WOODLAND
- GRASSLAND WOODLAND
- GRASSLAND
- VINEYARDS
- FARMLAND
- WATERSIDE
- RURAL LANDSCAPES & RECREATION AREAS

N

IDAHO FESCUE | Festuca idahoensis

N

BLUE WILD RYE | Elymus glaucus

N

CALIFORNIA OATGRASS | Dantonia californica

N

BUCKWHEAT | Eriogonum fasciculatum

N

MARINA STRAWBERRY TREE | Arbutus ‘Marina’

N

WESTERN REDBUD | Cercis occidentalis

FUJI APPLE | Malus pumila

LONDON PLANE | Platanus × acerifolia

N

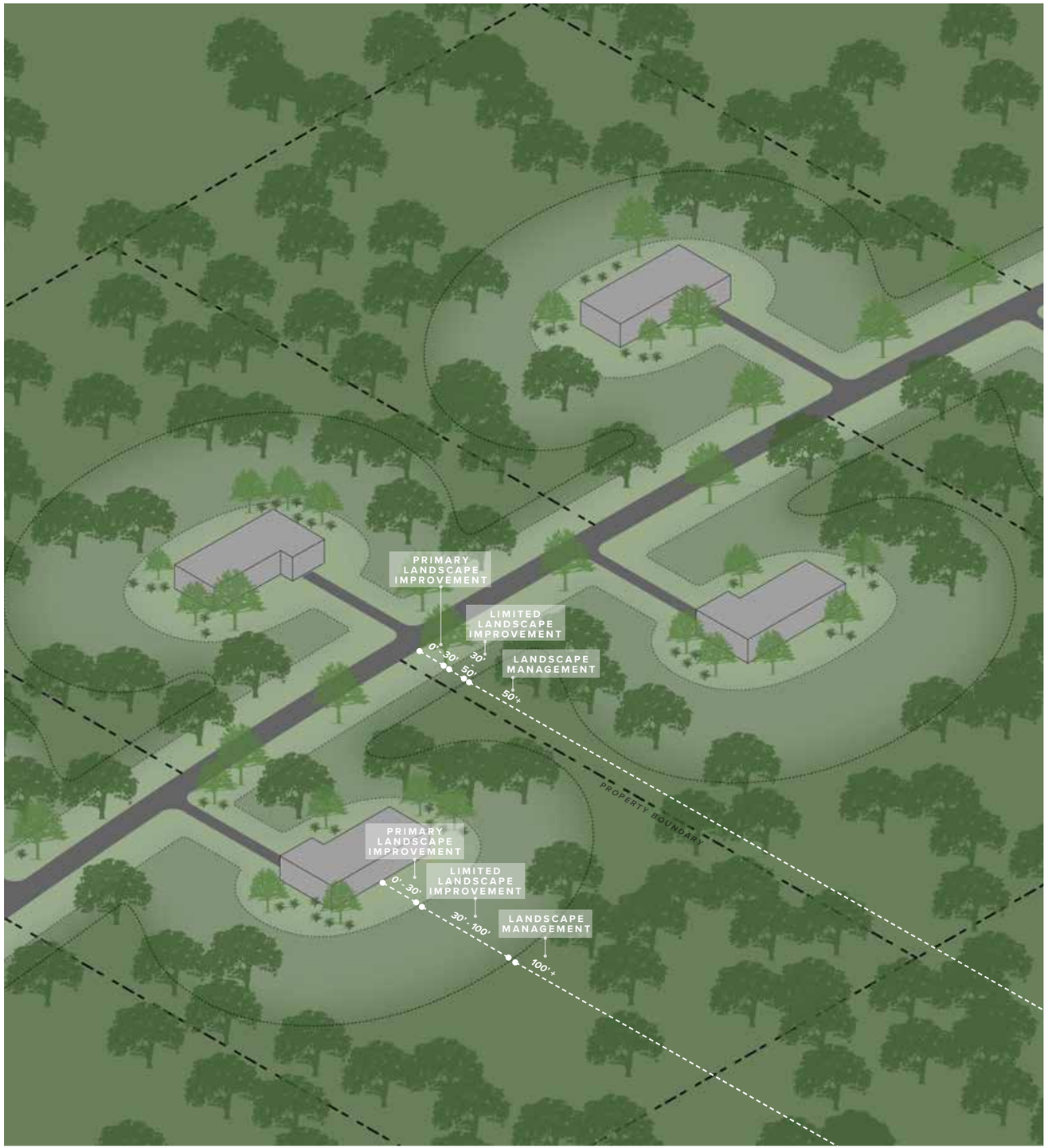
CALIFORNIA SYCAMORE | Platanus racemosa

N

BLACK WALNUT | Juglans californica

OLIVE | Olea europaea

LANDSCAPE ZONES TYPICAL LANDSCAPE STRATEGY



LANDSCAPE IMPROVEMENT EXTENTS

The overall approach to landscape improvements throughout the site are to exhibit a “light touch” approach that emphasizes the existing natural and rural character. New landscaping will generally provide a transition between more highly developed (and irrigated) landscapes near buildings and selectively along roadways to more natural landscapes managed to reduce fire risk.

PRIMARY LANDSCAPE IMPROVEMENT

0’ - 30’ FROM EDGE OF ROADS AND BUILDINGS

The majority of newly planted and irrigated landscape will be within this area. The landscape design will be guided by the landscape zone character and fuel reduction standard, which includes a priortization of native and low fuel vegetation.

LIMITED LANDSCAPE IMPROVEMENT

30’ - 50’ FROM EDGE OF ROADWAYS; 30’ - 100’ FROM EDGE OF BUILDINGS

A limited amount of landscape improvement will occur within this buffer area. The landscape improvements within this area will be minimal, and mostly involve defining the edges of the landscape design and reducing vegetated fire risk.

LANDSCAPE MANAGEMENT

BEYOND 50’ FROM EDGE OF ROADWAYS; BEYOND 100’ FROM EDGE OF BUILDINGS

Within this area, plants and vegetated conditions with a high fire risk concern will be selectively addressed. This will primarily include cutting down dead and highly-combustible vegetation. Otherwise, the existing landscape will be conserved to the maximum extent.

AGRICULTURE

Both historic and active agricultural practices such as vineyards and grazing operations are part of the culture of the Guenoc Valley. The PROJECT proposes to continue this historic land use culture and expand it for on-site food production. Furthering agriculture within Guenoc Valley, through promotion of local produce and artisans' products, farm-to-table restaurants, farmers markets, and recreational activities, will ensure the continued viability of Lake County's agricultural culture and economy. Furthermore, the grazing of livestock on the landscape enhances agri-tourism experiences, helps promote local agricultural products and supports fire management strategies for vegetative management. By farming grass-fed beef, sheep and goats, the PROJECT will create a variety of opportunities for agriculture within the Maha Farm and throughout the site.

VINEYARDS

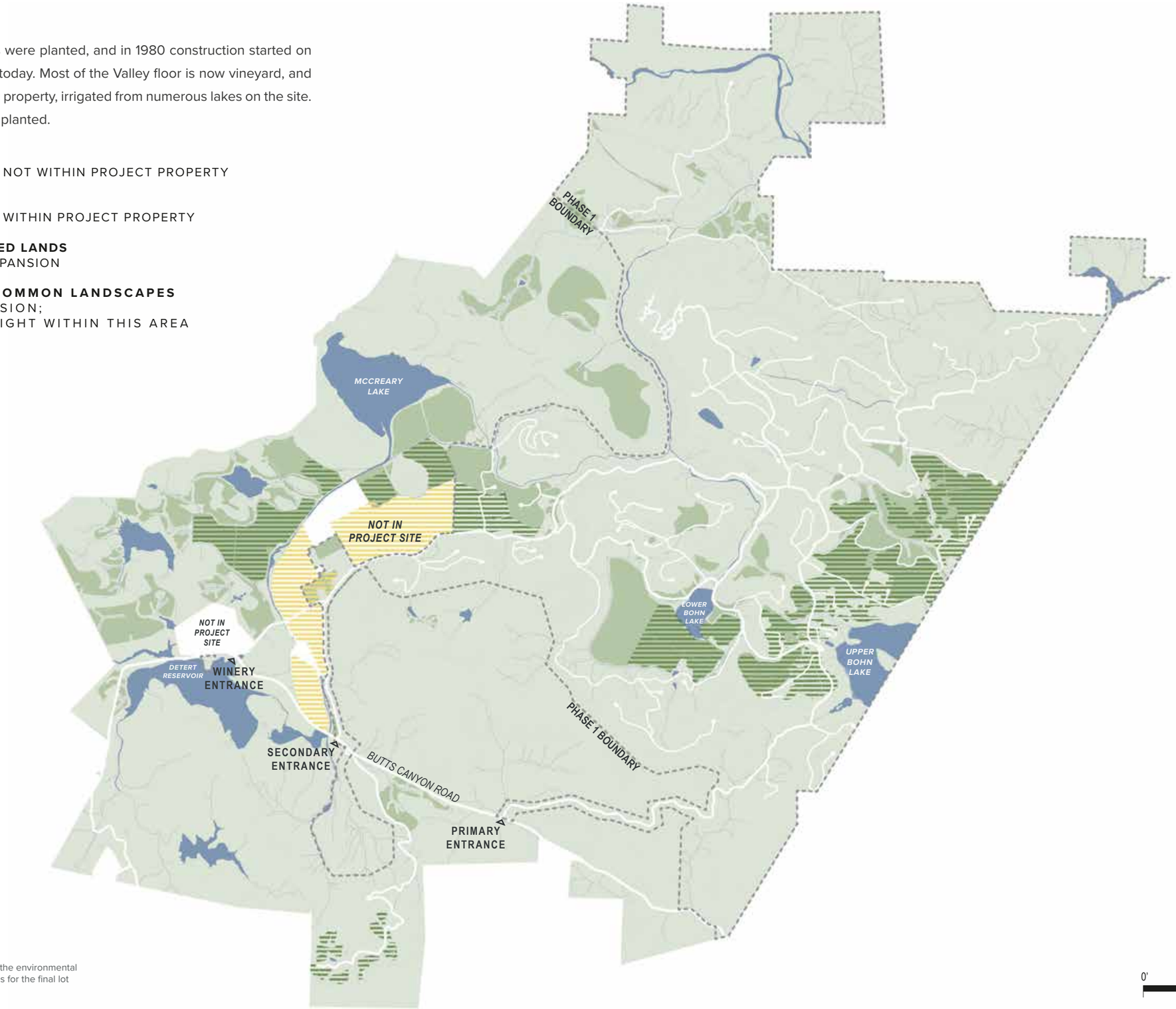
In the late 1970's, some irrigated vineyards were planted, and in 1980 construction started on Guenoc Winery which is still in production today. Most of the Valley floor is now vineyard, and vineyards are being planted throughout the property, irrigated from numerous lakes on the site. There are 964 acres of vineyards currently planted.

FOLEY VINEYARDS
CURRENTLY PLANTED VINEYARDS NOT WITHIN PROJECT PROPERTY

LANGTRY VINEYARDS
CURRENTLY PLANTED VINEYARDS WITHIN PROJECT PROPERTY

POTENTIAL VINEYARDS ON LEASED LANDS
AREAS FOR LEASED VINEYARD EXPANSION

POTENTIAL VINEYARDS ON COMMON LANDSCAPES
AREAS FOR VINEYARD EXPANSION;
AGRICULTURE ALLOWED BY RIGHT WITHIN THIS AREA



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DIVERSIFIED AGRICULTURE

The following farming activities will occur at Maha Farm and throughout the site:

A CSA program for residents – A Community Supported Agriculture (CSA) program consists of a community of individuals who pledge support to a farm operation by paying a subscription fee to get various products delivered. The community and the growers provide mutual support and share in the risks and benefits of food production. Residents who opt to participate in a CSA program as well as the visitors will be able to purchase beef from the resident herd, pursuant to USDA laws about purchasing grass fed beef shares. (Animals are purchased directly from the farm, but slaughtered, butchered and wrapped at a USDA facility.)

Beef for restaurants & retail – Beef from the resident herd, once slaughtered and butchered off-site, will be returned to an on-site butchery for further handling. Thus, beef from the on-site herd can be supplied to the on-site restaurants, and also sold at retail outlets at the Maha Farm.

Tallow candles & beef cuts for retail sale – Beef tallow can be used to create candles for workshops and for sale in various retail outlets, including the Farmer's Market and Grocery.

Lamb for restaurants & retail – Lamb from either the on-site resident herd or from the seasonal herd will be sent off-site to a certified slaughter facility and butchering facility, and a small portion will be processed by the Maha butchery for sale to restaurants and at the farmer's market and included as a CSA option as well.

Wool shearing and fiber spinning – Wool sheared from the sheep that graze the site can be hand-processed into fiber products including hand-spinning and felted products used for on-site workshops. Wool can then be turned into various fiber products and sold on-site.

Agriculture and Horticulture – Up to five acres will be allocated on the Maha Farm site for the production of annual and perennial crops to produce a suite of mixed vegetables, fruits, and nuts. Value-added products, including pickling and jam preserves will also be processed on-site.

Hedgerows, windbreaks, and Integrated Pest Management (IPM) – Native Hedgerows will be planted for a variety of uses, including: aesthetic landscape borders, fire breaks, pollinator and bird habitat, carbon sequestration and other ecosystem services. These hedgerows will be places in various locations around the Maha Farm to ensure adequate plant material for harvesting (willow, dye plants) and provide resources for local fauna and flora, including perennials that will bloom during the times when bees may require extra forage.

Flower Farm – a small portion of the garden area within the Maha Farm's mixed vegetable/orchard will be set aside for the growing of flowers for the Maha hotels and also for sale in the farmer's market and other retail outlets. This will be managed by a resident flower-farmer, tending to a year-round flower and dye garden.

Agroforestry & poultry production – Integrated into the farm operation in further phases of the development will be a small-scale pastured poultry operation, which will help manage insect populations, fertilize soil, and contribute to the overall aesthetics of the farm, in addition to providing eggs on-site and meat for resident and guest consumption. Meat Birds will be processed at a state-inspected slaughter facility such as American Poultry, in Sacramento, or the Rabbit barn, Turlock or Mary's Chicken in Petaluma. Ultimately, Maha will consider investing in developing its own state-inspected meat bird facility.

Apothecary with Herbs Processing Facility – This will showcase an "old-timey" country store that sells dried herbs and tinctures, alongside teas, herbs, soaps, candles, and a variety of other natural products available for purchase. Many of these will be produced on-site and there is ample opportunity to educate customers about the source ingredients, enhancing their connection to the property.

On-site bee operation (for honey and bee pollen) – An on-site bee operation with at least 30 hives can supply the restaurant and various on-site retail areas with honey and bee pollen.

Small-scale dairy – In later phases of the PROJECT a regenerative, pasture-based dairy may be developed to ensure high-quality local dairy products for client consumption.

Aquaculture / aquaponics – Aquaponics is slated to be incorporated into the farming system.

Greenwave – bivalves + purple urchins – We are considering a polyculture farming system that can yield shellfish and seaweed. This system can also incorporate the production of purple urchins.

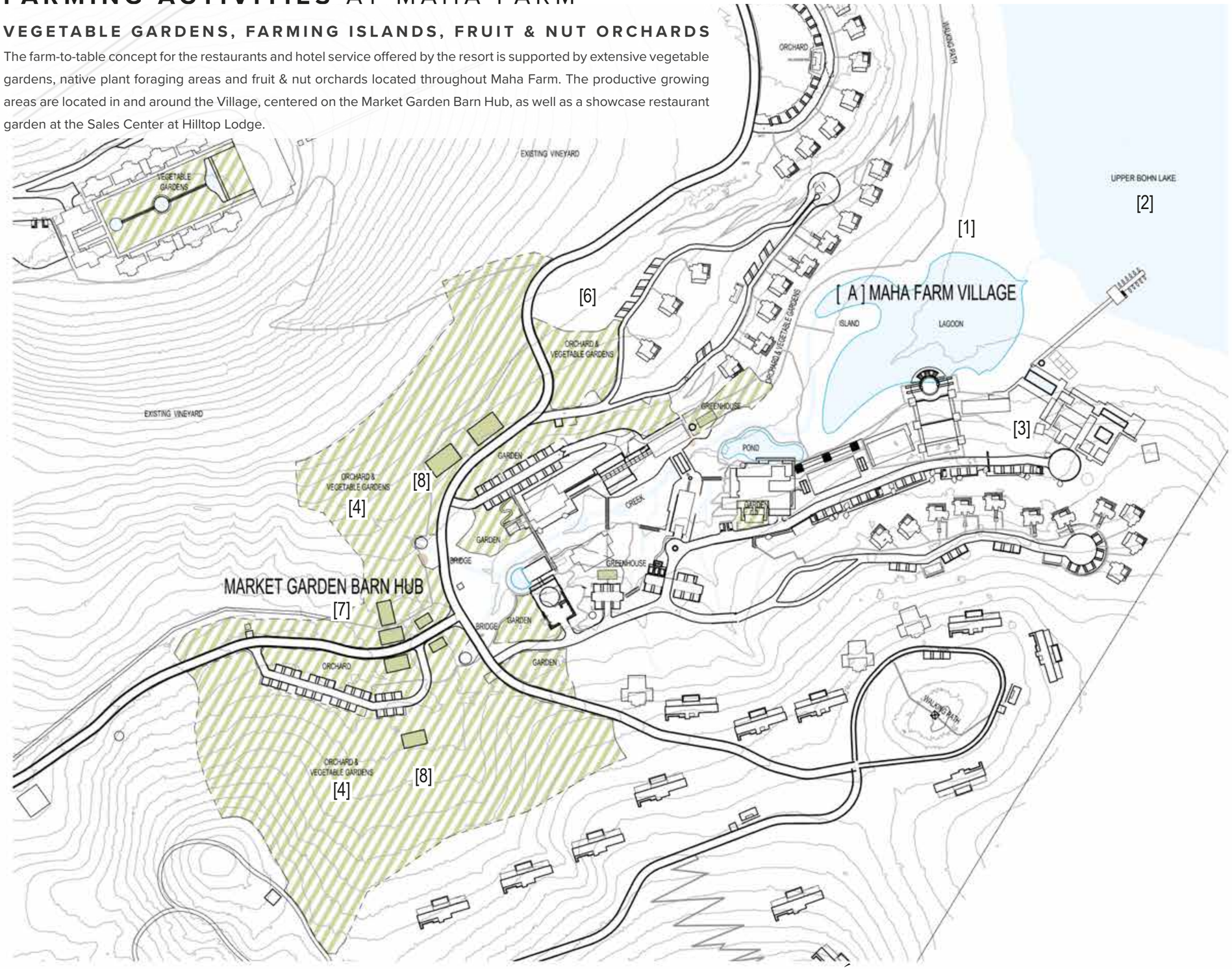
Wild forage – Opportunities to forage for native plants, including mushrooms, will be offered under the supervision of a certified mycologist or botanist.

Composting – All organic materials will be composted on-site in compliance with CA Air Resources, CA Water Resources board and CALRecycle on-site composting regulations. SOPs for appropriate composting will be regularly updated and there will be a compost manager assigned to manage the composting and stay updated with the regulatory environment. To minimize the amount of greenhouse gas emissions from composting, we are considering utilizing an Aerated Static Pile composting system.

FARMING ACTIVITIES AT MAHA FARM

VEGETABLE GARDENS, FARMING ISLANDS, FRUIT & NUT ORCHARDS

The farm-to-table concept for the restaurants and hotel service offered by the resort is supported by extensive vegetable gardens, native plant foraging areas and fruit & nut orchards located throughout Maha Farm. The productive growing areas are located in and around the Village, centered on the Market Garden Barn Hub, as well as a showcase restaurant garden at the Sales Center at Hilltop Lodge.



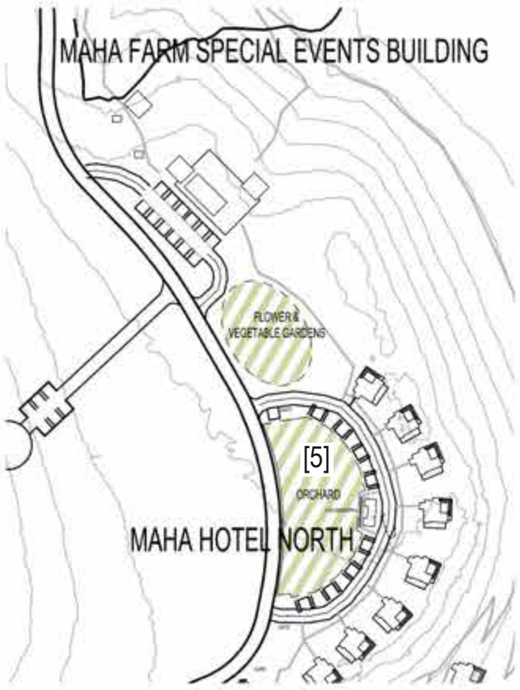
COLOR LEGEND

AGRICULTURE- OUTDOOR

AGRICULTURE- ACCESSORY

MAHA FARM VEGETABLE GARDENS & ORCHARDS

MAHA RESTAURANT VEGETABLE GARDENS	AGRICULTURE PRIMARY	AGRICULTURE	000 SF	0.3 ACRES
MARKET GARDEN BARN HUB	AGRICULTURE PRIMARY	AGRICULTURE	000 SF	20.5 ACRES
SPECIAL EVENTS ORCHARD & FLOWER GARDENS	AGRICULTURE PRIMARY	AGRICULTURE	000 SF	1.3 ACRES
SALES CENTER VEGETABLE GARDENS	AGRICULTURE PRIMARY	AGRICULTURE	000 SF	1.2 ACRES
GRAND TOTAL			000 SF	up to 23.3 ACRES



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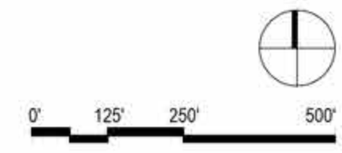
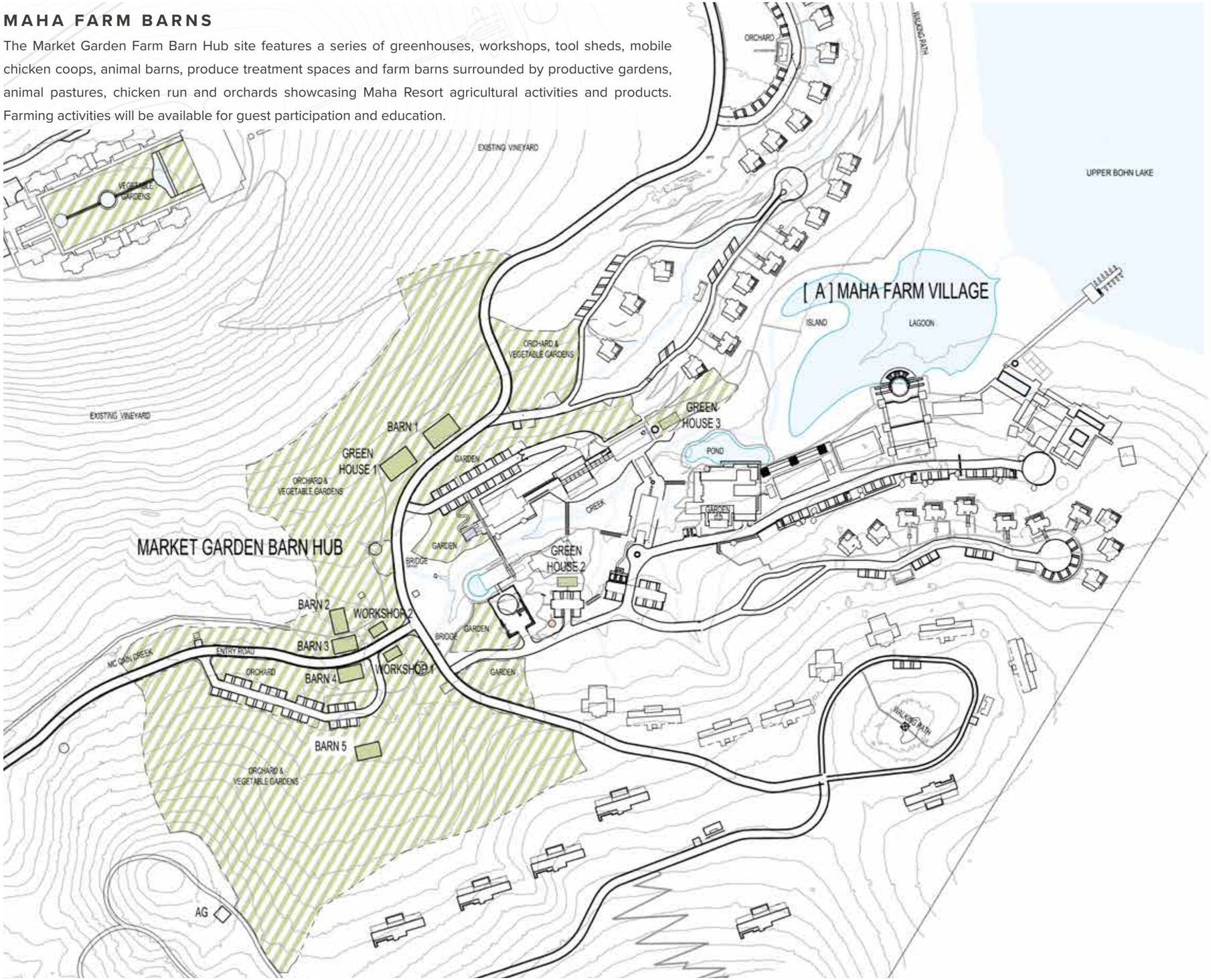


FARMING ACTIVITIES FARM BARN LAND USE FLOOR PLANS

MAHA FARM BARNS

The Market Garden Farm Barn Hub site features a series of greenhouses, workshops, tool sheds, mobile chicken coops, animal barns, produce treatment spaces and farm barns surrounded by productive gardens, animal pastures, chicken run and orchards showcasing Maha Resort agricultural activities and products. Farming activities will be available for guest participation and education.



COLOR LEGEND				
AGRICULTURE- ACCESSORY				
AGRICULTURE- OUTDOOR				
RESORT- ACCESSORY				
RESORT-UTILITY				
MAHA FARM BARNS				
HS HIKER / HORSE SHELTER	RESORT ACCESSORY	OUTDOOR RECREATION	400 SF X 11 = 4,400 SF	
BARN 1	AGRICULTURE ACCESSORY	SUPPORTING FACILITY	4,000 SF	
BARN 2	AGRICULTURE ACCESSORY	SUPPORTING FACILITY	2,500 SF	
BARN 3	AGRICULTURE ACCESSORY	SUPPORTING FACILITY	2,500 SF	
BARN 4	AGRICULTURE ACCESSORY	SUPPORTING FACILITY	2,500 SF	
BARN 5	AGRICULTURE ACCESSORY	SUPPORTING FACILITY	2,500 SF	
AG CHICKEN COOPS	AGRICULTURE ACCESSORY	SUPPORTING FACILITY	400 SF X 4 = 1,600 SF	
WORKSHOP 1	AGRICULTURE ACCESSORY	SUPPORTING FACILITY	1,000 SF	
WORKSHOP 2	AGRICULTURE ACCESSORY	SUPPORTING FACILITY	1,000 SF	
GREENHOUSE 1	AGRICULTURE ACCESSORY	SUPPORTING FACILITY	4,000 SF	
GREENHOUSE 2	AGRICULTURE ACCESSORY	SUPPORTING FACILITY	2,000 SF	
GREENHOUSE 3	AGRICULTURE ACCESSORY	SUPPORTING FACILITY	2,000 SF	
GARDENS	AGRICULTURE PRIMARY	AGRICULTURE		23.3 ACRES
GRAND TOTAL			30,000 SF	23.3 ACRES

NOTE
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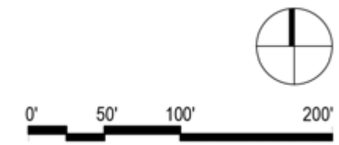


GRAZING ACTIVITIES

The PROJECT's grazing plan takes a current on-site use and continues that use while harnessing the potential for landscape management, providing high fuel load vegetation reduction and site-wide fire mitigation activities.

The PROJECT is committed to landscape stewardship. The managed grazing of livestock is a primary tenet of sustainable agriculture and fire prevention both in the open space and designated corridors. Well-managed grazing balances regular and systematic movement of animals to forage and reduce fuel loads thought the site. Targeted grazing by expanding the current use of cattle, sheep or goats can measurably reduce or eliminated fire ladders, therefore promoting fire resilience on site. Additionally, grazing promotes grassland health and diversity, reduces internal susceptibility to wildfires, and increases soil organic carbon helping the on-site water retention. Therefore, Maha Resort utilizes managed grazing in our comprehensive fire management plan.

GRAZING STANDARDS MATRIX

The following matrix provides general standards to guide site-wide, long-term grazing practices. Although the exact configuration of grazing areas and corridors may shift over time, these general parameters will help to coordinate the placement and movement of herds throughout the site.

Species	**Primary Foraging Behavior**	**Equivalent Animal Unit** *	**Preferred Vegetation**	**Minimum Practical Grazing Area** (Acres) **	**Maximum Practical Grazing Slope** (Percent %) (Wet Ground / Dry Ground)	**Maximum Density** (lbs per acre) (Wet Ground/Dry Ground) ***	**Grazing Season**	**Herd Type**
Goats	Browsing	0.2	Chaparral, Brush, Poison Oak, Weeds	0.15 AC	60% / 80%	15,000 lbs / 60,000 lbs	April - October	Seasonal/ Contracted
Sheep	Grazing	0.2	Oak Woodland/ Grassland, select weeds	0.15 AC	60% / 80%	15,000 lbs / 60,000 lbs	April - June	Seasonal/ Contracted
Cattle	Grazing	1.0	Oak Woodland/ Grassland	0.5 AC	50% / 70%	10,000 lbs / 50,000 lbs	Year Round	Resident

* ”Equivalent Animal Units” establishes a consistent unit factor to compare herd sizes; for example, a herd of 10 cows (1.0 AU) is equivalent to a herd of 50 goats (0.2 AU)
** The “Minimum Practical Grazing Area” is signfigantly dependent on herd size; these minimum practical grazing areas assume that herd sizes will remain equally small in order to accomodate efficient grazing in and around small spaces between buidlings and roads.
*** The “Maximum Density” is the maximum collective herd weight supported per grazeable acre

GOAT BROWSING

SHEEP GRAZING

CATTLE GRAZING

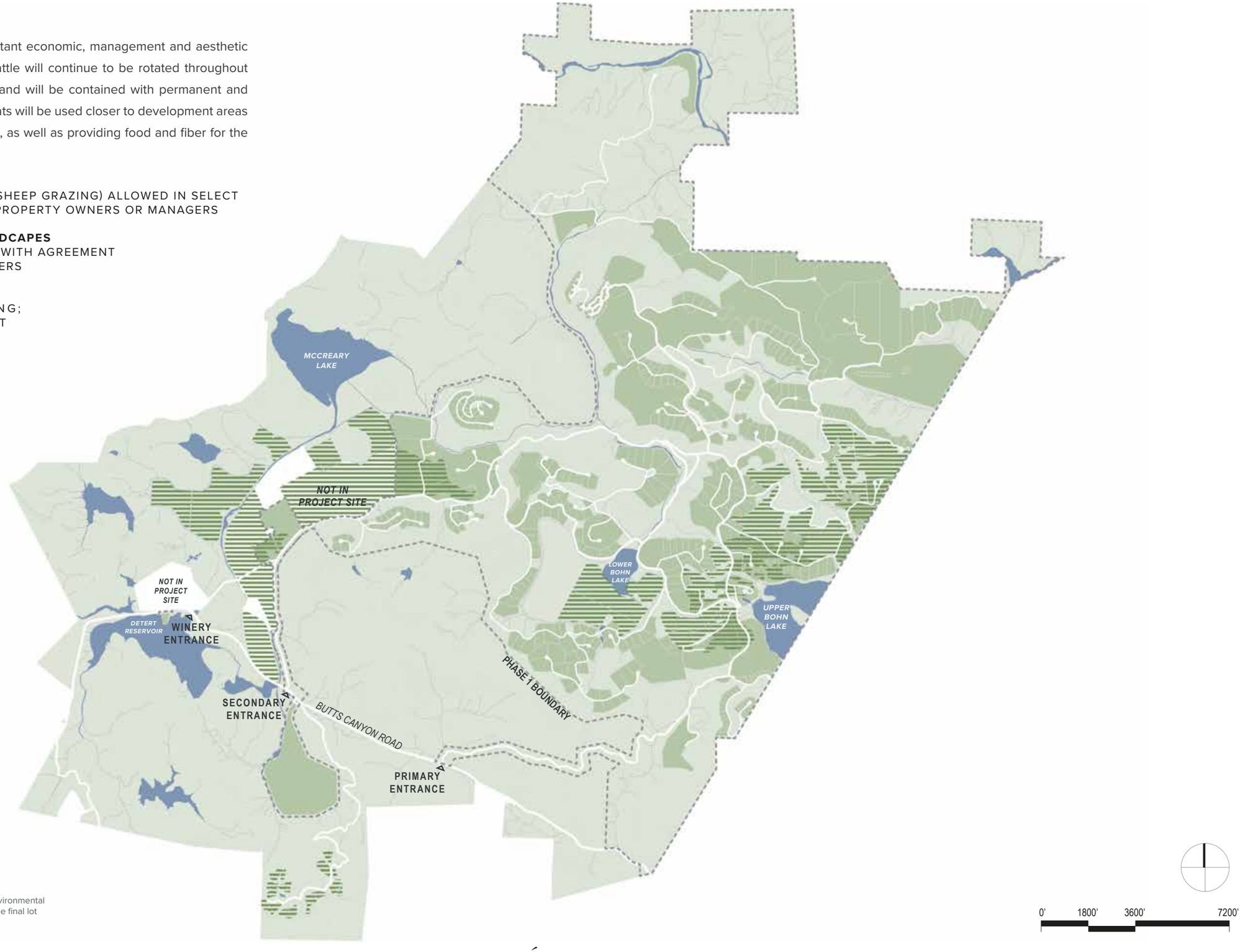
GRAZING

Animal husbandry will continue to be an important economic, management and aesthetic experience of the Guenoc Valley PROJECT. Cattle will continue to be rotated throughout the site within larger open and pasture areas and will be contained with permanent and temporary fencing as applicable. Sheep and goats will be used closer to development areas to aid in reducing vegetative cover and fire risk, as well as providing food and fiber for the Maha Farm.

VINEYARDS
MINIMALLY IMPACTFUL GRAZING (I.E. SHEEP GRAZING) ALLOWED IN SELECT VINEYARDS WITH AGREEMENT FROM PROPERTY OWNERS OR MANAGERS

RESIDENTIAL AND COMMERCIAL LANDCAPES
GRAZING ALLOWED IN SELECT AREAS WITH AGREEMENT FROM PROPERTY OWNERS OR MANAGERS

COMMON LANDSCAPES
CONTINUED YEAR-ROUND GRAZING; AGRICULTURE ALLOWED BY RIGHT



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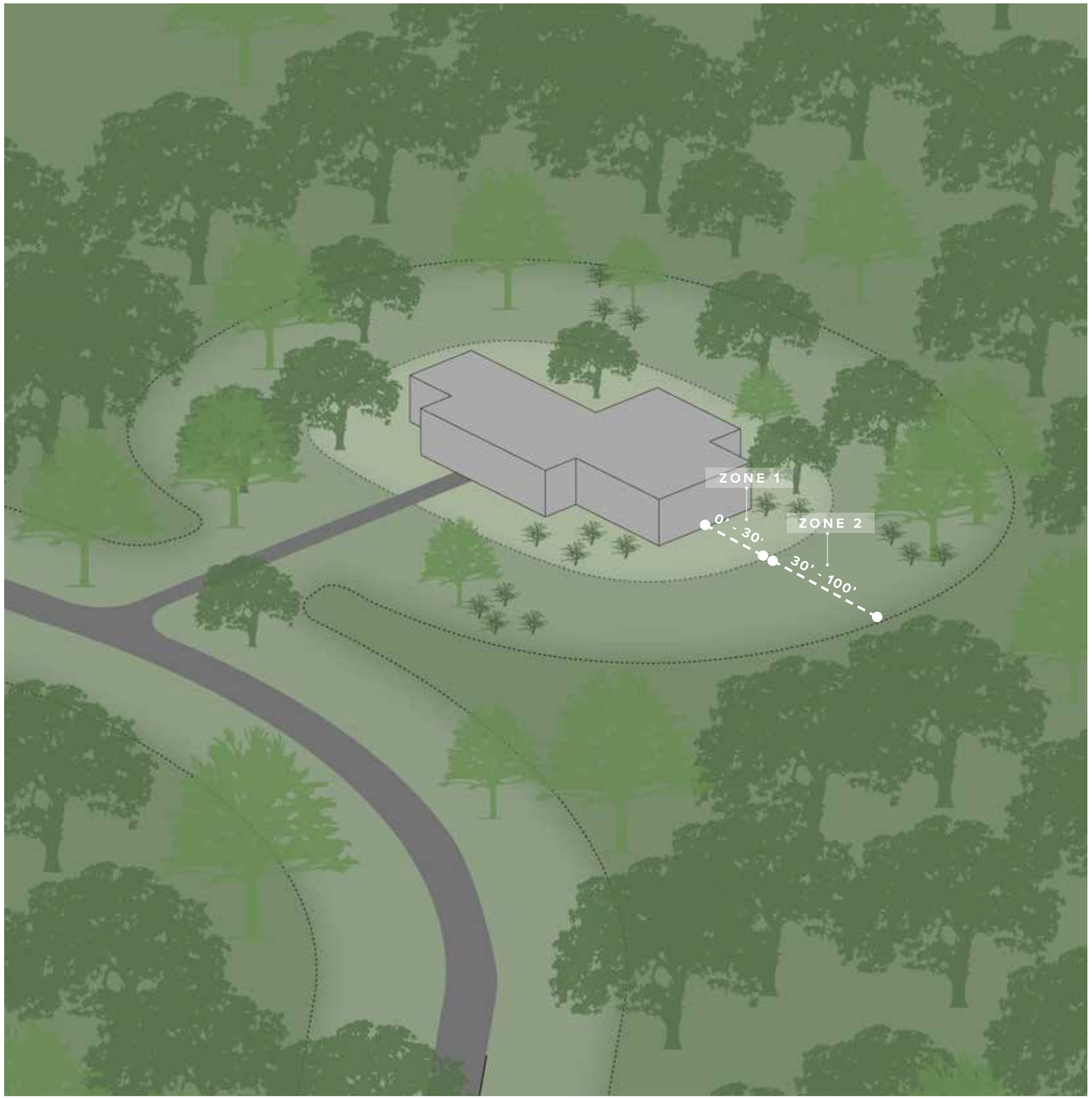
LANDSCAPE FIRE PLAN

The site is located in a high fire hazard area as classified by the California Department of Forestry and Fire Protection (CDF). Development in wildland hazard areas is required to meet safety and design standards. Measures beyond the minimum fire safety regulations have been proposed by the development to ensure adequate access, fuel breaks, temporary areas of refuge and vegetation management, such as the construction of an on-site emergency fire center and helipad for emergency access/transportation. Multiple on-site water sources are available for fire suppression and will be supplemented, in architectural clusters, with fire hydrants for first responders. Extensive fire management plans and fire mitigation strategies are outlined in the Guenoc Valley Emergency Action and Fire Management Plan.

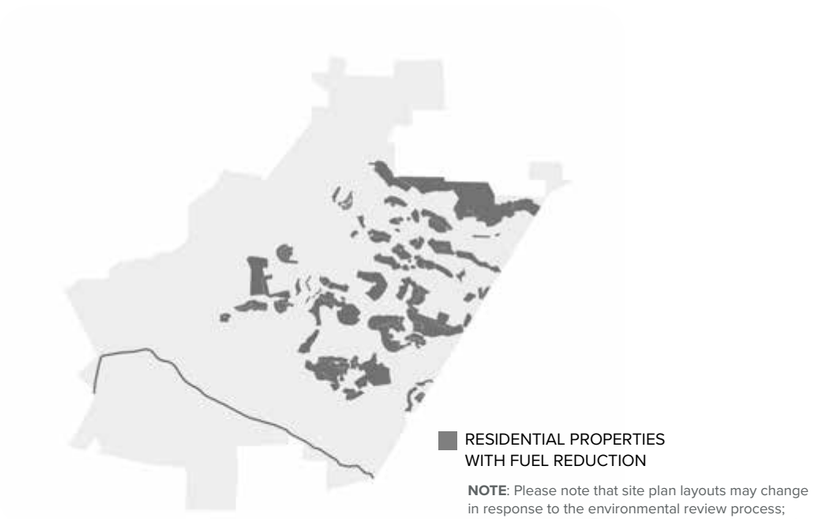
A development of this size and expense requires all measures possible to protect and preserve the environment, buildings and longevity of the landscape. It is in the best interest of both the long-term viability of the PROJECT and the County to plan for wildfire risk and to actively manage the landscape to reduce the risks as well as to plan for first responder access and emergency response plans to ensure and improve public safety. With careful planning and maintenance of defensible space the PROJECT is offering 27 miles of fuel breaks through the entire PROJECT. This is possible due to the commitment the PROJECT has made that all two-lane roads will be maintained with a 50-foot buffer on each side, resulting in continued site-wide fuel breaks.

In anticipation of the high level of vegetation and fuel management and maintenance of buffer zones, the greatest fire threat will often be an exterior threat. In an effort to mitigate exterior threats, on-site dozers will be available for emergency fire digging, to be utilized by approval of Cal Fire. Additionally, measures such as an on-site emergency response center and on-site all terrain response vehicles will be available for first responders.

RESIDENTIAL TYPICAL FUEL REDUCTION STRATEGY



RESIDENTIAL PROPERTY LOCATIONS



RESIDENTIAL PROPERTIES WITH FUEL REDUCTION

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RESIDENTIAL FUEL REDUCTION ZONES

All residential properties will follow common fuel reduction strategies established by Public Resource Code (PRC) Section 4291. This involves creating and maintaining a defensible property in the fire management strategies described below.

BUILDING CONSTRUCT TO WILDLAND-URBAN INTERFACE (WUI) BUILDING CODES

Buildings will be constructed using materials that resist ignition or sustained burning when exposed to embers and small flames from wildfire. Exterior fire sprinkler systems will be installed on all buildings with independent water connections.

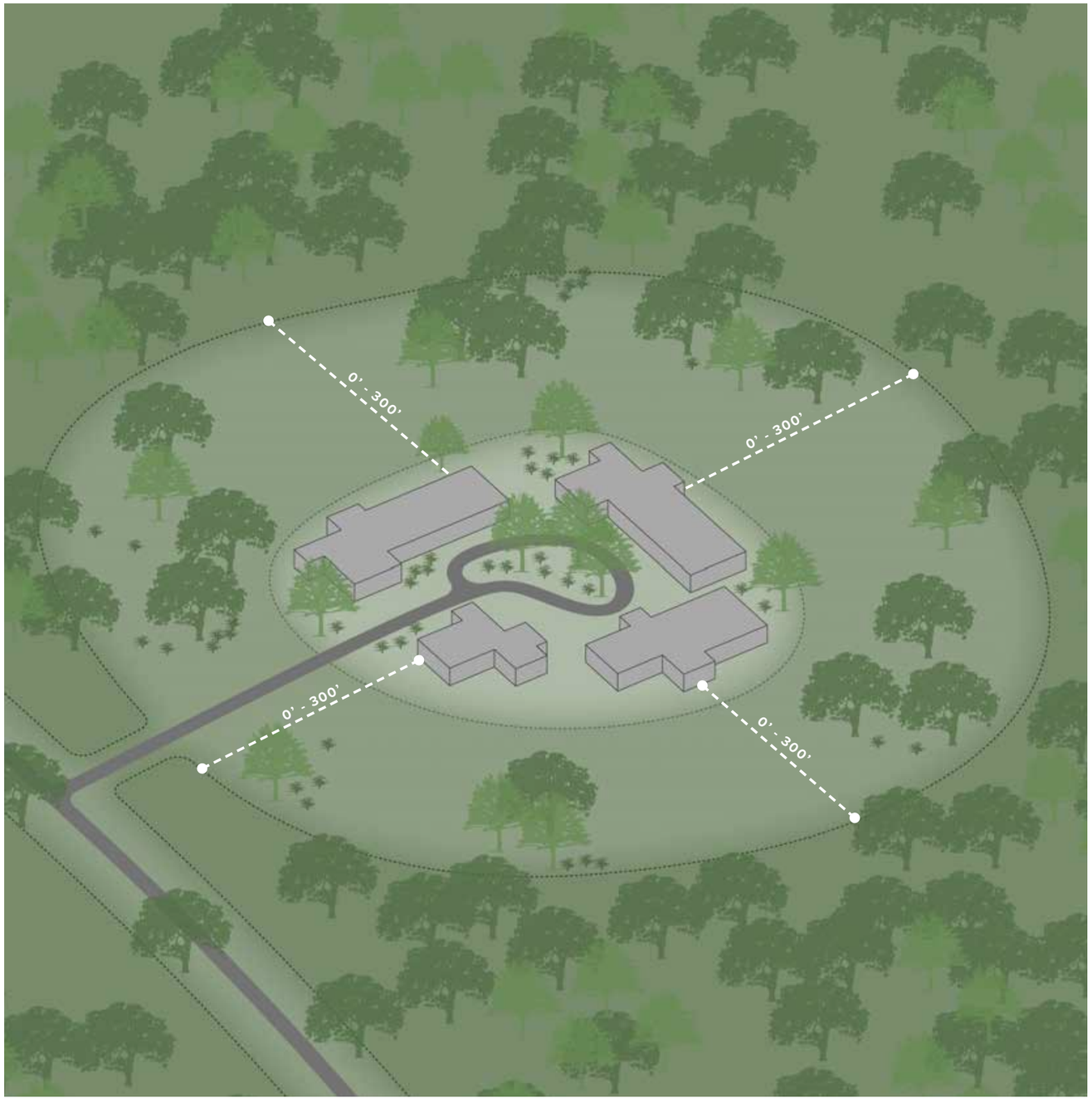
ZONE 1 REMOVE FLAMMABLE VEGETATION
0' - 30' FROM EDGE OF BUILDING

Within this zone, fire-prone vegetation will be eliminated. This includes removing all dead vegetation and removing or adequately pruning flammable shrub species. Trees will generally be pruned up to a height of 10 feet depending on species and understory conditions, with tree crowns and shrubs adequately separated to prevent fires from spreading.

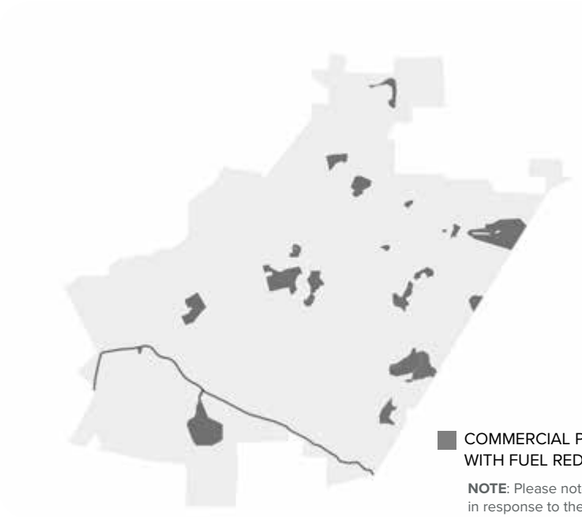
ZONE 2 REDUCE FLAMMABLE VEGETATION
30' - 100' FROM EDGE OF BUILDING

Within this zone, fire-prone vegetation will be reduced. This could include pruning branches from trees, cutting dead wood from shrubs, and mowing dried grass. In addition, individual trees or tree clusters will be adequately spaced to prevent fires from quickly spreading.

COMMERCIAL TYPICAL FUEL REDUCTION STRATEGY



COMMERCIAL PROPERTY LOCATIONS



COMMERCIAL PROPERTIES WITH FUEL REDUCTION

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COMMERCIAL FUEL REDUCTION ZONES

All commercial buildings—including major hotel and restaurant buildings as well as supporting amenities, such as back-of-house operational buildings—will reduce and selectively remove fire-prone vegetation within 300' from the edge of the building. This strategy is in compliance with regulations applied to commercial buildings by the Certified Unified Program Agencies (CUPA) program, as overseen by the California Environmental Protection Agency (CalEPA).

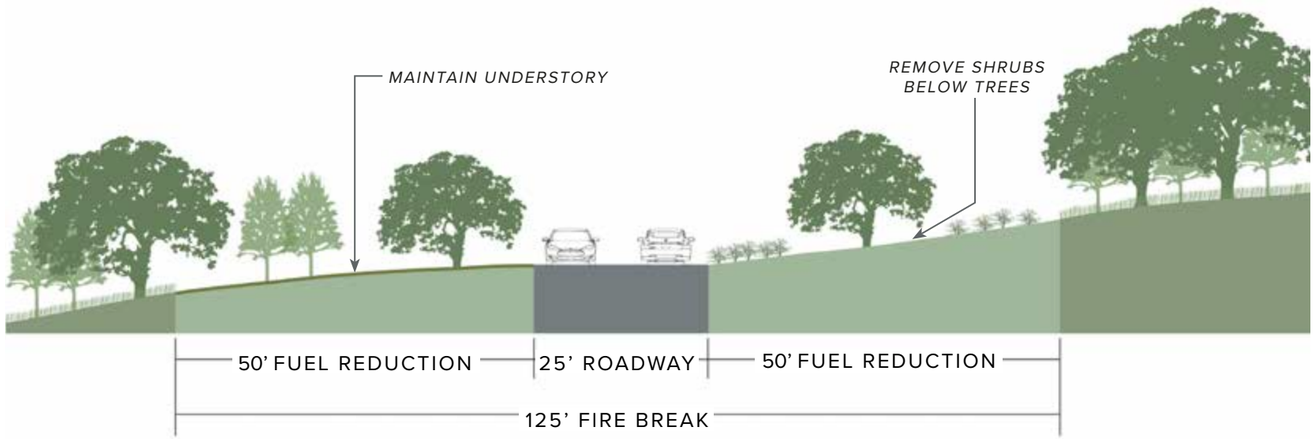
BUILDING CONSTRUCT TO WILDLAND-URBAN INTERFACE (WUI) BUILDING CODES

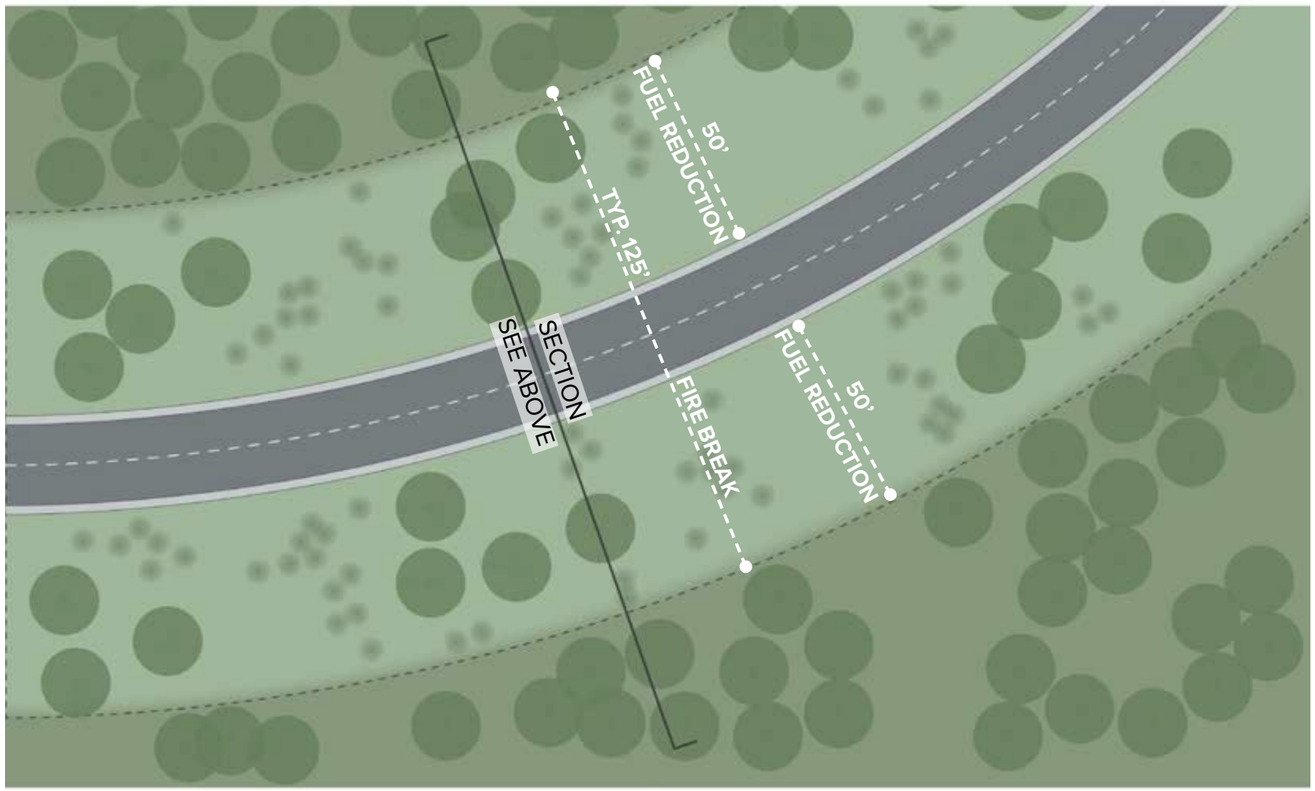
Buildings will be constructed using materials that resist ignition or sustained burning when exposed to embers and small flames from wildfire. Exterior fire sprinkler systems will be installed on all buildings with independent water connections.

FUEL REDUCTION ZONE REMOVE AND REDUCE FLAMMABLE VEGETATION
0' - 300' FROM EDGE OF BUILDING

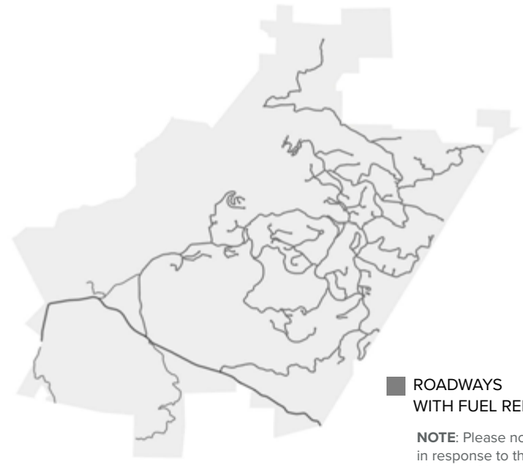
Within 300' from the edge of the building, fire-prone vegetation will be removed and reduced. This includes removing all dead vegetation and selectively removing flammable shrubs. Additional actions include pruning lower branches from trees, cutting dead wood from shrubs, and mowing dried grass. In addition, individual trees or tree clusters will be adequately spaced to prevent fires from quickly spreading.

ROADWAY TYPICAL FUEL REDUCTION & FIRE BREAK STRATEGY





ROADWAY ROUTES



ROADWAYS WITH FUEL REDUCTION

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ROADWAY FUEL REDUCTION ZONES & FIRE BREAKS

Flammable vegetation will be reduced and removed within the first 50' from both edges of roadways. This strategy will create a network of fire breaks throughout the property and ensure navigable access and evacuation routes in the case of an emergency.

FUEL REDUCTION ZONE REMOVE AND REDUCE FLAMMABLE VEGETATION
0' - 50' FROM BOTH ROADWAY EDGES

Within the first 50' from the edge of the road, fire-prone vegetation will be removed and reduced. This includes cutting down dead trees and removing all flammable shrubs. The understory below trees will be maintained by mowing, grazing, and manual vegetation removal; in addition, shrubs will be removed below trees. Within this zone, individual trees or tree clusters will be adequately spaced to prevent fires from quickly spreading.

LANDSCAPE FIRE MANAGEMENT SITE PLAN

As detailed below, a variety of actions and strategies will be deployed in order to address fire concerns throughout the site. Grazing, manual vegetation removal, and irrigation will be used throughout the site's common, residential, and commercial landscapes to reduce fire risk. A network of fire breaks will be formed through a system of roadways, vineyards, and recreation fields; in addition, a property boundary fire break will also be maintained to further reduce the risk of fires from entering the site. In the case of a fire, a series of temporary refuge areas and emergency access roads will be essential in ensuring safety for residents and access for emergency personnel. A detailed fire management plan will be submitted under a separate cover

ACTIVE LANDSCAPE MANAGEMENT FUEL REDUCTION
MANUAL VEGETATION REMOVAL | GRAZING

RESIDENTIAL/COMMERCIAL FUEL REDUCTION & FIRE BREAKS
MANUAL VEGETATION REMOVAL | GRAZING | IRRIGATION |
FIRE RESILIENT BUILDING CONSTRUCTION

ROADWAY FIRE BREAKS
MANUAL VEGETATION REMOVAL | GRAZING

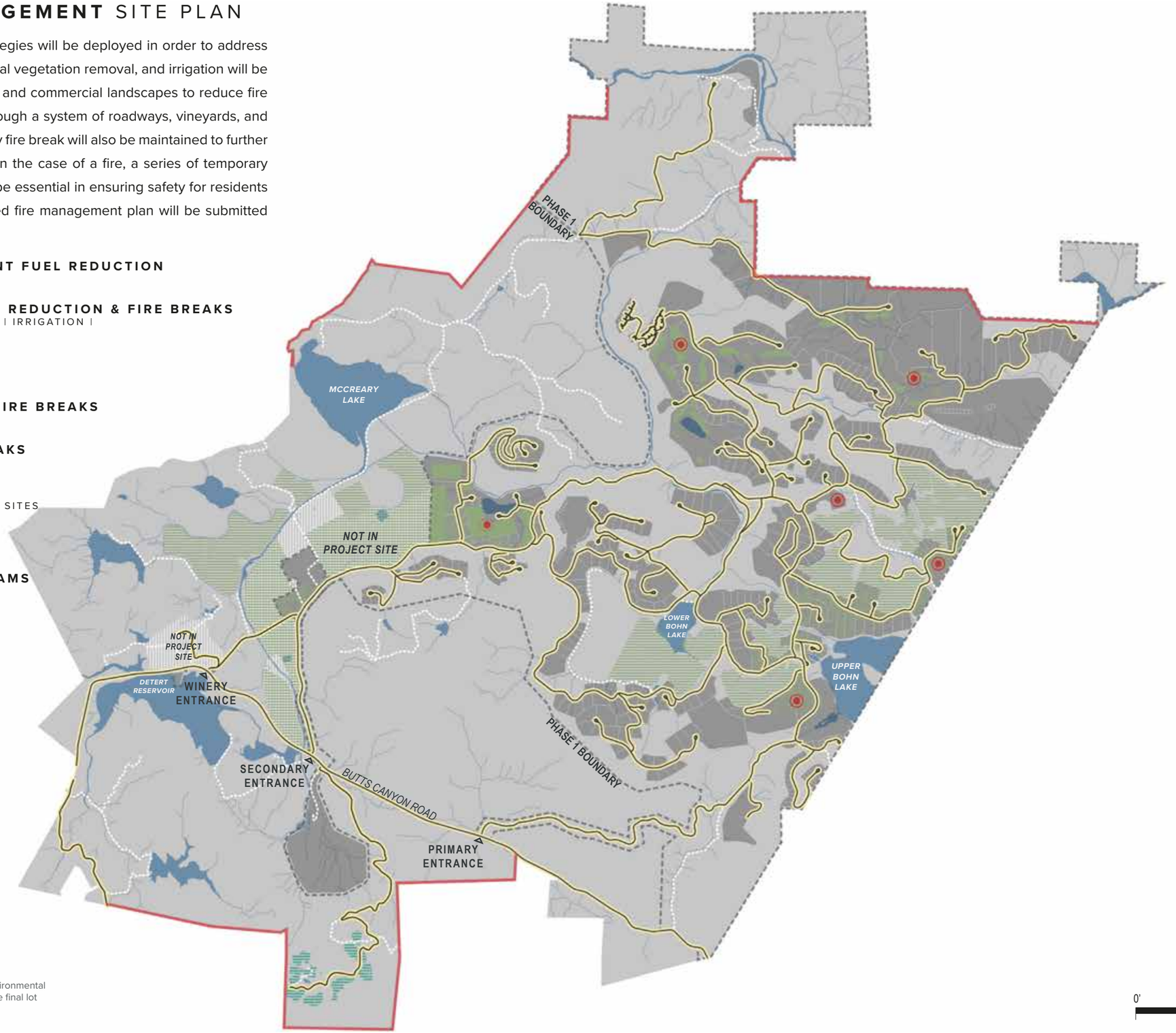
AGRICULTURAL/RECREATIONAL FIRE BREAKS
IRRIGATION

PROPERTY BOUNDARY FIRE BREAKS
MANUAL VEGETATION REMOVAL | GRAZING

TEMPORARY REFUGE AREAS
EMERGENCY GATHERING AND PROTECTION SITES

EMERGENCY ACCESS ROADS
RE-PURPOSING EXISTING RANCH ROADS

LAKES, PONDS, CREEKS, & STREAMS
WATER SOURCES AND WATERWAYS



NOTE
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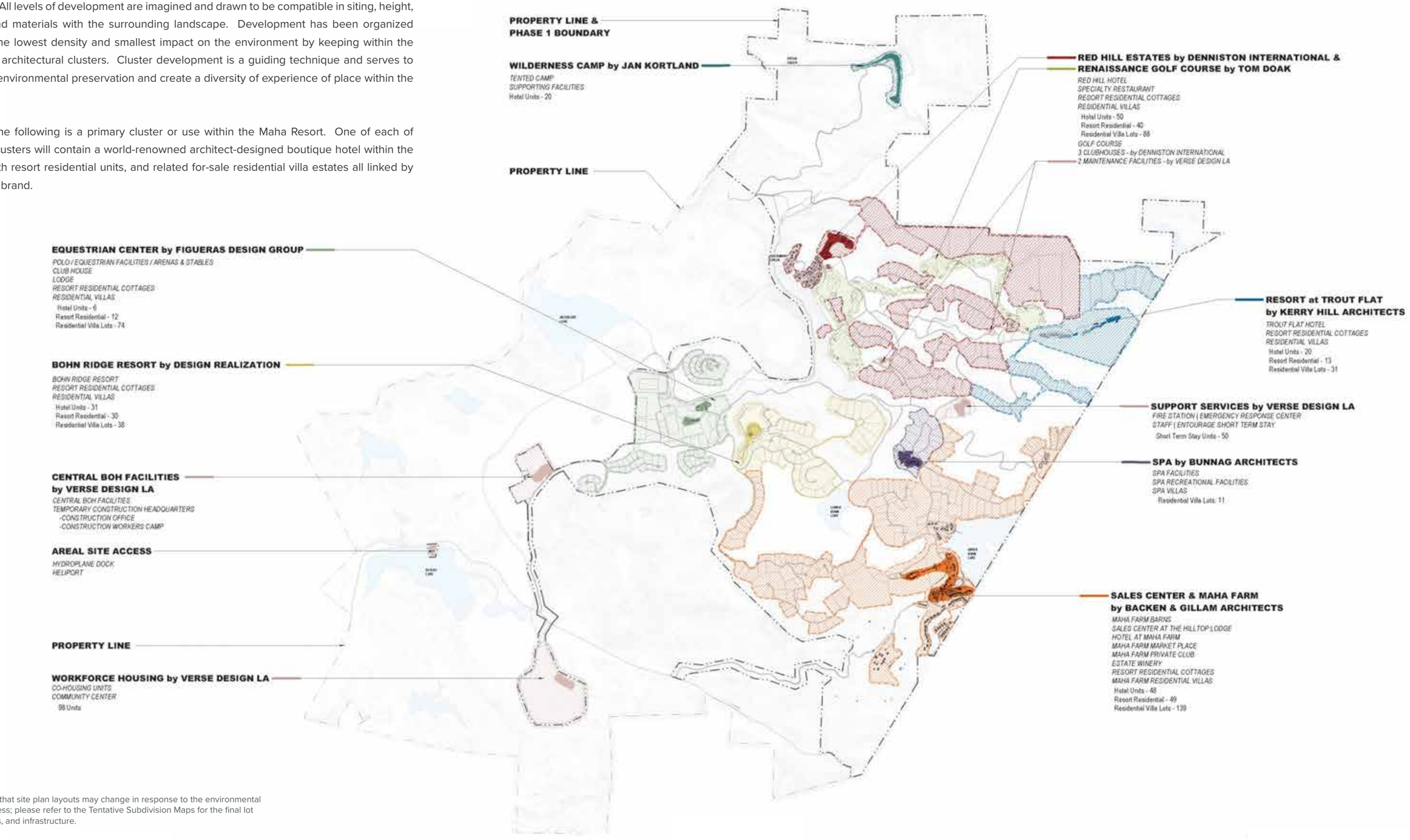
SECTION 3 ARCHITECTURE AND LAND USE PLANS

ARCHITECTURE AND LAND USE PLANS

Inspired by the existing beauty of the surrounding landscape, the architectural clusters of the Maha Resort, responding to the potential of each site, have been designed in response to the land. All levels of development are imagined and drawn to be compatible in siting, height, colors, and materials with the surrounding landscape. Development has been organized to have the lowest density and smallest impact on the environment by keeping within the identified architectural clusters. Cluster development is a guiding technique and serves to promote environmental preservation and create a diversity of experience of place within the Property.

Each of the following is a primary cluster or use within the Maha Resort. One of each of the five clusters will contain a world-renowned architect-designed boutique hotel within the resort, with resort residential units, and related for-sale residential villa estates all linked by the Maha brand.

ARCHITECTURAL CLUSTER MAP



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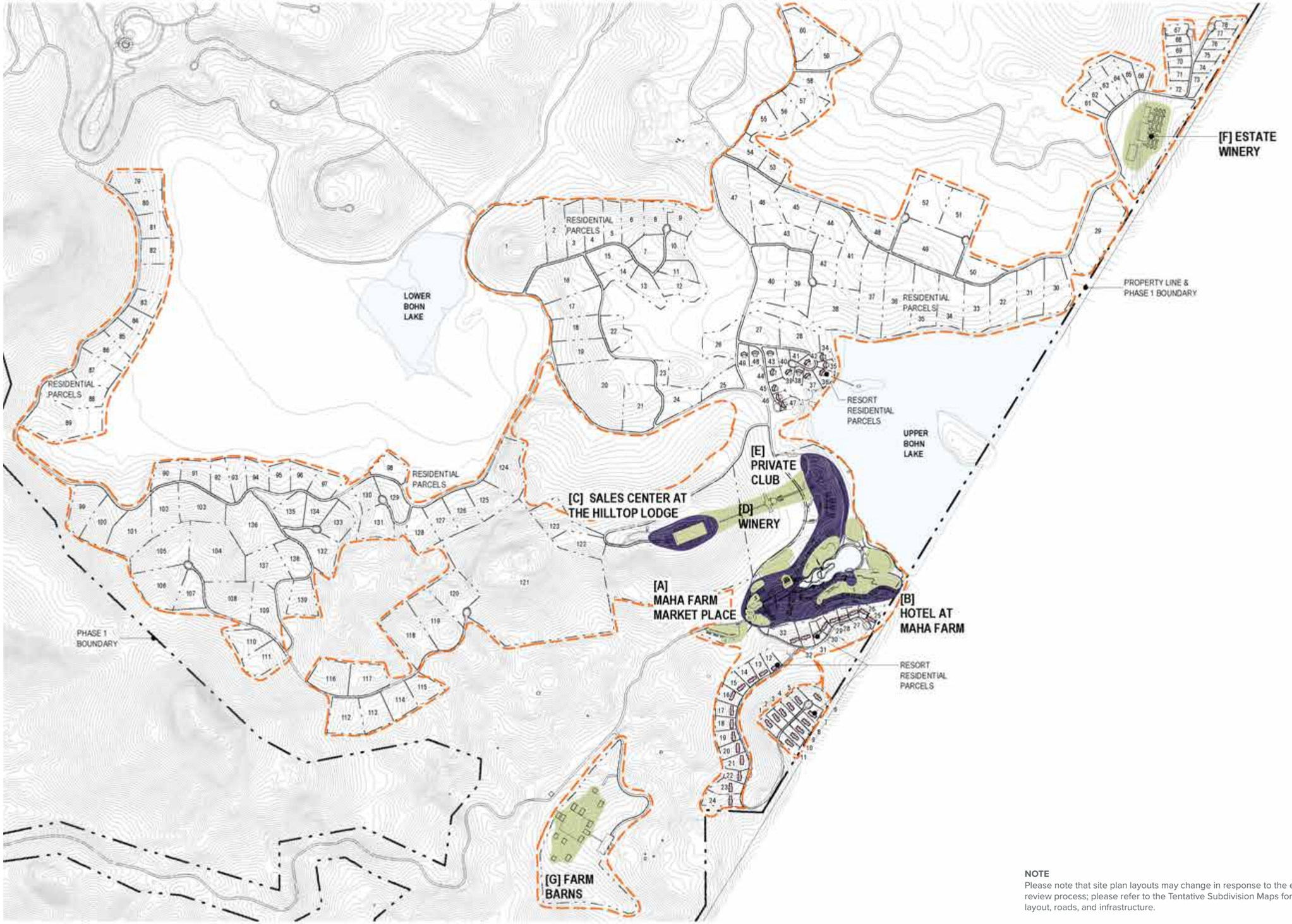
Maha Farm—Backen & Gillam Architects

The Maha Farm is anticipated to be the heart of Maha. The Farm is located near Upper Bohn Lake and designed in response to the naturally occurring terrain. The highest elevation of each building is one story high, even in instances where elevation is incorporated to create a two-story building accessed at grade on each level.

The Maha Farm connects visitors to the Winery, Private Club and Sales Center. Within this area locally grown foods will be promoted and showcased in gardens within and surrounding the commercial center. This is anticipated to be a hub for events, farmers markets and commercial activities such as restaurants and retail as well as artisan market experiences.

MAHA FARM AND SALES CENTER | LAND USE CLUSTER MAP



COLOR LEGEND

- RESORT - PRIMARY
- RESORT - COMMERCIAL
- RESORT - ACCESSORY
- RESORT - RESIDENTIAL
- AGRICULTURE

CLUSTER USES

48 HOTEL UNITS
139 RESIDENTIAL VILLAS
49 RESORT RESIDENTIAL UNITS
FACILITIES
[A] MAHA FARM MARKET PLACE
[B] MAHA FARM HOTEL
[C] SALES CENTER
[D] WINERY
[E] PRIVATE CLUB
[F] FARM BARN COMPLEX

NOTE
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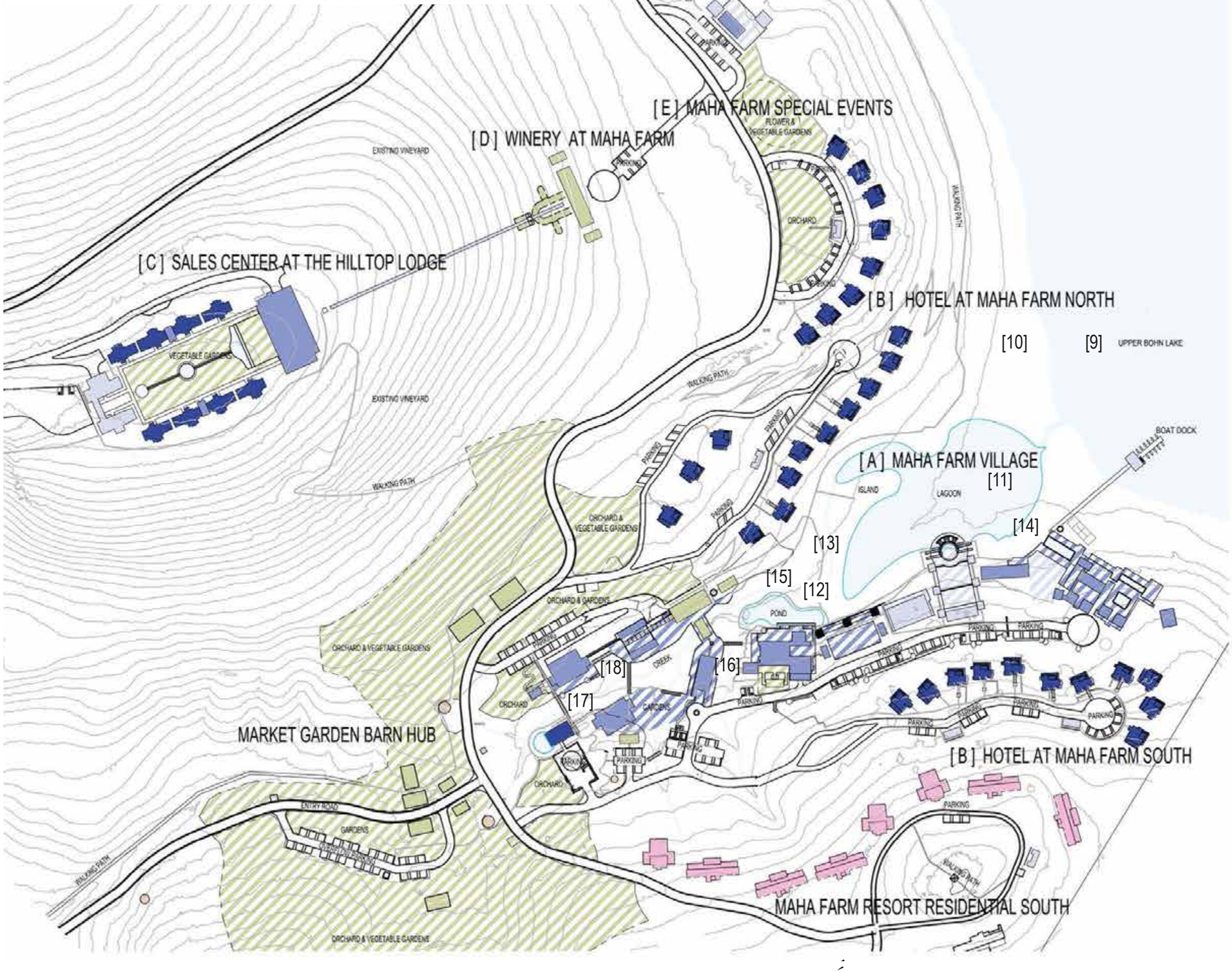
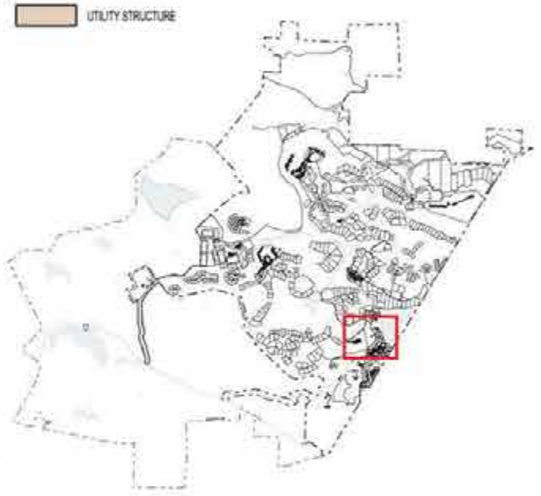
0' 600' 1200' 2400'
ORIGINAL SCALE: 1" = 1200'-0"



COLOR LEGEND

- AGRICULTURE- ACCESSORY
- AGRICULTURE- OUTDOOR
- RESORT- PRIMARY
- RESORT- COMMERCIAL
- RESORT- ACCESSORY
- RESORT- RESIDENTIAL
- RESORT- OUTDOOR HARDSCAPE
- RESORT - COMMERCIAL OUTDOOR HARDSCAPE
- UTILITY STRUCTURE



MAHA FARM | DETAILED CLUSTER MAP

MAHA FARM MARKETPLACE

THE MAHA FARM VILLAGE [A] LIES AT THE CORE OF THE GUEST EXPERIENCE. ONLY A SHORT WALKING DISTANCE FROM THE COTTAGE HOTEL ROOMS [B], GUESTS CAN ENJOY FARM-TO-TABLE DINING IN THE RESTAURANT OR PICK UP CASUAL PICNIC SNACKS AT THE GROCERY STORE. MULTIPURPOSE PATHWAYS PROVIDE CONNECTION TO OTHER DESTINATIONS IN MAHA FARM SUCH AS THE SALES CENTER AT THE HILLTOP LODGE [C], WINERY [D] AND SPECIAL EVENTS BUILDING [E]. THE RESIDENTS CLUB IS RELOCATED AT THE EAST SIDE OF THE VILLAGE NEAR THE LAKE.

NOTE

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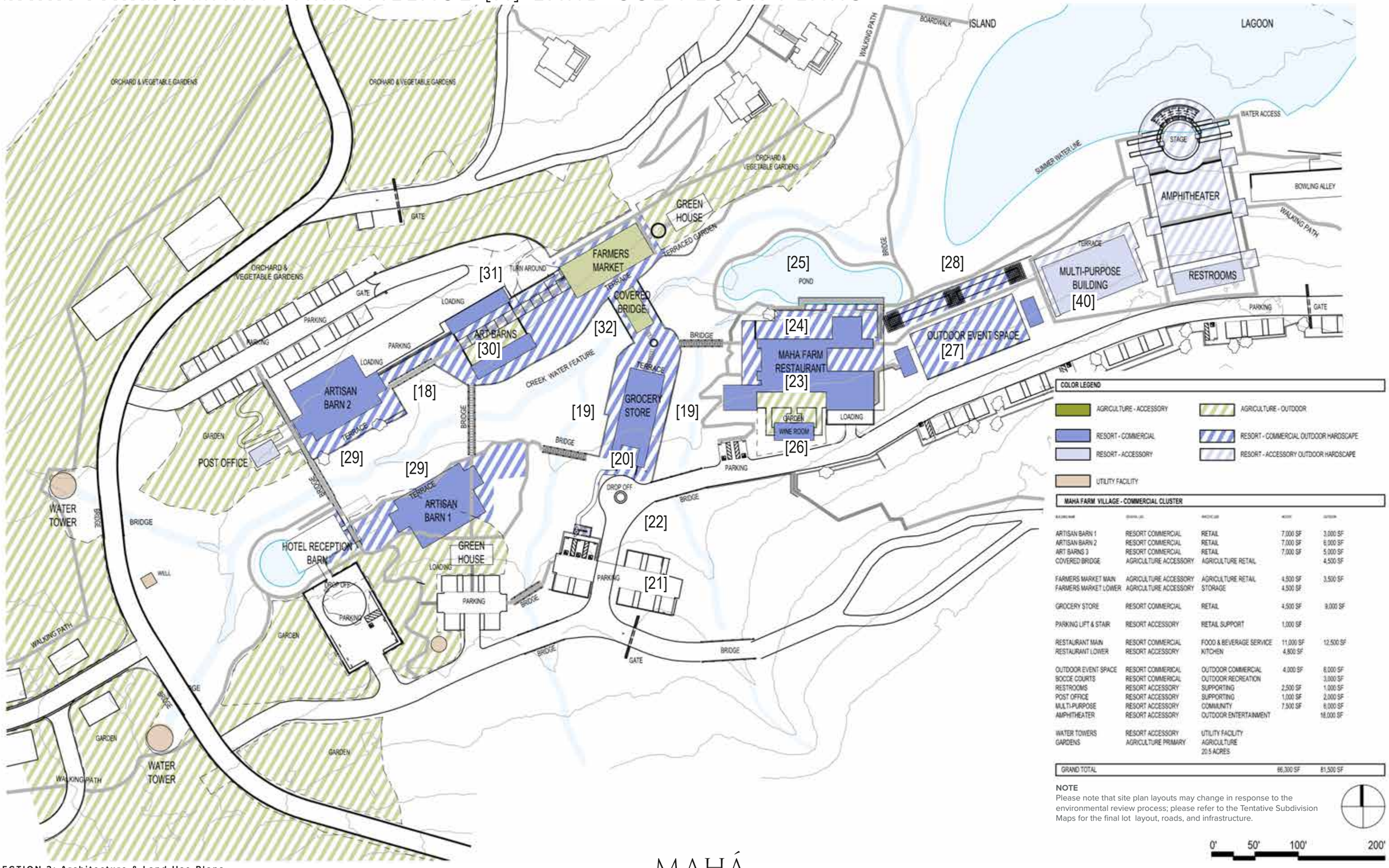
0' 50' 100' 200'



COLOR LEGEND

- AGRICULTURE - ACCESSORY
- AGRICULTURE - OUTDOOR
- RESORT - COMMERCIAL
- RESORT - COMMERCIAL OUTDOOR HARDSCAPE
- RESORT - ACCESSORY
- RESORT - ACCESSORY OUTDOOR HARDSCAPE
- UTILITY FACILITY

MAHA FARM VILLAGE - COMMERCIAL CLUSTER

ARTISAN BARN 1	RESORT COMMERCIAL	RETAIL	7,000 SF	3,000 SF
ARTISAN BARN 2	RESORT COMMERCIAL	RETAIL	7,000 SF	6,000 SF
ART BARNS 3	RESORT COMMERCIAL	RETAIL	7,000 SF	5,000 SF
COVERED BRIDGE	AGRICULTURE ACCESSORY	AGRICULTURE RETAIL		4,500 SF
FARMERS MARKET MAIN	AGRICULTURE ACCESSORY	AGRICULTURE RETAIL	4,500 SF	3,500 SF
FARMERS MARKET LOWER	AGRICULTURE ACCESSORY	STORAGE	4,500 SF	
GROCERY STORE	RESORT COMMERCIAL	RETAIL	4,500 SF	9,000 SF
PARKING LIFT & STAIR	RESORT ACCESSORY	RETAIL SUPPORT	1,000 SF	
RESTAURANT MAIN	RESORT COMMERCIAL	FOOD & BEVERAGE SERVICE	11,000 SF	12,500 SF
RESTAURANT LOWER	RESORT ACCESSORY	KITCHEN	4,800 SF	
OUTDOOR EVENT SPACE	RESORT COMMERICAL	OUTDOOR COMMERCIAL	4,000 SF	8,000 SF
SOCCE COURTS	RESORT COMMERICAL	OUTDOOR RECREATION		3,000 SF
RESTROOMS	RESORT ACCESSORY	SUPPORTING	2,500 SF	1,000 SF
POST OFFICE	RESORT ACCESSORY	SUPPORTING	1,000 SF	2,000 SF
MULTI-PURPOSE	RESORT ACCESSORY	COMMUNITY	7,500 SF	6,000 SF
AMPHITHEATER	RESORT ACCESSORY	OUTDOOR ENTERTAINMENT		18,000 SF
WATER TOWERS	RESORT ACCESSORY	UTILITY FACILITY		
GARDENS	AGRICULTURE PRIMARY	AGRICULTURE 20.5 ACRES		
GRAND TOTAL			66,300 SF	81,500 SF

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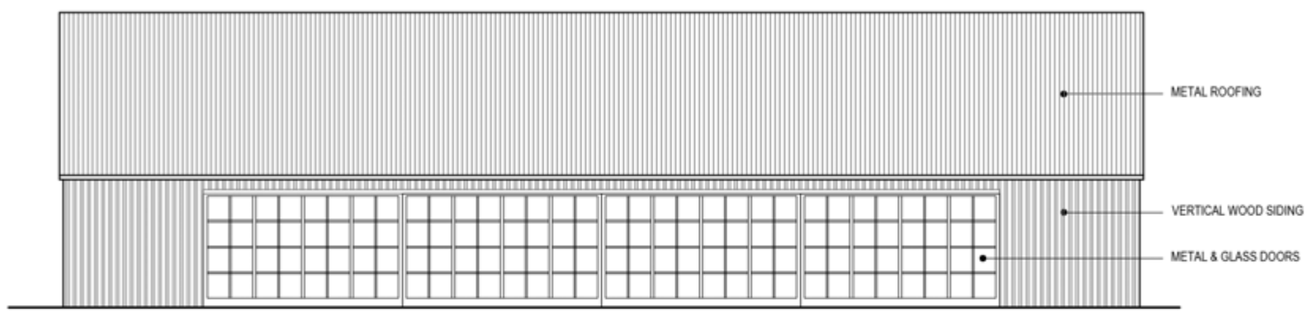
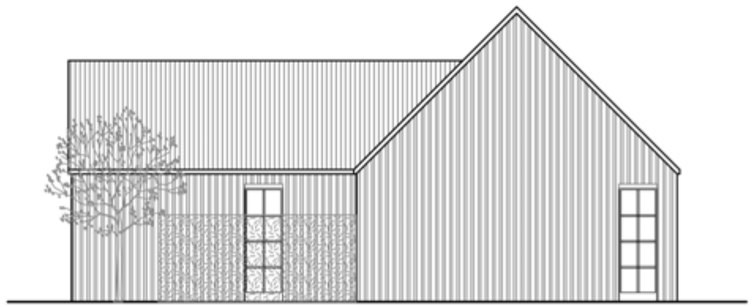
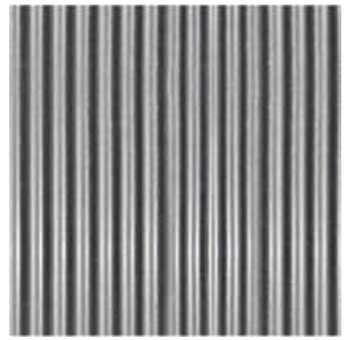
0' 50' 100' 200'



FRONT ELEVATION



SIDE ELEVATION

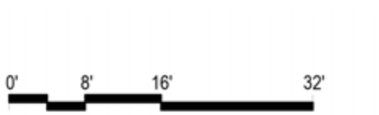


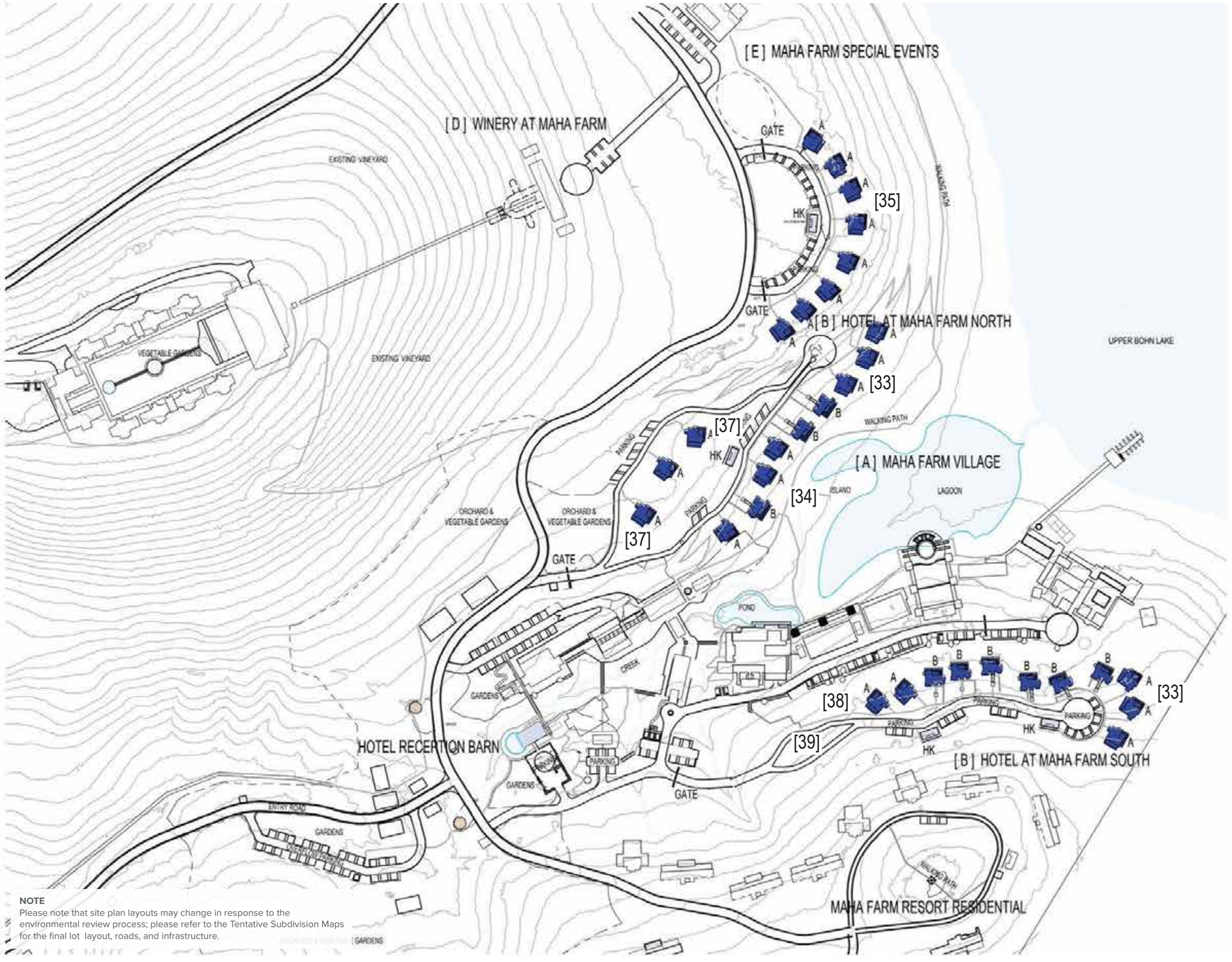
METAL ROOF

VERTICAL WOOD SIDING

BOARDFORM CONCRETE

EXTERIOR STONE SURFACE





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COLOR LEGEND

RESORT- PRIMARY
RESORT- UTILITY
RESORT- ACCESSORY

HOTEL AT MAHA FARM

BUILDING NAME	BUILDING USE	SPECIFIC USE	INDOOR	OUTDOOR
RECEPTION BARN MAIN	RESORT ACCESSORY	RESORT MANAGEMENT	2,800 SF	1,000 SF
RECEPTION BARN LOWER	RESORT ACCESSORY	RESORT MANAGEMENT	3,000 SF	
HOTEL ROOM A COTTAGES	RESORT PRIMARY	HOTEL UNIT	1,400 SF x 22 = 30,800 SF	4,300 SF x 22 = 94,600 SF
HOTEL ROOM B COTTAGES 1ST FL	RESORT PRIMARY	HOTEL UNIT	1,400 SF x 9 = 12,600 SF	220 SF x 9 = 1980 SF
HOTEL ROOM B COTTAGES 2ND FL	RESORT PRIMARY	HOTEL UNIT	1,400 SF x 9 = 12,600 SF	220 SF x 9 = 1980 SF
HOTEL ROOM C COTTAGES	DELETED			
HK HOUSEKEEPING	RESORT ACCESSORY	SUPPORTING	800 SF x 4 = 3,200 SF	500 SF X 4 = 2,000 SF
GATE	RESORT ACCESSORY	SUPPORTING	000 SF	
GRAND TOTAL			65,000 SF	101,560 SF

MAHA FARM | MAHA FARM HOTEL LAND USE FLOOR PLANS

MAHA FARM HOTEL

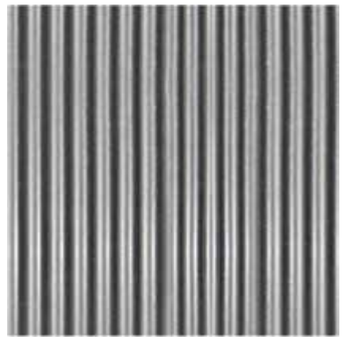
GUESTS WILL ARRIVE AT THE HOTEL RECEPTION BARN AND BE VALETED TO THEIR INDIVIDUAL HOTEL COTTAGE. TWO TYPES OF COTTAGES ARE PLANNED: COTTAGE 'A' IS A ONE STORY WITH A TRADITIONAL PITCHED ROOF IN A VERNACULAR STYLE. COTTAGE 'B' IS A TWO STORY PITCHED ROOF STRUCTURE WITH LANDSCAPE STEPS TO THE LOWER UNIT AND FOOT BRIDGES TO THE UPPER UNITS. GUESTS WILL BE SHUTTLED FROM THEIR HOTEL ROOMS TO OTHER AREAS OF THE MAHA RESORT FOR RECREATION, ENTERTAINMENT AND FARM-TO-TABLE DINING.

0' 50' 100' 200'

FRONT ELEVATION

SIDE ELEVATION

0' 8' 16' 32'



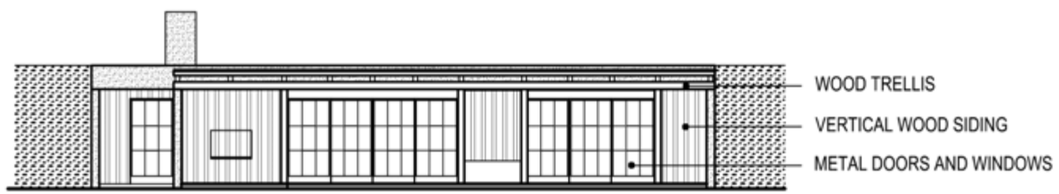
METAL ROOF

VERTICAL WOOD SIDING

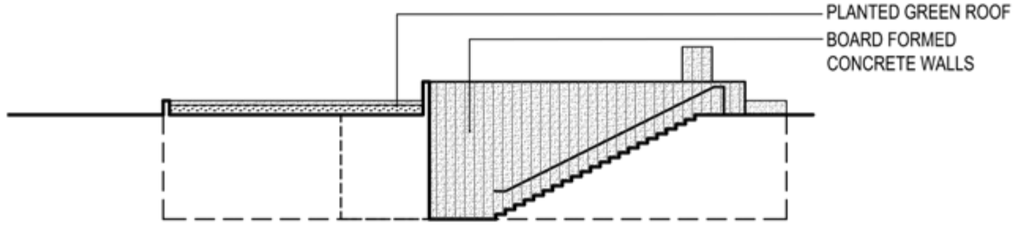
BOARDFORM CONCRETE

EXTERIOR STONE SURFACE

MAHA FARM | TYPICAL HOTEL COTTAGE WITH PLANTED GREEN ROOF



FRONT ELEVATION



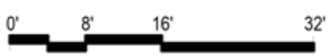
SIDE ELEVATION

GREEN ROOF

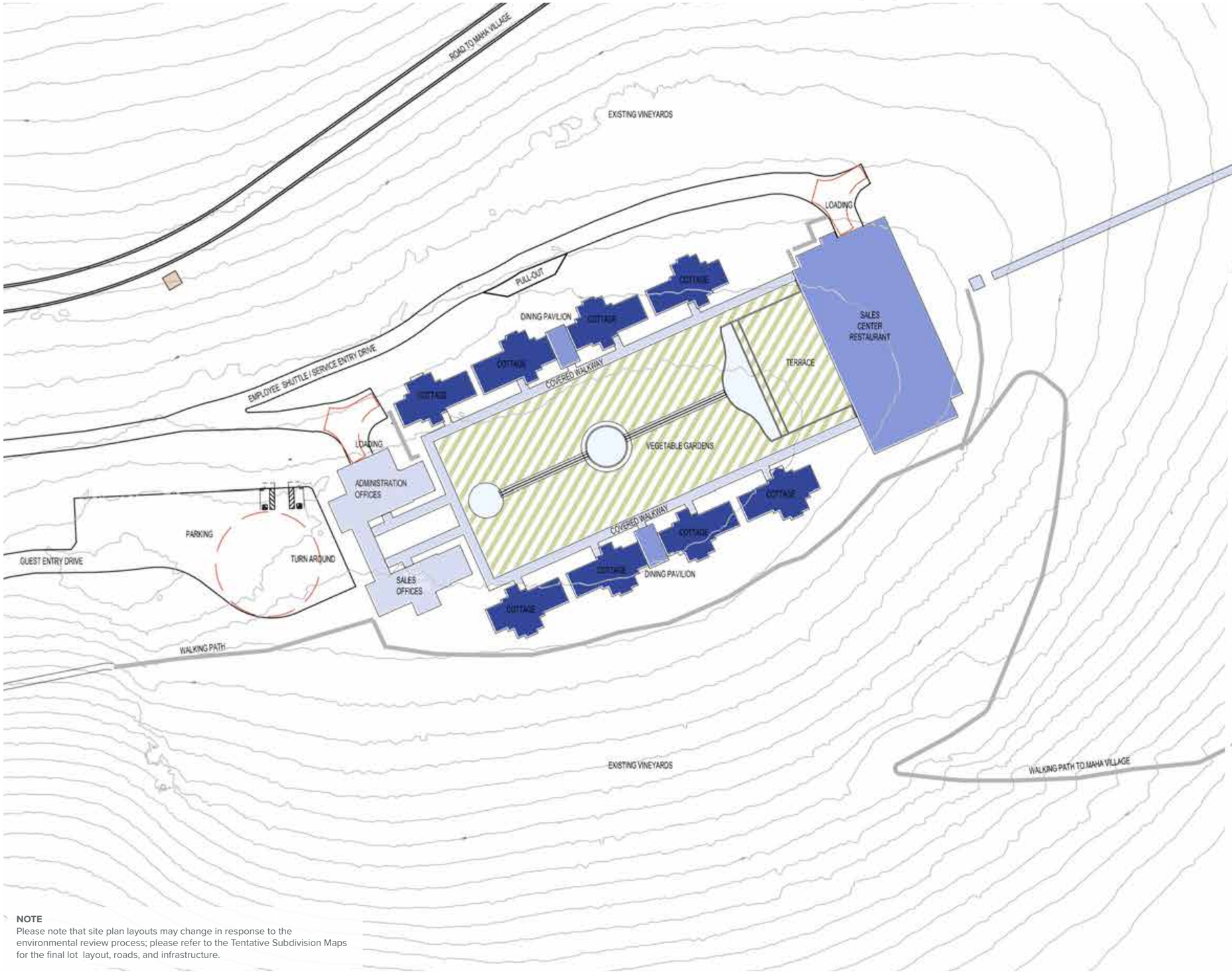
VERTICAL WOOD SIDING

BOARDFORM CONCRETE

EXTERIOR STONE SURFACE



MAHA FARM | SALES CENTER AT THE HILLTOP LODGE [C] LAND USE FLOOR PLANS



COLOR LEGEND

- RESORT- PRIMARY
- RESORT- COMMERCIAL
- RESORT- ACCESSORY
- AGRICULTURE- OUTDOOR
- UTILITY FACILITY

SALES CENTER AT THE HILLTOP LODGE

BUILDING NAME	GENERAL USE	SPECIFIC USE	INDOOR	OUTDOOR
SALES OFFICES	RESORT ACCESSORY	MANAGEMENT	4,000 SF	1,000 SF
ADMIN OFFICES MAIN	RESORT ACCESSORY	MANAGEMENT	5,000 SF	1,000 SF
ADMIN OFFICES LOWER	RESORT ACCESSORY	MANAGEMENT	3,600 SF	
DINING PAVILION	RESORT COMMERCIAL	FOOD & BEVERAGE SERVICE		600 SF
DINING PAVILION	RESORT COMMERCIAL	FOOD & BEVERAGE SERVICE		600 SF
COTTAGES	RESORT PRIMARY	HOTEL UNIT	1,725 SF X 8 = 13,800 SF	4,000 SF
RESTAURANT MAIN	RESORT COMMERCIAL	FOOD & BEVERAGE SERVICE	13,000 SF	3,500 SF
RESTAURANT LOWER	RESORT COMMERCIAL	FOOD & BEVERAGE SERVICE	10,000 SF	1,500 SF
COVERED WALKWAY	RESORT ACCESSORY	SUPPORTING FACILITY		9,000 SF
FUNICULAR 1	RESORT ACCESSORY	SUPPORTING FACILITY		6,500 SF
VEGETABLE GARDENS	AGRICULTURE PRIMARY	AGRICULTURE 1.2 ACRES		
GRAND TOTAL			49,400 SF	27,700 SF

0' 50' 100' 200'

NOTE
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COLOR LEGEND

AGRICULTURE- ACCESSORY

WINERY AT MAHA FARM

WINERY 1ST	AGRICULTURE ACCESSORY	WINERY	6,000 SF	1,500 SF
WINERY 2ND	AGRICULTURE ACCESSORY	WINERY	6,000 SF	2,500 SF
WINERY 3RD	AGRICULTURE ACCESSORY	WINERY	1,000 SF	3,500 SF
CAVES	AGRICULTURE ACCESSORY	WINERY	6,000 SF	
STORAGE	AGRICULTURE ACCESSORY	WINERY	1,000 SF	
STORAGE	AGRICULTURE ACCESSORY	WINERY	1,000 SF	
VINEYARDS	AGRICULTURE PRIMARY	AGRICULTURE		
GRAND TOTAL			21,000 SF	7,500 SF

NOTE
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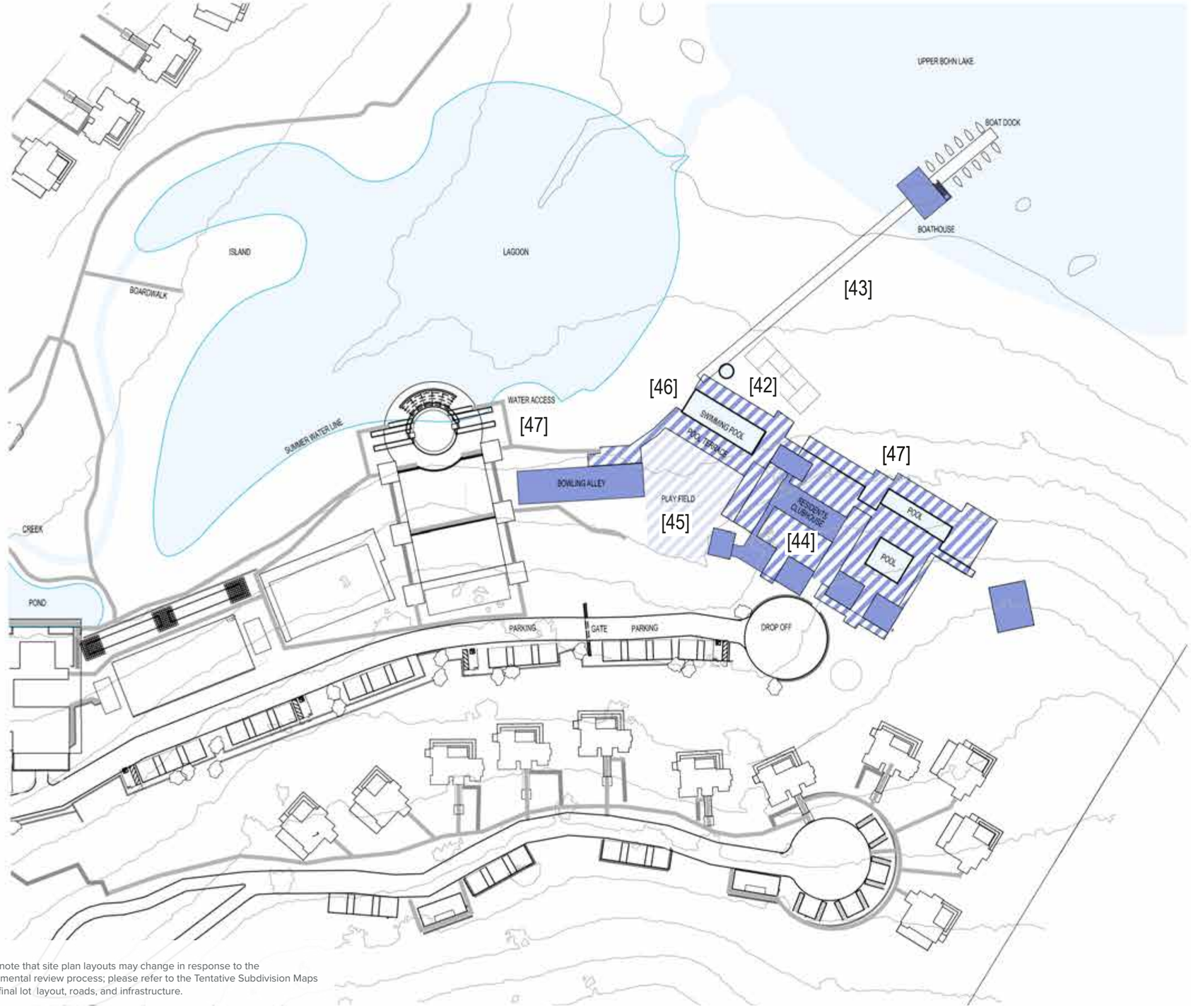
0' 50' 100' 200'

[41]



COLOR LEGEND

RESORT- COMMERCIAL	RESORT- COMMERCIAL OUTDOOR HARDSCAPE
RESORT- ACCESSORY	RESORT- OUTDOOR HARDSCAPE

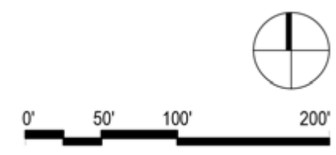
MAHA FARM RESIDENTS CLUB

CLUBHOUSE UPPER	RESORT COMMERCIAL	OUTDOOR RECREATION	7,000 SF	18,000 SF
CLUBHOUSE MAIN	RESORT COMMERCIAL	FOOD & BEVERAGE SERVICE	22,000 SF	5,000 SF
CLUBHOUSE LOWER	RESORT COMMERCIAL	INDOOR ENTERTAINMENT	12,000 SF	9,000 SF
BOATHOUSE	RESORT COMMERCIAL	FOOD & BEVERAGE SERVICE	4,000 SF	
BOAT DOCK	RESORT ACCESSORY	OUTDOOR RECREATION		
WATER ACCESS	RESORT ACCESSORY	OUTDOOR RECREATION		10,000 SF
PLAY FIELD	RESORT ACCESSORY	OUTDOOR RECREATION		18,000 SF
GRAND TOTAL			45,000 SF	60,000 SF

MAHA FARM | MAHA FARM RESIDENTS CLUB LAND USE FLOOR PLANS

MAHA FARM RESIDENTS' CLUB

RESIDENTS CAN ENJOY RECREATIONAL COMMUNITY ACTIVITIES IN THE CLUBHOUSE, BOWLING ALLEY AND BOATHOUSE AT THE MAHA FARM PRIVATE RESIDENTS CLUB. THE CLUBHOUSE AND SWIMMING POOL TERRACE OVERLOOK UPPER BOHN LAKE. A PATHWAY AND BOARDWALK CREATES ACCESS FROM THE EMBANKMENT DOWN TO A FIXED ELEVATION BOATHOUSE AND FLOATING DOCKS ON THE LAKE.



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COLOR LEGEND

RESORT- COMMERCIAL	AGRICULTURE-OUTDOOR
RESORT- ACCESSORY	RESORT- OUTDOOR HARDSCAPE

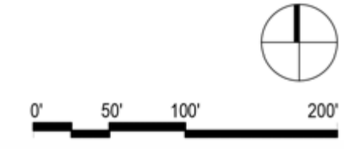
MAHA FARM SPECIAL EVENTS CENTER

SPECIAL EVENTS BUILDING	RESORT COMMERCIAL	FOOD & BEVERAGE SERVICE	3,000 SF	30,000 SF
SUPPORT BUILDING 1	RESORT ACCESSORY	FOOD & BEVERAGE SERVICE	1,500 SF	
SUPPORT BUILDING 2	RESORT ACCESSORY	FOOD & BEVERAGE SERVICE	1,500 SF	
SUPPORT BUILDING 3	RESORT ACCESSORY	FOOD & BEVERAGE SERVICE	500 SF	
SUPPORT BUILDING 4	RESORT ACCESSORY	FOOD & BEVERAGE SERVICE	500 SF	
SUPPORT BUILDING 5	RESORT ACCESSORY	FOOD & BEVERAGE SERVICE	1,500 SF	
GRAND TOTAL			8,500 SF	30,000 SF

MAHA FARM | MAHA FARM SPECIAL EVENTS [E] LAND USE FLOOR PLANS

MAHA FARM SPECIAL EVENTS

THE SPECIAL EVENTS CENTER [E] WILL CREATE AN AREA FOR EVENTS SUCH AS WEDDINGS AND PARTIES. THE SITE WILL FEATURE A LARGE SHADY OUTDOOR TERRACE FOR GATHERINGS. CUT FLOWERS WILL BE CULTIVATED NEARBY TO ENHANCE HABITAT FOR THREATENED BUTTERFLIES AND OTHER POLLINATORS. STORMWATER FROM CULTIVATED AREAS WILL BE APPROPRIATELY RETAINED AND TREATED. AN OLD RANCH ROAD WILL BE USED AS A WALKING TRAIN FROM THE HOTEL COTTAGES TO THE OUTDOOR EVENTS CENTER.



NOTE
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COLOR LEGEND

RESORT- ACCESSORY
RESORT- UTILITY
RESORT- RESIDENTIAL

MAHA FARM RESORT RESIDENTIAL PROGRAM - SOUTH

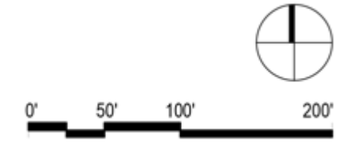
RESORT RESIDENTIAL UNITS: RR 1-27	RESORT PRIMARY	RESORT RESIDENTIAL UNIT	3,000 SF x 27 = 81,000 SF	3,000 SF X 27 = 81,000 SF
HK HOUSEKEEPING	RESORT ACCESSORY	SUPPORTING FACILITY	1,100 SF x 5 = 5,500 SF	
GRAND TOTAL			86,500 SF	81,000 SF

FINAL LAYOUT OF BUILDINGS & IMPROVEMENTS ON RESIDENTIAL LOTS TO BE CONFIRMED AT BUILDING PERMIT.

MAHA FARM | RESORT RESIDENTIAL SOUTH LAND USE FLOOR PLANS

MAHA FARM RESORT RESIDENTIAL SOUTH

THIRTY THREE RESORT RESIDENTIAL VILLAS WITH GREEN PLANTED ROOFS AND PEACEFUL VISTAS OF THE RESORT PROPERTY ARE PLANNED SOUTH OF THE MAHA FARM MARKETPLACE & HOTEL. EACH VILLA HAS LIVING SPACE THAT INCLUDES A KITCHEN WITH TWO BEDROOMS AND TWO BATHROOMS. OUTDOOR AMENITIES INCLUDE A SWIMMING POOL FOR EACH RESIDENTIAL RESORT UNIT.



RESIDENTIAL VILLA LOT
RESIDENTIAL VILLA LOT
EXISTING VINEYARD
RESIDENTIAL VILLA LOT
RESIDENTIAL VILLA LOT
RESIDENTIAL VILLA LOT
RESIDENTIAL VILLA LOT
RESIDENTIAL VILLA LOT
RESIDENTIAL VILLA LOT
RESIDENTIAL VILLA LOT
EXISTING VINEYARD
RESIDENTIAL VILLA LOT
HK
PARKING
RR40
RR39
RR43
RR42
RR41
PARKING
HK
RR38
RR28
RR29
RR44
RR34
RR33
RR32
RR30
RR35
RR31
RR45
RR36
RR37
COVE
RESIDENTIAL VILLA LOT
RESIDENTIAL VILLA LOT
PARKING
HK
[55]
UPPER BOHN LAKE
CULTURAL SITE
EXISTING VINEYARD

NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

COLOR LEGEND

RESORT- ACCESSORY

RESORT- RESIDENTIAL

MAHA FARM RESORT RESIDENTIAL PROGRAM - NORTH

RESORT RESIDENTIAL UNITS RR28-45	RESORT PRIMARY	RESORT RESIDENTIAL UNIT	3,000 SF x 18 = 54,000 SF	3,000 SF X 18 = 54,000 SF
HK HOUSEKEEPING	RESORT ACCESSORY	SUPPORTING FACILITY	700 SF x 3 = 2,100 SF	
GRAND TOTAL			44,100 SF	42,000 SF

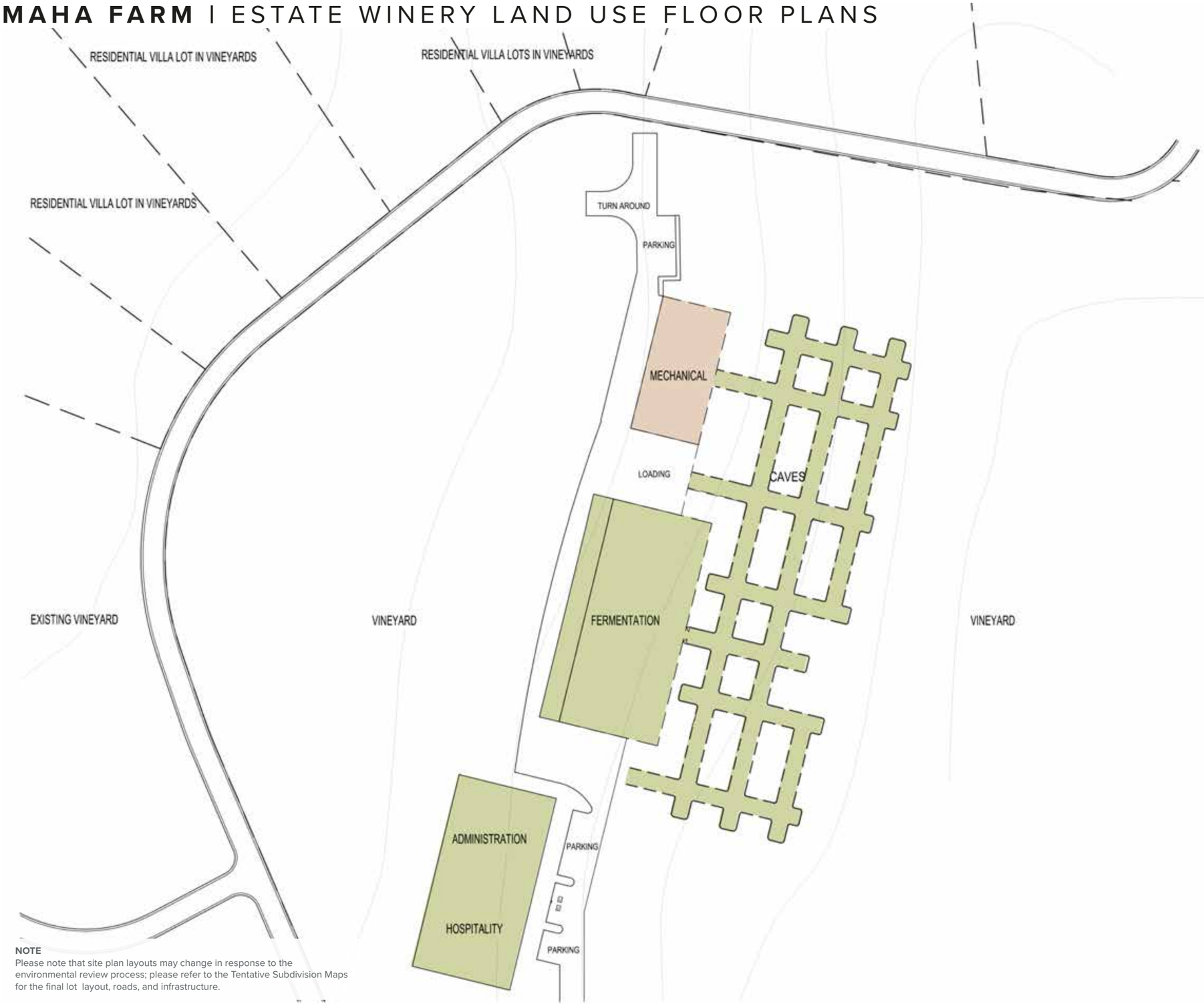
FINAL LAYOUT OF BUILDINGS & IMPROVEMENTS ON RESIDENTIAL LOTS TO BE CONFIRMED AT BUILDING PERMIT.

MAHA FARM | RESORT RESIDENTIAL NORTH LAND USE FLOOR PLANS

MAHA FARM RESORT RESIDENTIAL NORTH

FOURTEEN RESORT RESIDENTIAL VILLAS WITH GREEN PLANTED ROOFS AND PEACEFUL VISTAS OF UPPER BOHN LAKE ARE PLANNED NORTH OF THE MAHA FARM MARKETPLACE & HOTEL. EACH VILLA HAS LIVING SPACE THAT INCLUDES A KITCHEN WITH TWO BEDROOMS AND TWO BATHROOMS. OUTDOOR AMENITIES INCLUDE A SWIMMING POOL FOR EACH RESIDENTIAL RESORT UNIT.

0' 125' 250' 500'



NOTE
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COLOR LEGEND

- AGRICULTURE- ACCESSORY
- UTILITY STRUCTURE

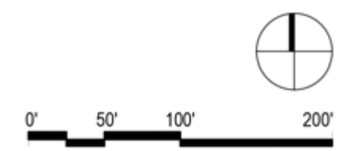
ESTATE WINERY

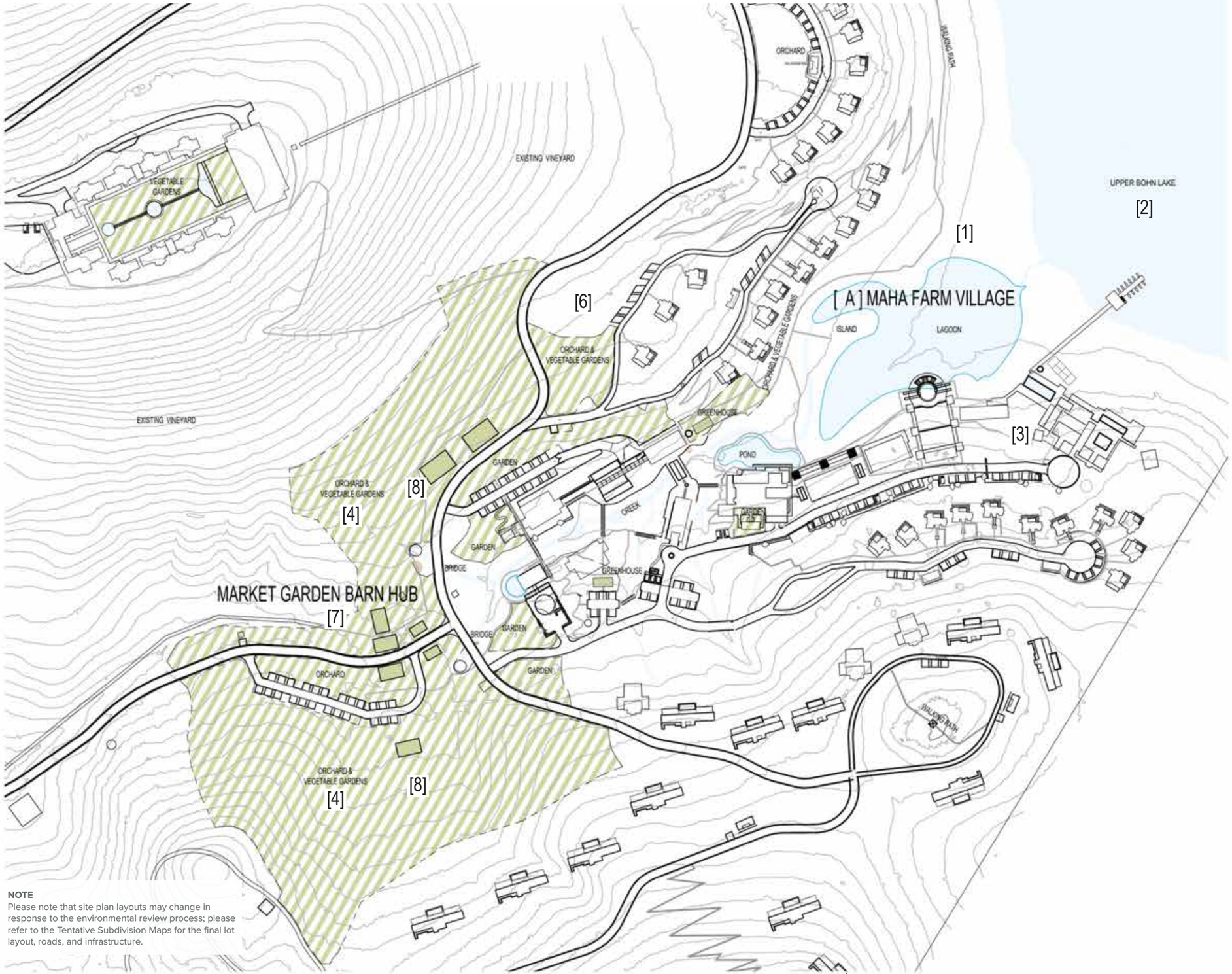
BUILDING NAME	GENERAL USE	SPECIFIC USE	INDOOR	OUTDOOR
FERMENTATION	AGRICULTURE ACCESSORY	WINERY	28,200 SF	
CAVES	AGRICULTURE ACCESSORY	WINERY	35,000 SF	
MECHANICAL	AGRICULTURE ACCESSORY	UTILITY	4,000 SF	1,800 SF
HOSPITALITY	AGRICULTURE ACCESSORY	WINERY	5,000 SF	9,000 SF
ADMINISTRATION	AGRICULTURE ACCESSORY	WINERY	5,000 SF	
GRAND TOTAL			77,200 SF	10,800 SF

MAHA FARM | ESTATE WINERY LAND USE FLOOR PLANS

ESTATE WINERY

GUESTS CAN ENJOY THE FRUITS OF THE PRODUCTIVE VINEYARDS SURROUNDING THIS SMALL BOUTIQUE WINERY. MULTIPLE LEVELS ALLOW INDOOR AND OUTDOOR WINE TASTINGS PAIRED WITH FOOD GROWN IN THE MAHA FARM ORCHARDS AND GARDENS. FOOD AND WINE HOSPITALITY IS ALSO ENVISIONED IN ROOMS CARVED FROM THE BARREL STORAGE CAVES. A FUNICULAR ALLOWS GUESTS VISITING THE SALES CENTER AT THE HILLTOP LODGE TO EASILY ACCESS THE WINERY.





NOTE
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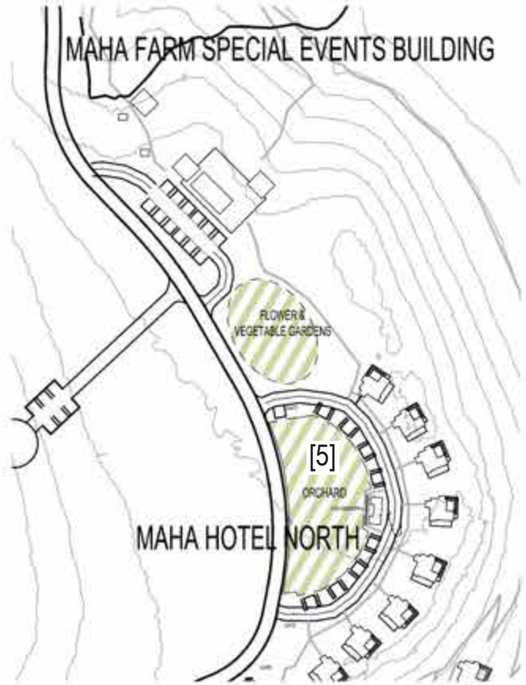
COLOR LEGEND

AGRICULTURE- OUTDOOR | AGRICULTURE- ACCESSORY

MAHA FARM VEGETABLE GARDENS & ORCHARDS

MAHA RESTAURANT VEGETABLE GARDENS	AGRICULTURE PRIMARY	AGRICULTURE	000 SF	0.3 ACRES
MARKET GARDEN BARN HUB	AGRICULTURE PRIMARY	AGRICULTURE	000 SF	20.5 ACRES
SPECIAL EVENTS ORCHARD & FLOWER GARDENS	AGRICULTURE PRIMARY	AGRICULTURE	000 SF	1.3 ACRES
SALES CENTER VEGETABLE GARDENS	AGRICULTURE PRIMARY	AGRICULTURE	000 SF	1.2 ACRES
GRAND TOTAL			000 SF	up to 23.3 ACRES

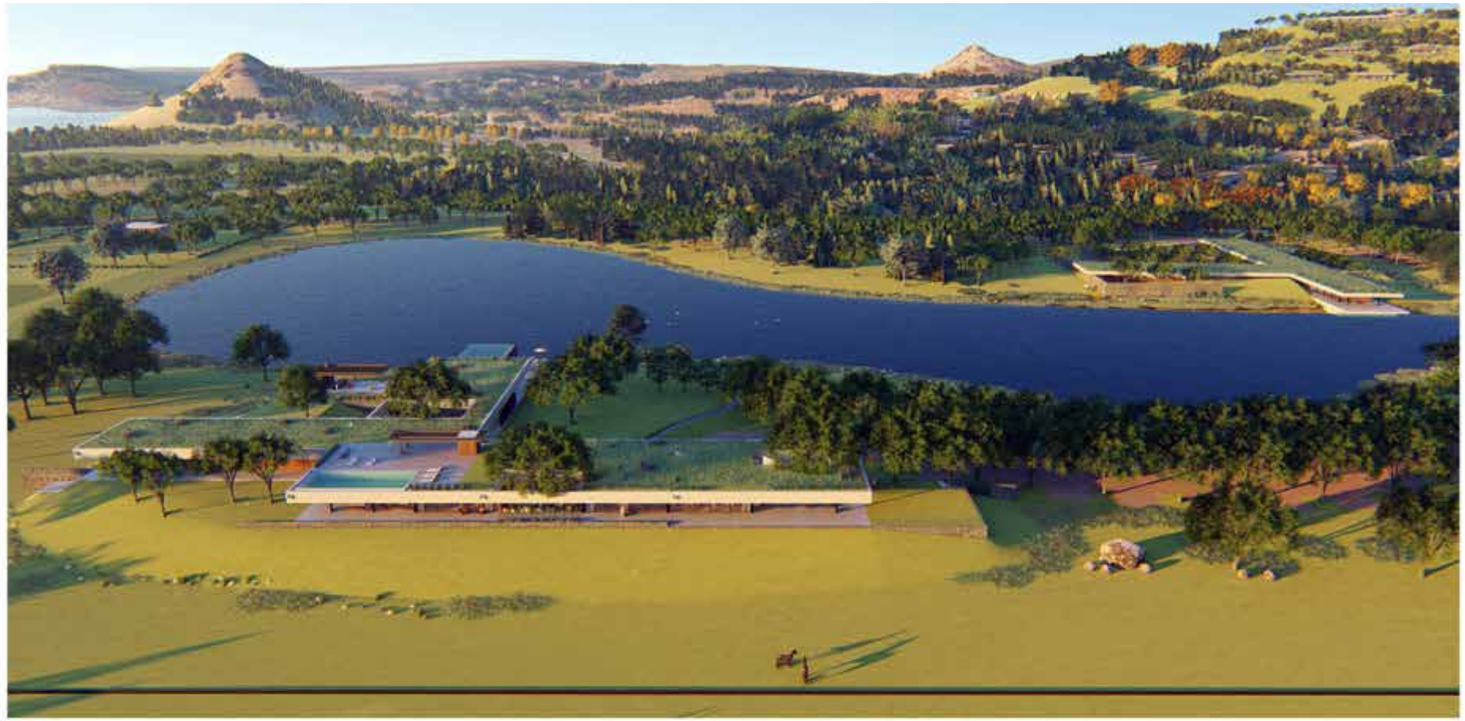


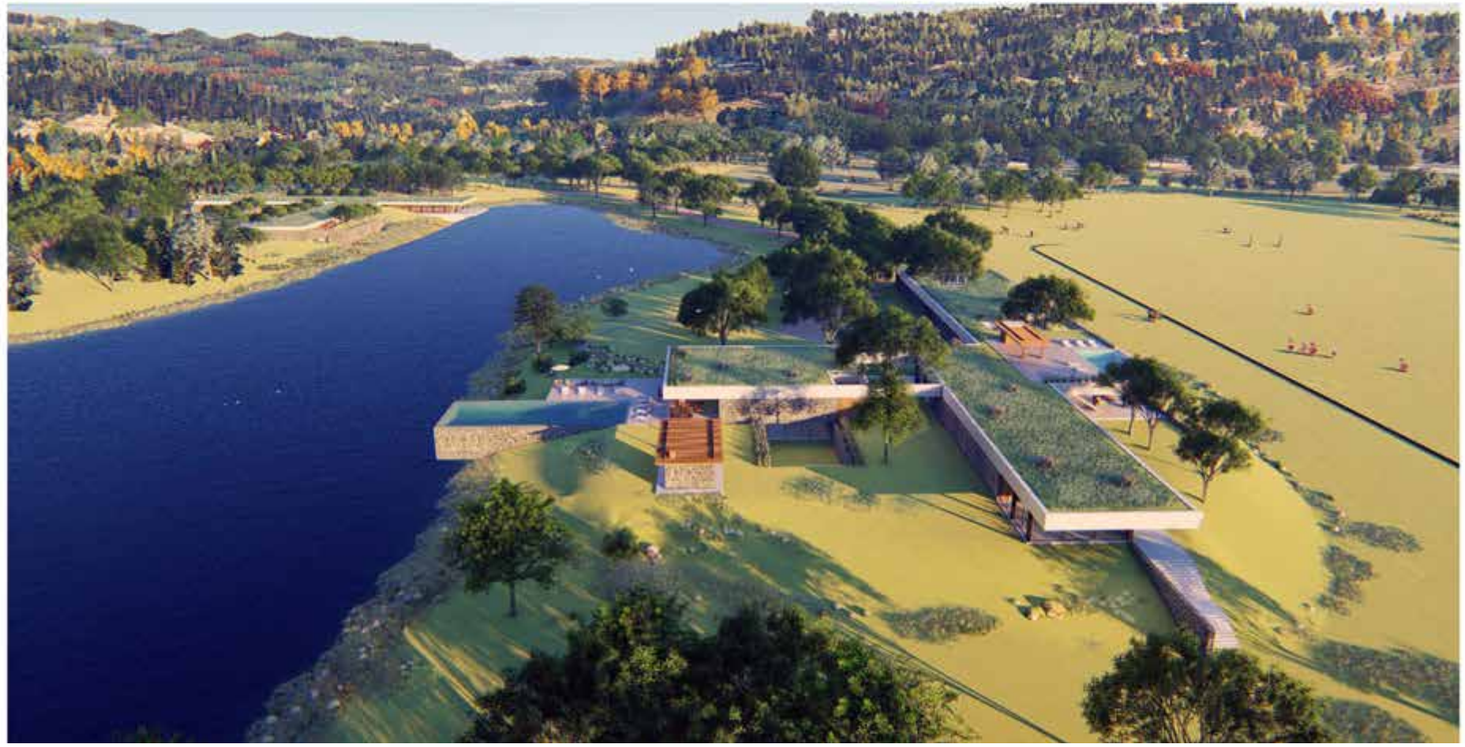
MAHA FARM | MAHA FARM SPECIAL EVENTS BUILDING

MAHA FARM GARDEN

THE FARM-TO-TABLE CONCEPT FOR THE RESTAURANTS AND HOTEL SERVICE OFFERED BY THE RESORT IS SUPPORTED BY EXTENSIVE VEGETABLE GARDENS, CULTIVATED NATIVE PLANT FORAGING AREAS AND FRUIT & NUT ORCHARDS LOCATED IN MAHA FARM. THE PRODUCTIVE GROWING AREAS ARE LOCATED IN AND AROUND THE VILLAGE, CENTERED ON THE MARKET GARDEN BARN HUB, AS WELL AS A SHOWCASE RESTAURANT GARDEN AT THE HILLTOP LODGE.

0' 125' 250' 500'





Equestrian–Figueras Design Group

Redesigning a historical use within the Guenoc Valley required a respectful and honest dialogue between the current and proposed architecture to include world class equestrian facilities and stables as well as the Lodge for social activities. The equestrian area will be centered on the element of water. The buildings will blend with the landscape through implementation of green roofs that imply buildings as an extension of the landscape. The natural materials of stone, concrete, and wood will create a restrained aesthetic expression.

EQUESTRIAN CENTER | LAND USE CLUSTER MAP

COLOR LEGEND

- RESORT - PRIMARY
- RESORT - COMMERCIAL
- RESORT - ACCESSORY
- RESORT - RESIDENTIAL

CLUSTER USES

6 HOTEL UNITS
12 RESORT RESIDENTIAL UNITS
74 RESIDENTIAL VILLAS
FACILITIES
[A] EQUESTRIAN LODGE
[B] POLO CLUB HOUSE
[C] EQUESTRIAN STABLES
[D] PONY CAMP
[E] INDOOR ARENA

NOTE
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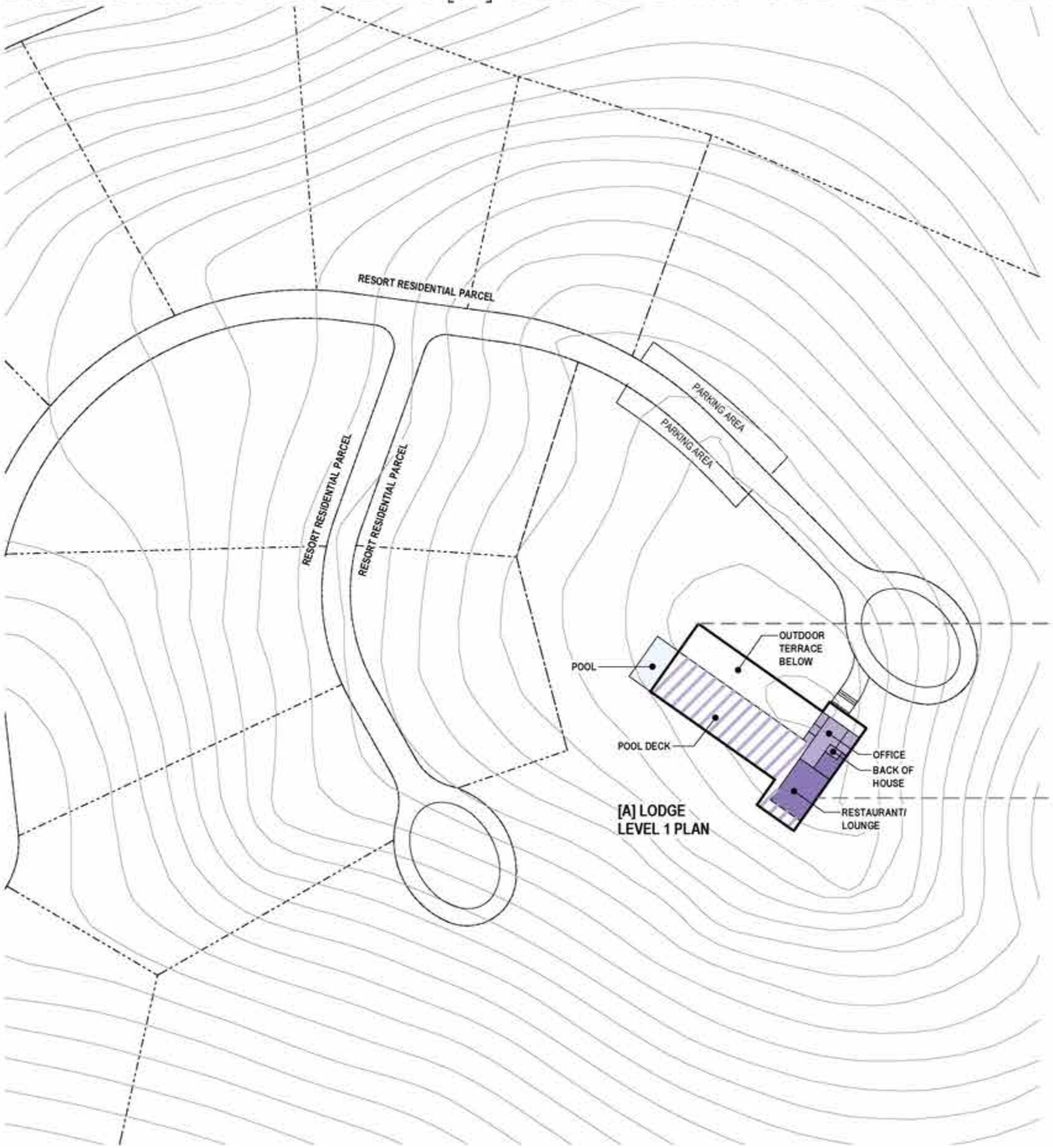
0' 350' 700' 1400'

ORIGINAL SCALE: 1" = 700'-0"

EQUESTRIAN CENTER | [A] LODGE LAND USE FLOOR PLANS



COLOR LEGEND	
INDOOR / OUTDOOR	
	RESORT - PRIMARY
	RESORT - COMMERCIAL
	RESORT - ACCESSORY

EQUESTRIAN CENTER 1

BUILDING NAME	SPECIFIC USE	GENERAL USE	INDOOR	OUTDOOR	TOTAL
[A] LODGE					
	HOTEL ROOM [6]	HOTEL UNIT	4,800 SF	0 SF	
	RESTAURANT/LOUNGE	FOOD & BEVERAGE	1,800 SF	0 SF	
	OFFICE	RESORT MANAGEMENT	3,100 SF	0 SF	
	BOH/MECHANICAL	RESORT SUPPORT	1,300 SF	0 SF	
	OUTDOOR POOL	RECREATION	0 SF	1,000 SF	
	OUTDOOR TERRACE	RECREATION	0 SF	4,100 SF	
	POOL DECK	RECREATION	0 SF	6,700 SF	
GRAND TOTAL					22,700 SF

DESCRIPTION

The Equestrian Lodge, with its cantilevered concrete structure, will give the visitors the feeling of floating above the Guenoc Valley. It's strategic location on the top of the mountain will provide a bird's eye view of the entire Equestrian Center blending with nature.

Entering the building, guests will be struck by the spectacular mountain and lake vistas that fluctuate seasonally. The predominance of local wood and stone will provide warmth and rusticity to the modern spaces. The intention is to make the guests feel immersed in a retreat nestled in the mountains. The planted roof terrace opens to the soft winds and invites one to stop for a refreshment and dive into the infinity pool overlooking McCreary Lake. The lower level holds the most private and sheltered areas of the building. It's courtyard garden, carved into the mountain slope, gives light and tranquility to the guest room areas. Each bedroom opens to the dramatic views of the surrounding landscape.

NOTE

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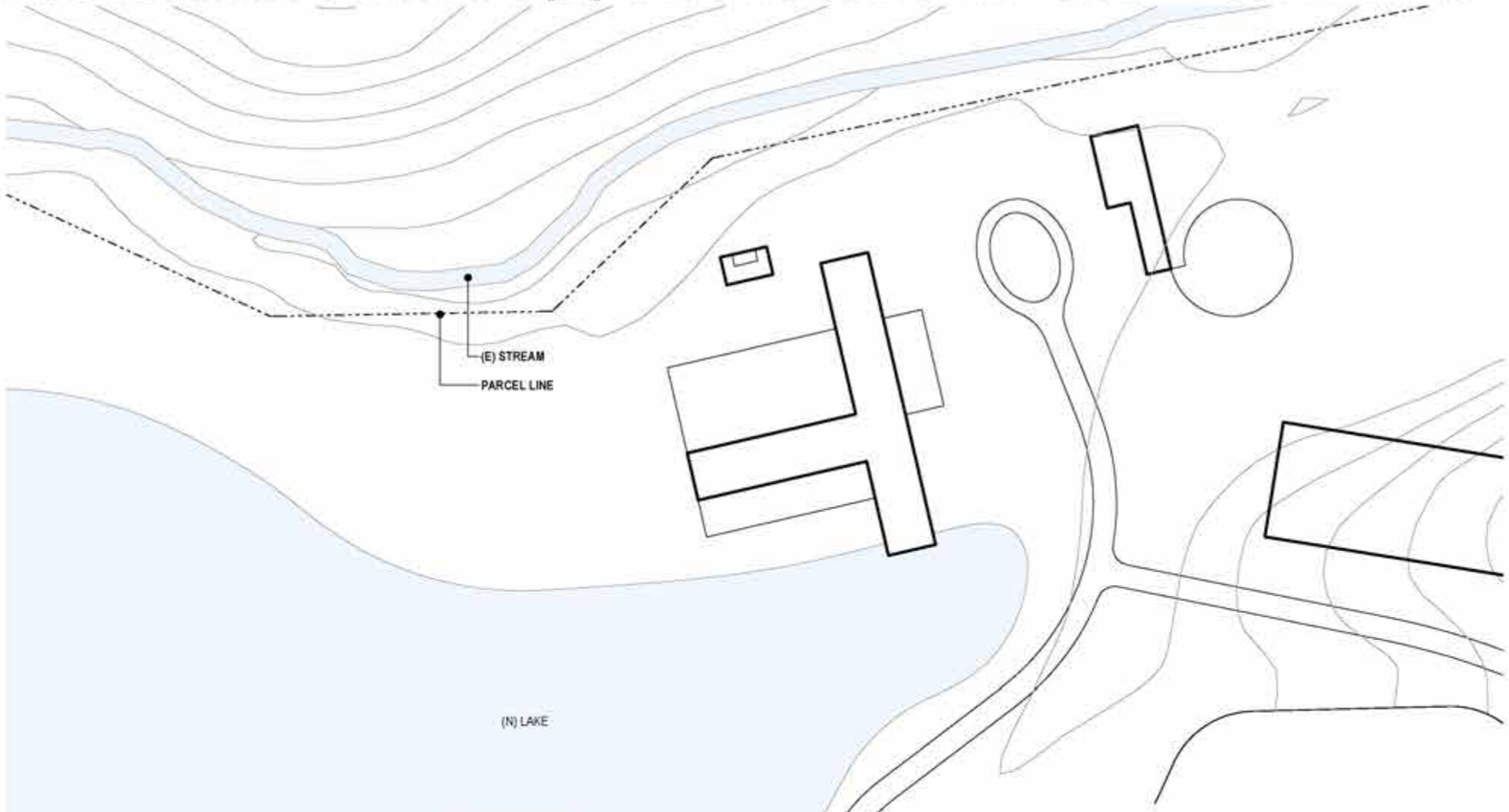
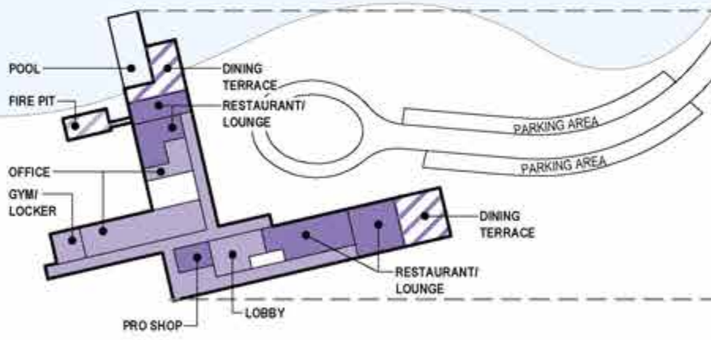
0' 50' 100' 200'

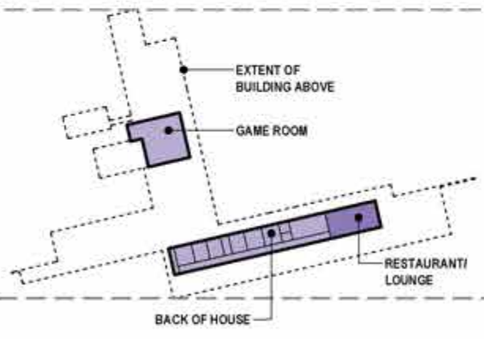
ORIGINAL SCALE: 1" = 100'-0"

EQUESTRIAN CENTER | [B] CLUBHOUSE LAND USE FLOOR PLANS

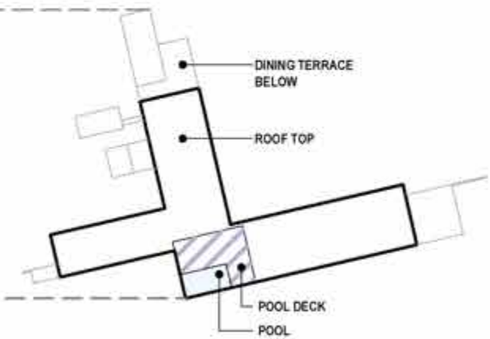




[B] CLUBHOUSE
LEVEL 1 PLAN



[B] CLUBHOUSE
BASEMENT PLAN



[B] CLUBHOUSE
ROOF PLAN

COLOR LEGEND

INDOOR	OUTDOOR	
		RESORT - PRIMARY
		RESORT - COMMERCIAL
		RESORT - ACCESSORY

EQUESTRIAN CENTER 2

BUILDING NAME	SPECIFIC USE	GENERAL USE	INDOOR	OUTDOOR	TOTAL
[B] CLUBHOUSE					
	PRO SHOP	RETAIL	900 SF	0 SF	
	RESTAURANT/LOUNGE	FOOD & BEVERAGE	10,600 SF	0 SF	
	DINING TERRACE	FOOD & BEVERAGE	0 SF	4,700 SF	
	LOBBY	RESORT MANAGEMENT	10,100 SF	0 SF	
	OFFICE	RESORT MANAGEMENT	4,100 SF	0 SF	
	BACK OF HOUSE	RESORT SUPPORT	4,700 SF	0 SF	
	OFFICE	RESORT SUPPORT	1,200 SF	0 SF	
	FIRE PIT	ENTERTAINMENT	300 SF	0 SF	
	GAME ROOM	ENTERTAINMENT	2,300 SF	0 SF	
	FIRE PIT	ENTERTAINMENT	0 SF	900 SF	
	GYM/LOCKER	RECREATION	1,000 SF	0 SF	
	OUTDOOR POOL	RECREATION	0 SF	3,600 SF	
	POOL DECK	RECREATION	0 SF	3,200 SF	
GRAND TOTAL					47,600 SF

DESCRIPTION

The Clubhouse, the heart of the Equestrian Center, is strategically located between the main polo field and the new projected lake. The building is conceived with two main perpendicular wings. One parallel to the central polo field and the other extending towards the lake. Including large windows with spectacular views towards the natural landscape, stunning planted roofs, and internal patios will enhance the experience of living in such a magnificent environment

Members will enjoy drinks or lunch while watching a polo match from the restaurant and the terraces that over-look the field. They will also be able to stop at the exclusive tack shop to purchase riding apparel and equipment. Centrally located is the club's office where guests can get assistance booking a polo practice or a riding class.

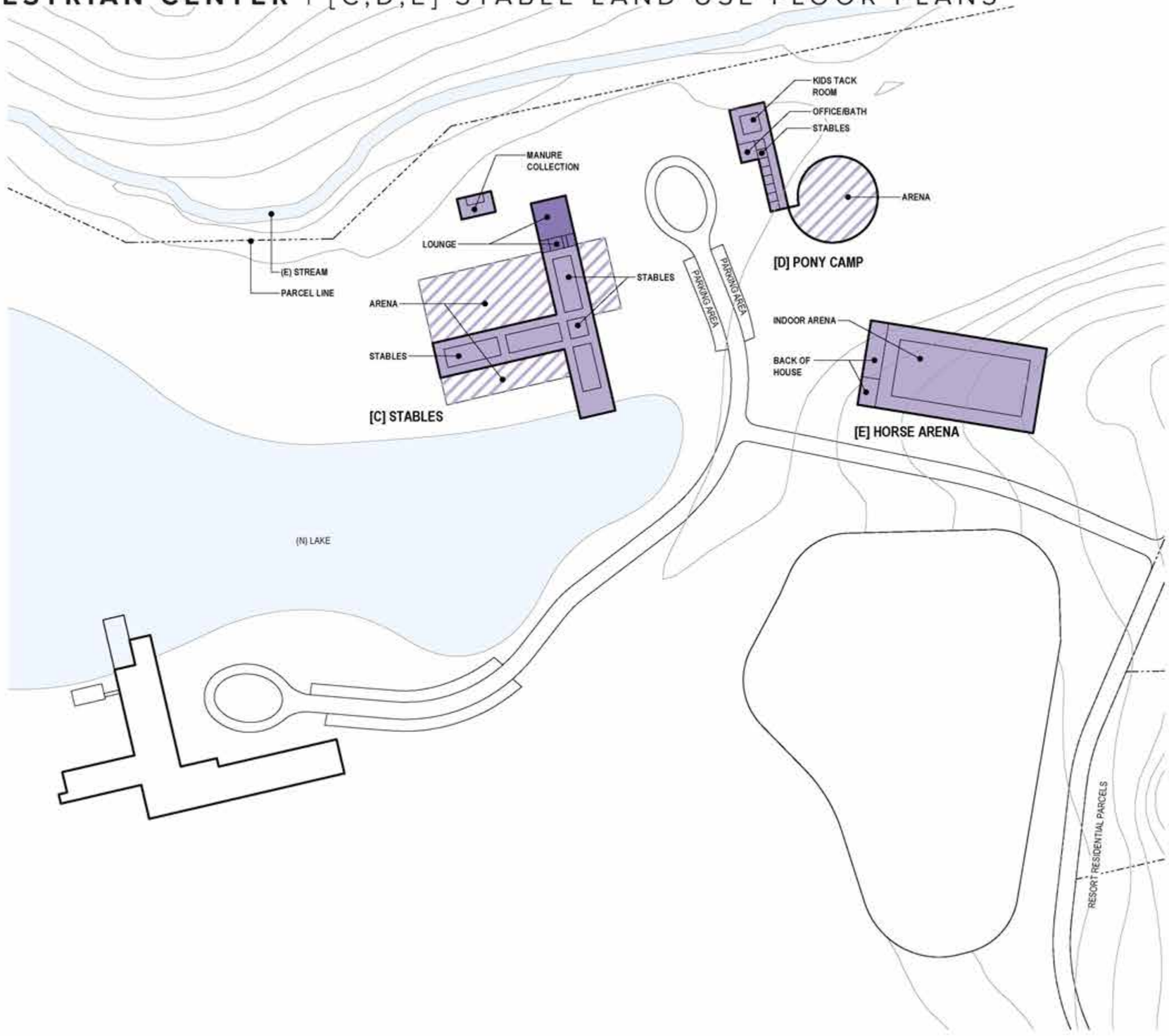
After competition polo players and riders will be able to have a drink and socialize at the bar, take a massage at the spa, or shower and change in the wooden lined locker rooms. Adult members will also enjoy a garden roof terrace with a singular infinity pool and bar lounge while unwinding and watching polo games. On the north wing, families will be able to relax and gather around the swimming pool or the restaurant overlooking the lake and mountains

NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

0' 75' 150' 300'

ORIGINAL SCALE: 1" = 150'-0"

EQUESTRIAN CENTER | [C,D,E] STABLE LAND USE FLOOR PLANS



COLOR LEGEND

INDOOR	OUTDOOR	
		RESORT - PRIMARY
		RESORT - COMMERCIAL
		RESORT - ACCESSORY

EQUESTRIAN CENTER 3

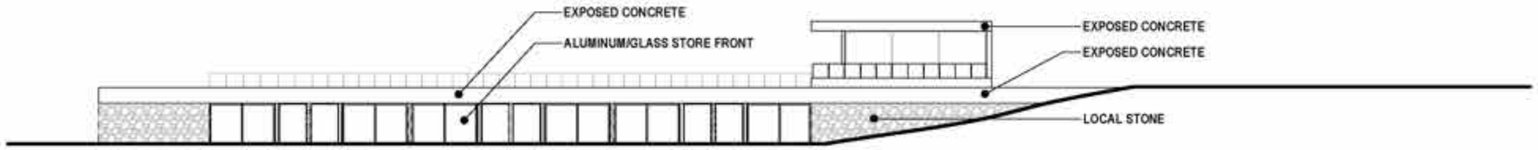
BUILDING NAME	SPECIFIC USE	GENERAL USE	INDOOR	OUTDOOR	TOTAL
[C] STABLES					58,500 SF
	MANURE COLLECTION	BACK OF HOUSE	1,600 SF	0 SF	
	STABLES	RECREATION	23,000 SF	0 SF	
	ARENA	RECREATION	0 SF	30,100 SF	
	LOUNGE	FOOD & BEVERAGE	3,900 SF	0 SF	
[D] PONY CAMP					18,700 SF
	OFFICE/BATH	RESORT SUPPORT	700 SF	0 SF	
	KIDS TACK ROOM	ENTERTAINMENT	700 SF	0 SF	
	STABLES	RECREATION	4,900 SF	0 SF	
	ARENA	RECREATION	0 SF	12,400 SF	
[E] HORSE ARENA					33,000 SF
	BACK OF HOUSE	RESORT SUPPORT	3,300 SF	0 SF	
	INDOOR HORSE ARENA	RECREATION	29,700 SF	0 SF	
GRAND TOTAL					110,200 SF

NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

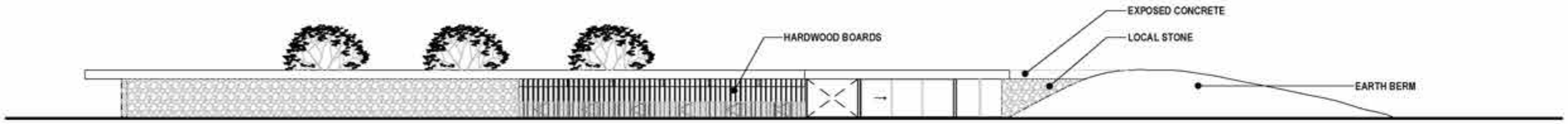
0' 50' 100' 200'

ORIGINAL SCALE: 1" = 100'-0"

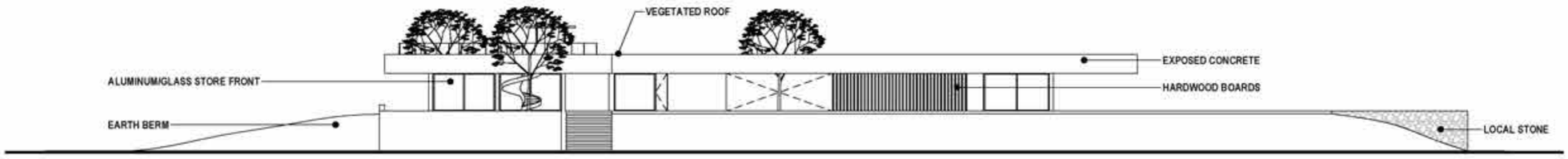
EQUESTRIAN CENTER | ELEVATIONS



LODGE NORTH ELEVATION



STABLES EAST ELEVATION



CLUBHOUSE EAST ELEVATION

0' 16' 32' 64'

ORIGINAL SCALE: 1/32" = 1'-0"

EXPOSED CONCRETE

HARDWOOD BOARDS

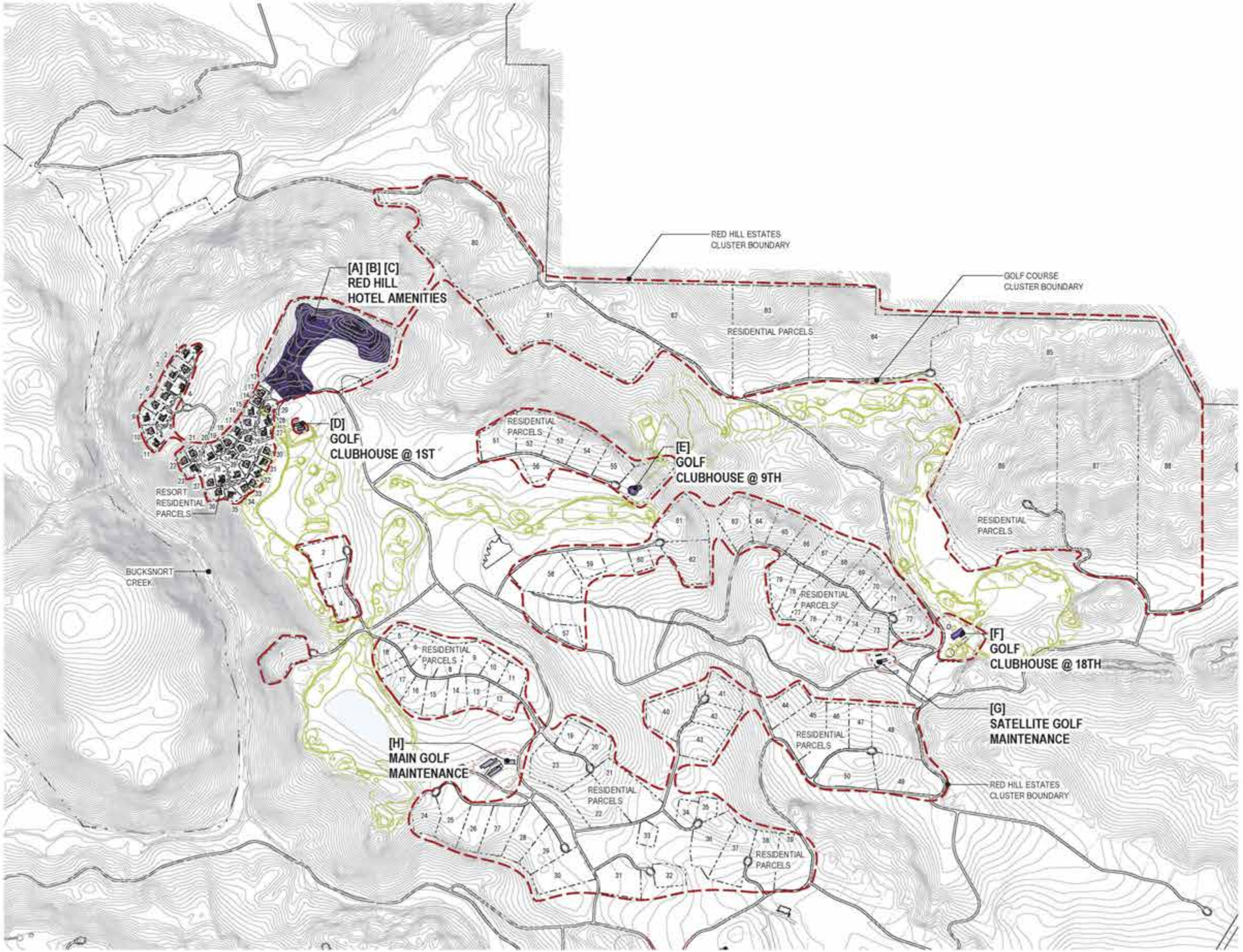
LOCAL STONE

HARDWOOD FLOORING

Red Hill Estates - Denniston International

Guests arrive at a lower level and are introduced to the landscape which they will traverse in a curated procession to the Main Lodge. Amenities such as a lounge, bar, dining room, library, and boutique occur under one roof at the Main Lodge. Derived from local Native American dwellings, the round shape allows for maximum views from its circumference and takes advantage of the resulting internal courtyard, which offers a prime location for special dinners and events.

RED HILL ESTATES & RENAISSANCE GOLF COURSE | LAND USE CLUSTER MAP



COLOR LEGEND

- RESORT - PRIMARY
- RESORT - COMMERCIAL
- RESORT - ACCESSORY
- RESORT - RESIDENTIAL

CLUSTER USES

50 HOTEL UNITS
40 RESORT RESIDENTIAL UNITS
89 RESIDENTIAL VILLAS

FACILITIES

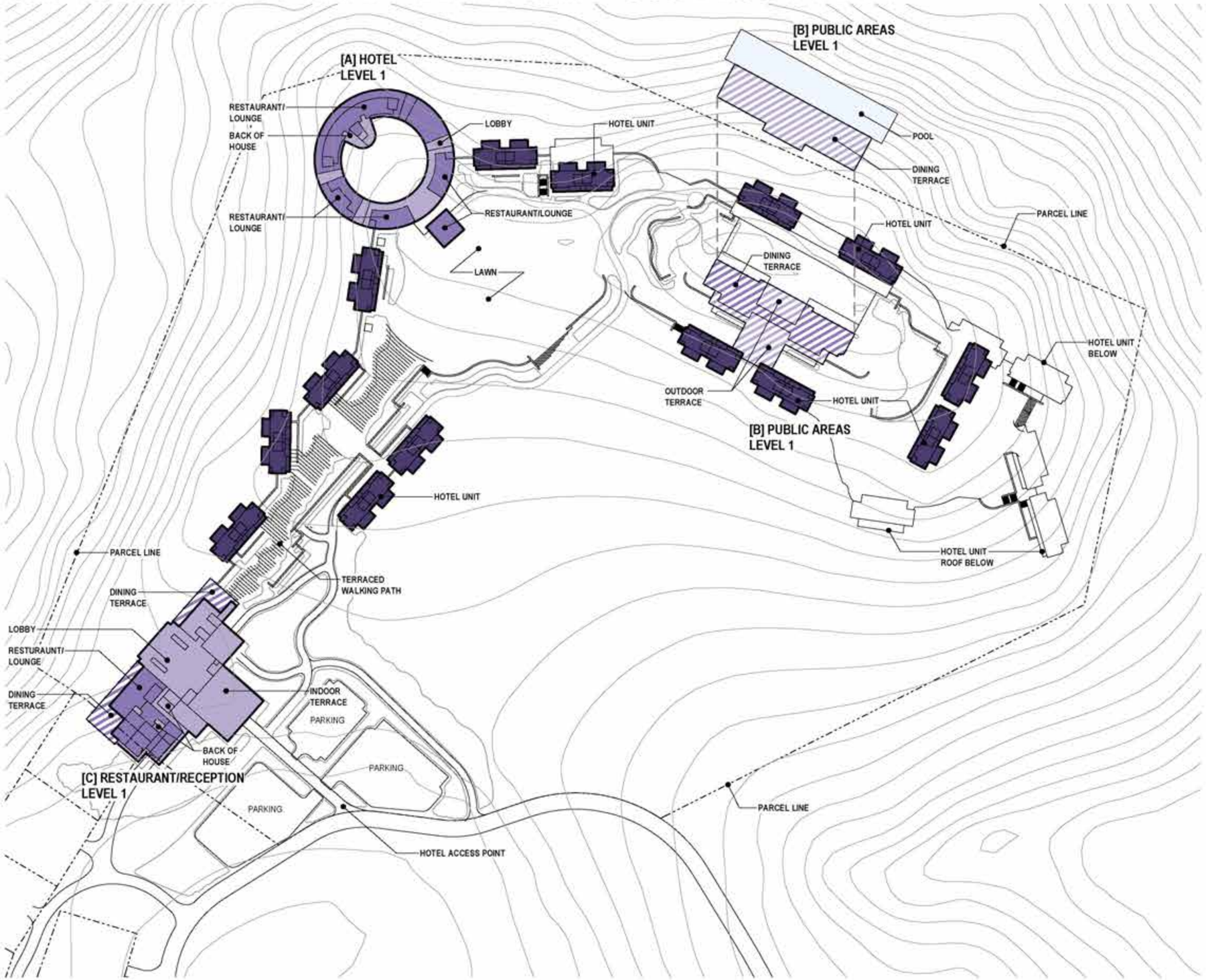
[A] RED HILL HOTEL
[B] PUBLIC AREAS
[C] SPECIALTY RESTAURANT
RENESSAINCE GOLF COURSE
[D] GOLF COURSE – 1ST CLUBHOUSE
[E] GOLF COURSE – 9TH CLUBHOUSE
[F] GOLF COURSE – 18TH CLUBHOUSE
[G] & [H] GOLF COURSE MAINTENANCE

NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

0' 600' 1200' 2400'

ORIGINAL SCALE: 1" = 1200'-0"

RED HILL HOTEL | ENTRY LEVEL LAND USE FLOOR PLAN



COLOR LEGEND

INDOOR	OUTDOOR	
		RESORT - PRIMARY
		RESORT - COMMERCIAL
		RESORT - ACCESSORY

RED HILL HOTEL 1

BUILDING NAME	SPECIFIC USE	GENERAL USE	INDOOR	OUTDOOR	TOTAL
[A] HOTEL					**78,200 SF**
	HOTEL ROOM [28]	HOTEL UNIT	52,600 SF	0 SF	
	RESTAURANT/LOUNGE	FOOD & BEVERAGE	18,700 SF	0 SF	
	LOBBY	RESORT MANAGEMENT	5,500 SF	0 SF	
	BACK OF HOUSE	RESORT SUPPORT	1,400 SF	0 SF	
[B] PUBLIC AREAS					**47,100 SF**
	DINING TERRACE	FOOD & BEVERAGE	0 SF	24,300 SF	
	OUTDOOR POOL	RECREATION	0 SF	14,500 SF	
	OUTDOOR TERRACE	RECREATION	0 SF	8,300 SF	
[C] RESTAURANT/RECEPTION					**38,200 SF**
	RESTAURANT/LOUNGE	FOOD & BEVERAGE	8,300 SF	0 SF	
	DINING TERRACE	FOOD & BEVERAGE	0 SF	4,700 SF	
	LOBBY	RESORT MANAGEMENT	23,200 SF	0 SF	
	OFFICE	RESORT MANAGEMENT	400 SF	0 SF	
	BACK OF HOUSE	RESORT SUPPORT	1,600 SF	0 SF	
GRAND TOTAL					**163,500 SF**

DESCRIPTION

The design aims to provide to all guest and visitors a close to nature and elements experience, but in a conformable and secure environment. Already the wandering roads through the resort to the several hotel components is an experience of nature and wildlife, with unobstructed views and a feeling of freedom. Only in close proximity the buildings smoothly reveal themselves as elements that belong to their surroundings, giving the impression that they have always been there. When entering the building, the guest should feel a change of scenery, however still seamlessly connected to nature, with framed and controlled views of the landscape, dramatic experience of levels, as well as discovering micro environments inside always just one step away from the door or window.

NOTE

Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

0' 75' 150' 300'

ORIGINAL SCALE: 1" = 150'-0"

RED HILL HOTEL | LOWER LEVEL LAND USE PLAN

COLOR LEGEND

INDOOR	OUTDOOR	
		RESORT - PRIMARY
		RESORT - COMMERCIAL
		RESORT - ACCESSORY

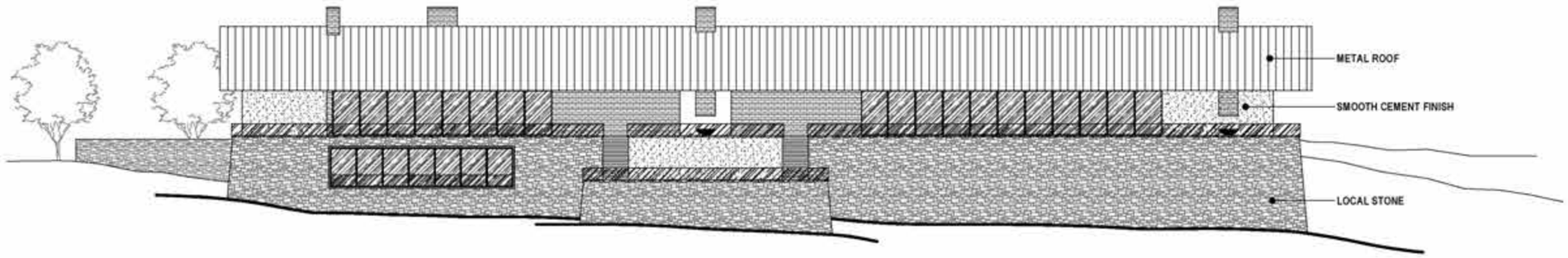
RED HILL HOTEL 4

BUILDING NAME	SPECIFIC USE	GENERAL USE	INDOOR	OUTDOOR	TOTAL
[A] HOTEL					**84,900 SF**
	HOTEL ROOM [22]	HOTEL UNIT	41,300 SF	0 SF	
	LOBBY	RESORT MANAGEMENT	16,100 SF	0 SF	
	BACK OF HOUSE	RESORT SUPPORT	14,000 SF	0 SF	
	MUSIC STUDIO	ENTERTAINMENT	6,800 SF	0 SF	
	OUTDOOR TERRACE	RECREATION	0 SF	6,700 SF	
[C] RESTAURANT/RECEPTION					**17,100 SF**
	RESTAURANT/LOUNGE	FOOD & BEVERAGE	10,300 SF	0 SF	
	OFFICE	RESORT MANAGEMENT	2,500 SF	0 SF	
	BACK OF HOUSE	RESORT SUPPORT	4,300 SF	0 SF	
GRAND TOTAL					**102,100 SF**

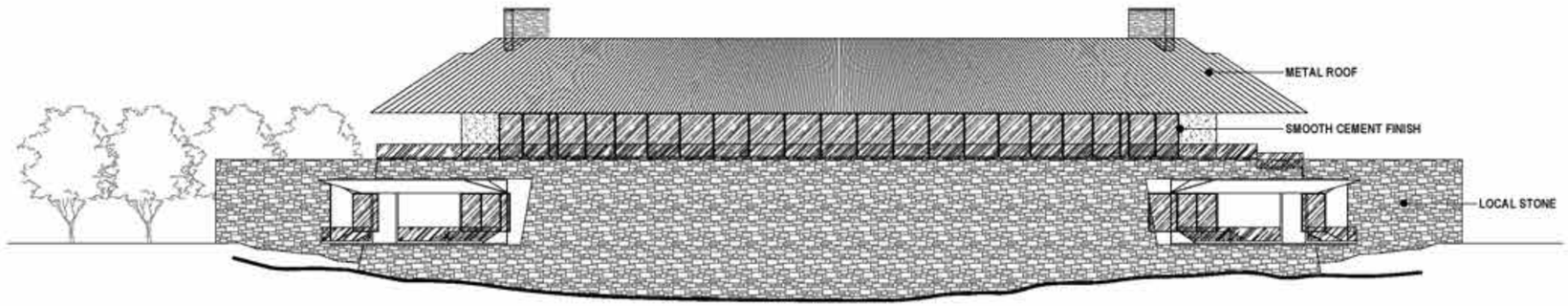
NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

0' 75' 150' 300'

ORIGINAL SCALE: 1" = 150'-0"



ARRIVAL BUILDINGS & SPECIALITY RESTAURANT SOUTH ELEVATION



LODGE RESTAURANT SOUTH ELEVATION

SMOOTH CEMENT FINISH

METAL ROOF

LOCAL STONE

0' 16' 32' 64'

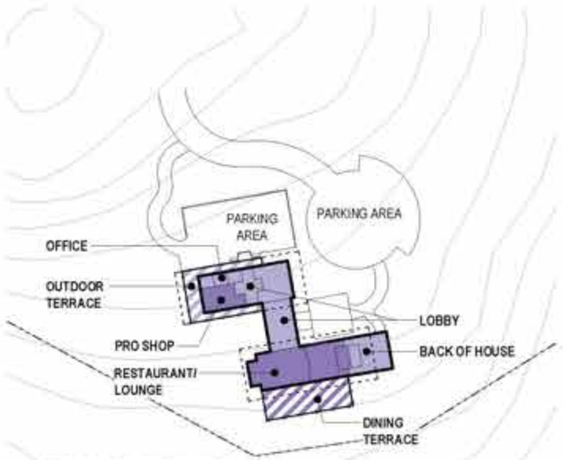
ORIGINAL SCALE: 1/32" = 1'-0"

Renaissance Golf Course - Tom Doak

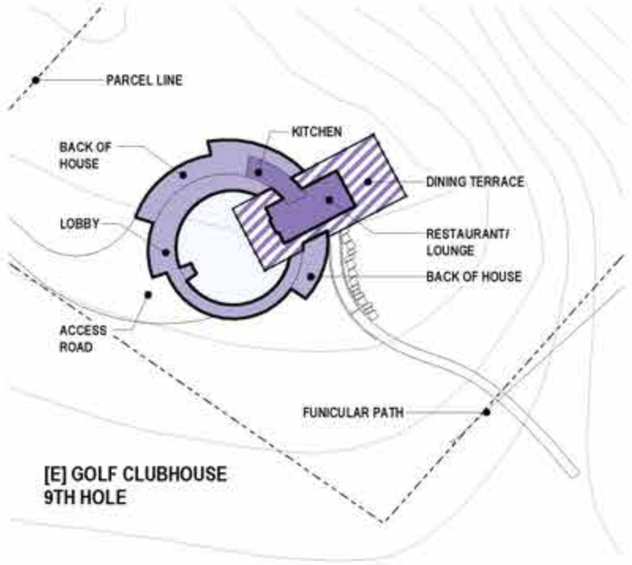
The design of these buildings aims to create harmony with the natural context through the implementation of materials, finishes and careful detailing that carry on the architectural language set forth by the Main Lodge. The first and 18th Golf Clubhouses integrate lounge, bar and dining areas for the use of its members. The clubhouse at the ninth hole is highlighted by sculptural landscape and integrated building form creating a unique event space with views along the cliff line.

The Golf Maintenance buildings, while housing utilitarian and practical support aspects, will reflect the homestead feel of the main back of house program.

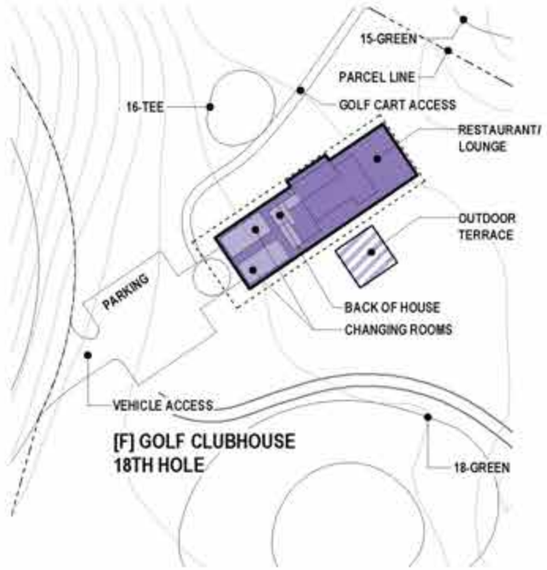
RENAISSANCE GOLF COURSE | CLUBHOUSES & MAINTENANCE LAND USE FLOOR PLANS



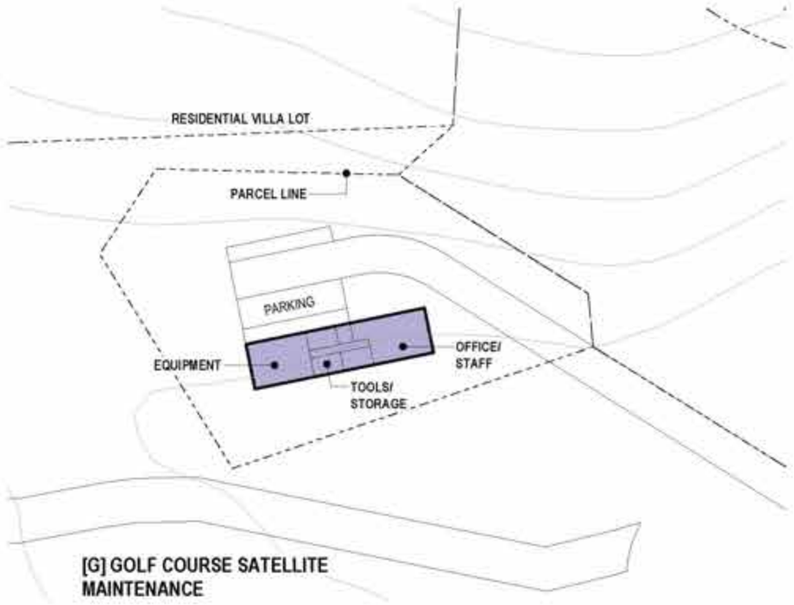
[D] GOLF CLUBHOUSE
1ST HOLE



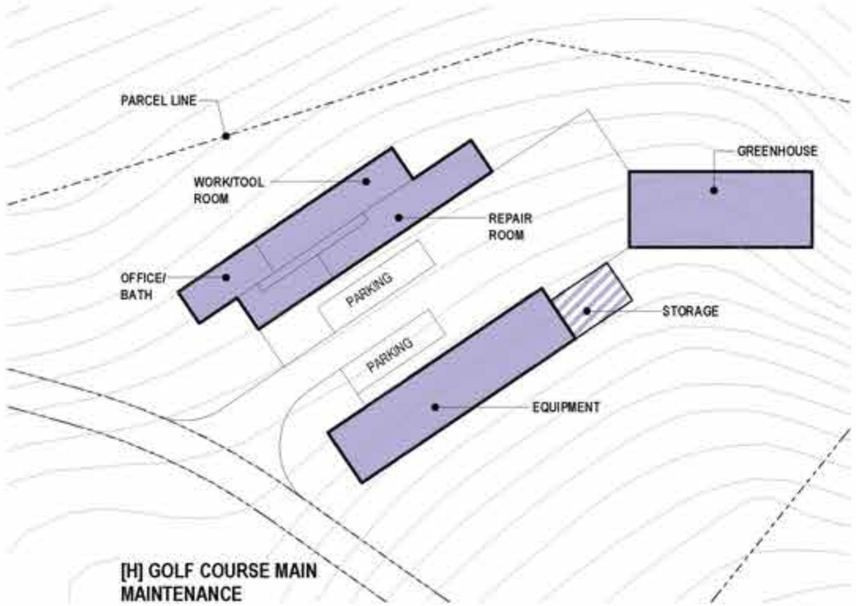
[E] GOLF CLUBHOUSE
9TH HOLE



[F] GOLF CLUBHOUSE
18TH HOLE



[G] GOLF COURSE SATELLITE
MAINTENANCE



[H] GOLF COURSE MAIN
MAINTENANCE

COLOR LEGEND

INDOOR	OUTDOOR	
		RESORT - PRIMARY
		RESORT - COMMERCIAL
		RESORT - ACCESSORY

GOLF CLUBHOUSE 1

BUILDING NAME	SPECIFIC USE	GENERAL USE	INDOOR	OUTDOOR	TOTAL
[D] GOLF CLUBHOUSE 1ST HOLE					6,900 SF
	PRO SHOP	RETAIL	500 SF	0 SF	
	RESTAURANT/LOUNGE	FOOD & BEVERAGE	1,700 SF	0 SF	
	DINING TERRACE	FOOD & BEVERAGE	0 SF	1,300 SF	
	LOBBY	RESORT MANAGEMENT	1,000 SF	0 SF	
	OFFICE	RESORT MANAGEMENT	200 SF	0 SF	
	BACK OF HOUSE	RESORT SUPPORT	500 SF	0 SF	
	CHANGING ROOMS	RECREATION	600 SF	0 SF	
	OUTDOOR TERRACE	RECREATION	0 SF	800 SF	
[E] GOLF CLUBHOUSE 9TH HOLE					14,700 SF
	LOBBY	RESORT MANAGEMENT	2,900 SF	0 SF	
	RESTAURANT/LOUNGE	FOOD & BEVERAGE	1,500 SF	0 SF	
	DINING TERRACE	FOOD & BEVERAGE	0 SF	3,500 SF	
	BACK OF HOUSE	RESORT SUPPORT	2,500 SF	0 SF	
	POND	RECREATION	0 SF	3,600 SF	
	KITCHEN	FOOD & BEVERAGE	600 SF	0 SF	
[F] GOLF CLUBHOUSE 18TH HOLE					6,800 SF
	RESTAURANT/LOUNGE	FOOD & BEVERAGE	4,700 SF	0 SF	
	OFFICE	RESORT MANAGEMENT	100 SF	0 SF	
	BACK OF HOUSE	RESORT SUPPORT	200 SF	0 SF	
	CHANGING ROOMS	RECREATION	1,000 SF	0 SF	
	OUTDOOR TERRACE	RECREATION	0 SF	700 SF	
GRAND TOTAL					28,300 SF

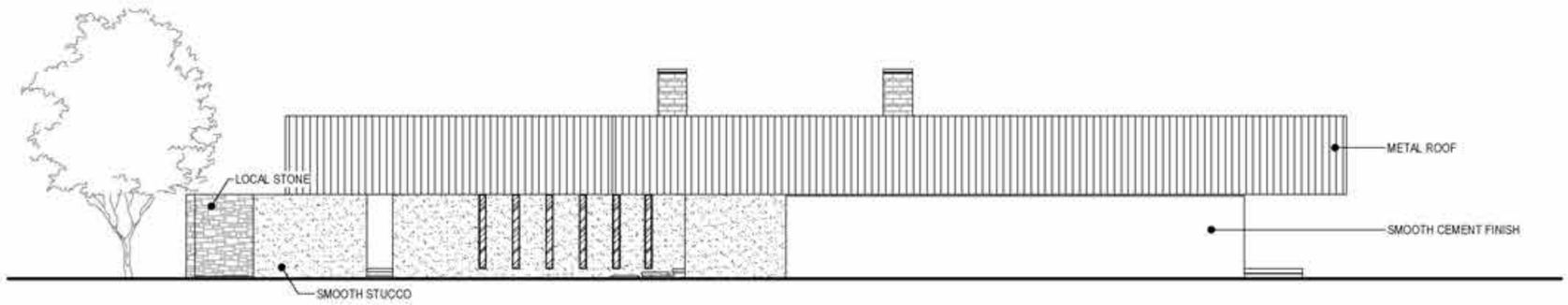
GOLF COURSE MAINTENANCE 1

BUILDING NAME	SPECIFIC USE	GENERAL USE	INDOOR	OUTDOOR	TOTAL
[G] GOLF COURSE SATELLITE MAINTENANCE					4,000 SF
	OFFICE/BATH	RESORT MANAGEMENT	1,800 SF	0 SF	
	EQUIPMENT	RESORT SUPPORT	1,300 SF	0 SF	
	TOOLS/STORAGE	RESORT SUPPORT	800 SF	0 SF	
[H] GOLF COURSE MAIN MAINTENANCE					25,400 SF
	OFFICE/BATH	RESORT MANAGEMENT	3,600 SF	0 SF	
	EQUIPMENT	RESORT SUPPORT	7,500 SF	0 SF	
	GREENHOUSE	RESORT SUPPORT	6,600 SF	0 SF	
	REPAIR ROOM	RESORT SUPPORT	3,200 SF	0 SF	
	STORAGE	RESORT SUPPORT	0 SF	1,500 SF	
	WORK/TOOL ROOM	RESORT SUPPORT	3,000 SF	0 SF	
GRAND TOTAL					29,300 SF

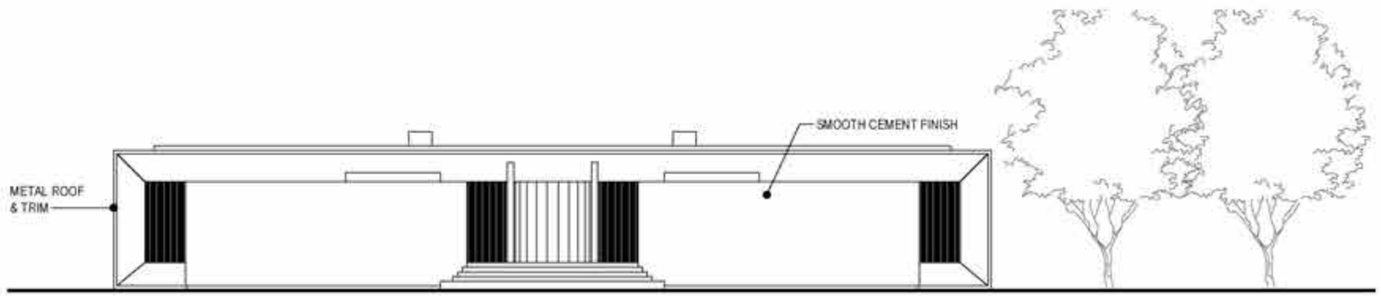
NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

0' 50' 100' 200'

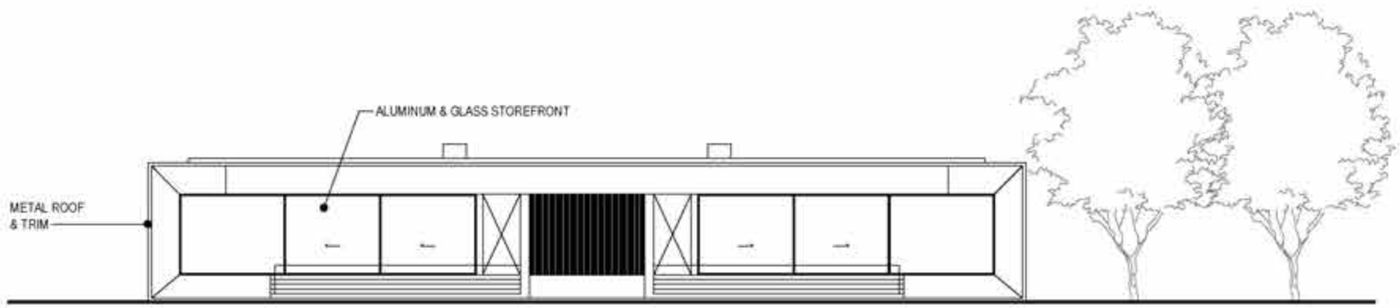
ORIGINAL SCALE: 1" = 100'-0



GOLF CLUBHOUSE 1ST SOUTH ELEVATION



HOTEL ROOM FRONT ELEVATION

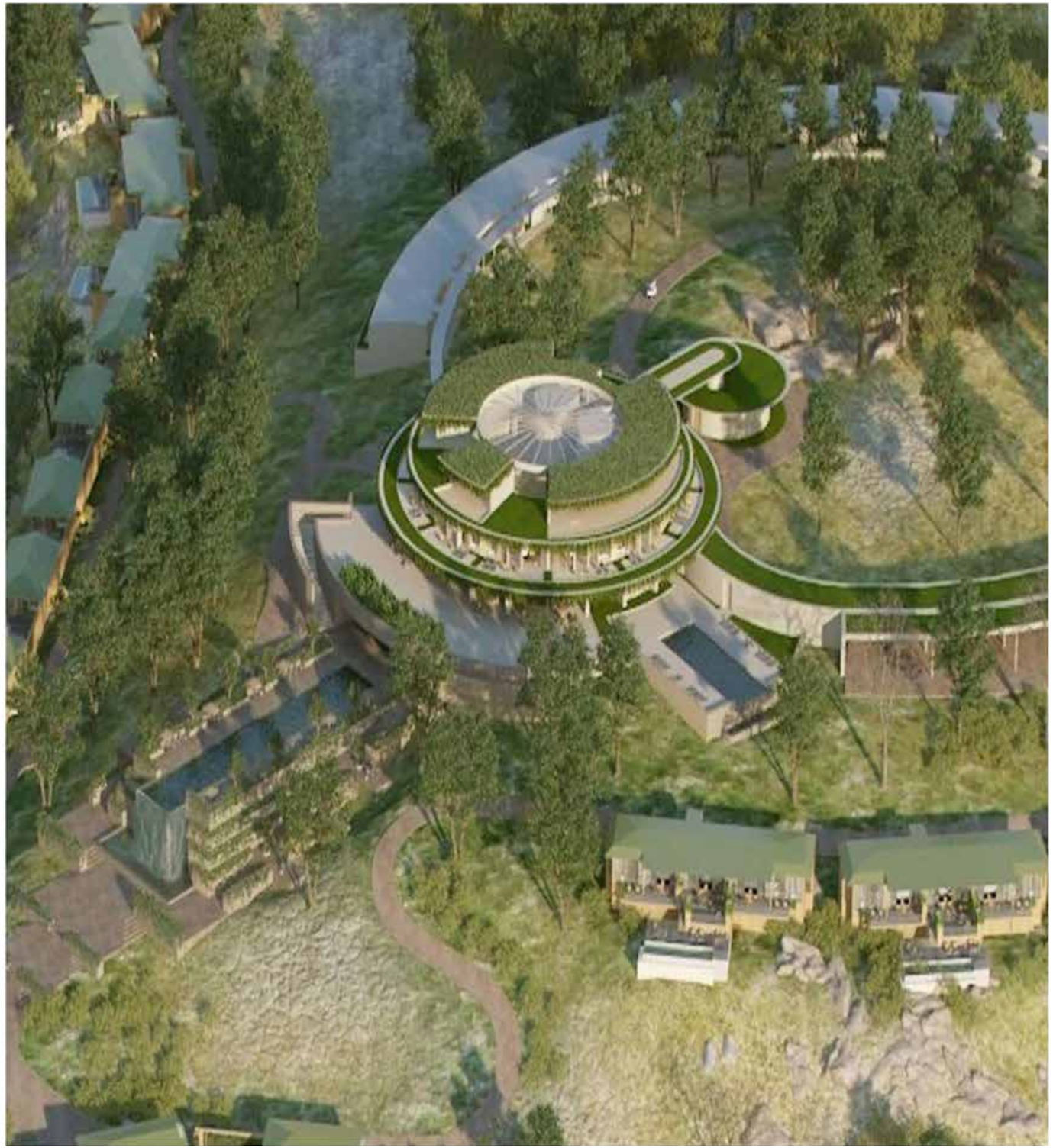


HOTEL ROOM REAR ELEVATION

SMOOTH CEMENT FINISH

METAL ROOF

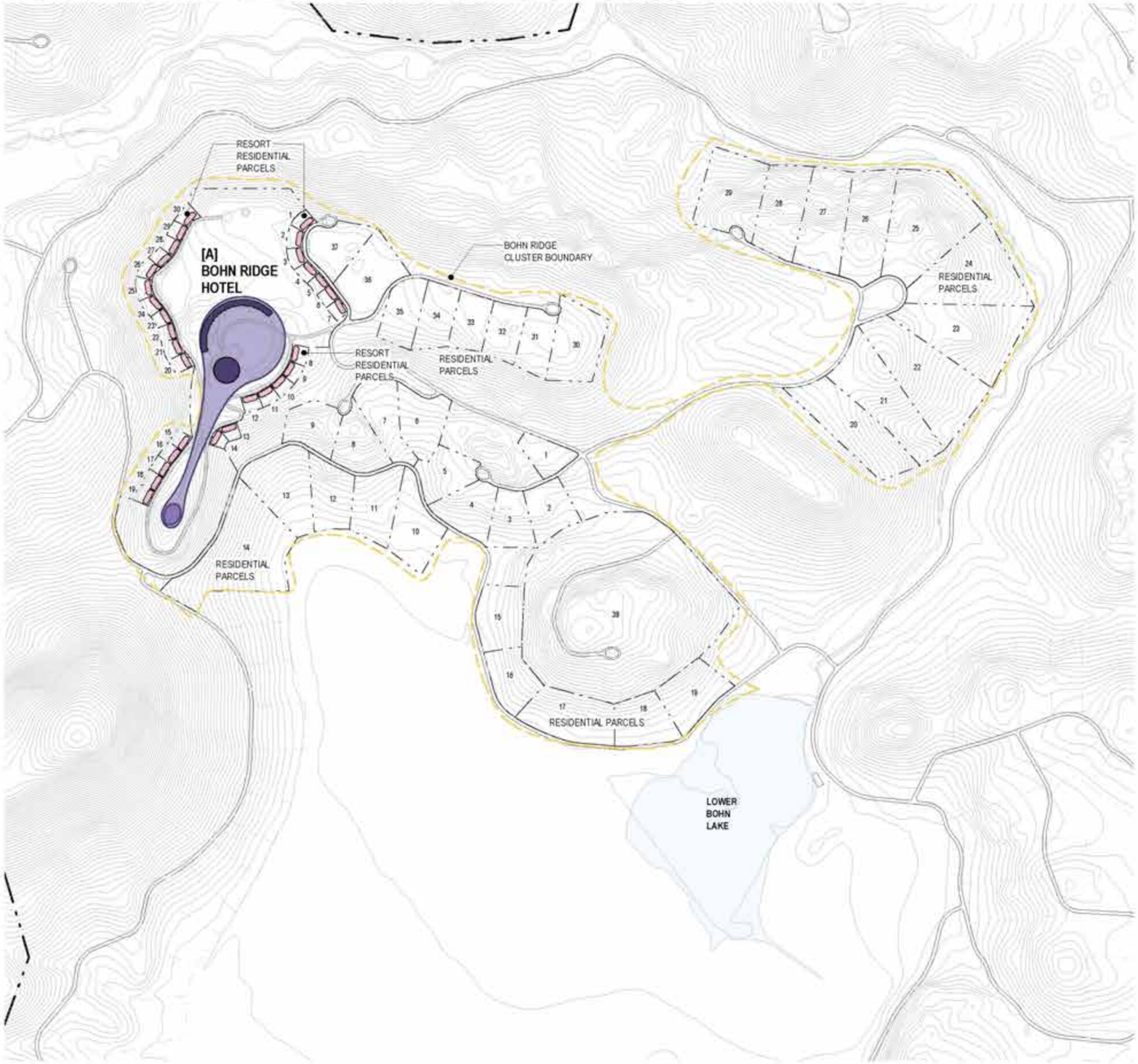
LOCAL STONE



Bohn Ridge Resort - Design Realization

Before the vast beauty of Bohn Ridge and its panoramic views, this architectural cluster adopts the simplicity of barn architecture in shapes, volumes, and the intermingled juxtaposition between indoor and outdoor living spaces. Building footprints are scaled according to the existing geological footprints, minimizing the built form in respect to the site. Low-lying residential resort structures with pitched roofs, planted roofs and stone paved terraces will complement the site.

BOHN RIDGE RESORT | LAND USE CLUSTER MAP



COLOR LEGEND

- RESORT - PRIMARY
- RESORT - COMMERCIAL
- RESORT - ACCESSORY
- RESORT - RESIDENTIAL

CLUSTER USES

31 HOTEL UNITS
30 RESORT RESIDENTIAL UNITS
39 RESIDENTIAL VILLAS

NOTE
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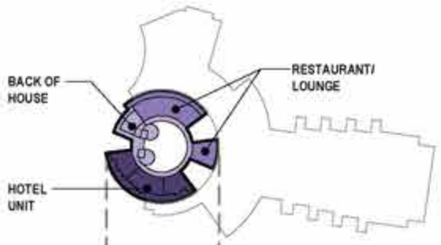
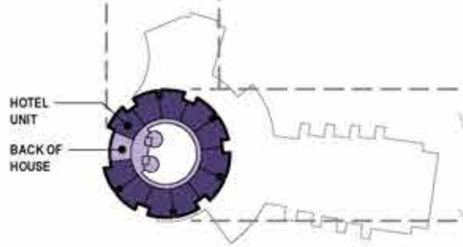
0' 400' 800' 1600'

ORIGINAL SCALE: 1" = 800'-0"

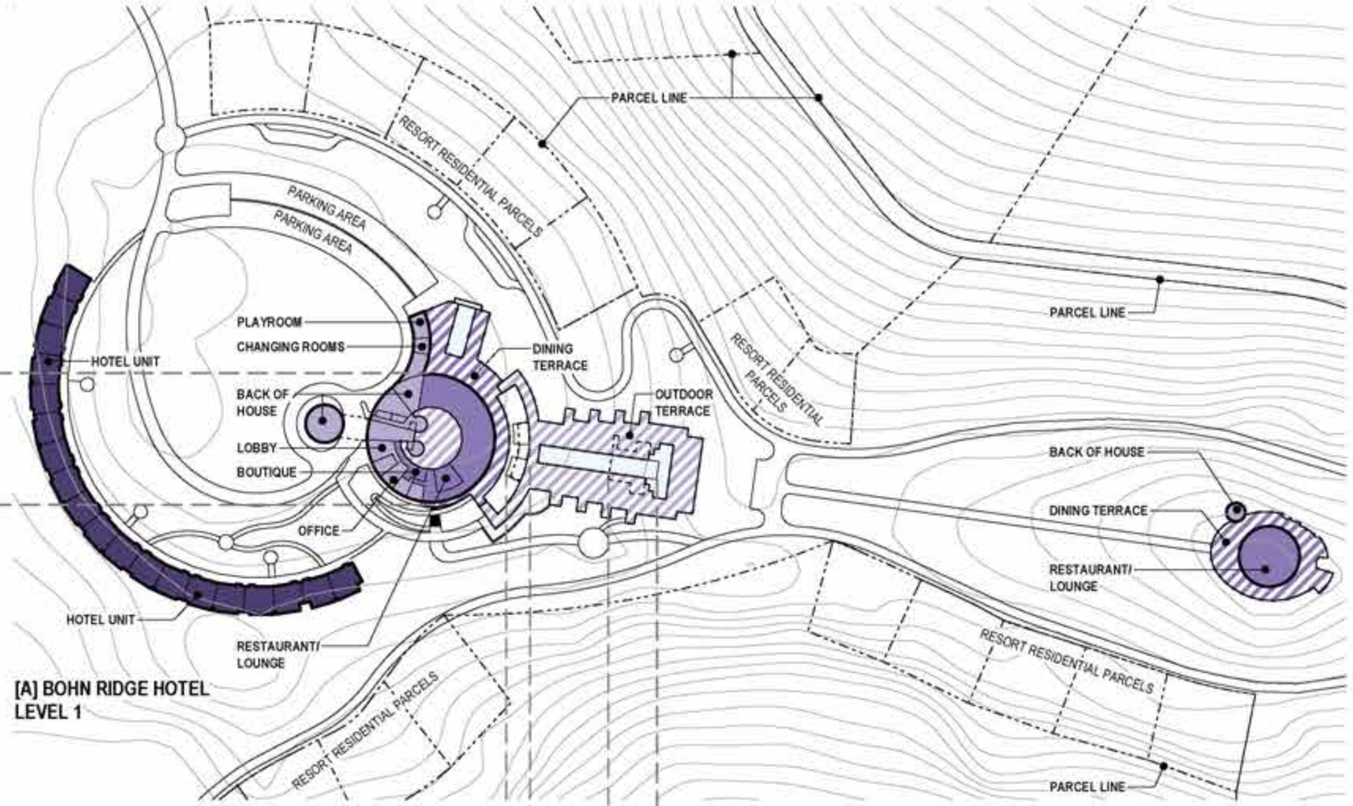
BOHN RIDGE RESORT | LAND USE FLOOR PLANS



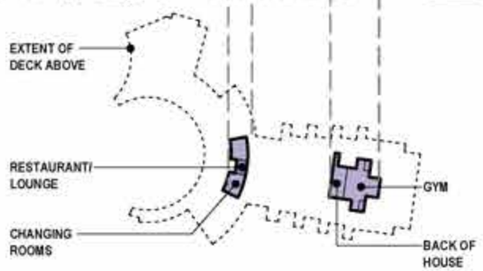
[A] BOHN RIDGE HOTEL
LEVEL 3



[A] BOHN RIDGE HOTEL
LEVEL 2



[A] BOHN RIDGE HOTEL
LEVEL 1



[A] BOHN RIDGE HOTEL
BASEMENT

COLOR LEGEND

INDOOR	OUTDOOR	
		RESORT - PRIMARY
		RESORT - COMMERCIAL
		RESORT - ACCESSORY

BOHN RIDGE

BUILDING NAME	SPECIFIC USE	GENERAL USE	INDOOR	OUTDOOR	TOTAL
[A] BOHN RIDGE HOTEL					
	31 UNITS	HOTEL UNIT	48,500 SF	0 SF	
	BOUTIQUE	RETAIL	900 SF	0 SF	
	RESTAURANT/LOUNGE	FOOD & BEVERAGE	15,300 SF	0 SF	
	DINING TERRACE	FOOD & BEVERAGE	0 SF	10,700 SF	
	LOBBY	RESORT MANAGEMENT	2,800 SF	0 SF	
	OFFICE	RESORT MANAGEMENT	1,300 SF	0 SF	
	BACK OF HOUSE	RESORT SUPPORT	16,700 SF	0 SF	
	PLAYROOM	ENTERTAINMENT	800 SF	0 SF	
	CHANGING ROOMS	RECREATION	1,900 SF	0 SF	
	GYM	RECREATION	2,300 SF	0 SF	
	OUTDOOR POOL	RECREATION	0 SF	7,900 SF	
	OUTDOOR TERRACE	RECREATION	0 SF	29,700 SF	
GRAND TOTAL					138,600 SF

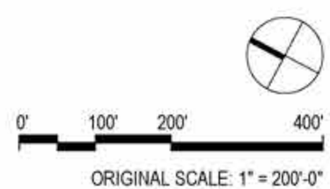
DESCRIPTION

Our approach is to blend with the site and allow the guests to experience a place where interior and exterior spaces are well integrated, either public or private.

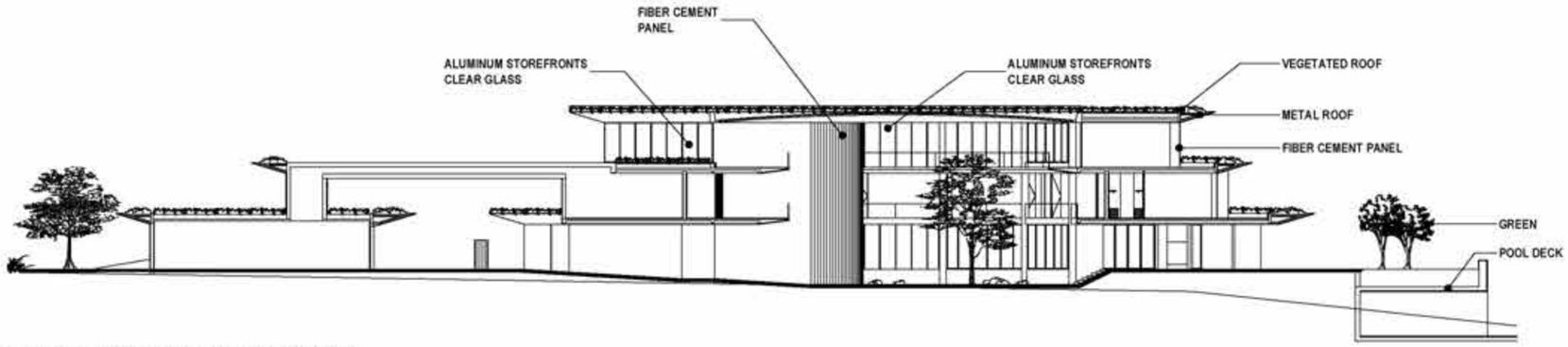
Bohn Ridge Resort is composed of 1 and 2 bedrooms which are snuggled into a beautiful natural landscape following the levels of the terrain, located around a central element which is the core of the hotel and offers 360 degrees sweeping views. The buildings seem to grow out of the hillside in a monolithic way, emphasized by the choice of materials and colors, relating to the site. The various buildings openings onto terraces are the features which best define the essence of the project, ie: allowing the guests to feel part of the nature around. This is because of the natural beauty of the site, hills, trees, rock formations.

NOTE

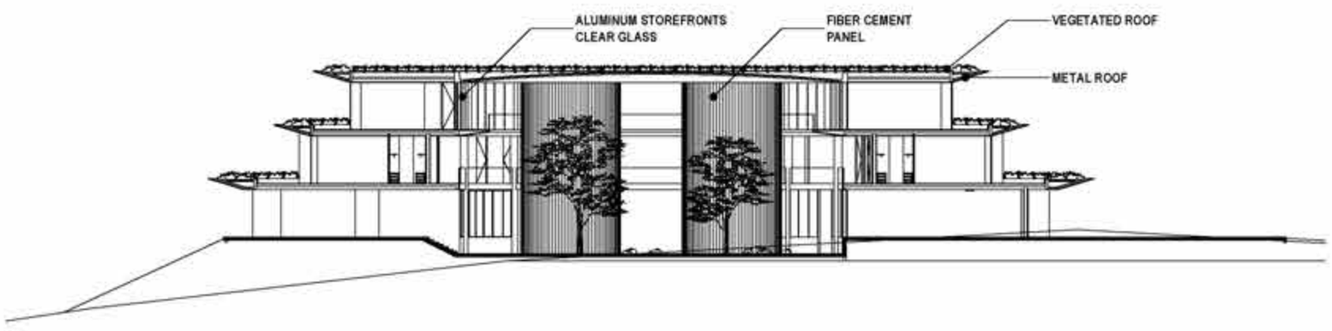
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.



BOHN RIDGE HOTEL | ELEVATIONS



BOHN RIDGE HOTEL WEST-EAST ELEVATION



BOHN RIDGE HOTEL WEST-EAST ELEVATION

0' 16' 32' 64'

ORIGINAL SCALE: 1/32" = 1'-0"

METAL ROOF

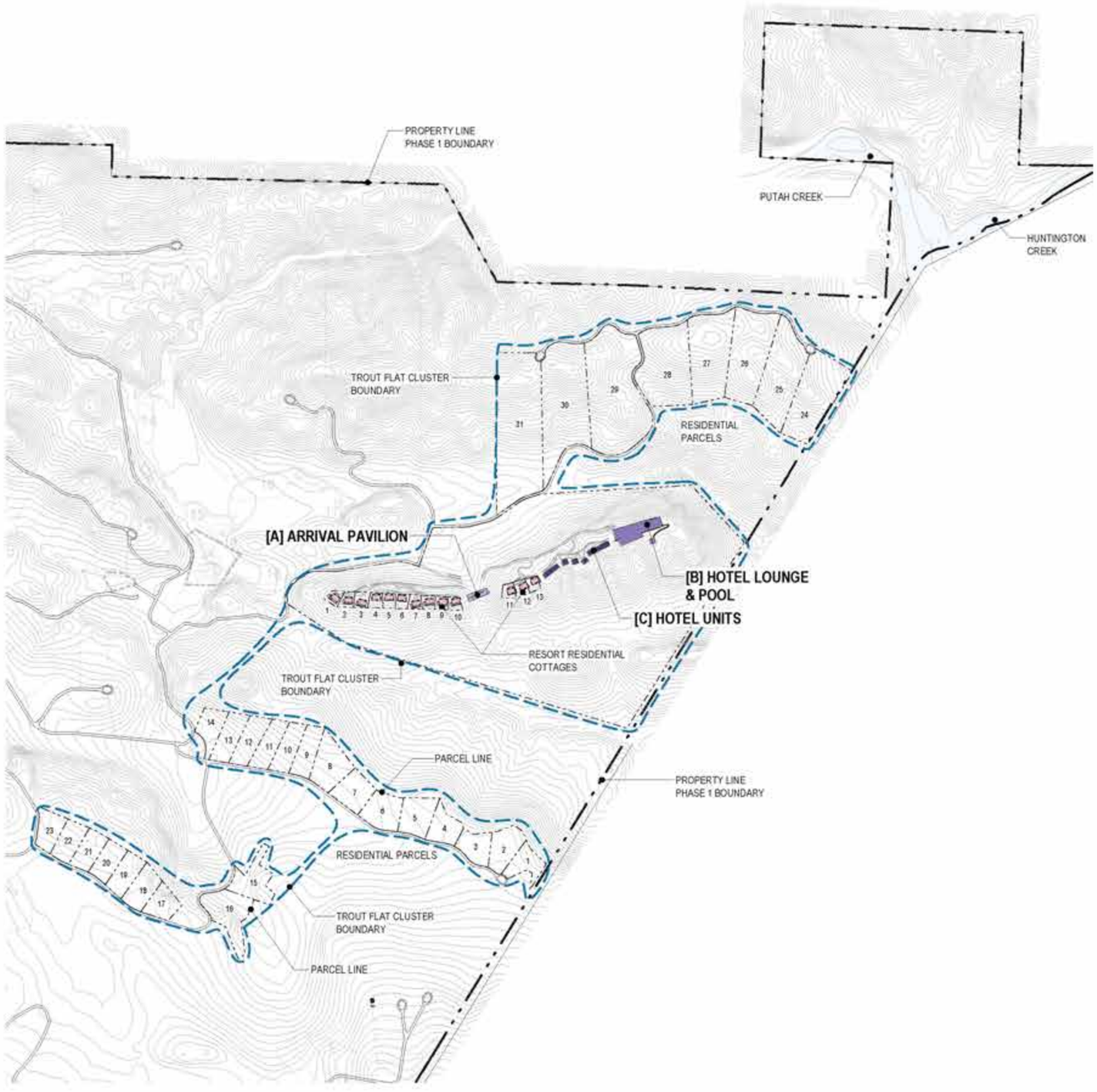
FORMED CONCRETE

HONED STONE

Resort at Trout Flat - Kerry Hill Architects

A cluster of single story pavilions along the ridgeline will overlook vineyards on the Property. Inspired by the concept of a low-impact eco-lodge, the plan positions each building according to existing contours to minimize disturbance to the terrain. Combining stone plinths and rammed earth walls, high ceilings extend the feeling of openness and transparency from the exterior landscape into the interior. This site is detailed by outdoor spaces, a lounge veranda, and dining terrace overlooking a reflection pool.

RESORT AT TROUT FLAT | LAND USE CLUSTER MAP



COLOR LEGEND

- RESORT - PRIMARY
- RESORT - COMMERCIAL
- RESORT - ACCESSORY
- RESORT - RESIDENTIAL

CLUSTER USES

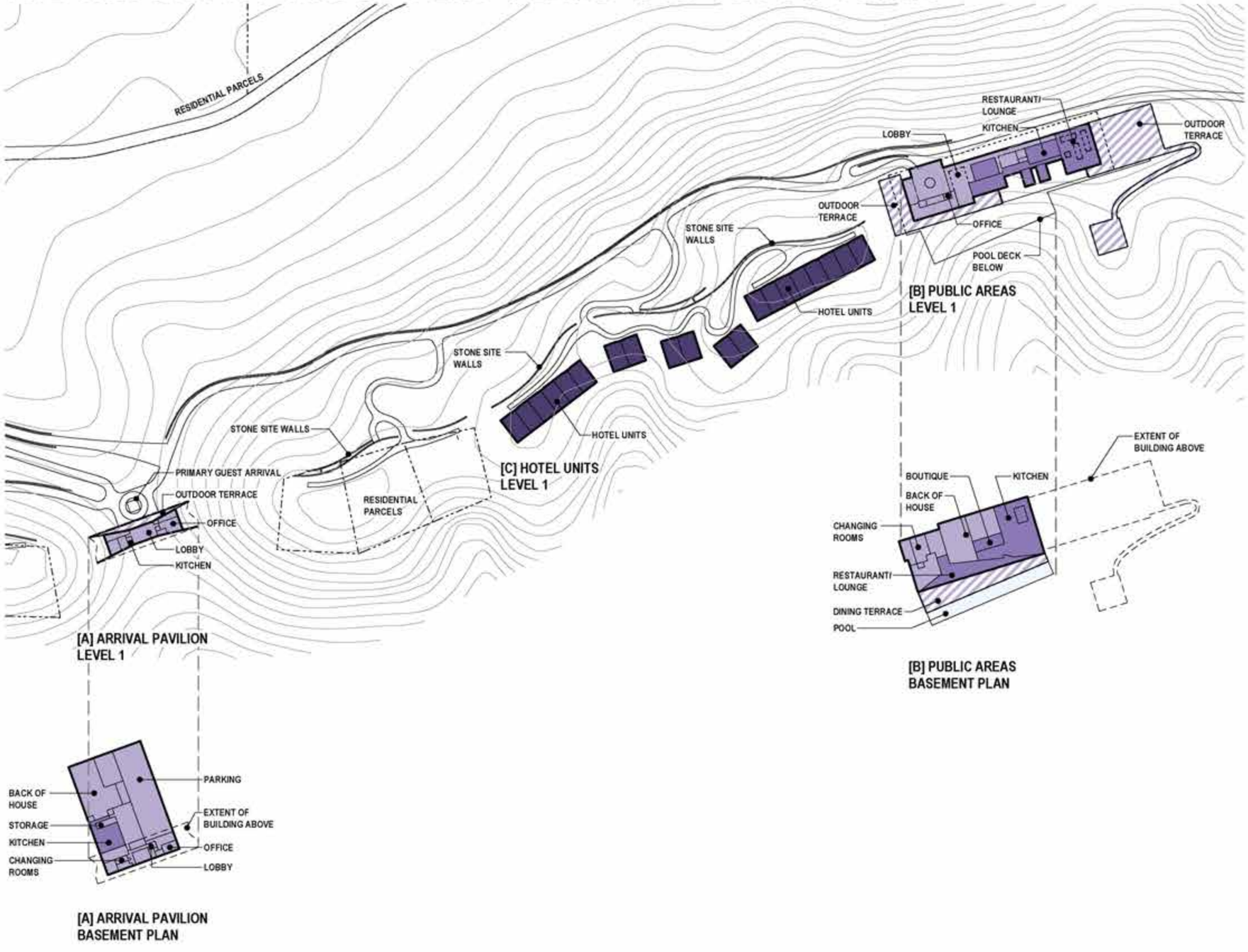
20 HOTEL UNITS
13 RESORT RESIDENTIAL UNITS
31 RESIDENTIAL VILLAS
FACILITIES
[A] ARRIVAL PAVILLION
[B] LOUINGE & POOL

NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

0' 600' 1200' 2400'

ORIGINAL SCALE: 1" = 1200'-0"

THE RESORT AT TROUT FLAT | LAND USE FLOOR PLANS



COLOR LEGEND

INDOOR	OUTDOOR	
		RESORT - PRIMARY
		RESORT - COMMERCIAL
		RESORT - ACCESSORY

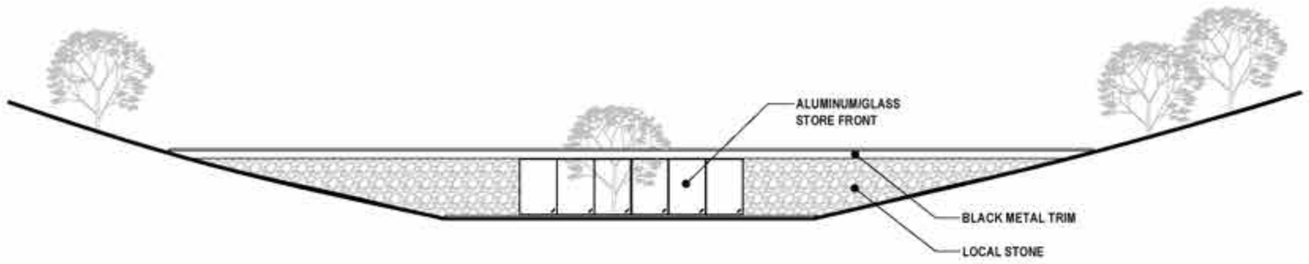
TROUT FLAT HOTEL 1

BUILDING NAME	SPECIFIC USE	GENERAL USE	INDOOR	OUTDOOR	TOTAL
(A) ARRIVAL PAVILON					**39,900 SF**
	KITCHEN	FOOD & BEVERAGE	3,000 SF	0 SF	
	LOBBY	RESORT MANAGEMENT	4,200 SF	0 SF	
	OFFICE	RESORT MANAGEMENT	3,000 SF	0 SF	
	BACK OF HOUSE	RESORT SUPPORT	16,000 SF	0 SF	
	PARKING	RESORT SUPPORT	10,800 SF	0 SF	
	STORAGE	RESORT SUPPORT	500 SF	0 SF	
	CHANGING ROOMS	RECREATION	600 SF	0 SF	
	OUTDOOR TERRACE	RECREATION	0 SF	1,700 SF	
(B) PUBLIC AREAS					**99,500 SF**
	BOUTIQUE	RETAIL	1,300 SF	0 SF	
	KITCHEN	FOOD & BEVERAGE	10,900 SF	0 SF	
	RESTAURANT/LOUNGE	FOOD & BEVERAGE	17,000 SF	0 SF	
	DINING TERRACE	FOOD & BEVERAGE	0 SF	7,800 SF	
	LOBBY	RESORT MANAGEMENT	18,600 SF	0 SF	
	OFFICE	RESORT MANAGEMENT	400 SF	0 SF	
	BACK OF HOUSE	RESORT SUPPORT	7,800 SF	0 SF	
	CHANGING ROOMS	RECREATION	3,000 SF	0 SF	
	OUTDOOR POOL	RECREATION	0 SF	6,900 SF	
	OUTDOOR TERRACE	RECREATION	0 SF	25,800 SF	
(C) HOTEL UNITS					**35,100 SF**
	HOTEL ROOM [20]	HOTEL UNIT	35,100 SF	0 SF	
GRAND TOTAL					**174,600 SF**

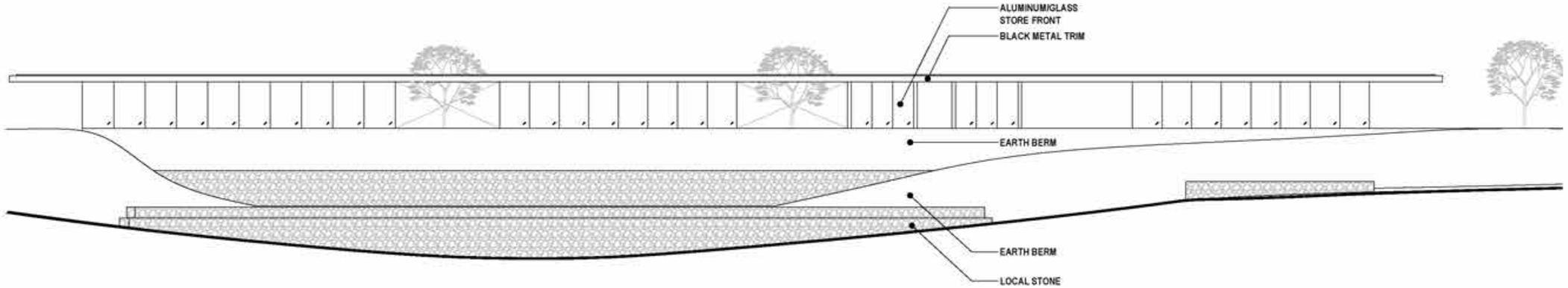
NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

0' 100' 200' 400'

ORIGINAL SCALE: 1" = 200'-0"



ARRIVAL PAVILION NORTH ELEVATION



PUBLIC AREAS SOUTH ELEVATION

ORIGINAL SCALE: 1/32" = 1'-0"

FINISHED CONCRETE

BLACK METAL

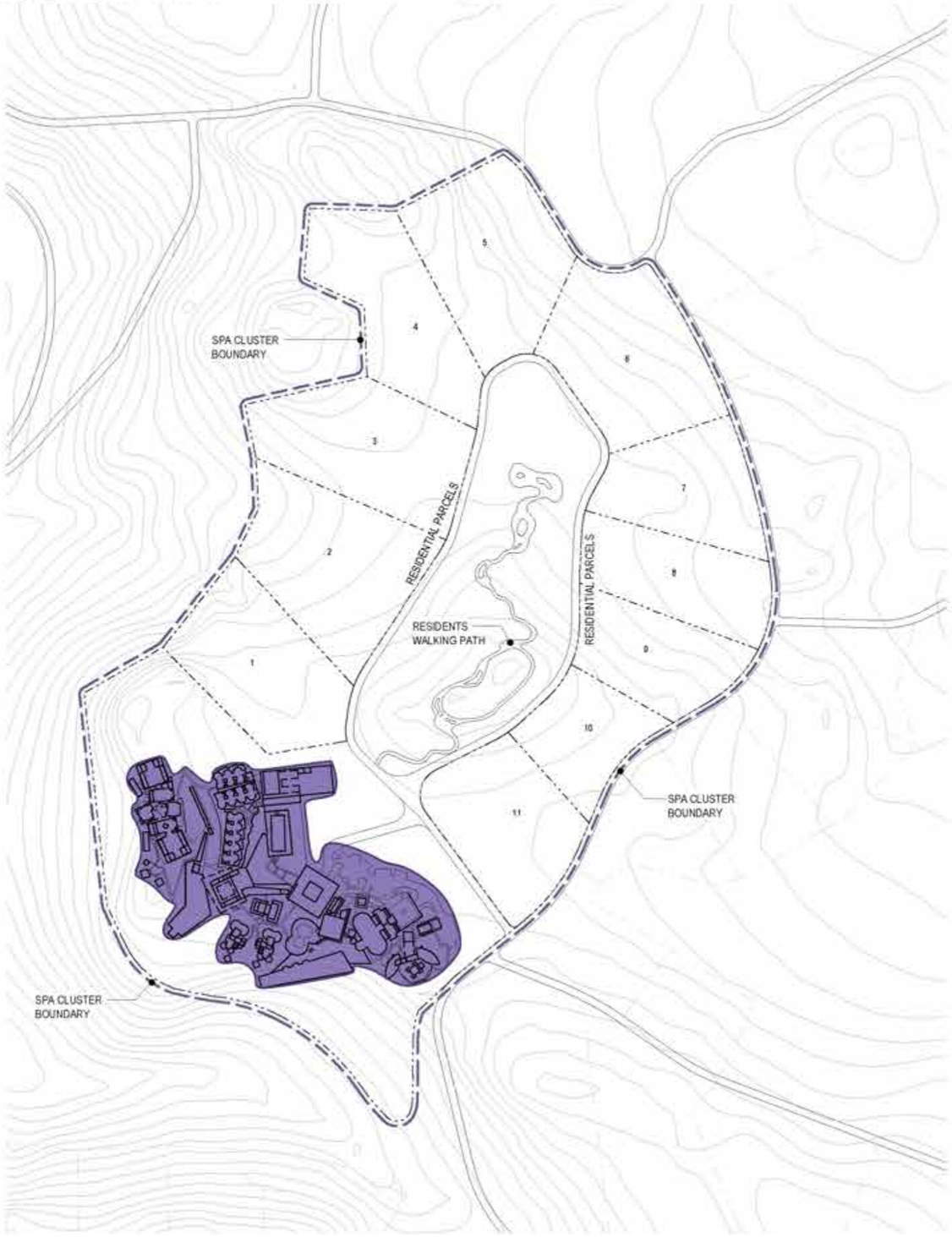
LOCAL STONE

TIMBER

Spa - Bunnag Architects

The celebration of the cultural heritage, which inspired the Veranda and Courtyard, also informs the design of the Spa. The sense of interior and exterior spaces blend into one integrated space. Replacing the traditional concept of architecture defined by a singular space, the spa was designed to embrace both interior and exterior spaces.

SPA | LAND USE CLUSTER MAP



COLOR LEGEND

- RESORT - PRIMARY
- RESORT - COMMERCIAL
- RESORT - ACCESSORY
- RESORT - RESIDENTIAL

CLUSTER USES

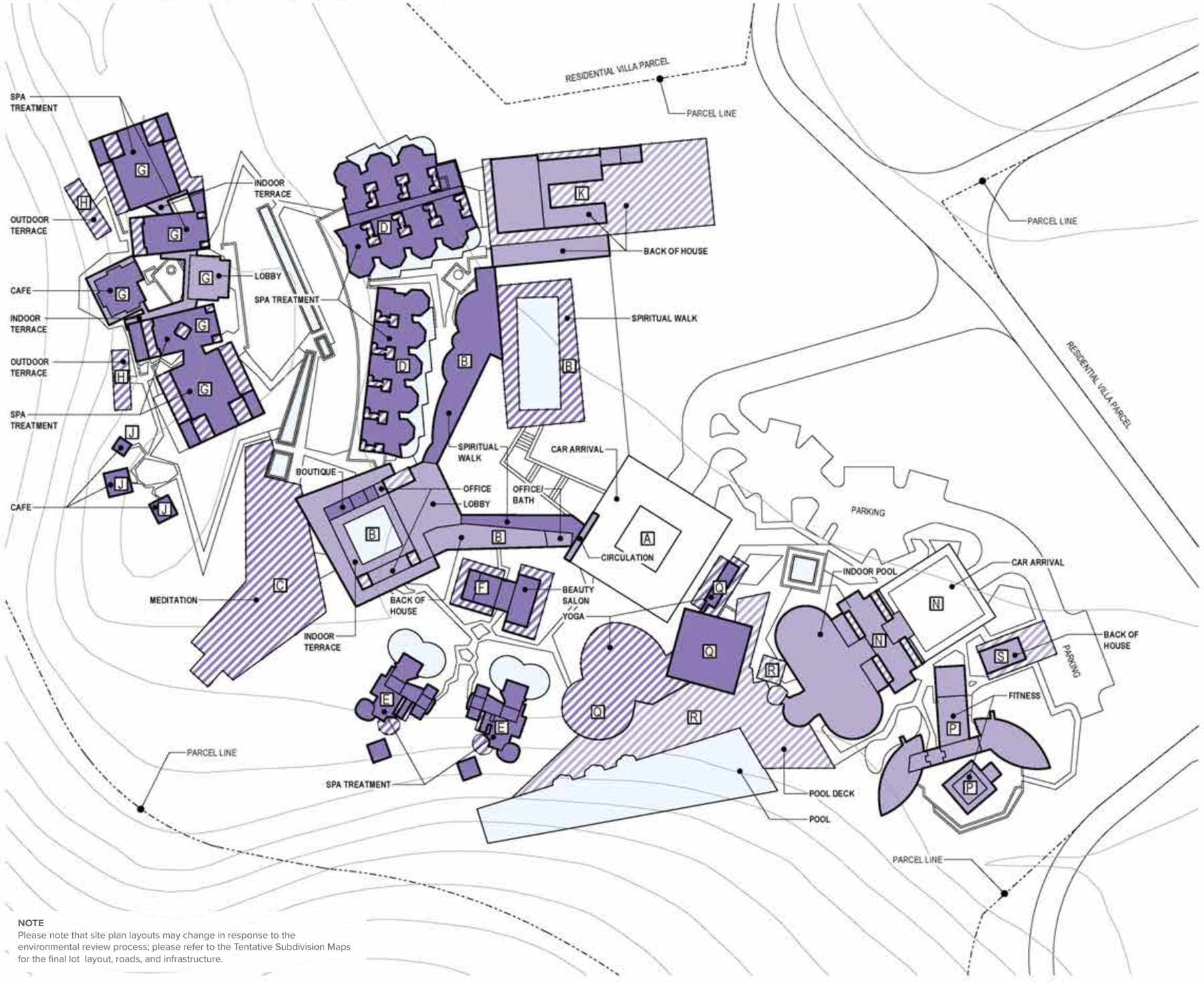
11 *SPA VILLAS*
FACILITIES
SPA
SPA RECREATION

NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

0' 200' 400' 800'

ORIGINAL SCALE: 1" = 400'-0"

SPA | LAND USE FLOOR PLAN



NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

COLOR LEGEND

INDOOR	OUTDOOR	
		RESORT - PRIMARY
		RESORT - COMMERCIAL
		RESORT - ACCESSORY

SPA

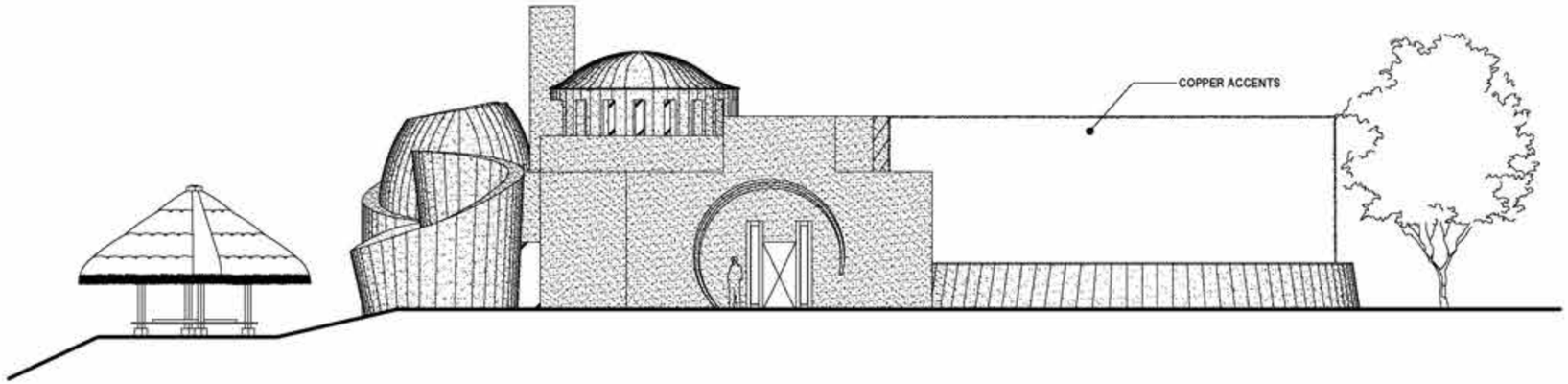
BUILDING NAME	SPECIFIC USE	GENERAL USE	INDOOR	OUTDOOR	TOTAL
[A] CAR ARRIVAL					**400 SF**
	CAR ARRIVAL	RESORT SUPPORT	400 SF	0 SF	
[B] RECEPTION					**38,200 SF**
	BOUTIQUE	RETAIL	800 SF	0 SF	
	POND	HEALTH & BEAUTY	0 SF	7,200 SF	
	SPIRITUAL WALK	HEALTH & BEAUTY	8,400 SF	6,300 SF	
	LOBBY	RESORT MANAGEMENT	4,000 SF	700 SF	
	OFFICE	RESORT MANAGEMENT	800 SF	0 SF	
	OFFICE/BATH	RESORT MANAGEMENT	400 SF	0 SF	
	BACK OF HOUSE	RESORT SUPPORT	2,800 SF	0 SF	
	INDOOR TERRACE	RECREATION	6,900 SF	0 SF	
[C] RAISED GRASS COURT					**16,400 SF**
	MEDITATION	HEALTH & BEAUTY	0 SF	16,400 SF	
[D] STANDARD TREATMENT					**26,600 SF**
	POND	HEALTH & BEAUTY	0 SF	4,900 SF	
	SPA TREATMENT	HEALTH & BEAUTY	18,900 SF	2,700 SF	
[E] DELUXE TREATMENT					**11,200 SF**
	POND	HEALTH & BEAUTY	0 SF	3,400 SF	
	SPA TREATMENT	HEALTH & BEAUTY	6,800 SF	900 SF	
[F] BEAUTY SALON					**5,000 SF**
	BEAUTY SALON	HEALTH & BEAUTY	2,800 SF	2,300 SF	
[G] DAY SPA & JUICE BAR					**27,400 SF**
	CAFE	FOOD & BEVERAGE	1,900 SF	0 SF	
	SPA TREATMENT	HEALTH & BEAUTY	15,700 SF	5,400 SF	
	LOBBY	RESORT MANAGEMENT	1,800 SF	0 SF	
	INDOOR TERRACE	RECREATION	2,500 SF	0 SF	
[H] RELAXATION TERRACE					**2,100 SF**
	INDOOR TERRACE	HEALTH & BEAUTY	0 SF	1,100 SF	
	OUTDOOR TERRACE	HEALTH & BEAUTY	0 SF	1,100 SF	
[J] TEA PAVILLION					**1,300 SF**
	CAFE	FOOD & BEVERAGE	1,300 SF	0 SF	
[K] BACK OF HOUSE 1					**20,700 SF**
	BACK OF HOUSE	RESORT SUPPORT	10,400 SF	10,400 SF	
[N] INDOOR POOL					**15,800 SF**
	INDOOR POOL	RECREATION	14,600 SF	1,200 SF	
[P] PILATES					**10,100 SF**
	FITNESS	RECREATION	10,100 SF	0 SF	
[Q] YOGA PAVILLION					**16,500 SF**
	YOGA	HEALTH & BEAUTY	5,900 SF	10,600 SF	
[R] OUTDOOR POOL					**32,100 SF**
	OUTDOOR POOL	RECREATION	0 SF	16,700 SF	
	POOL DECK	RECREATION	0 SF	15,400 SF	
[S] BACK OF HOUSE 2					**2,600 SF**
	BACK OF HOUSE	RESORT SUPPORT	1,000 SF	1,600 SF	
GRAND TOTAL					**228,800 SF**

DESCRIPTION
With an aim to harmonize our design interventions to the existing environment, we propose a variety of "pure geometrical form and space" as a series of "small pavilions" amongst landscape. This approach allows Architecture to be more adaptable and flexible to assimilate into the existing delicate environment. It is a soft-design-approach that we believe will ensure minimum disruptive impact to the timeless beauty of the Region's land and culture.

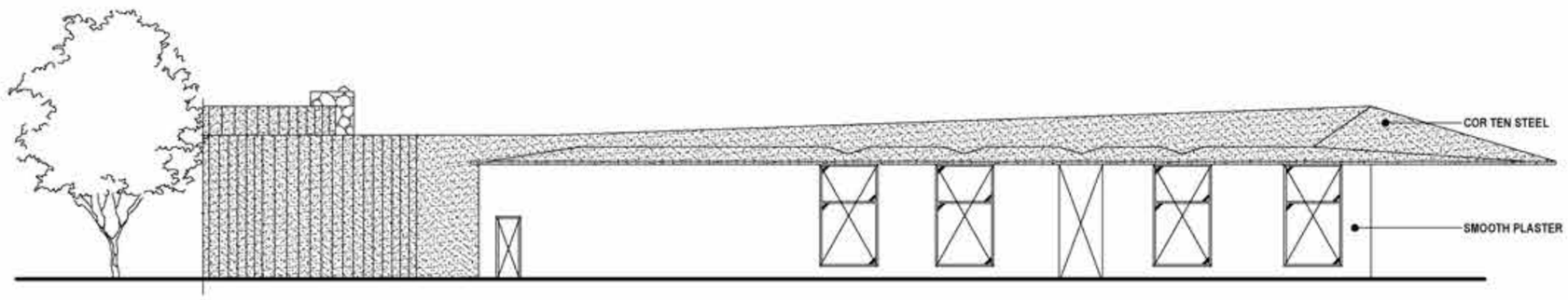
0' 50' 100' 200'

ORIGINAL SCALE: 1" = 100'-0"

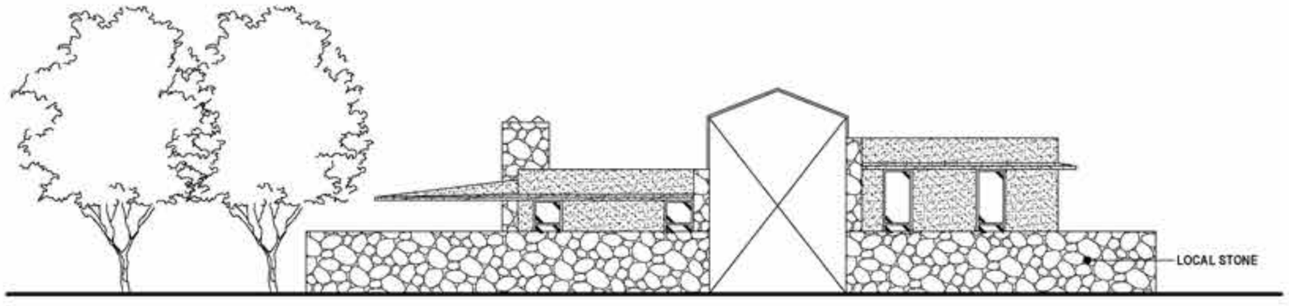
SPA | ELEVATIONS



DELUXE DOUBLE TREATMENT PAVILION WEST ELEVATION



SPA RECEPTION NORTH ELEVATION



BEAUTY SALON PAVILION SOUTH ELEVATION

0' 8' 16' 32'

ORIGINAL SCALE: 1/16" = 1'-0"

COPPER ACCENTS

COR TEN STEEL

LOCAL STONE

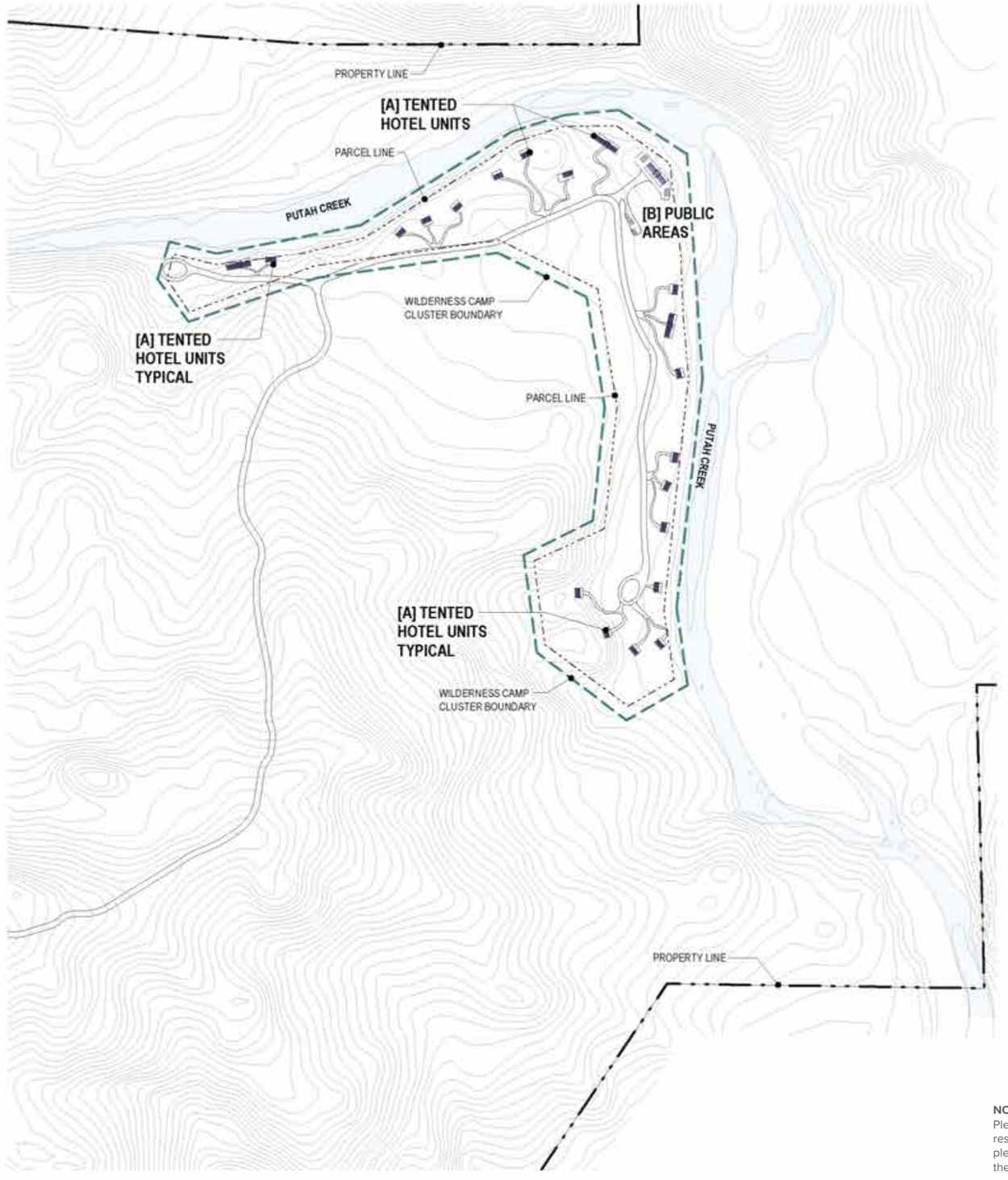
SMOOTH PLASTER

TENTED CAMP AREA

Tented Camp Area - Jan Kortland

The property will feature an escape within the most remote area of the property. Surrounded by the beauty of Lake County rolling hills and streams, the project includes a request for a series of tented campsites and limited accessory structures. This area will offer a seasonal opportunity for a limited number of guests.

TENTED CAMP AREA | LAND USE CLUSTER MAP



COLOR LEGEND

- RESORT - PRIMARY
- RESORT - COMMERCIAL
- RESORT - ACCESSORY
- RESORT - RESIDENTIAL

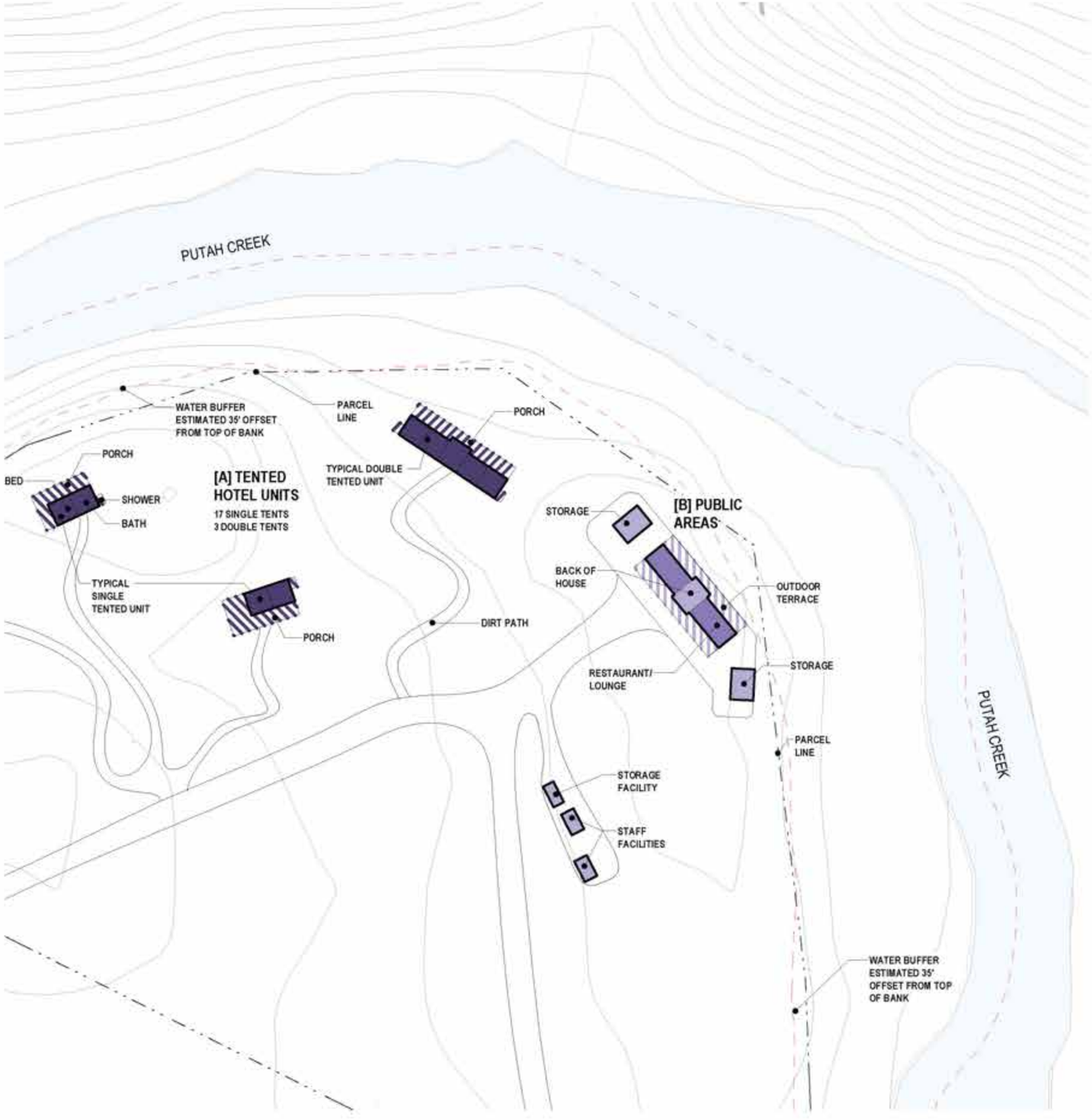
CLUSTER USES

20 [A] HOTEL UNITS
[B] PUBLIC AREAS
COMMUNAL DINNING
SUPPORT FACILITIES

NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

0' 150' 300' 600'
ORIGINAL SCALE: 1" = 500'-0"

WILDERNESS CAMP | LAND USE FLOOR PLAN



COLOR LEGEND

INDOOR	OUTDOOR	
		RESORT - PRIMARY
		RESORT - COMMERCIAL
		RESORT - ACCESSORY

TENTED CAMP

BUILDING NAME	SPECIFIC USE	GENERAL USE	INDOOR	OUTDOOR	TOTAL
[A] TENTED HOTEL					36,400 SF
	TENTED HOTEL UNIT [20]	HOTEL UNIT	23,000 SF	13,400 SF	
[B] PUBLIC AREAS					6,800 SF
	RESTAURANT/LOUNGE	FOOD & BEVERAGE	1,800 SF	0 SF	
	BACK OF HOUSE	RESORT SUPPORT	1,800 SF	2,500 SF	
	STAFF FACILITY	RESORT SUPPORT	500 SF	0 SF	
	STORAGE FACILITY	RESORT SUPPORT	200 SF	0 SF	
GRAND TOTAL					43,200 SF

NOTE
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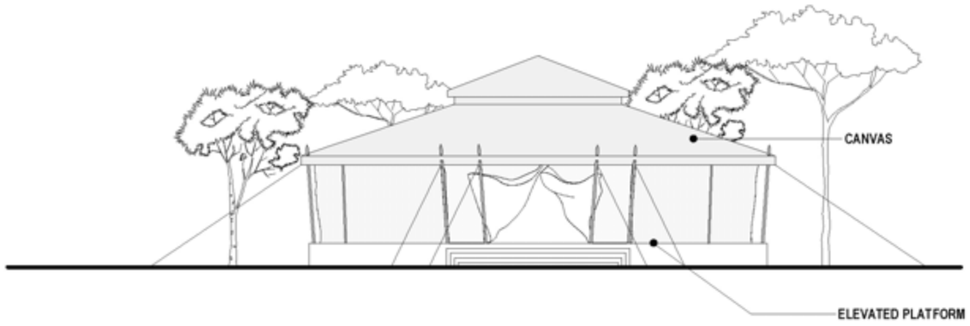
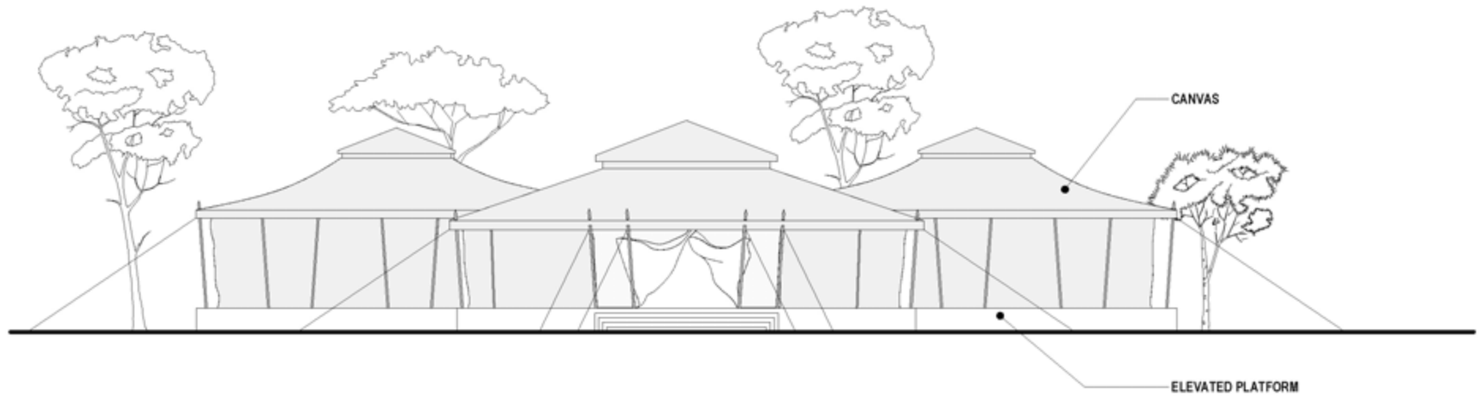
0' 50' 100' 200'
ORIGINAL SCALE: 1" = 100'-0"



SINGLE TENT ELEVATION

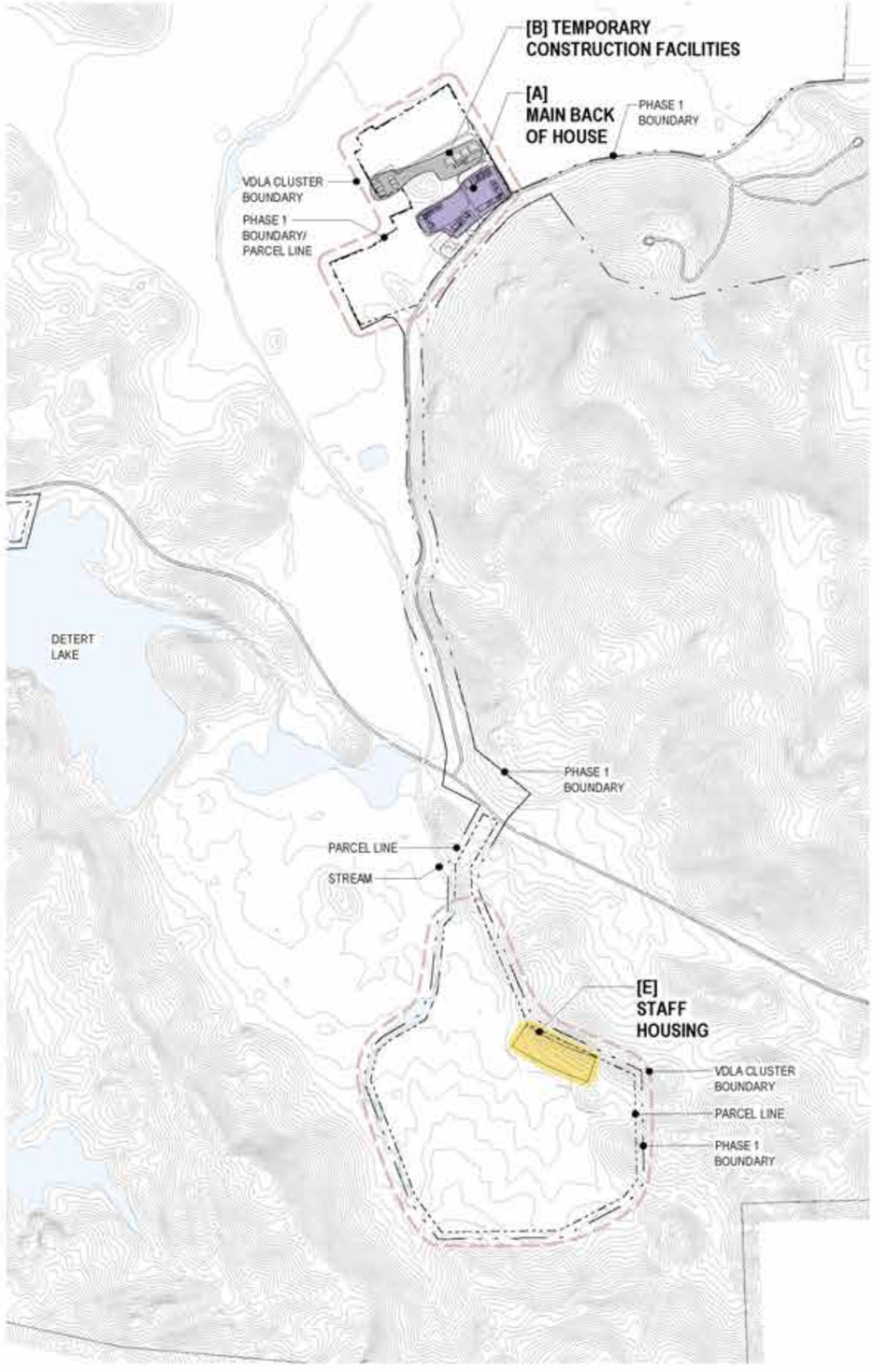


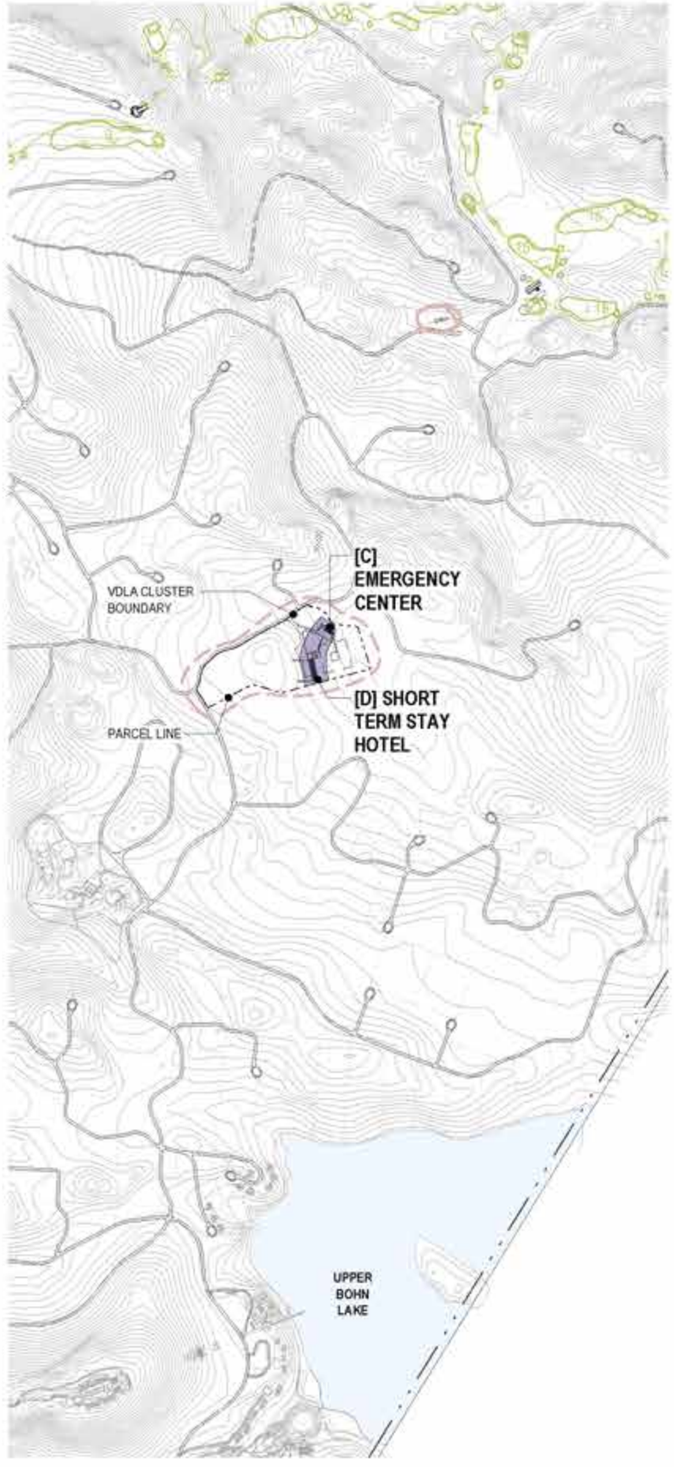
DOUBLE TENT ELEVATION

0' 16' 32' 64'

ORIGINAL SCALE: 1/32" = 1'-0"

SUPPORTING FACILITIES | LAND USE CLUSTER MAPS





COLOR LEGEND

- RESORT - PRIMARY
- RESORT - COMMERCIAL
- RESORT - ACCESSORY
- RESORT - RESIDENTIAL
- RESIDENTIAL - PRIMARY

CLUSTER USES

FACILITIES
- *[A] MAIN BACK OF HOUSE*
- *[B] TEMPORARY CONSTRUCTION FACILITIES*
- *[C] EMERGENCY CENTER*
- *[D] SHORT TERM STAY HOTEL*
- *[E] STAFF HOUSING*

Supporting Facilities | Verse Design LA

The various hotel clusters will be supported by multiple facilities. Workforce housing is designed to be flexible depending on employee demographics. In addition, there is an opportunity for short term overnight stays for employees and guest staff. Most importantly, a strategically placed emergency response center includes a fire response center, emergency medical staff, and a helipad dedicated for emergency purposes. Lastly, for guests choosing to arrive via a float plane or helicopter there is a welcome kiosk and arrival center located conveniently accessed directly from Butts Canyon Road.

NOTE
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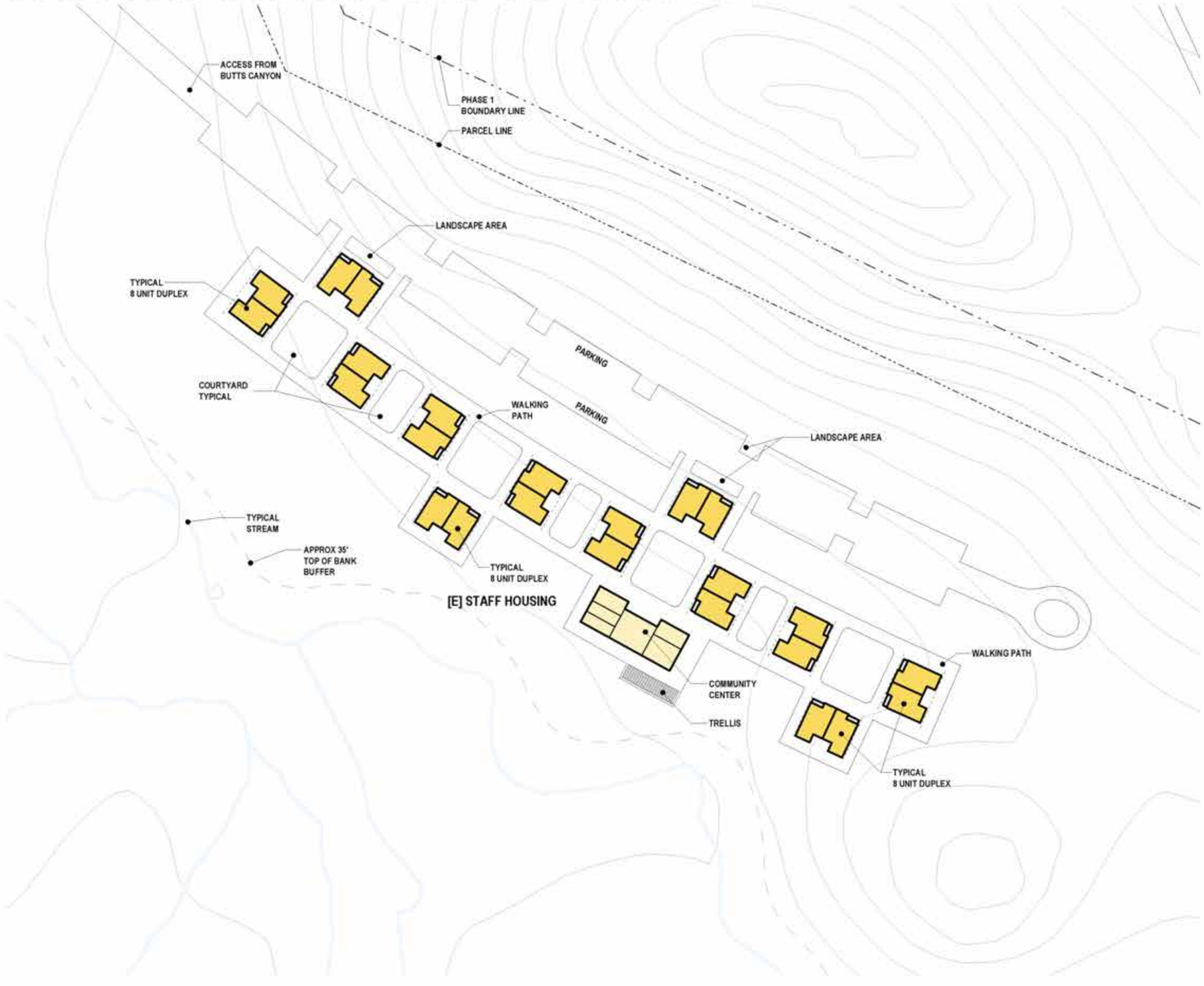
0' 9000' 18000' 36000'
ORIGINAL SCALE: 1" = 1800'-0"

Workforce Housing*

Land and housing costs continue to rise in response to wildfires, economic trends over the past decade, and in particular the demand for housing. Housing, homeownership, and renting has become more expensive throughout Northern California and within the County of Lake. The majority of housing available within the County is limited. Infill housing is a means of providing new housing stock in an area already proximate to public infrastructure. In conjunction with the resort development within Guenoc Valley, The project proposes a mixture of on-and off-site workforce housing for employees. This development will blend into the surrounding area offering ranch-style farmhouse exteriors, maintaining quality architecture, and reflecting positively the surrounding neighborhoods and the character of Lake County.

*Note: A housing unit is defined as a 400 sq. foot bedroom and bathroom. Our proposal indicated workforce housing to be designed as co-living housing structures, built in single-family style residency, with accessory dwelling units. We are proposing 50 parcels to be located off-site at a previously subdivided parcel in Middletown and 35 parcels with residences on-site off of the west side of Butts Canyon Rd.

WORKFORCE HOUSING | LAND USE FLOOR PLAN



COLOR LEGEND

- RESIDENTIAL - PRIMARY
- RESIDENTIAL - ACCESSORY

[E] STAFF HOUSING & COMMUNITY CENTER

BUILDING NAME	SPECIFIC USE	GENERAL USE	INDOOR	OUTDOOR	TOTAL
STAFF HOUSING					48,000 SF
	HOUSE [24]	RESIDENTIAL	2,000 SF	0 SF	
	* CO-HOUSING UNITS [98]				
COMMUNITY CENTER					4,100 SF
	COMMUNITY CENTER	RESIDENTIAL SUPPORT	4,100 SF	0 SF	
GRAND TOTAL					52,100 SF

NOTE
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0' 50' 100' 200'

ORIGINAL SCALE: 1" = 100'-0"

1ST FLOOR PLAN

2ND FLOOR PLAN

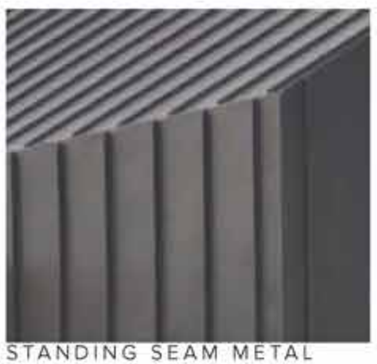
STAFF HOUSING ELEVATION

ORIGINAL SCALE: 1/16" = 1'-0"

HARDWOOD FLOORING

COR TEN STEEL

WOOD SIDING



STANDING SEAM METAL

EMERGENCY CENTER & SHORT TERM STAY | LAND USE FLOOR PLAN

COLOR LEGEND

INDOOR	OUTDOOR	
		RESORT - PRIMARY
		RESORT - COMMERCIAL
		RESORT - ACCESSORY

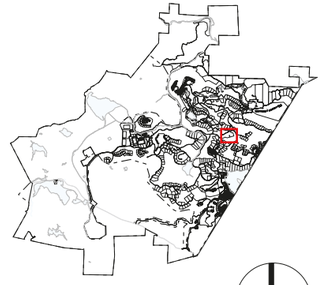
EMERGENCY CENTER AND ENTOURAGE HOUSING 1

BUILDING NAME	SPECIFIC USE	GENERAL USE	INDOOR	OUTDOOR	TOTAL
[C] EMERGENCY CENTER					17,200 SF
	BATHROOM	RESORT SUPPORTING	300 SF	0 SF	
	CIRCULATION	RESORT SUPPORTING	800 SF	0 SF	
	DAYROOM	RESORT SUPPORTING	2,000 SF	0 SF	
	DORM	RESORT SUPPORTING	1,000 SF	0 SF	
	ENGINE AREA	RESORT SUPPORTING	8,800 SF	0 SF	
	GYM	RESORT SUPPORTING	500 SF	0 SF	
	HOSE STORAGE	RESORT SUPPORTING	100 SF	0 SF	
	LAUNDRY	RESORT SUPPORTING	200 SF	0 SF	
	LOCKERS	RESORT SUPPORTING	200 SF	0 SF	
	MECH/ELEC	RESORT SUPPORTING	200 SF	0 SF	
	MEDICAL EXAM	RESORT SUPPORTING	200 SF	0 SF	
	MEDICAL OFFICE	RESORT SUPPORTING	200 SF	0 SF	
	MEETING ROOM	RESORT MANAGEMENT	500 SF	0 SF	
	OFFICE	RESORT MANAGEMENT	400 SF	0 SF	
	OUTDOOR PATIO	RESORT SUPPORTING	0 SF	600 SF	
	PPE STORAGE	RESORT SUPPORTING	200 SF	0 SF	
	RESTROOM	RESORT SUPPORTING	200 SF	0 SF	
	SHOP MAINT	RESORT SUPPORTING	300 SF	0 SF	
	STORAGE	RESORT SUPPORTING	200 SF	0 SF	
	TRASH	RESORT SUPPORTING	300 SF	0 SF	
[D] SHORT TERM STAFF HOUSING					28,700 SF
	HOTEL ROOM [50]	HOTEL UNIT	22,200 SF	0 SF	
	RESTAURANT/LOUNGE	FOOD & BEVERAGE	1,000 SF	0 SF	
	MEETING ROOM	RESORT MANAGEMENT	300 SF	0 SF	
	OFFICE/BATH	RESORT MANAGEMENT	2,300 SF	0 SF	
	RECEPTION	RESORT MANAGEMENT	700 SF	0 SF	
	BACK OF HOUSE	RESORT SUPPORTING	1,500 SF	0 SF	
	GYM	RECREATION	600 SF	0 SF	
GRAND TOTAL					45,900 SF

DESCRIPTION

The Emergency Center will continue the provincial and functional principles of the main back of house program, to facilitate the practical needs of the Emergency Center. The material palette will be integrated with the Back of House buildings throughout the site. The fire center will include a structure to house firefighting equipment, as well as a headquarters space in the case of emergency. It will also house minor medical supplies and a helipad location for emergency services.

Staff short term Housing, also referred to as, the Entourage Hotel, the design will reflect the barn vernacular used elsewhere to convey a sophisticated but restrained aesthetic with refined detailing and finishes. This, the most modest of hotels in the development, will serve event support personnel and guests and will echo The Project's characteristic respect for the land with thoughtful site placement and a minimal footprint. Communal spaces will orient to views of the rural landscape offering both indoor and outdoor resting space.



NOTE

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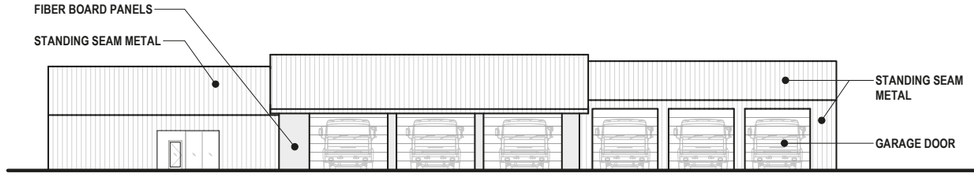
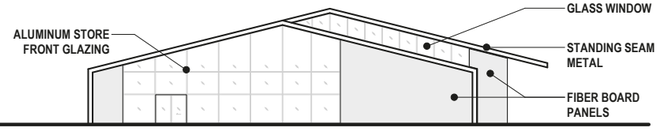
0' 50' 100' 200'

ORIGINAL SCALE: 1" = 100'-0"

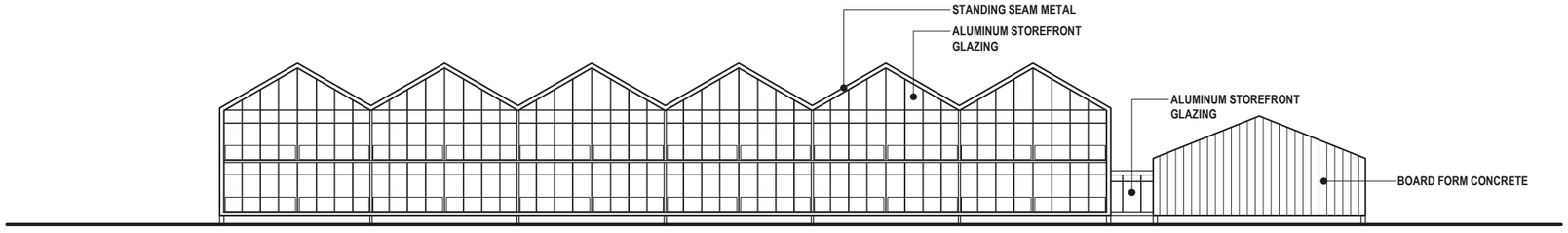
EMERGENCY CENTER & SHORT TERM STAY | ELEVATIONS



FIRE STATION WEST ELEVATION

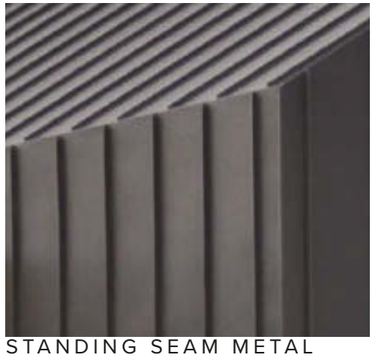


FIRE STATION NORTH ELEVATION



SHORT TERM STAFF HOUSING EAST ELEVATION

BOARD FORM CONCRETE



STANDING SEAM METAL

COR TEN STEEL

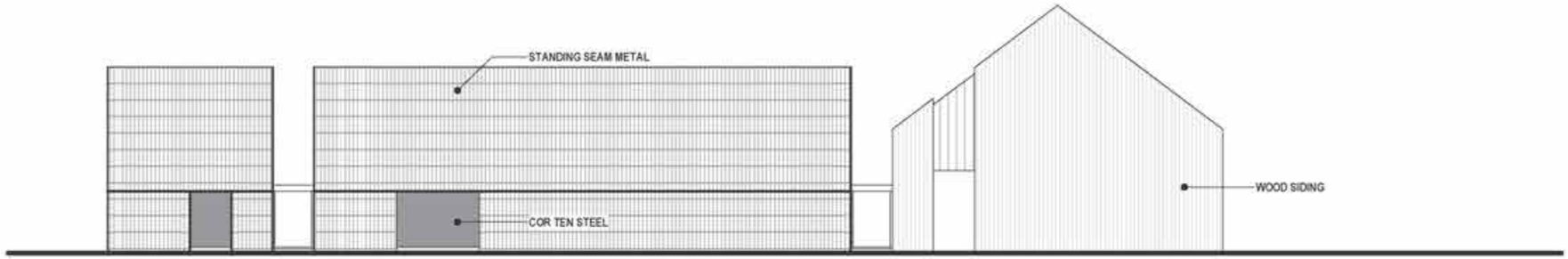
GABION WALL

0' 16' 32' 64'

Central Back-of-House Operations | Verse Design LA

Back of House - This campus of buildings serves as the heart of operations for the development, including laundry facilities, accounting, receiving and maintenance headquarters. Back of House buildings are provincial and functional structures that integrate modest, industrial, and raw materials with strategic detailing to introduce a reverie where the agrarian meets contemporary, and the pastoral meets the pragmatic.

CENTRAL BACK OF HOUSE | ELEVATIONS



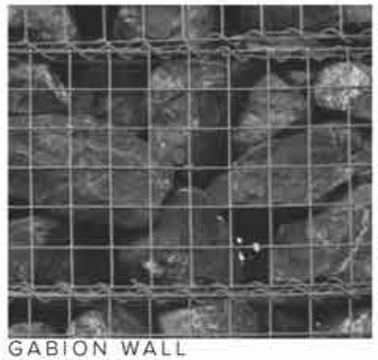
MAIN BACK OF HOUSE PUBLIC BUILDINGS SOUTH ELEVATION

MAIN BACK OF HOUSE SERVICE BUILDINGS SOUTH ELEVATION

0' 16' 32' 64'

ORIGINAL SCALE: 1/32" = 1'-0"

COR TEN STEEL

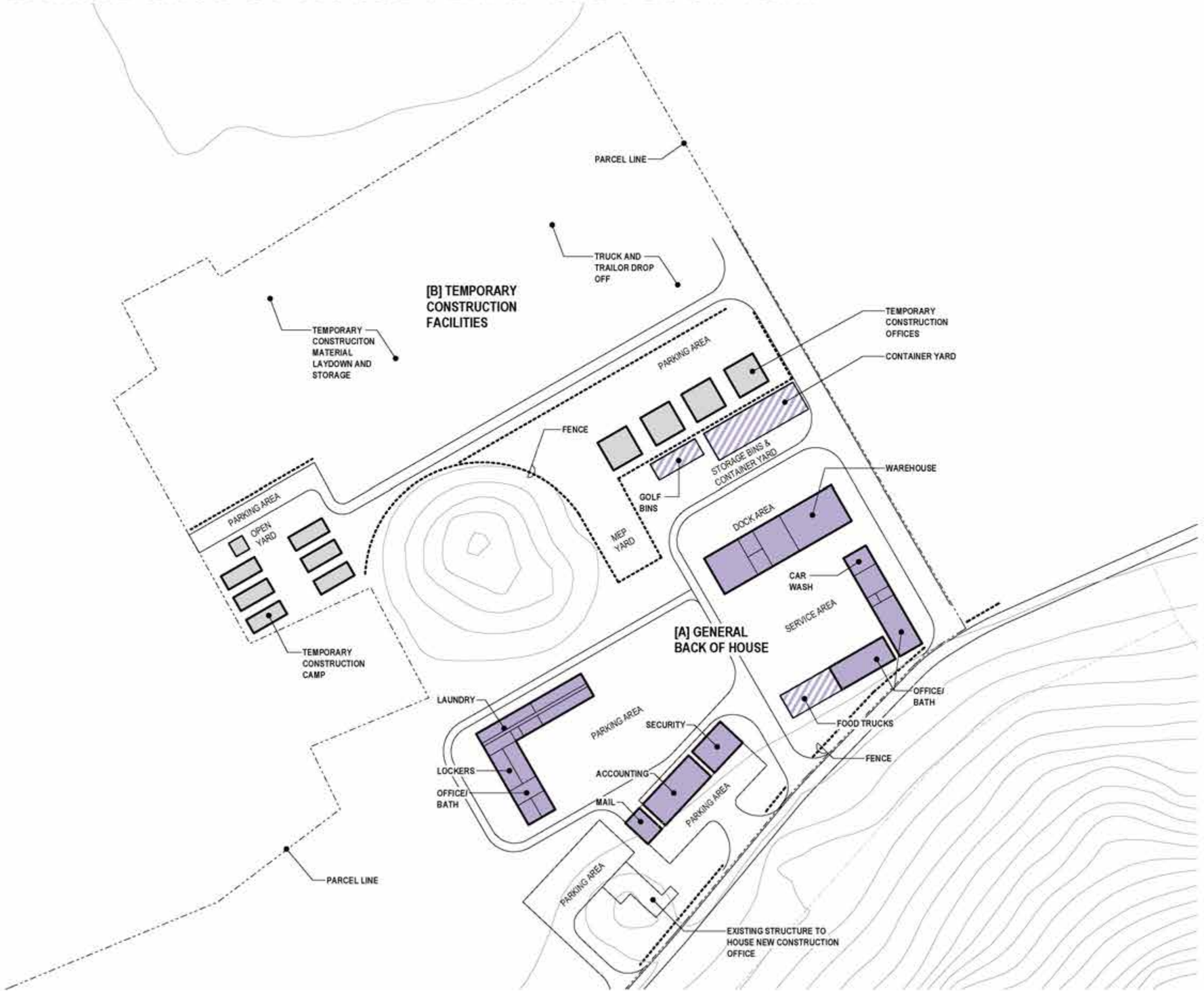


GABION WALL

WOOD SIDING

STANDING SEAM METAL

CENTRAL BACK OF HOUSE | LAND USE FLOOR PLAN



COLOR LEGEND

INDOOR	OUTDOOR	
		RESORT - PRIMARY
		RESORT - COMMERCIAL
		RESORT - ACCESSORY
		CONSTRUCTION - TEMPORARY

CENTRAL BACK OF HOUSE

BUILDING NAME	SPECIFIC USE	GENERAL USE	INDOOR	OUTDOOR	TOTAL
[A] GENERAL BACK OF HOUSE					
	OFFICE/BATH	RESORT MANAGEMENT	17,600 SF	0 SF	
	ACCOUNTING	RESORT SUPPORTING	8,600 SF	0 SF	
	CAR WASH	RESORT SUPPORTING	6,100 SF	0 SF	
	LAUNDRY	RESORT SUPPORTING	12,900 SF	0 SF	
	LOCKERS	RESORT SUPPORTING	5,200 SF	0 SF	
	MAIL	RESORT SUPPORTING	2,600 SF	0 SF	
	SECURITY	RESORT SUPPORTING	5,300 SF	0 SF	
	WAREHOUSE	RESORT SUPPORTING	25,100 SF	0 SF	
	CONTAINER YARD	RESORT SUPPORTING	0 SF	13,200 SF	
	FOOD TRUCKS	RESORT SUPPORTING	0 SF	6,000 SF	
	GOLF BINS	RESORT SUPPORTING	0 SF	3,800 SF	
[B] TEMPORARY CONSTRUCTION FACILITIES					
	TEMP. CONSTR. OFFICE	CONSTRUCTION	17,500 SF	0 SF	
	TEMP. CONSTR. CAMP	CONSTRUCTION	15,900 SF	0 SF	
GRAND TOTAL					139,800 SF

NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

Aerial Site Access - Verse Design LA

Being swept away from the bustling work life to a smooth and simple arrival on the Maha farms reservoir, our seaplane dock, and helicopter landing zone will be available on all pre-arrivals with our dedicated staff and chauffeur whisking you to your resort and or home within a few minutes after landing.

AERIAL SITE ACCESS | USE PLAN

COLOR LEGEND

INDOOR	OUTDOOR	
		RESORT - PRIMARY
		RESORT - COMMERCIAL
		RESORT - ACCESSORY

AERIAL SITE ACCESS

BUILDING NAME	SPECIFIC USE	GENERAL USE	INDOOR	OUTDOOR	TOTAL
	RECEPTION FALICITY	RESORT SUPPORT	1,400 SF	0 SF	
	RECEPTION DECK	RESORT SUPPORT	0 SF	2,100 SF	
GRAND TOTAL					3,500 SF

NOTE
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0' 75' 150' 300'

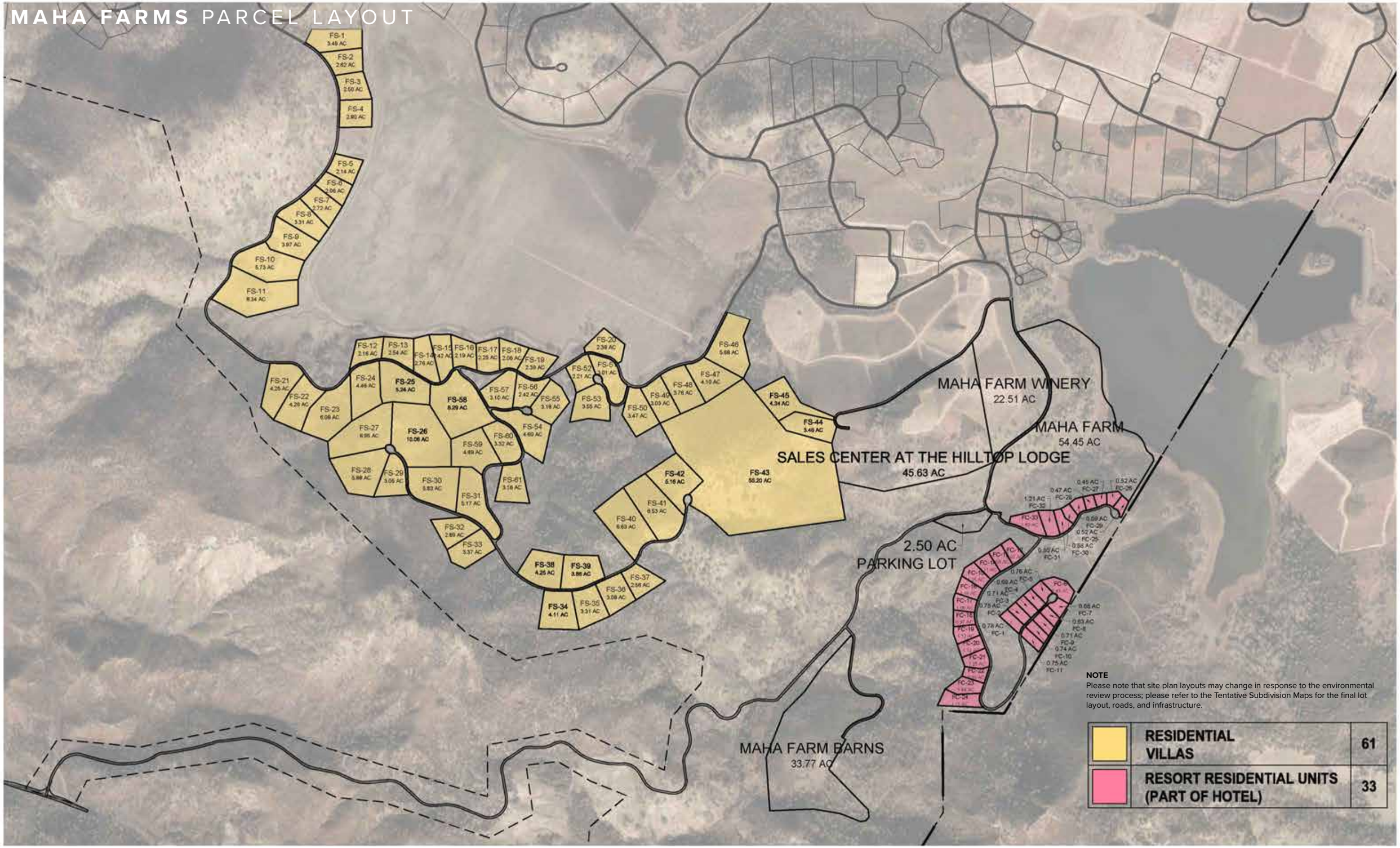
ORIGINAL SCALE: 1" = 150'-0"

SECTION 4 SUBDIVISION PLANS

SUBDIVISION PLANS

The PROJECT proposes multiple tentative subdivision maps submitted under separate cover. The following sheets coorespond to the subdivision phasing and show the lot layouts for all new parcels. Please note these plans do not include the siting of construction and the area planned for conservation or easements. These plans depict accurate road layouts and parcel configurations; more detailed site analysis is included in the tentative subdivison application.

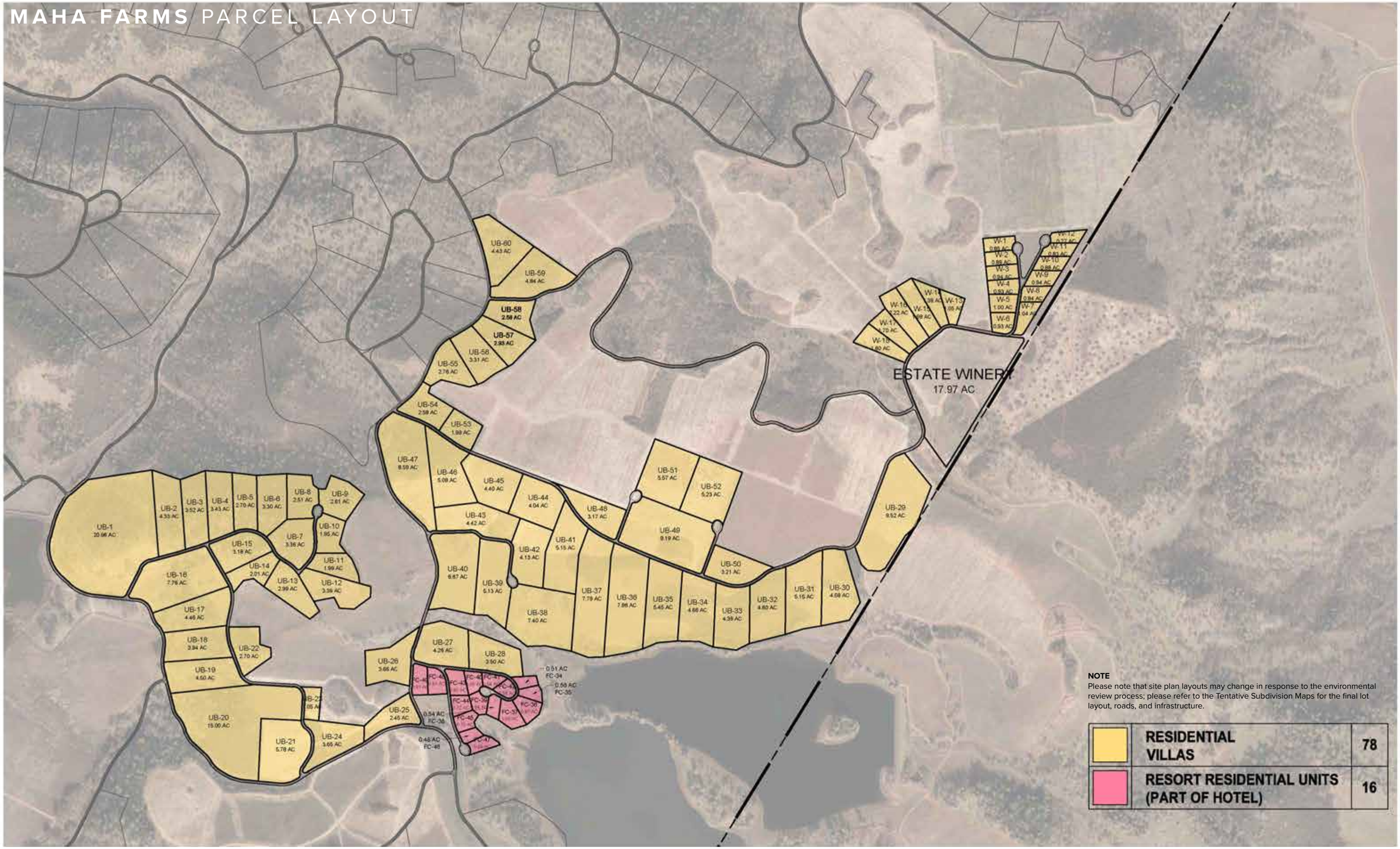
MAHA FARMS PARCEL LAYOUT



NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

	RESIDENTIAL VILLAS	**61**
	RESORT RESIDENTIAL UNITS (PART OF HOTEL)	**33**

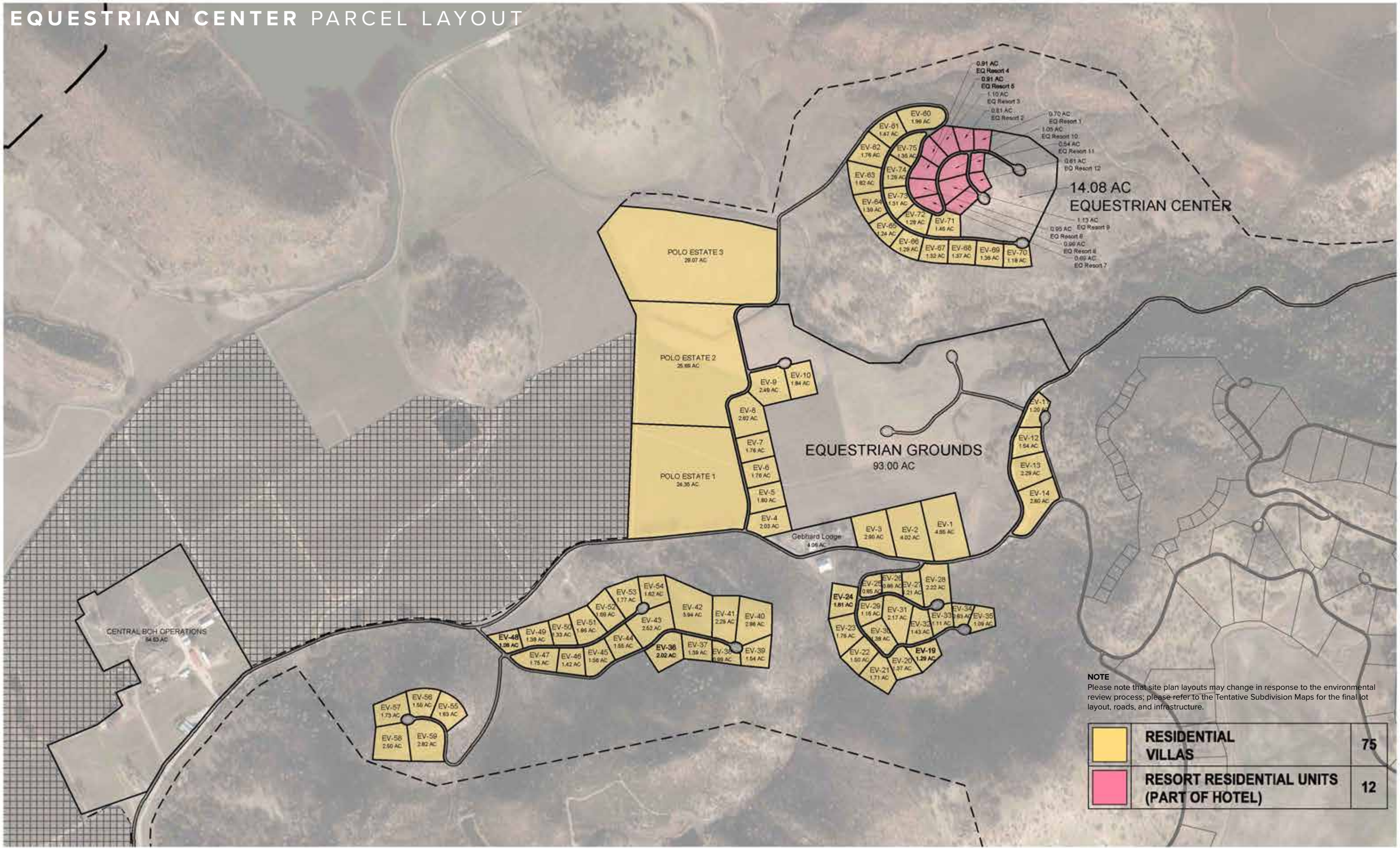
MAHA FARMS PARCEL LAYOUT



NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

	RESIDENTIAL VILLAS	78
	RESORT RESIDENTIAL UNITS (PART OF HOTEL)	16

EQUESTRIAN CENTER PARCEL LAYOUT



NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

	RESIDENTIAL VILLAS	**75**
	RESORT RESIDENTIAL UNITS (PART OF HOTEL)	**12**

RED HILL ESTATES PARCEL LAYOUT

	RESIDENTIAL VILLAS	88
	RESORT RESIDENTIAL UNITS (PART OF HOTEL)	40

HENNESY BARN PUBLIC RANCH
27.77 AC

RED HILL ESTATES
30.62 AC

6.36 AC
GOLF BLDG 1

T5-2
33.01 AC

T5-3
29.09 AC

T5-4
30.71 AC

T5-5
25.97 AC

T5-6
33.22 AC

T5-7
55.47 AC

T5-8
55.91 AC

T5-9
48.72 AC

T5-10
50.64 AC

GOLF 4
153.18 AC

GOLF 2
86.33 AC

GOLF 3
155.12 AC

4.55 AC
GOLF BLDG 2

GOLF 1
81.15 AC

3.79 AC
GOLF MAINTENANCE 2

1.02 AC
GOLF 7

0.95 AC
GOLF MAINTENANCE 1

2.37 AC
GOLF 5

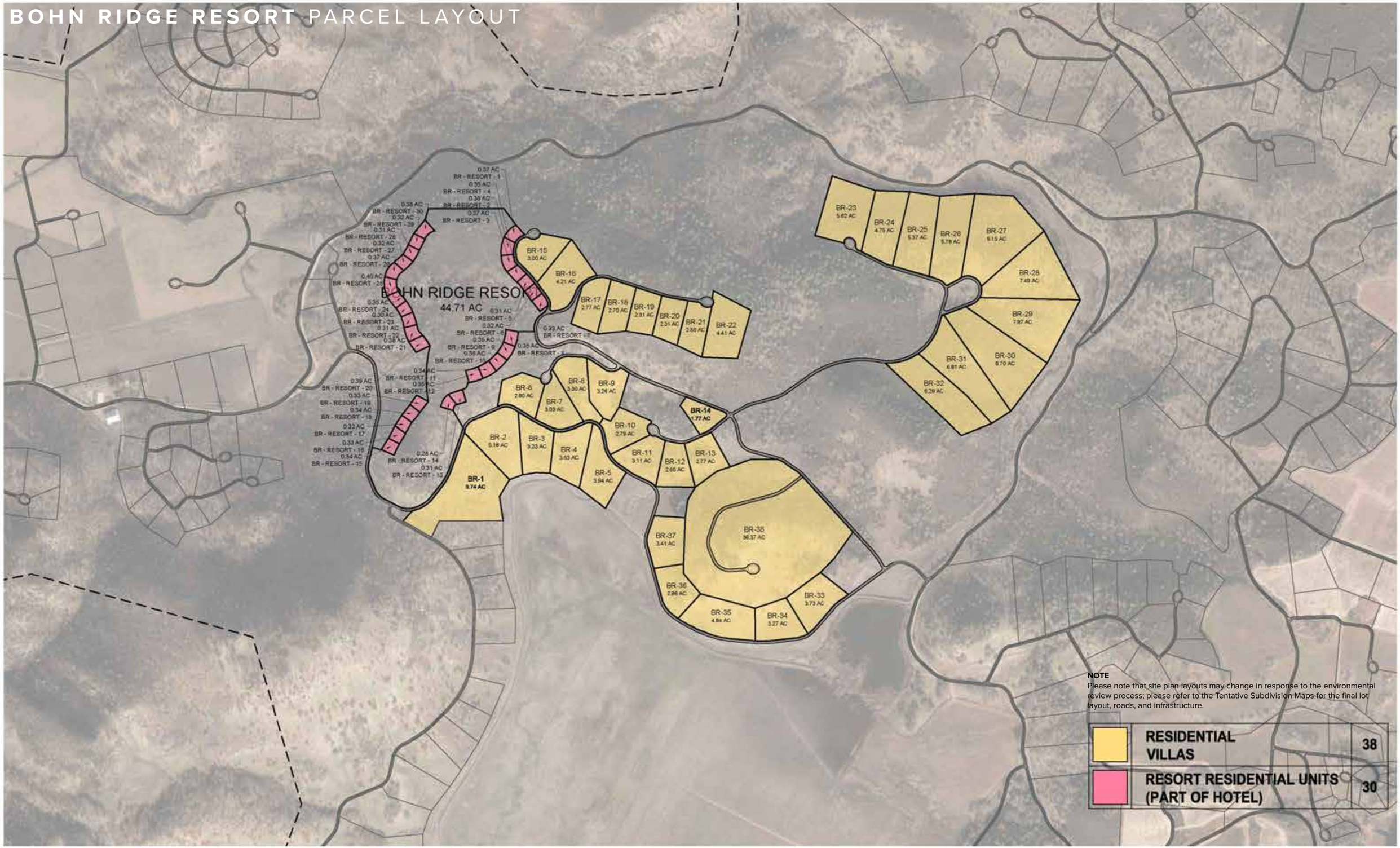
GOLF 8
2.72 AC

4.84 AC
CLUB HOUSE AND PADDOCK

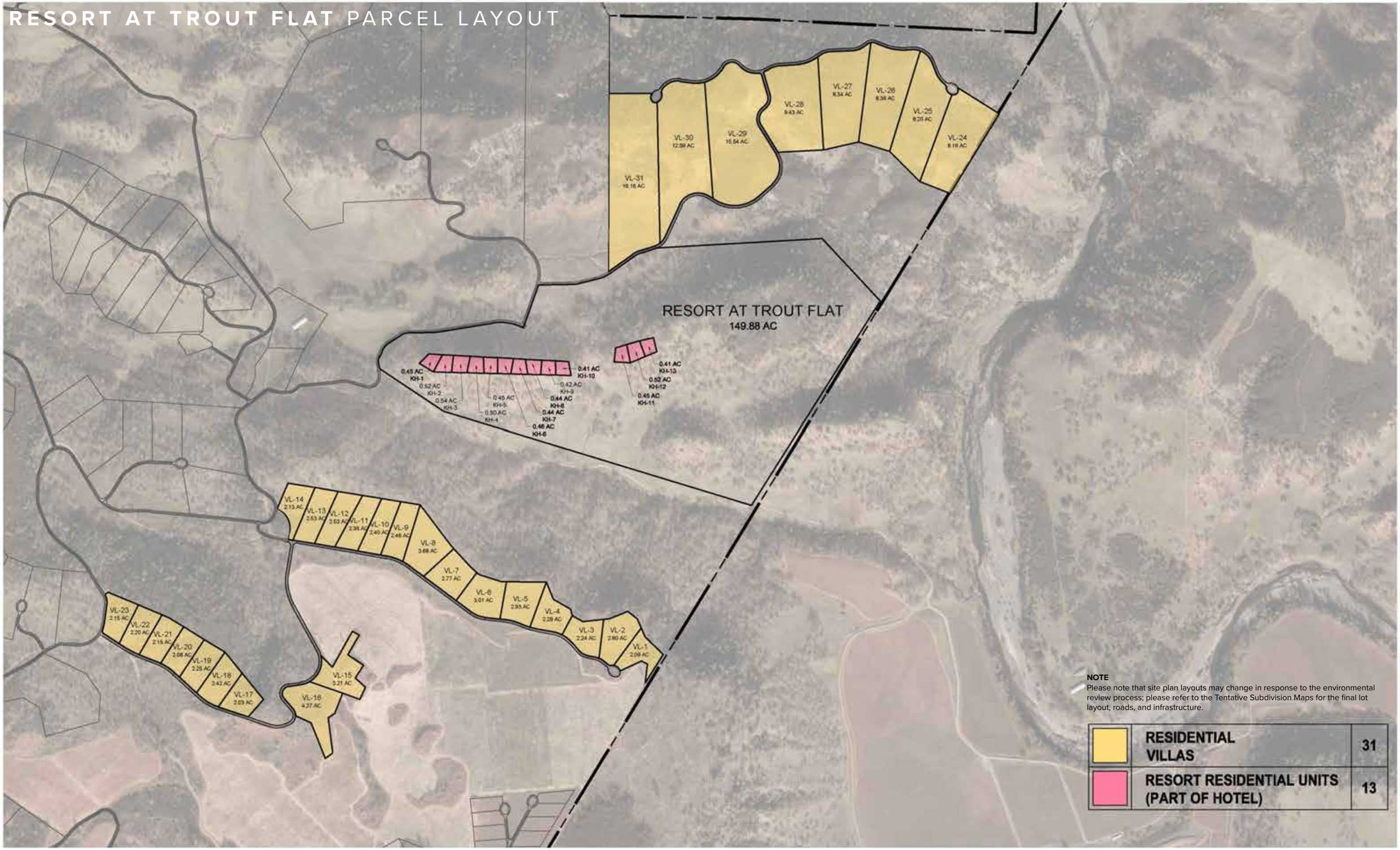
3.42 AC
RANCH MANAGER PADDOCK

NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

BOHN RIDGE RESORT PARCEL LAYOUT



RESORT AT TROUT FLAT PARCEL LAYOUT



NOTE
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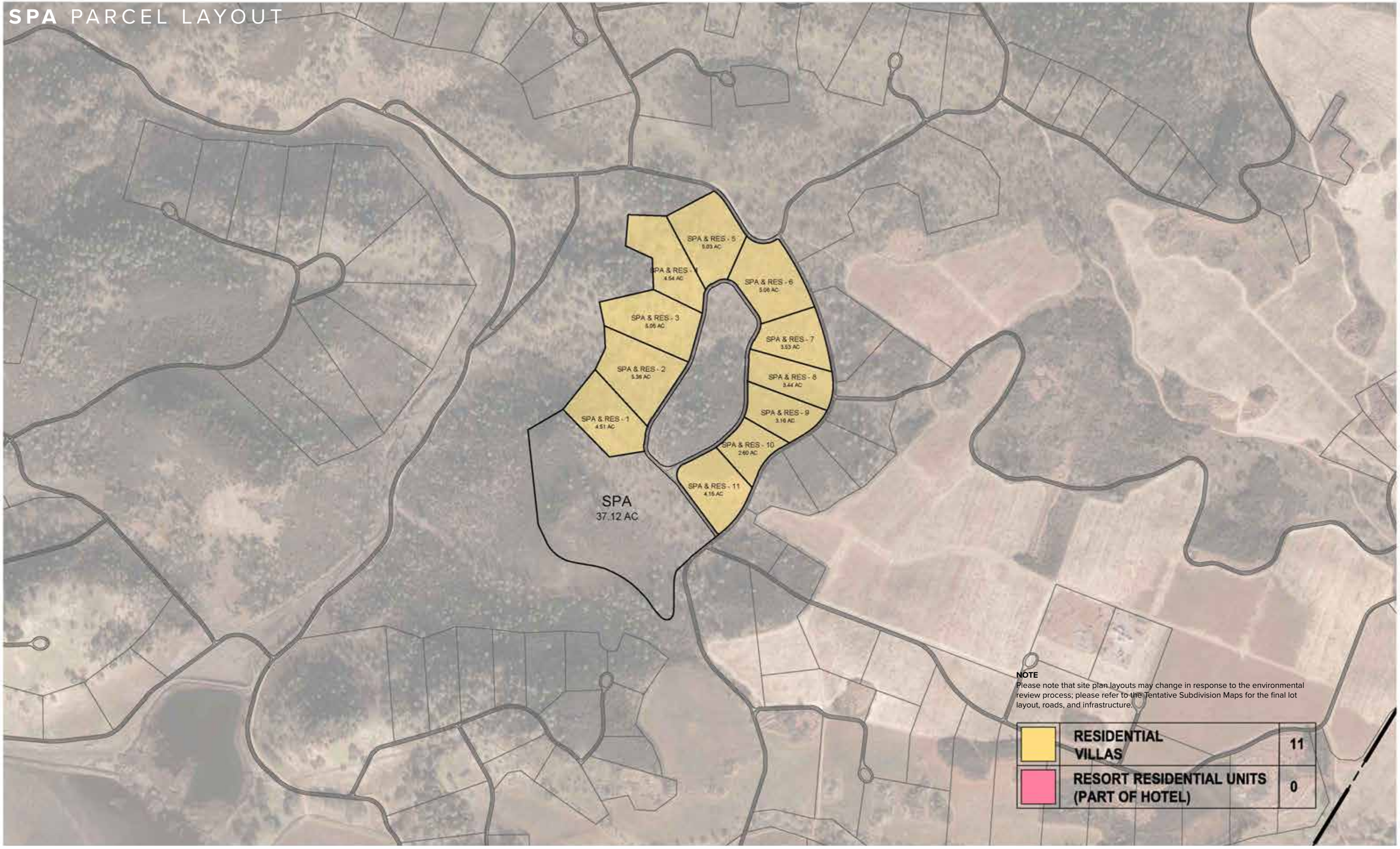
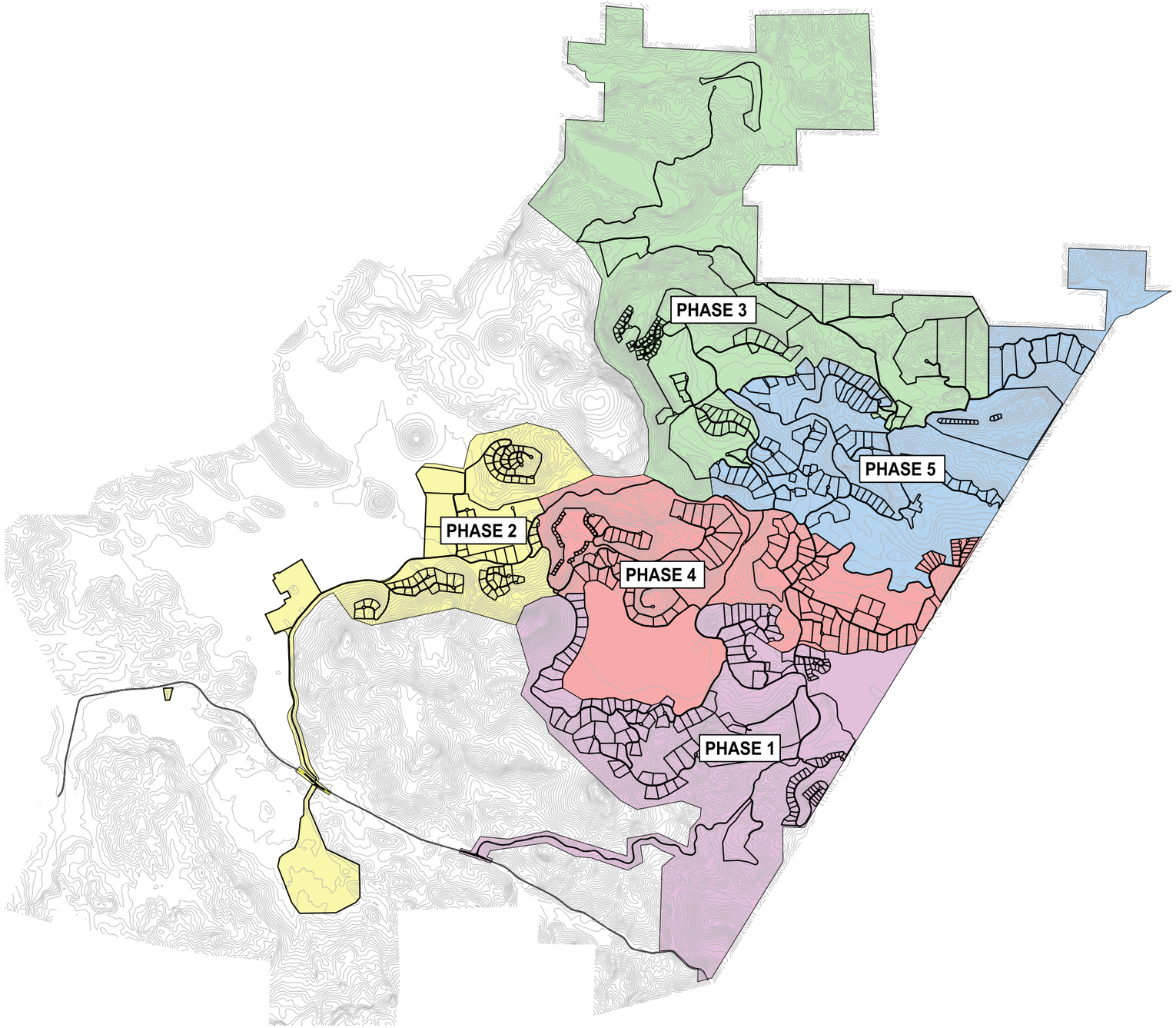
	RESIDENTIAL VILLAS	31
	RESORT RESIDENTIAL UNITS (PART OF HOTEL)	13

SPA PARCEL LAYOUT



SECTION 5 UTILITIES & INFRASTRUCTURE



POTENTIAL DEVELOPMENT PHASING

IMPLEMENTATION AND PHASING

The first phase of construction will include primary resort facilities as well as supporting infrastructure such as roads, utilities and support services. This figure describes the most likely construction phasing. However, construction will be based on market demand.

NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

CIRCULATION

The circulation system for the first phase of the Proposed project would comprise a system of primary and secondary vehicular two-way roads and would serve as multimodal circulation routes providing shared access to standard vehicles, minor commercial delivery vehicles, emergency response vehicles, recreational vehicles and bicycles. Equestrian and pedestrian use would be accommodated separately via alternative pathways and trails.

A non-vehicular circulation system would comprise a system of off-road trails traversing more rugged terrain that would be developed for use with hiking, horseback, and mountain bike riding. Additionally, existing and proposed gravel and fire roads would be utilized and maintained for landscape fuel reduction, corridors for moving grazing animals, and wildland fire protection.

Primary access to the project site is from Butts Canyon Road. A new entrance for resident and guest access would be located at a designated site along Butts Canyon Road. All new intersections would include turning lanes and deceleration/acceleration lanes as needed. A traffic study is currently under way that will outline further improvements to the intersections/entrances (signalization, stop signs, traffic-calming measures, etc.). Additionally, air transportation/arrival will be provided via a guest helipad and a float plane dock, with kiosk and internal transportation services, to be constructed on Guenoc Lake at Detert Reservoir. Additionally, an emergency heliport will be centrally located at the on-site Emergency Response Center.

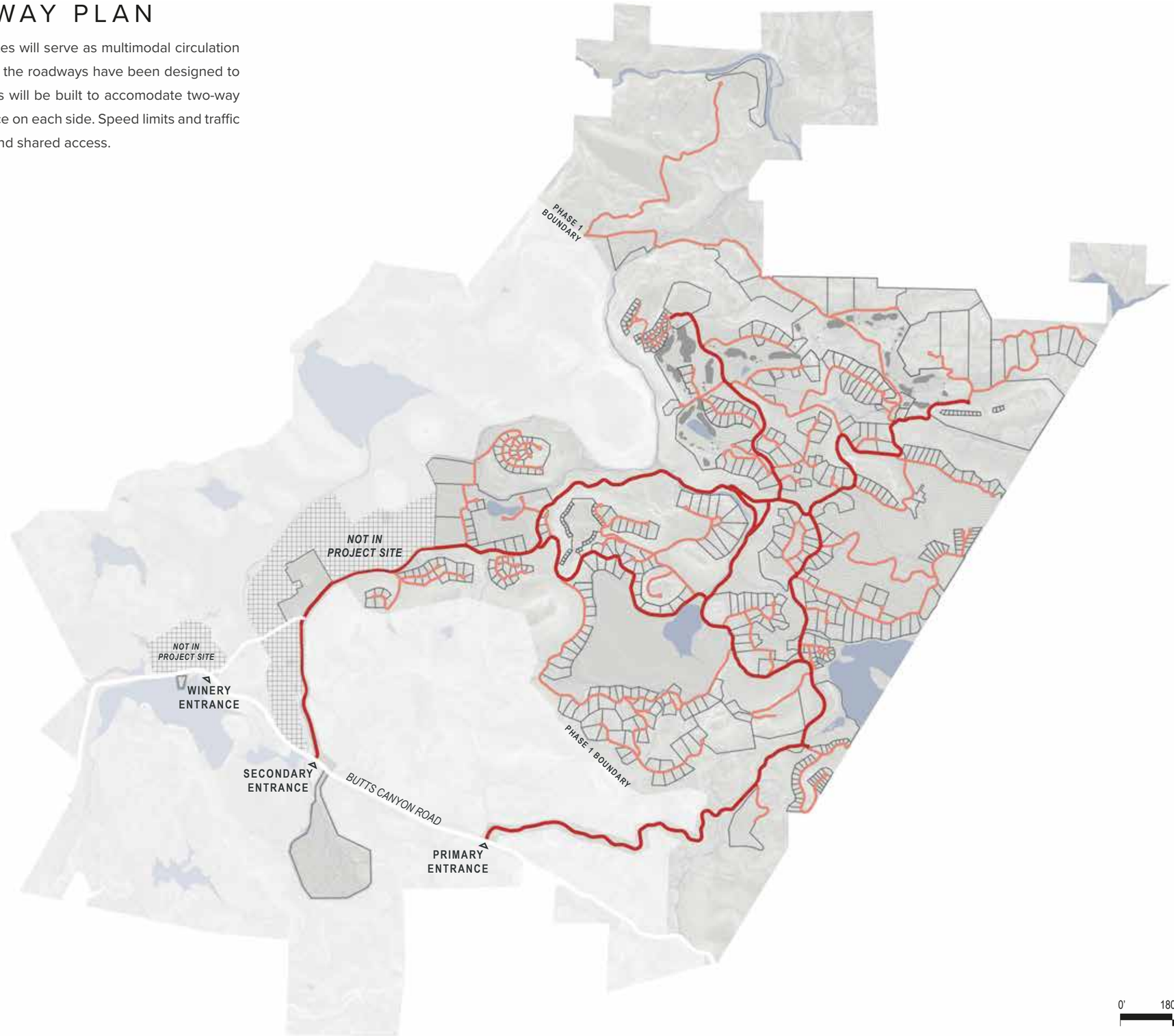
The existing intersection at Guenoc Road would be primarily used by staff and deliveries. A further access point would also extend from the proposed back of house facility westward along Butts Canyon Road, adjacent to Detert Reservoir, to converge with Guenoc Road and then run westward toward the Phase I project. At each of these two intersection locations, traffic and circulation improvements on Butts Canyon Road would be incorporated for improved safety, pending further traffic analysis.

CIRCULATION ROADWAY PLAN

The primary and secondary vehicular circulation routes will serve as multimodal circulation routes to provide access for standard vehicles. All of the roadways have been designed to be sensitive to the existing natural terrain. The roads will be built to accomodate two-way traffic lanes with a maintained 50 feet defensible space on each side. Speed limits and traffic calming techniques will be relied on to ensure safe and shared access.

PRIMARY ROADWAYS

SECONDARY ROADWAYS



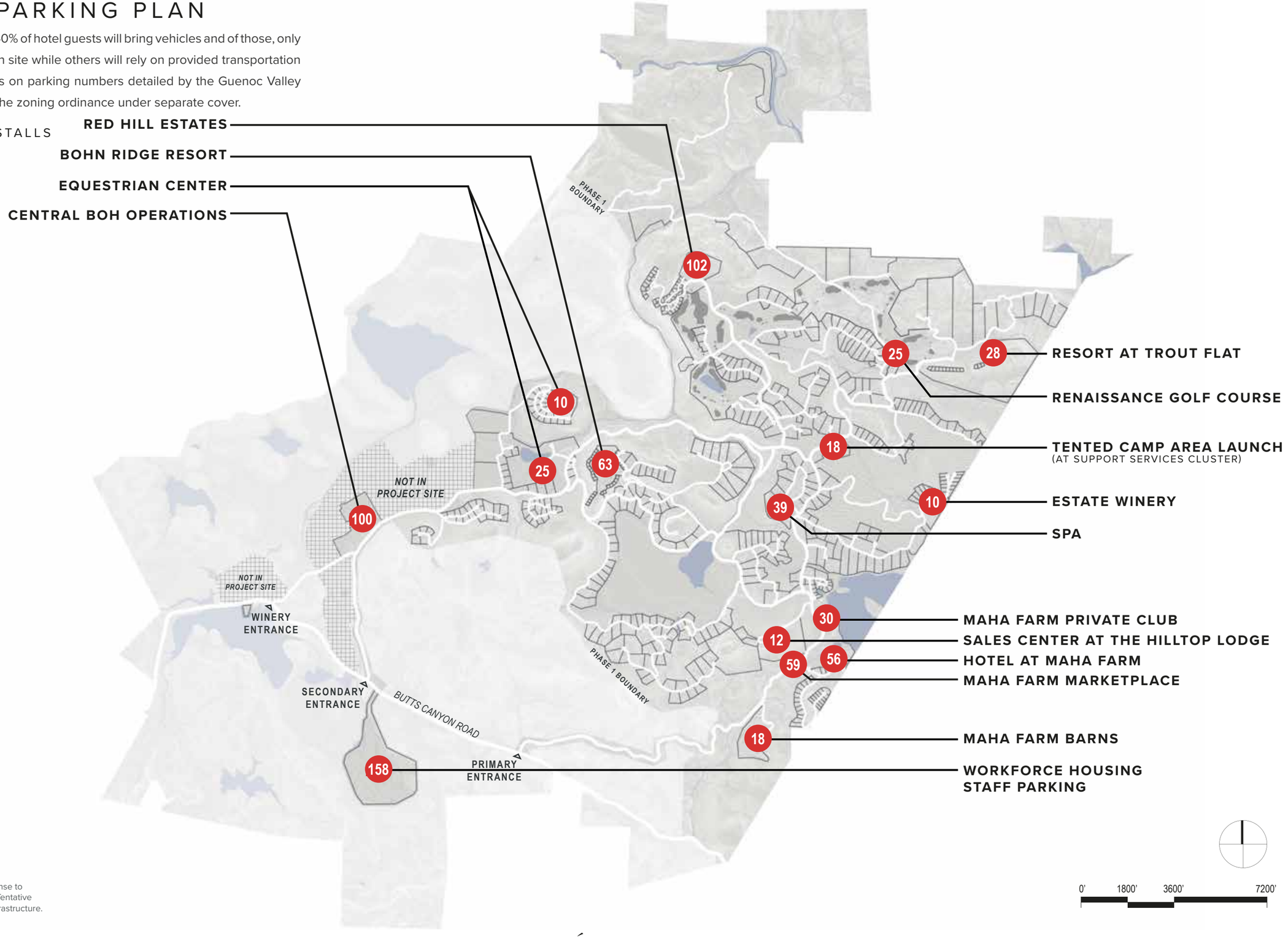
0’ 1800’ 3600’ 7200’

NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

CIRCULATION PARKING PLAN

Based on commensurate resorts, only 40% of hotel guests will bring vehicles and of those, only half will choose to use their vehicles on site while others will rely on provided transportation services. Therefore, the property relies on parking numbers detailed by the Guenoc Valley District parking code, as described in the zoning ordinance under separate cover.

NUMBER OF PARKING STALLS



NOTE
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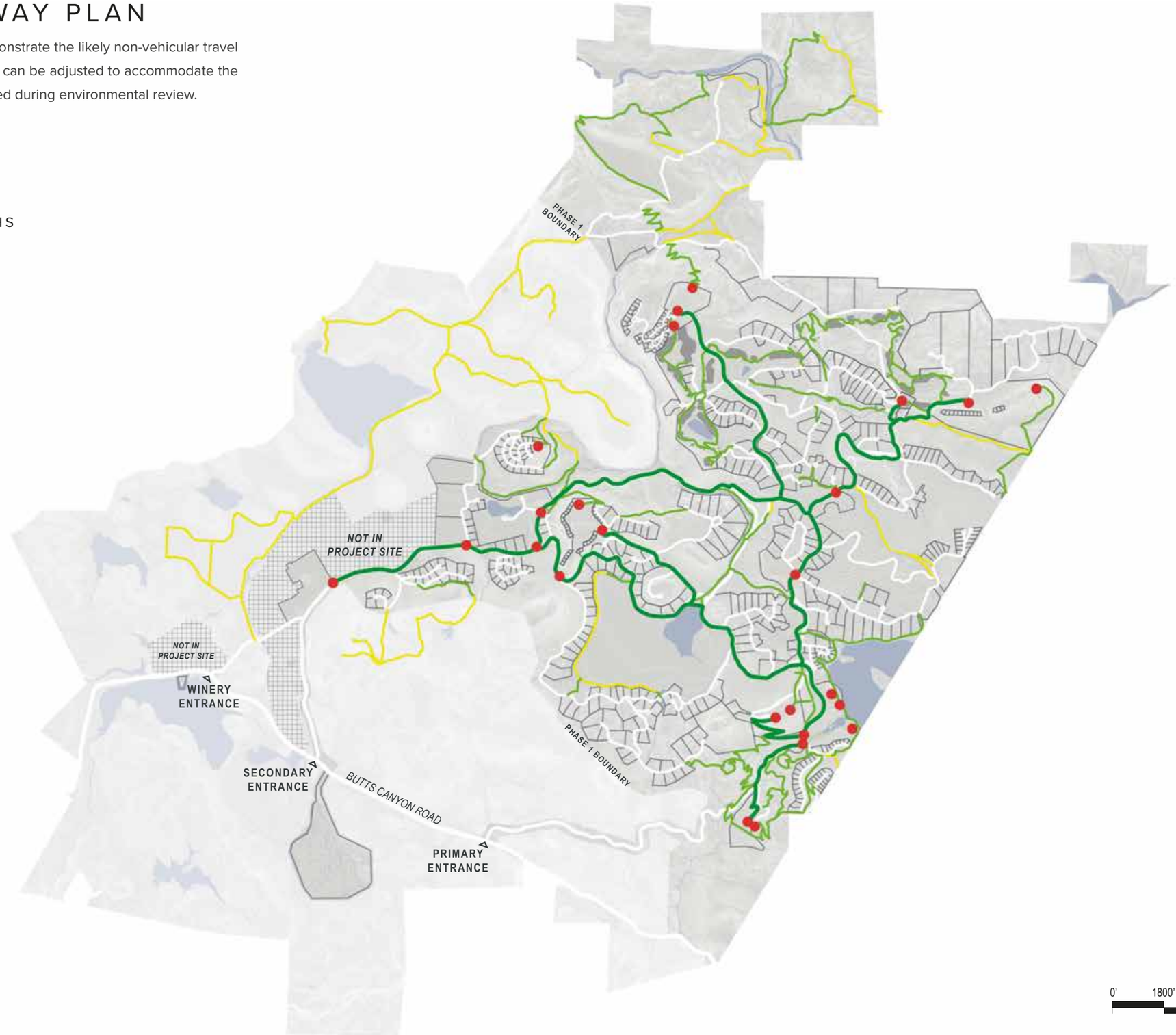
CIRCULATION PATHWAY PLAN

This conceptual pathway network is intended to demonstrate the likely non-vehicular travel routes and connections throughout the site. All paths can be adjusted to accommodate the protection of sensitive and protected species identified during environmental review.

- PRIMARY NEW PATHS *(ADJACENT TO PRIMARY ROADWAYS)*
- SECONDARY NEW TRAILS
- SECONDARY EXISTING TRAILS
- CONNECTION TO RESORT PATHS



0' 1800' 3600' 7200'

NOTE
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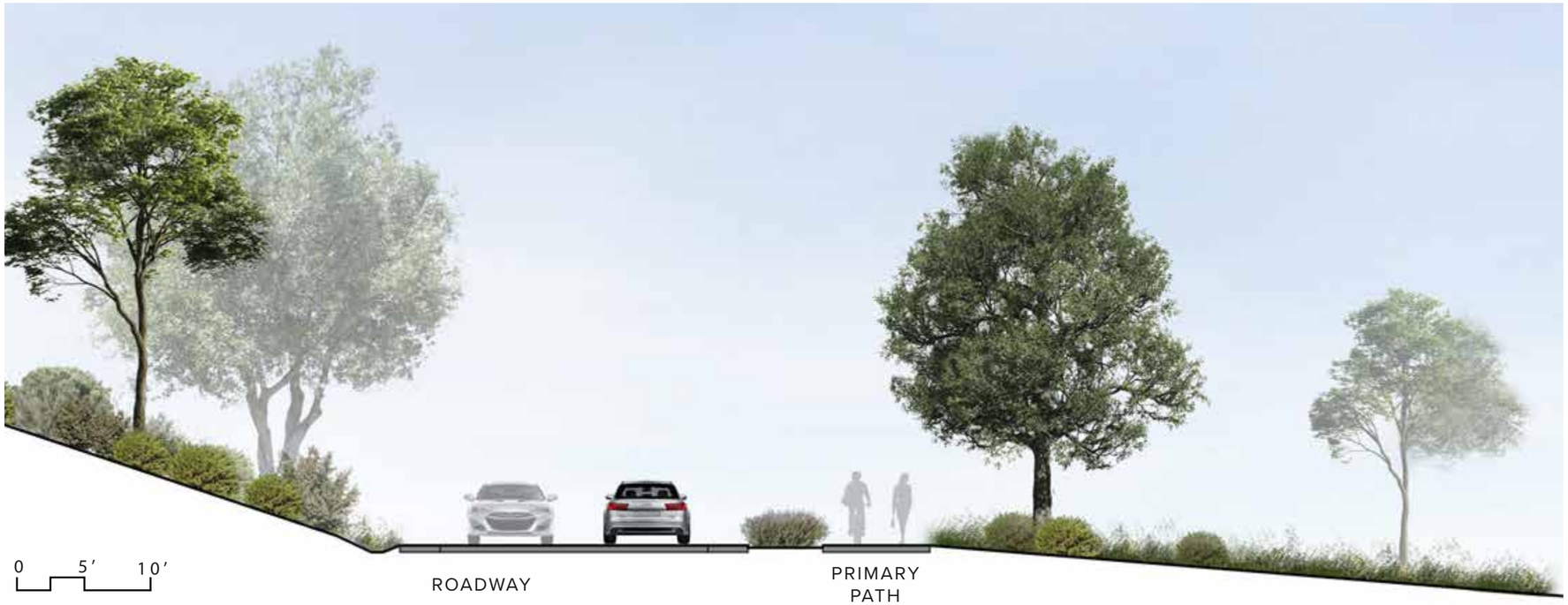
CIRCULATION PATHWAY TYPICAL CONDITIONS



PRIMARY PATH

SLOPE RANGE
0% - 8%

WIDTH RANGE
4' - 6'

SURFACE
Permeable Pavement

PURPOSE and CONDITIONS
Provide convenient pedestrian and bicycling routes to access resorts and amenities.

Pathway situated adjacent to primary roadway network; pathway separates vehicular and non-vehicular users on these more heavily-travelled routes.

SECONDARY TRAIL

SLOPE RANGE
0% - 15%

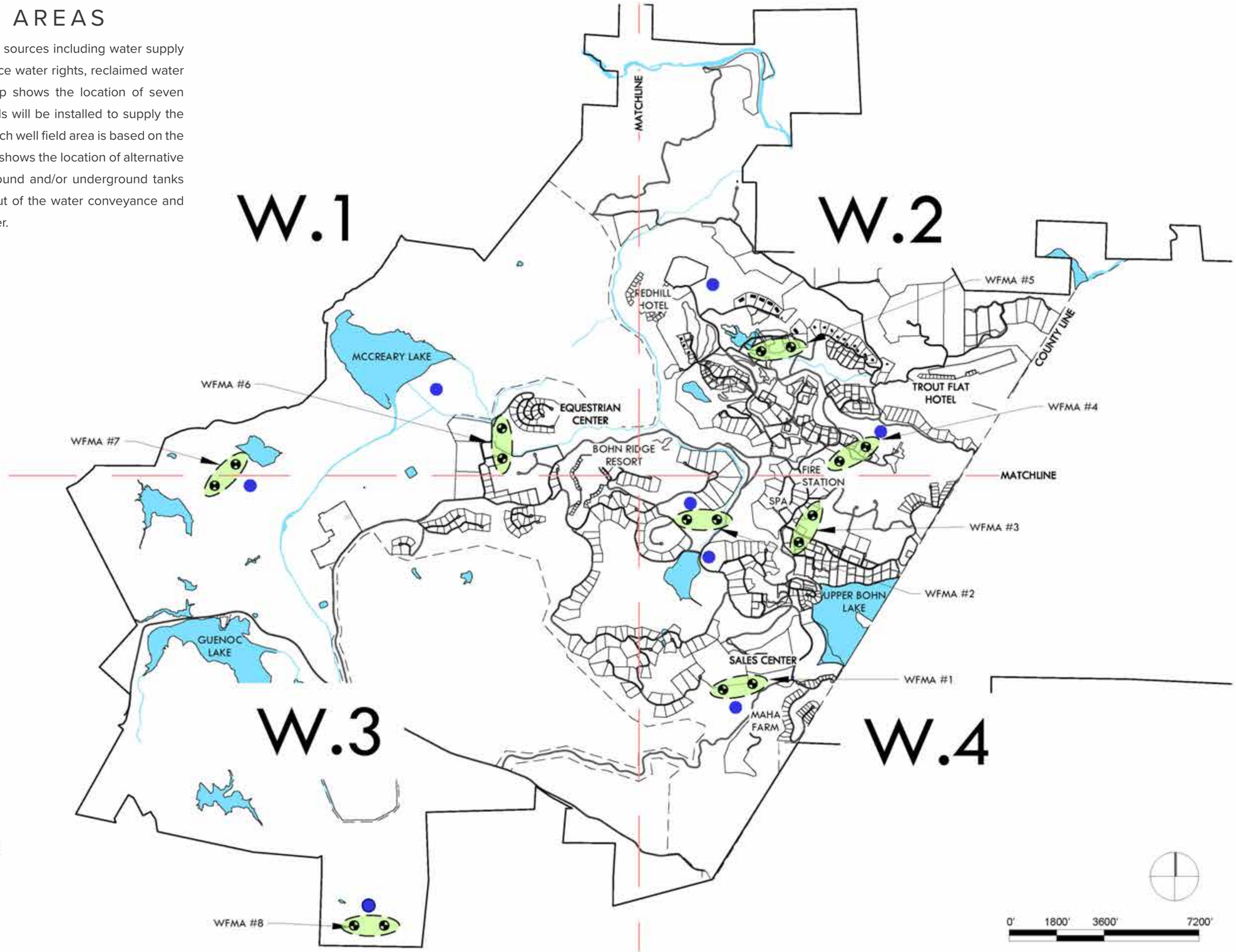
WIDTH RANGE
5' - 15'

SURFACE
Dirt/Gravel

PURPOSE and CONDITIONS
Re-utilize and expand upon existing ranch road network to provide recreational walking, running, hiking, biking, and horseback riding opportunities.

WATER MANAGEMENT AREAS

The project will be supplied by a combination of water sources including water supply wells for domestic purposes, reliance on existing surface water rights, reclaimed water from on-site treatment, and irrigation wells. The map shows the location of seven well fields where two or more, deep water supply wells will be installed to supply the domestic water supply to the project. The location of each well field area is based on the yield of test wells completed on the property. The plan shows the location of alternative water storage reservoirs that could include above ground and/or underground tanks or cisterns. The plans also show the conceptual layout of the water conveyance and distribution lines for both potable and non-potable water.



LEGEND

- WELL FIELD MANAGEMENT AREA (WFMA)
- ALTERNATIVE WATER STORAGE FACILITY (WSF)
- W.X SHEET INDEX

NOTE
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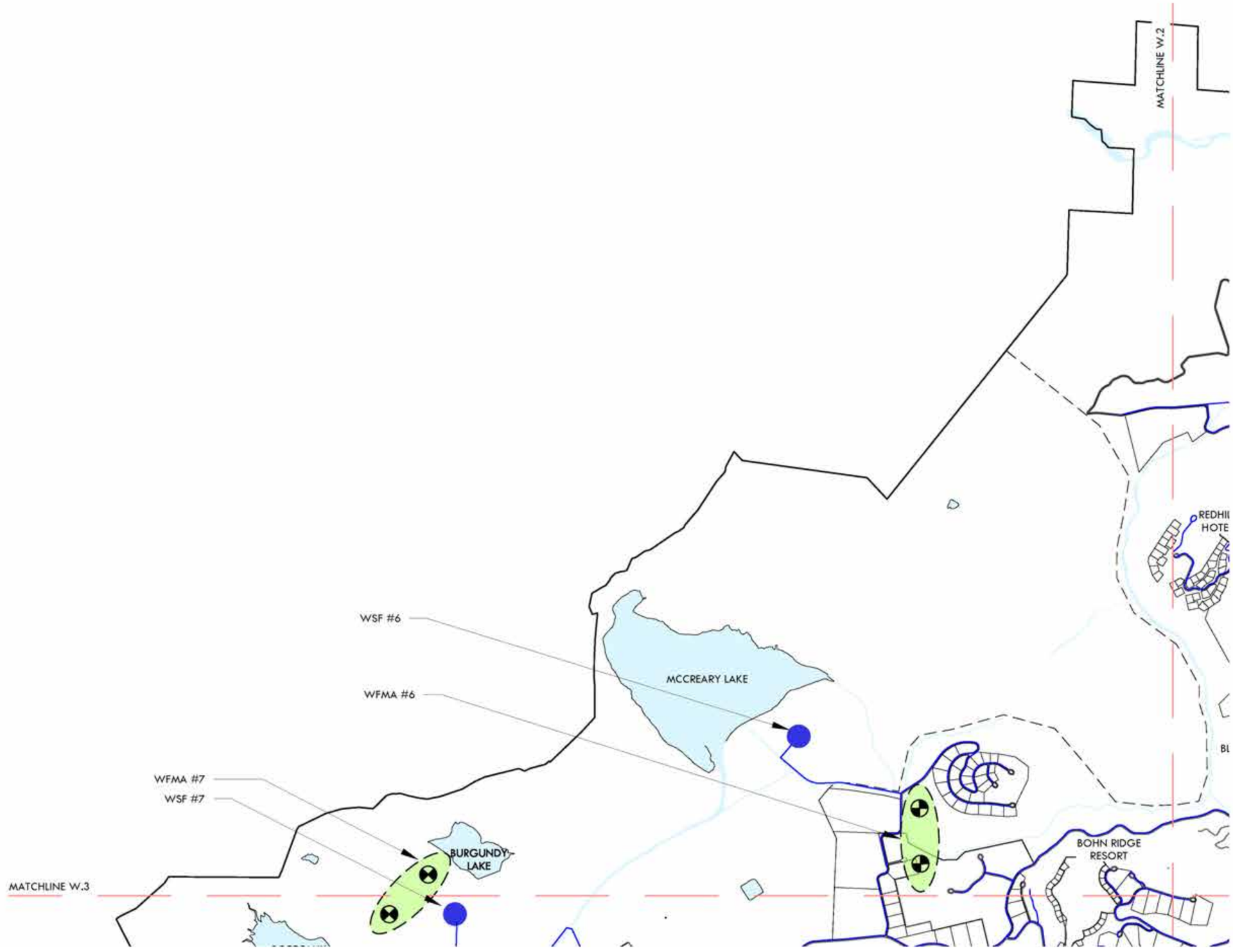
WATER MANAGEMENT AREA DETAIL

LEGEND

- WELL FIELD MANAGEMENT AREA (WFMA)
- ALTERNATIVE WATER STORAGE FACILITY (WSF)
- WATER CONVEYANCE AND DISTRIBUTION LINE



NOTE
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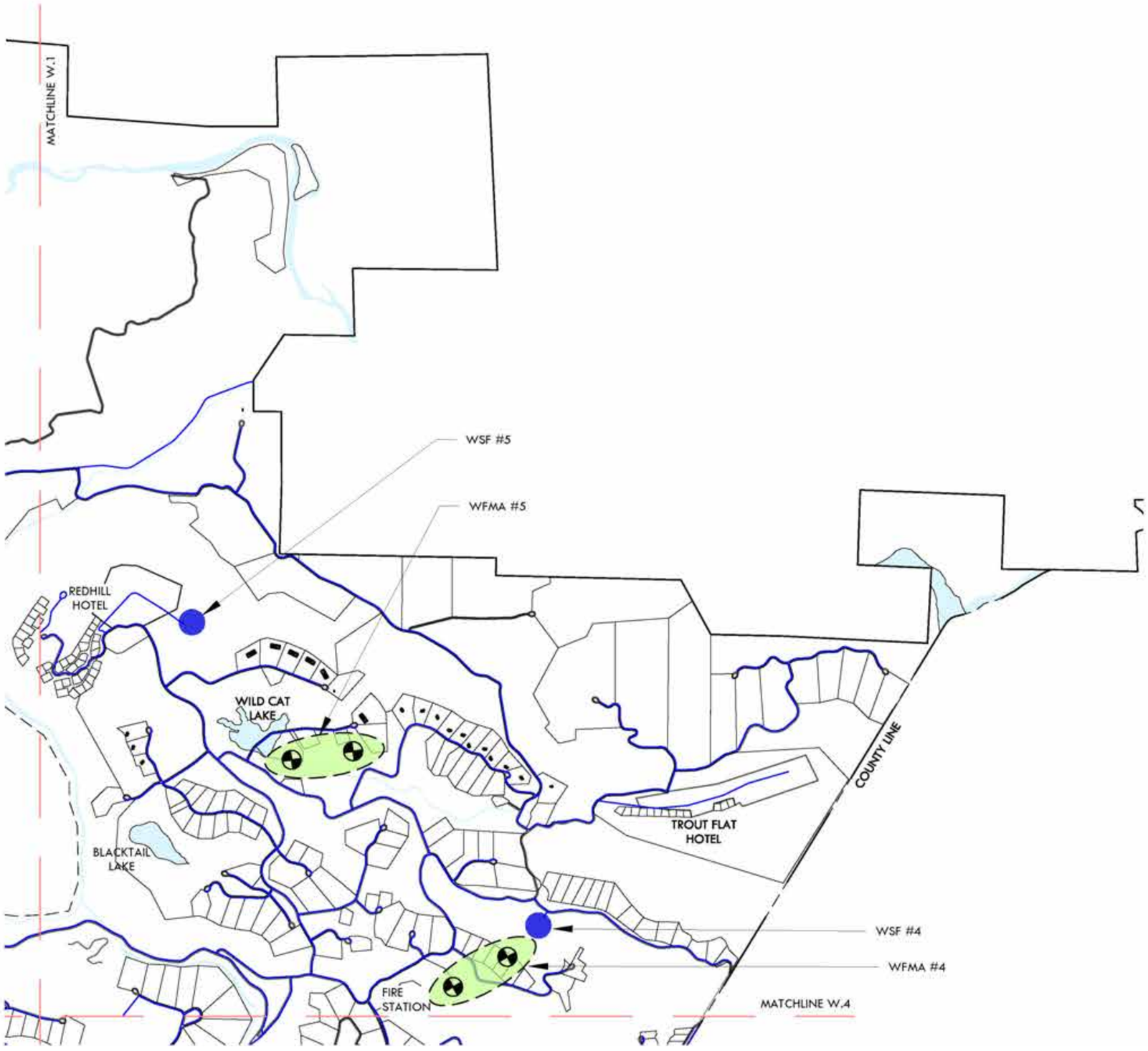
0' 1000' 2000' 4000'

WATER MANAGEMENT AREA DETAIL



LEGEND

- WELL FIELD MANAGEMENT AREA (WFMA)
- ALTERNATIVE WATER STORAGE FACILITY (WSF)
- WATER CONVEYANCE AND DISTRIBUTION LINE

NOTE
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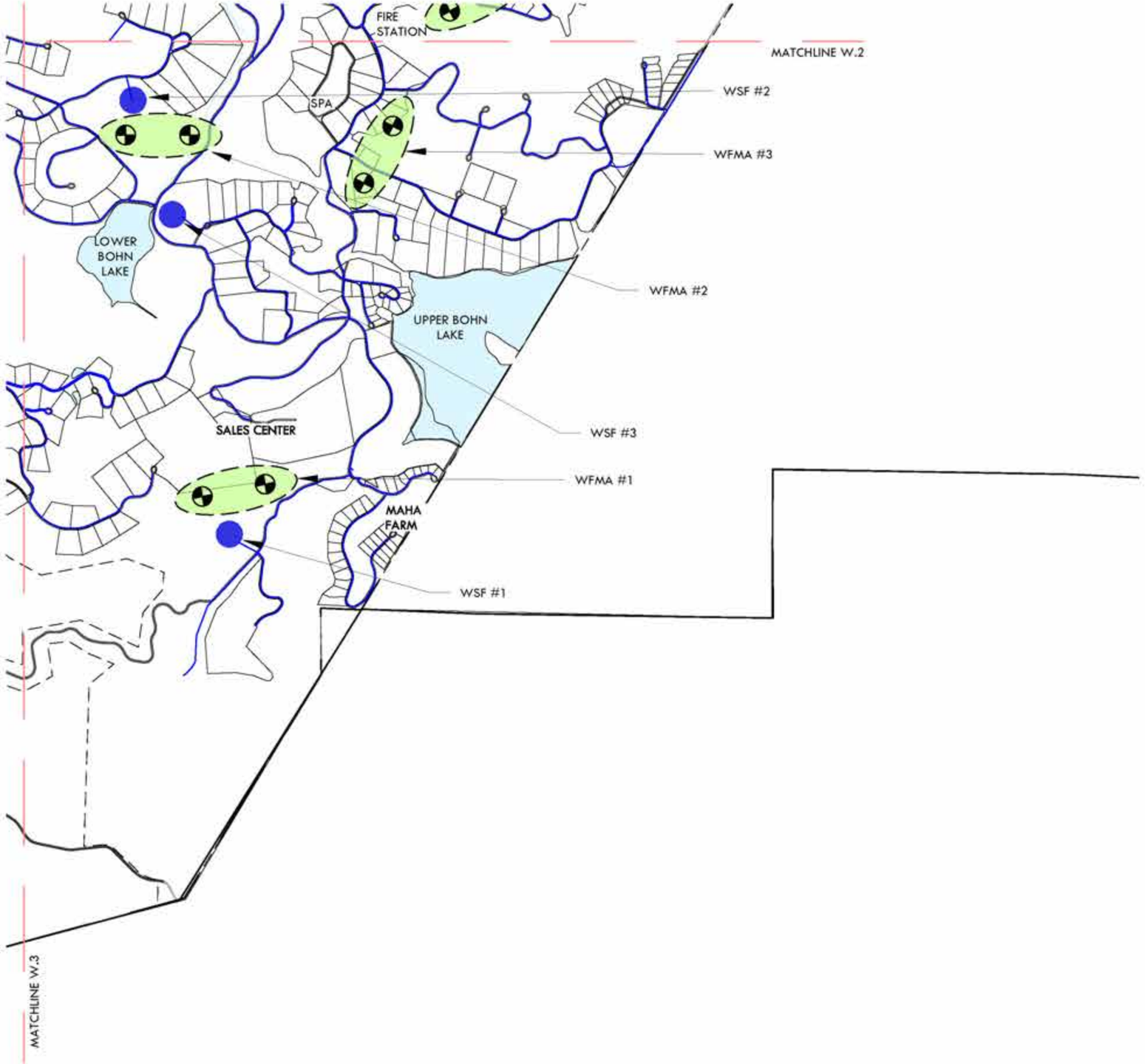
0' 1000' 2000' 4000'

WATER MANAGEMENT AREA DETAIL



LEGEND

- WELL FIELD MANAGEMENT AREA (WFMA)
- ALTERNATIVE WATER STORAGE FACILITY (WSF)
- WATER CONVEYANCE AND DISTRIBUTION LINE

NOTE
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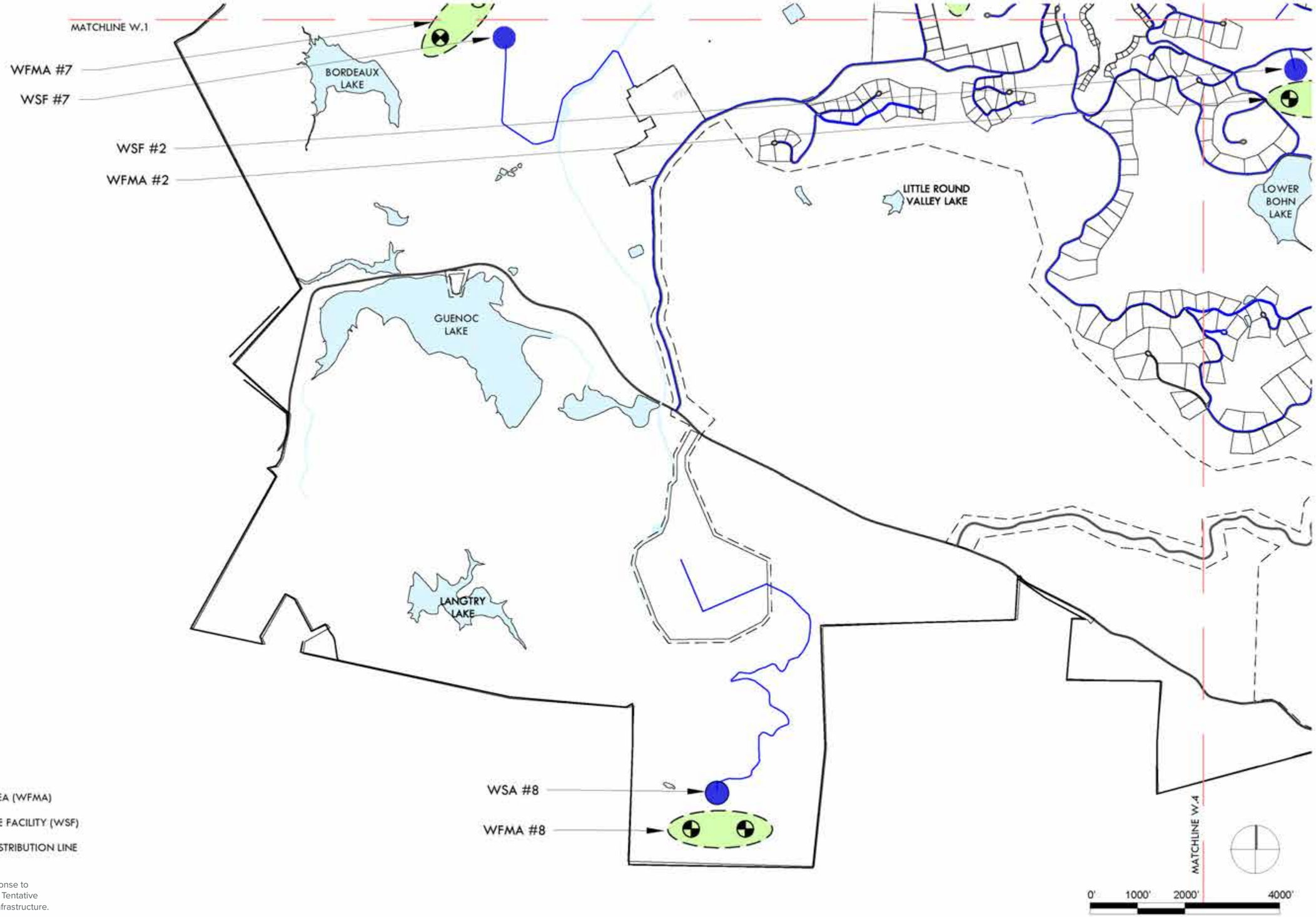
0' 1000' 2000' 4000'

WATER MANAGEMENT AREA DETAIL



LEGEND

- WELL FIELD MANAGEMENT AREA (WFMA)
- ALTERNATIVE WATER STORAGE FACILITY (WSF)
- WATER CONVEYANCE AND DISTRIBUTION LINE

NOTE
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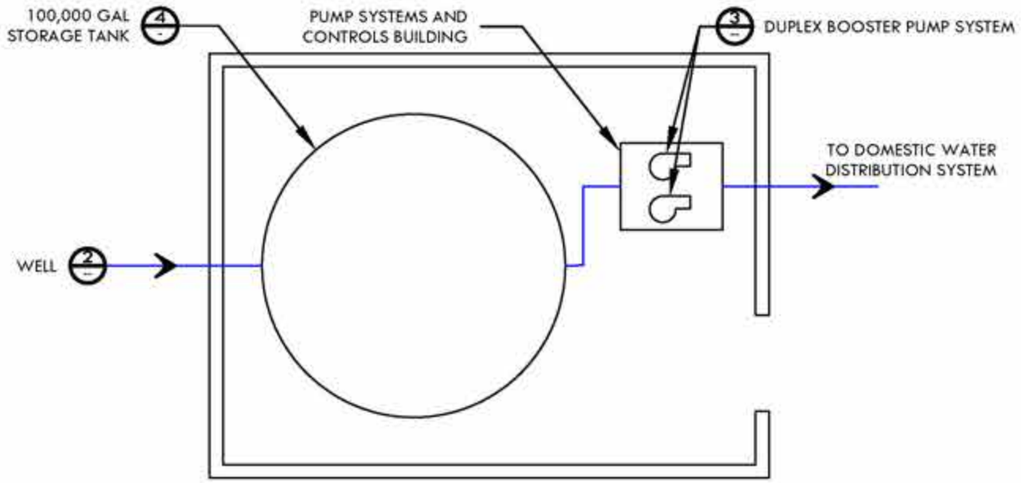
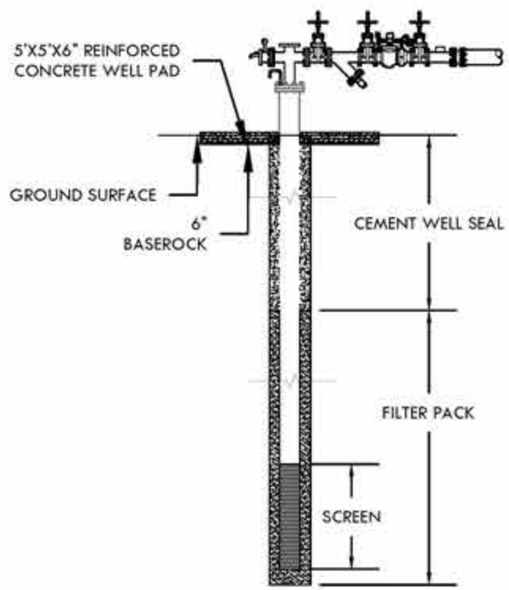
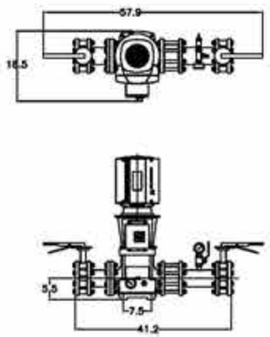
WATER TYPICAL STORAGE FACILITIES



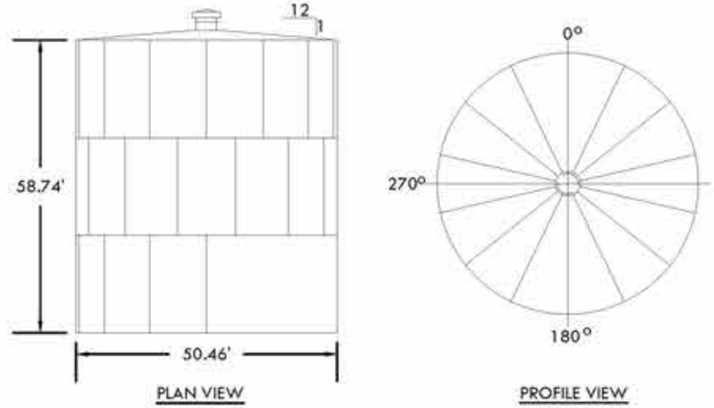
1 TYPICAL WATER STORAGE FACILITY PLAN VIEW
SCALE: 1" = 50'



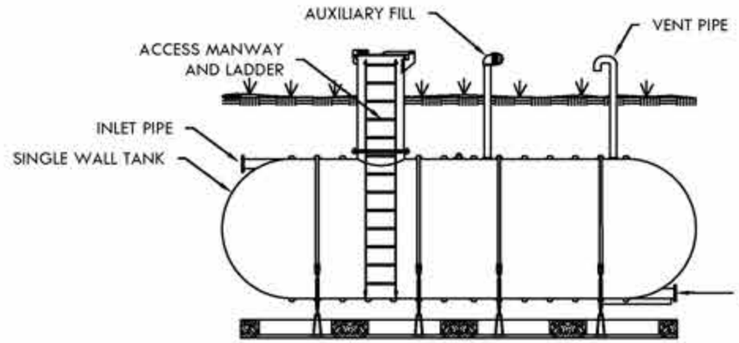
2 TYPICAL WELL
SCALE: AS DIMENSIONED



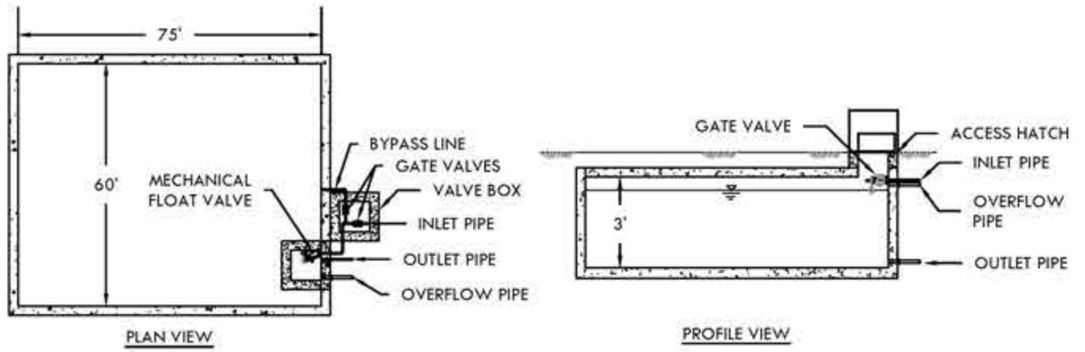
3 DUPLEX BOOSTER PUMP SYSTEM
SCALE: AS DIMENSIONED



TYPE 1 - BOLTED STEEL PANEL TANK



TYPE 2 - FIBERGLASS UNDERGROUND STORAGE TANK

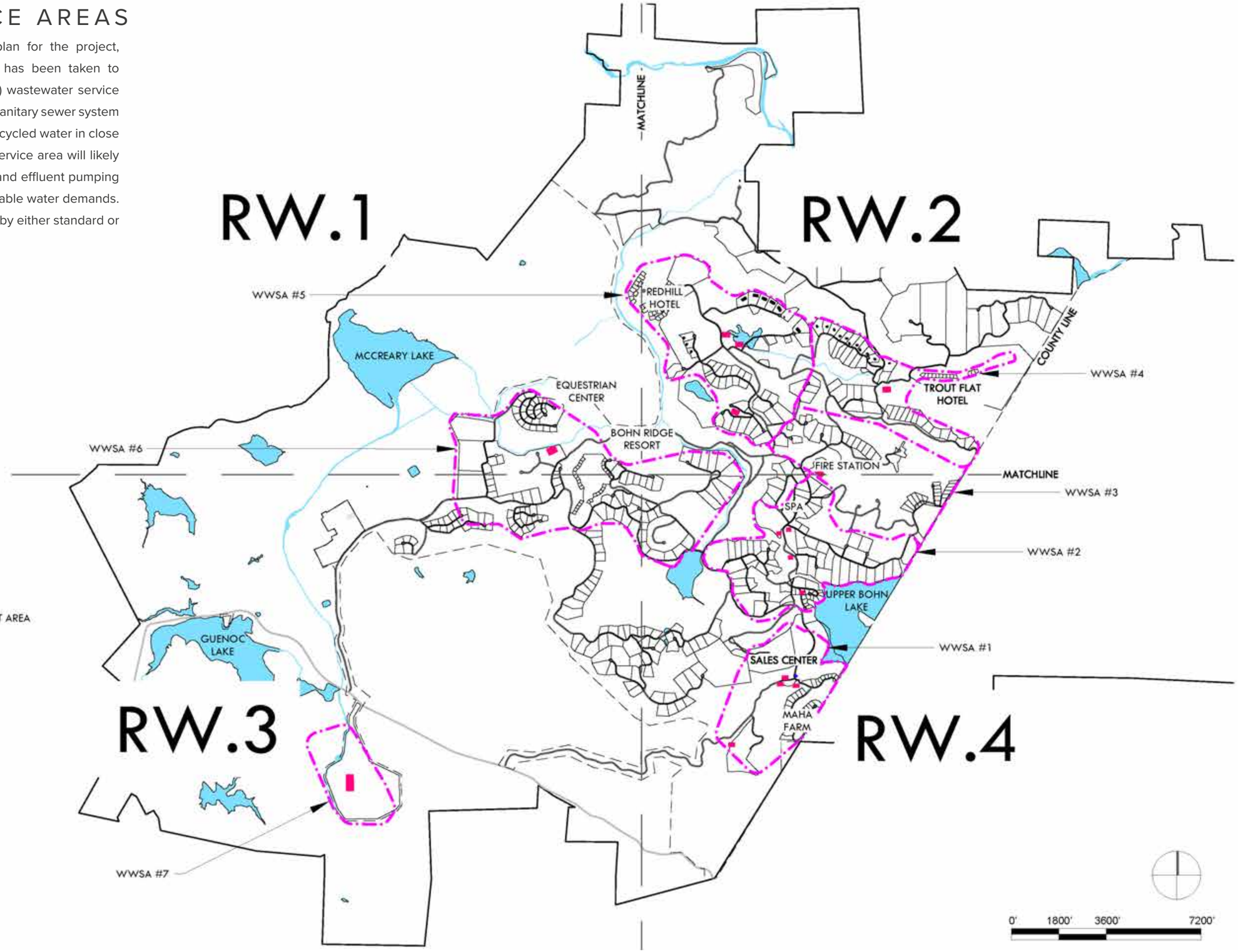


TYPE 3 - UNDERGROUND CONCRETE CISTERN

4 100,000 GALLON STORAGE TANK
SCALE: AS DIMENSIONED

WASTEWATER SERVICE AREAS

Based on the large and distributed development plan for the project, a decentralized wastewater management approach has been taken to manage wastewater from each cluster area. Eight (8) wastewater service areas are proposed and each area will have a discrete sanitary sewer system and wastewater reclamation plant to treat and reuse recycled water in close proximity to the commercial areas on the site. Each service area will likely have a 100,000 gallon recycled water storage facility and effluent pumping system. The recycled water will be reused for non-potable water demands. In addition individual lots have the option to be served by either standard or enhanced on-site wastewater septic systems.



LEGEND

- WASTE WATER SERVICE AREA (WWSA)
- ALTERNATIVE WASTE WATER MANAGEMENT AREA (WWMA)
- RW.X SHEET INDEX

NOTES

VILLA LOTS OUTSIDE OF WWSA'S WILL BE SERVED BY ONSITE WATER RECLAMATION FACILITIES. FACILITY DESIGN WILL DEPEND ON EXISTING SOIL CONDITIONS, SEE ONSITE WATER RECLAMATION FACILITIES, PAGE XX.

NOTE
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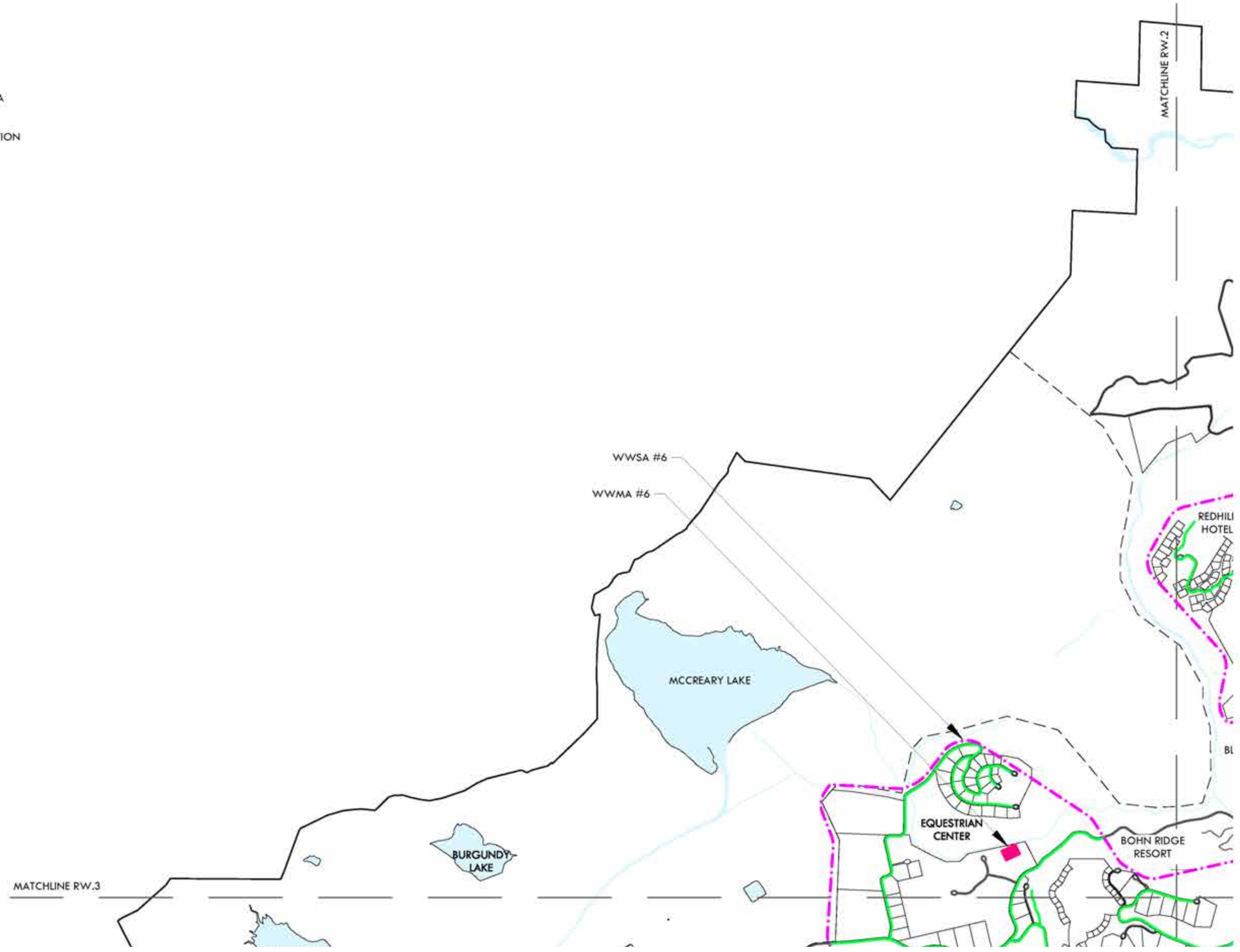
WASTEWATER SERVICE AREA DETAIL

LEGEND

- WASTE WATER SERVICE AREA (WWSA)
- ALTERNATIVE WASTE WATER MANAGEMENT AREA (WWMA)
- RECLAIMED WATER CONVEYANCE AND DISTRIBUTION SYSTEM



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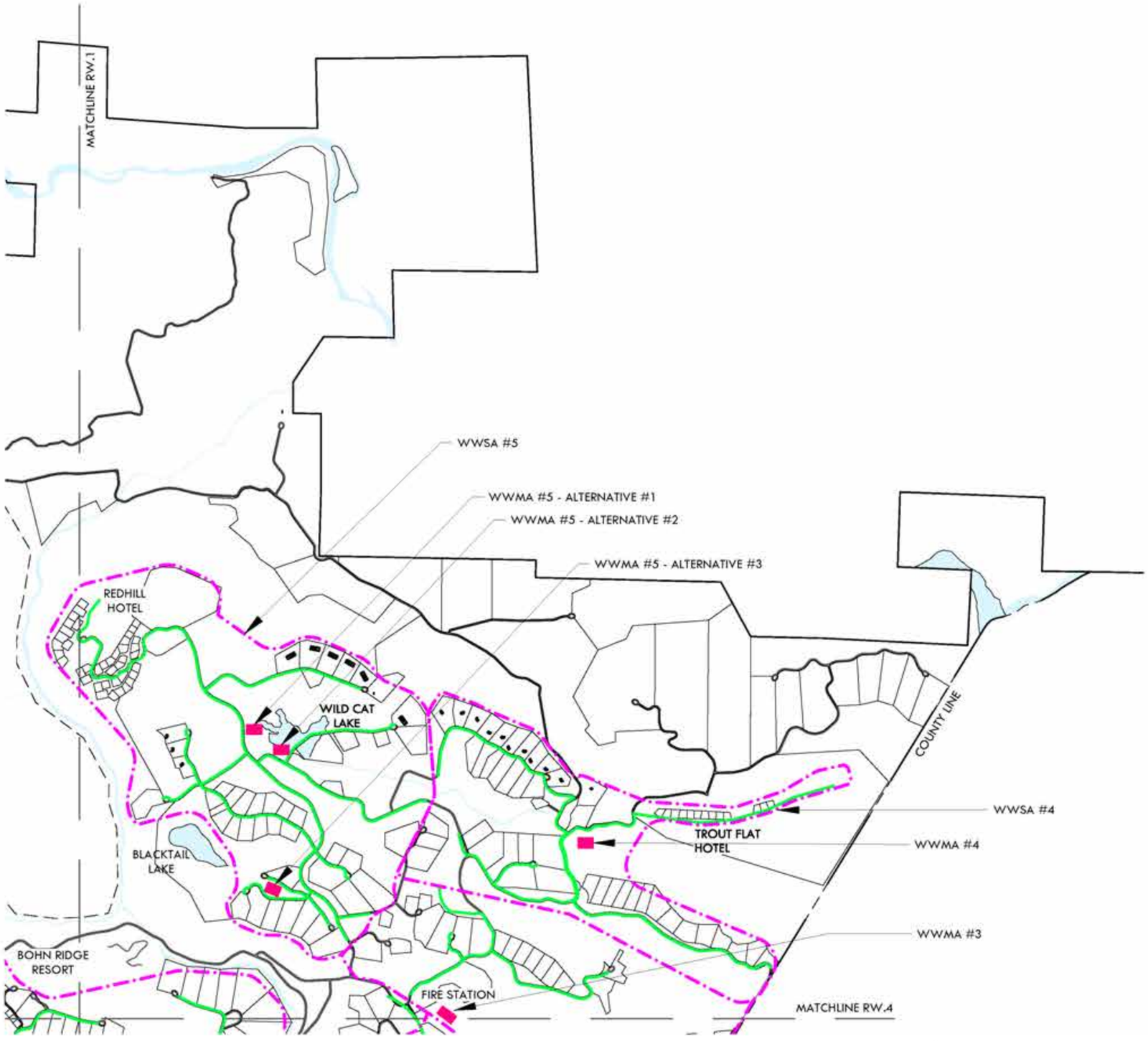

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0' 1000' 2000' 4000'

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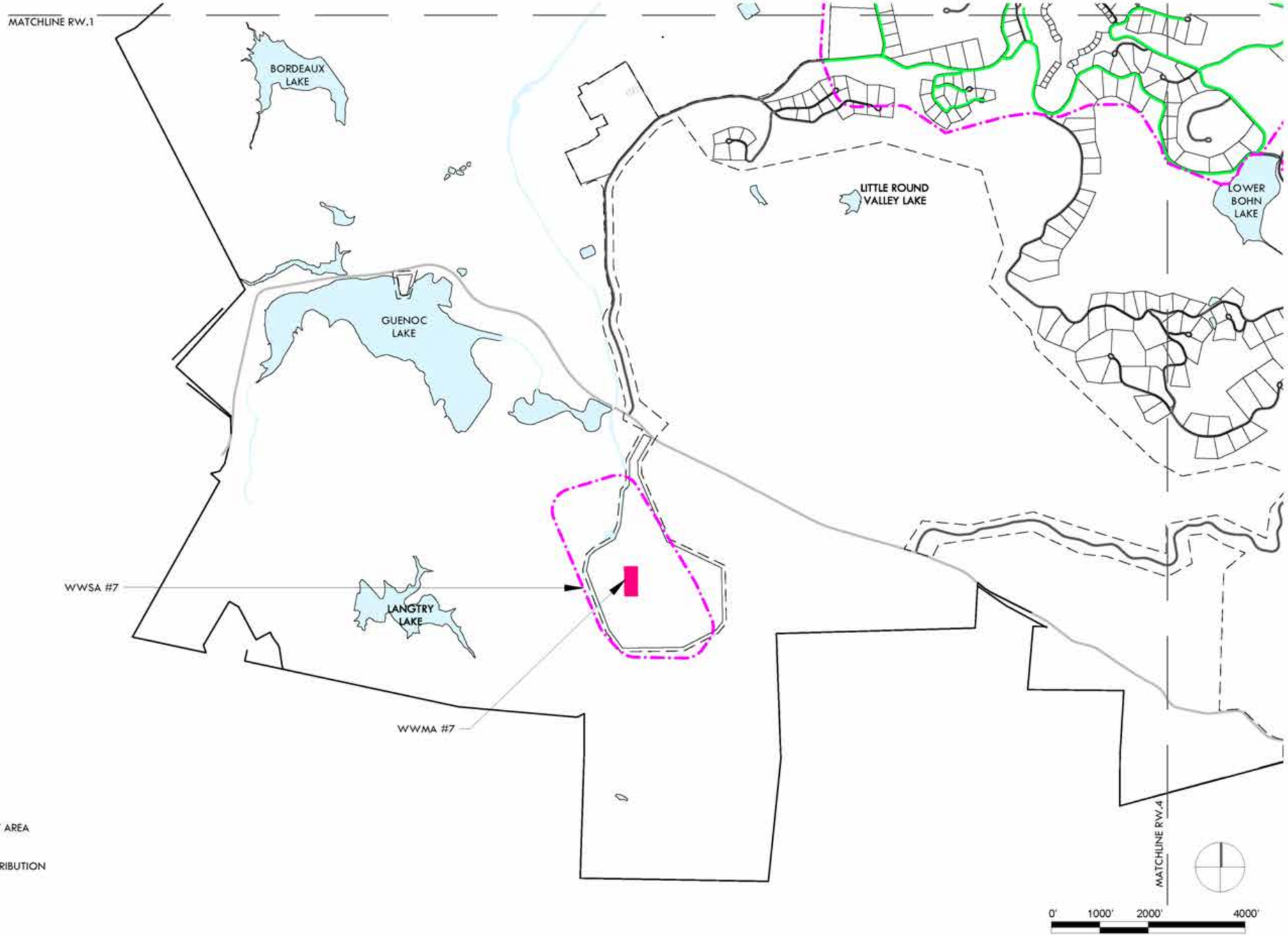

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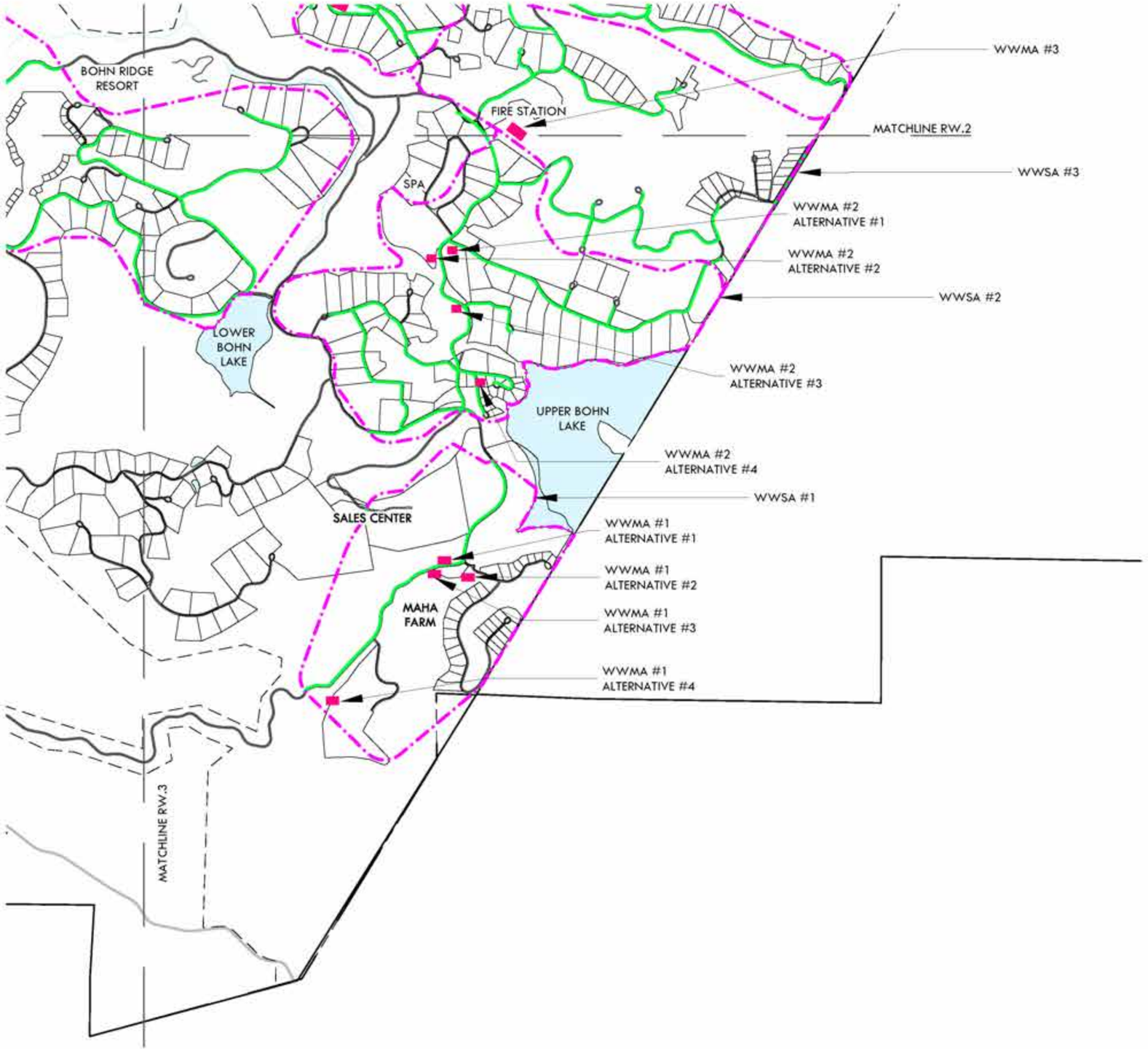

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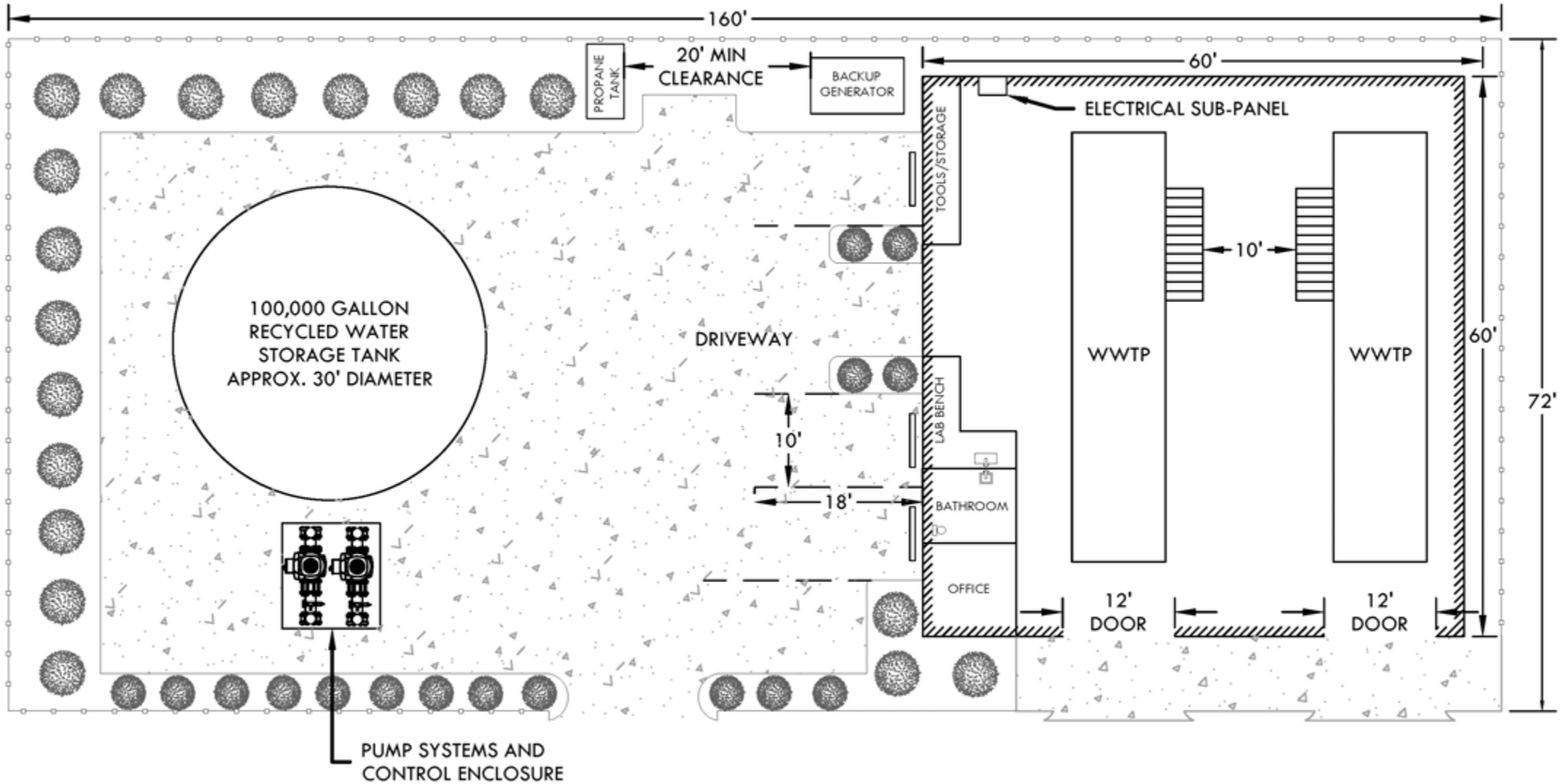
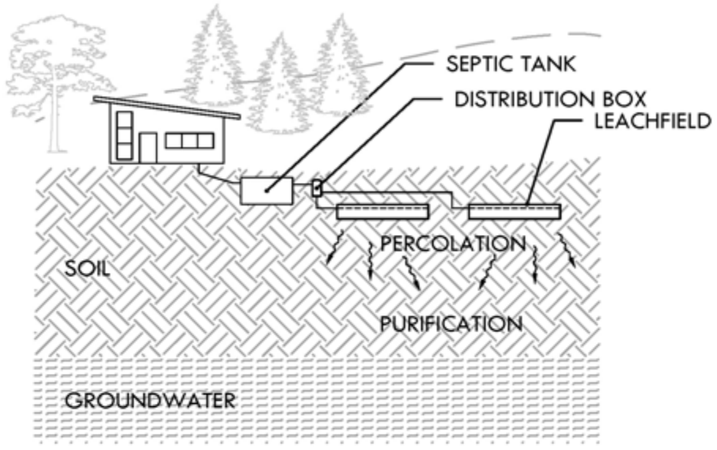
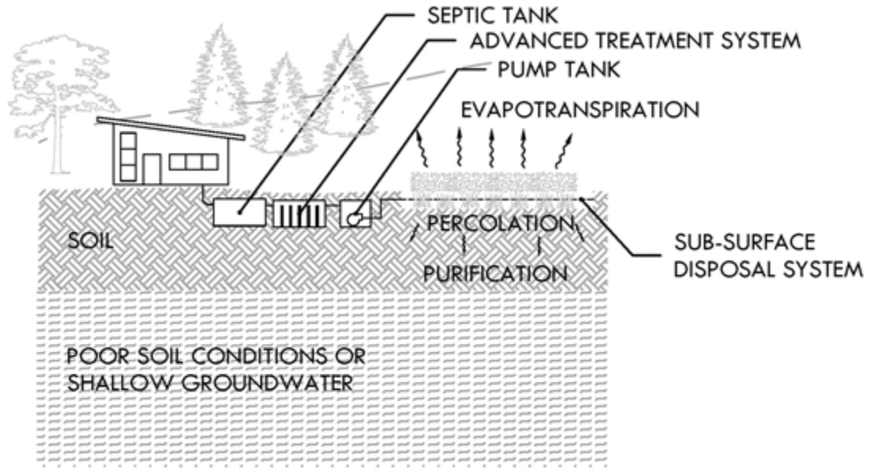
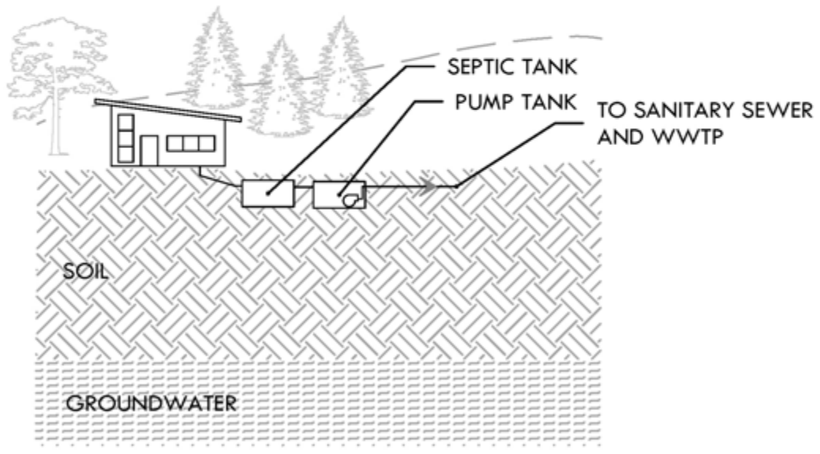

160'
PROPANE TANK
20' MIN CLEARANCE
BACKUP GENERATOR
60'
ELECTRICAL SUB-PANEL
TOOLS/STORAGE
100,000 GALLON RECYCLED WATER STORAGE TANK APPROX. 30' DIAMETER
DRIVEWAY
10'
WWTP
10'
WWTP
60'
72'
LAB BENCH
10'
18'
BATHROOM
OFFICE
12' DOOR
12' DOOR
PUMP SYSTEMS AND CONTROL ENCLOSURE



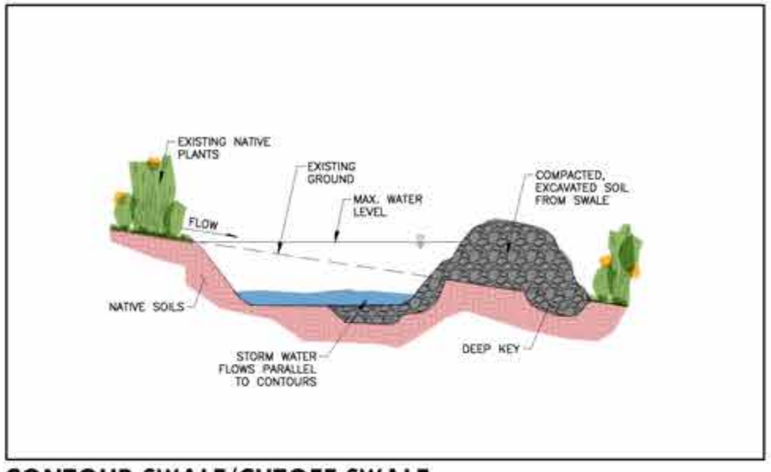
RESIDENTIAL SYSTEM TYPE 1A
STANDARD SEPTIC SYSTEM



RESIDENTIAL SYSTEM TYPE 1B
ONSITE ENHANCED
TREATMENT SYSTEM

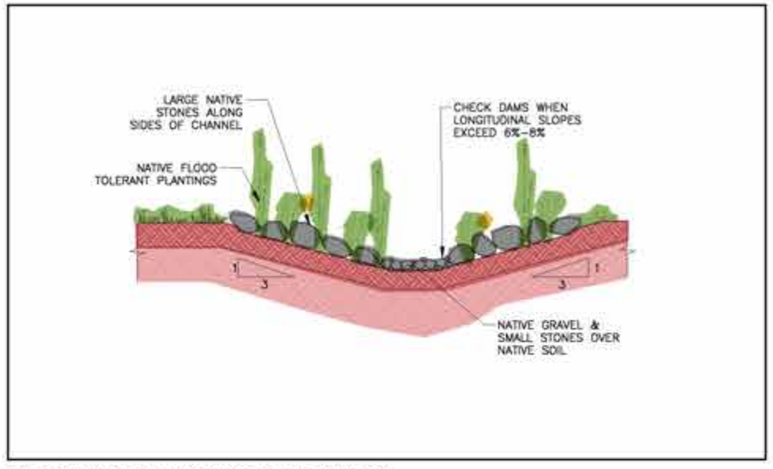


RESIDENTIAL SYSTEM TYPE 1C
SETPIC TANK EFFLUENT
SEWER SYSTEM



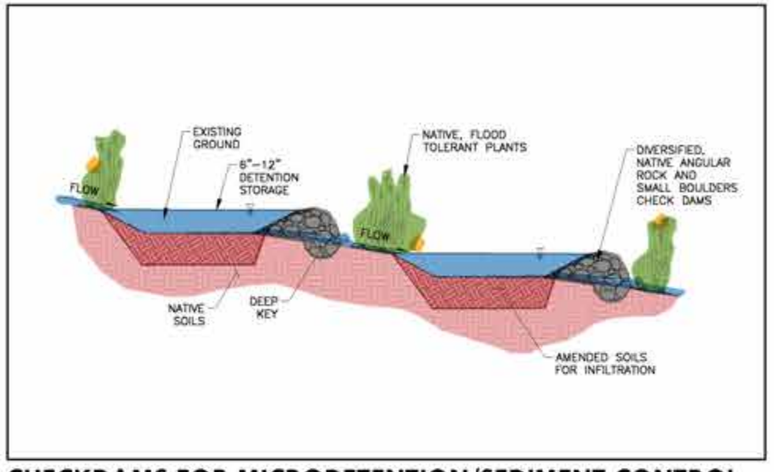
CONTOUR SWALE/CUTOFF SWALE

Contour swales and cutoff swales are integrated into the landscape to collect and transport hillside runoff prior to a roadside swale. The contour swales will also be used to disperse roof runoff and convey water towards raingardens, ponds and natural drainages. These on-contour features provide additional surface water storage and slow runoff to mimic the natural hydrologic response of the site.



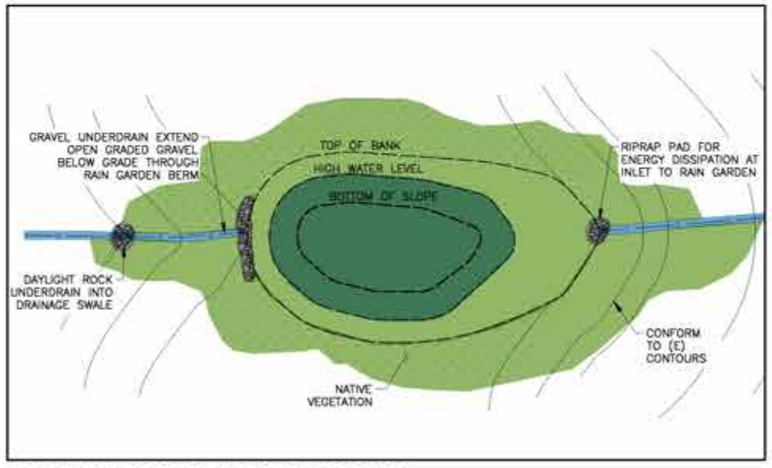
VEGETATED ROADSIDE SWALE

The project will use roadside swales in lieu of conventional piped conveyance systems. These swales will maintain existing surface drainage patters to the maximum extent feasible and will be used in conjunction with check dams and raingardens to provide passive stormwater conveyance and treatment with minimal site disturbance and reduced erosion.



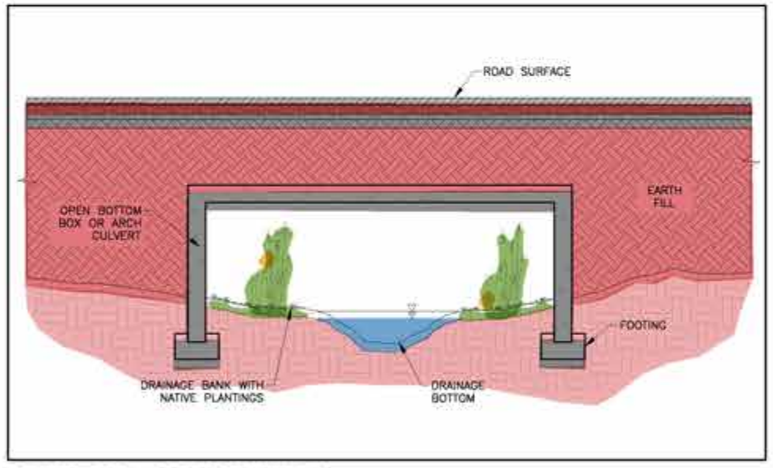
CHECKDAMS FOR MICRODETENTION/SEDIMENT CONTROL

Checkdams will be used in conjunction with vegetated roadside swales to provide erosion protection and stormwater treatment. They can be used in high slope (>4%) areas to control erosion and can be used in shallower slope regions to provide storage, treatment and infiltration. Through a series of micro detention pockets, stormwater will be slowed down and captured prior to migrating through the stone checkdams.



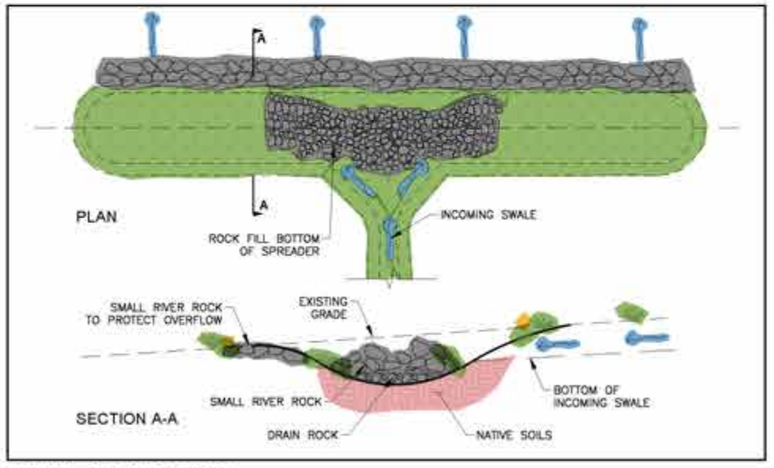
RAINGARDEN FOR TREATMENT

Raingardens will be used to provide treatment of stormwater running off roadways and hardscape areas prior to entering drainages. Generally, raingardens will be used in-line with vegetated roadside swales prior to entering a drainage. Raingardens will also be used within commercial areas to provide treatment for parking, hardscape, and roof areas. These treatment areas will be incorporated into the landscape and located to overflow into natural drainages.



OPEN BOTTOM CULVERTS

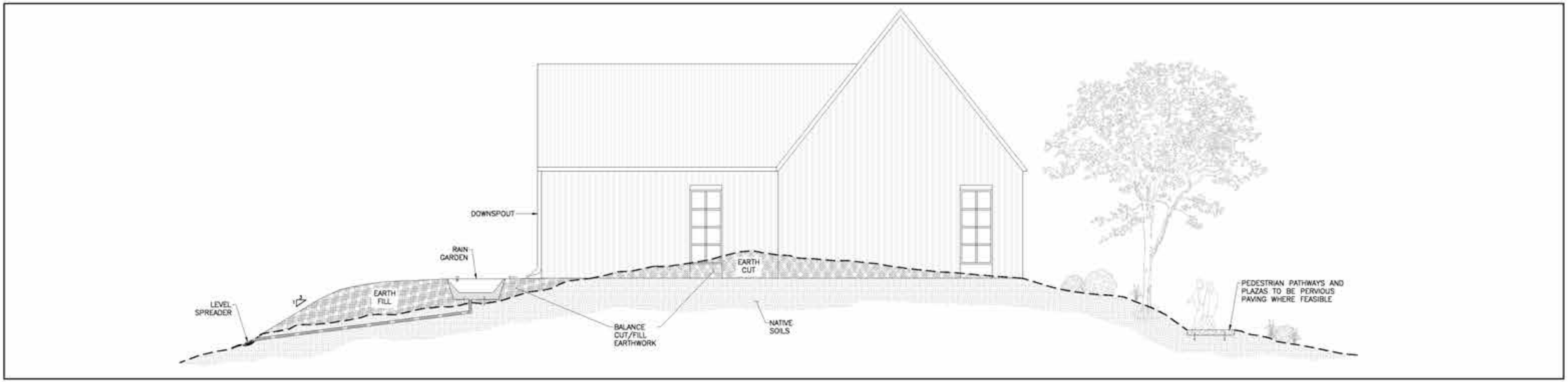
Throughout the site, there are existing drainages which have roadways crossing them. In order to provide a natural drainage channel, the project is using open bottom culverts to allow for a combination of stormwater conveyance and limited disturbance. These culverts will be both arch culverts, box culverts, and bridges.



LEVEL SPREADERS

Level spreaders will be used at the ends of drainages to allow for dispersion of stormwater from a channel into an undisturbed area of the site. This will help to prevent erosion channels from forming and provide for stormwater to drain and infiltrate through trees and undergrowth throughout the site, providing stormwater collection and treatment.

STORMWATER METHODS FOR ON-SITE DETENTION

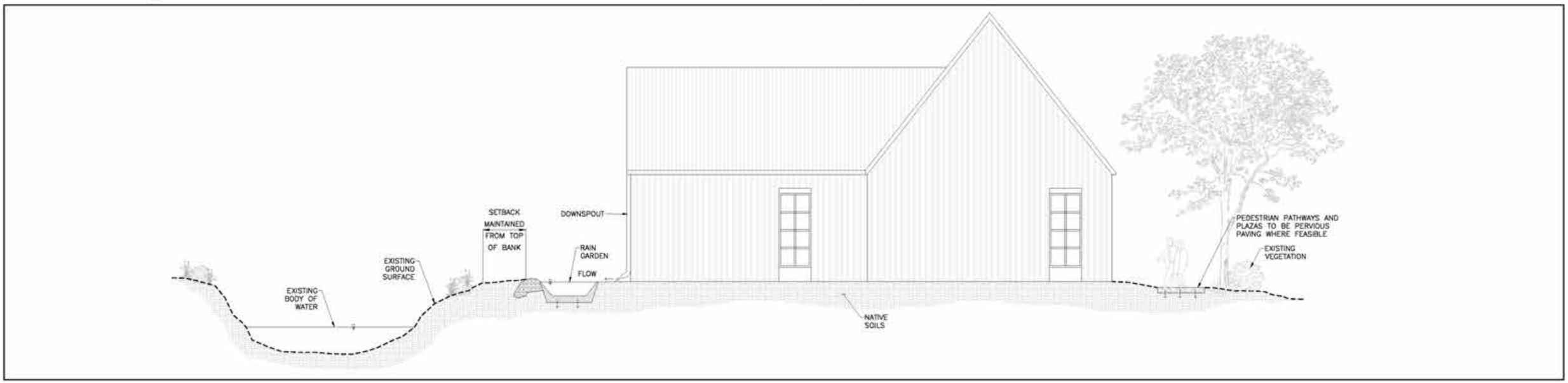


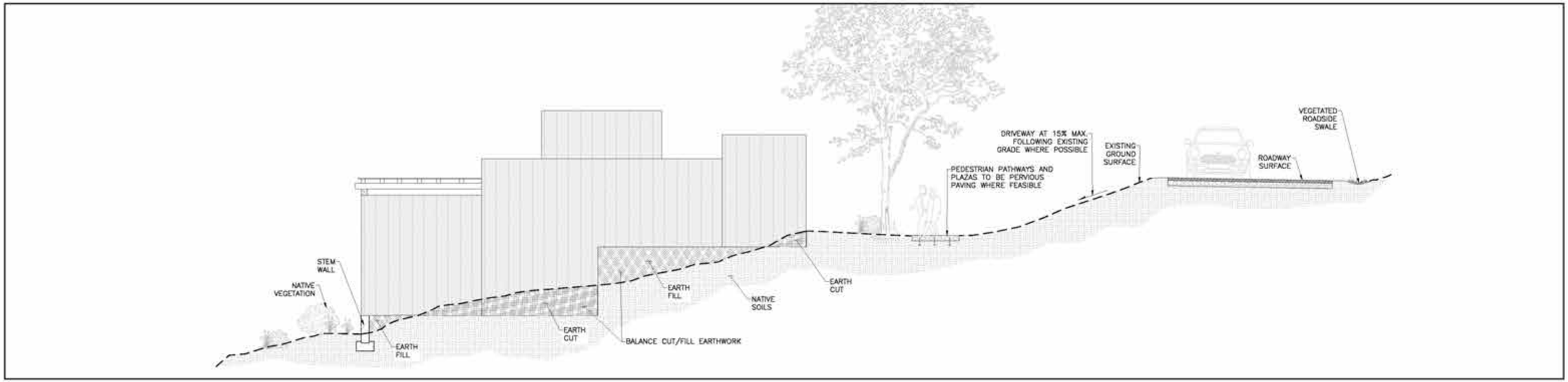
HILLTOP DEVELOPMENTS [ABOVE]

Many of the commercial areas are located at the high points of the site. Grading for these areas will attempt to balance the cut and fill within the disturbed area, while minimizing the overall extents of grading as much as is practical. Hardscape areas beyond the building will attempt to use pervious paving to reduce the amount of increased runoff coming off the hill zones.

WATER SIDE DEVEOPMENTS [BELOW]

Development adjacent to water bodies will include measures to minimize impacts to the existing hydrology, habitat, and receiving waters. These will include constructed storm water conveyances that mimic the natural drainage patterns, maintenance of setbacks from riparian zones, and material selections that preserve and improve runoff quality.



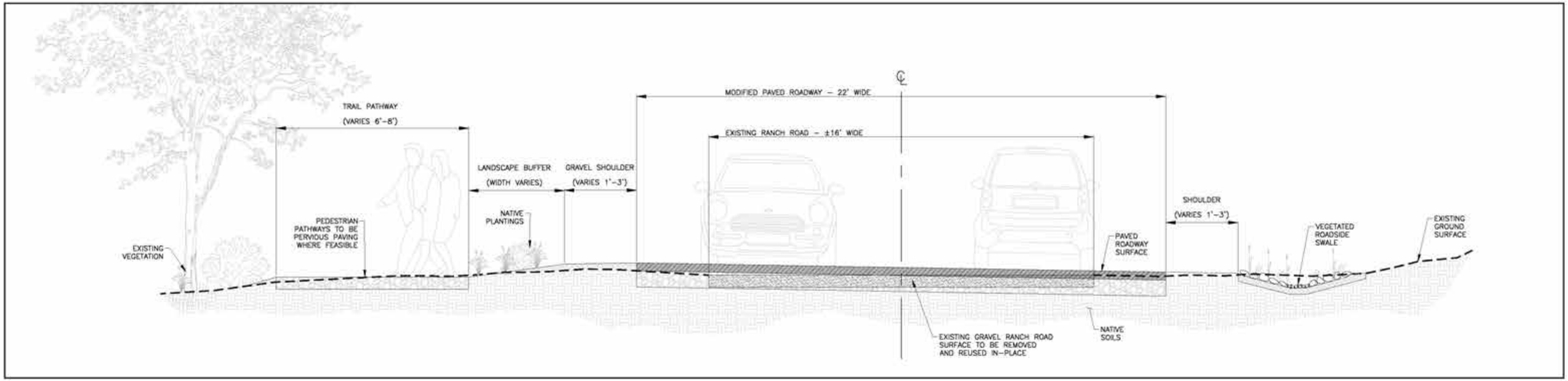


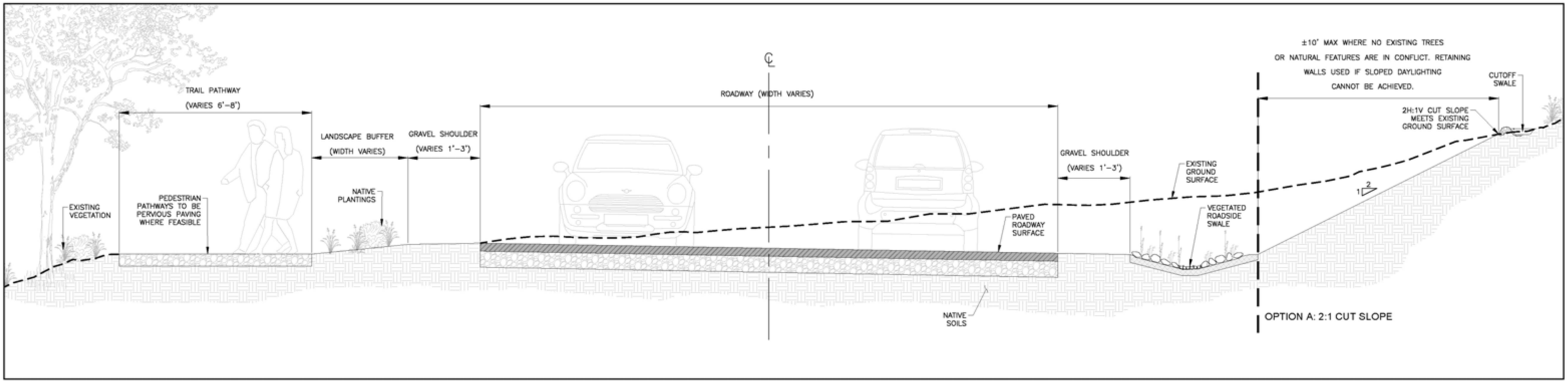
VILLA LOTS [ABOVE]

Villa lots employ a range of strategies to minimize impact to the existing site. Buildings will be located to achieve balanced earthwork cut and fill and maintain existing drainage patterns. Runoff collected from new impervious surfaces will be routed through landscape based conveyances that mitigate for water quality and peak runoff rate. Fuel maintenance and fire access will be prioritized on each developed site.

ROADWAYS OVER EXISTING RANCH ROADS [BELOW]

The majority of proposed roads will follow the alignments of existing ranch roads that are well established and maintained in good repair. Road corridors will be widened and improved to meet access requirements for emergency vehicles, guests, and operations. Runoff collected from new roads will be managed locally through a range of landscape based strategies. Earthwork cut and fill will be balanced locally as is feasible.



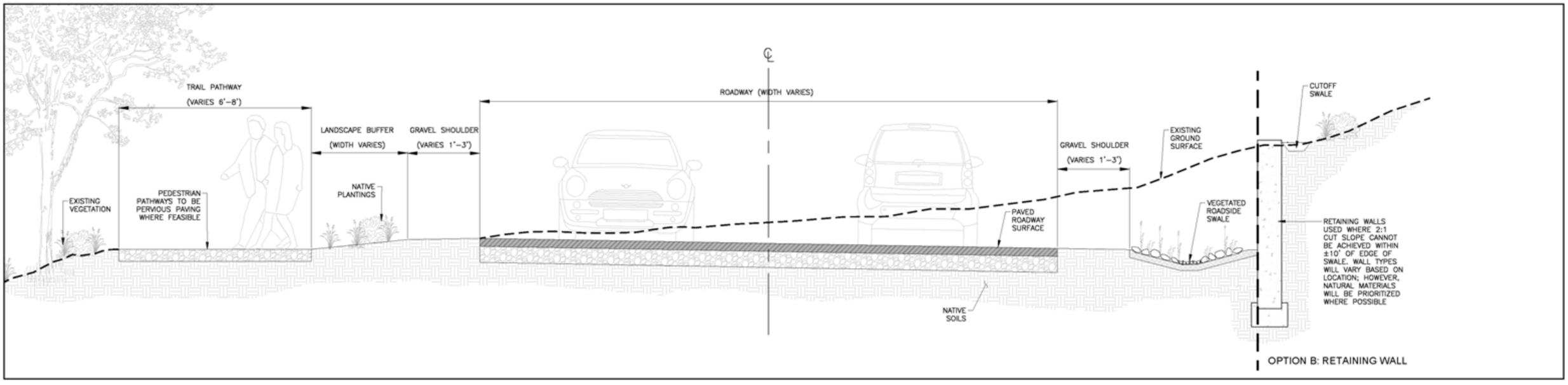


ROADWAYS THROUGH UNDEVELOPED LAND WITHOUT RETAINING WALL [ABOVE]

Roadways through undeveloped land will be carefully aligned to meet geometric and slope requirements while minimizing the impact to the existing topography, habitat, and hydrology. Where cross slopes are gentle, cut and fill slopes will be used to conform to existing grades. Cutoff swales will route run-on around new roads to preserve runoff quality and runoff collected from new impervious surfaces will be routed through site based elements that mitigate for water quality and peak runoff rates.

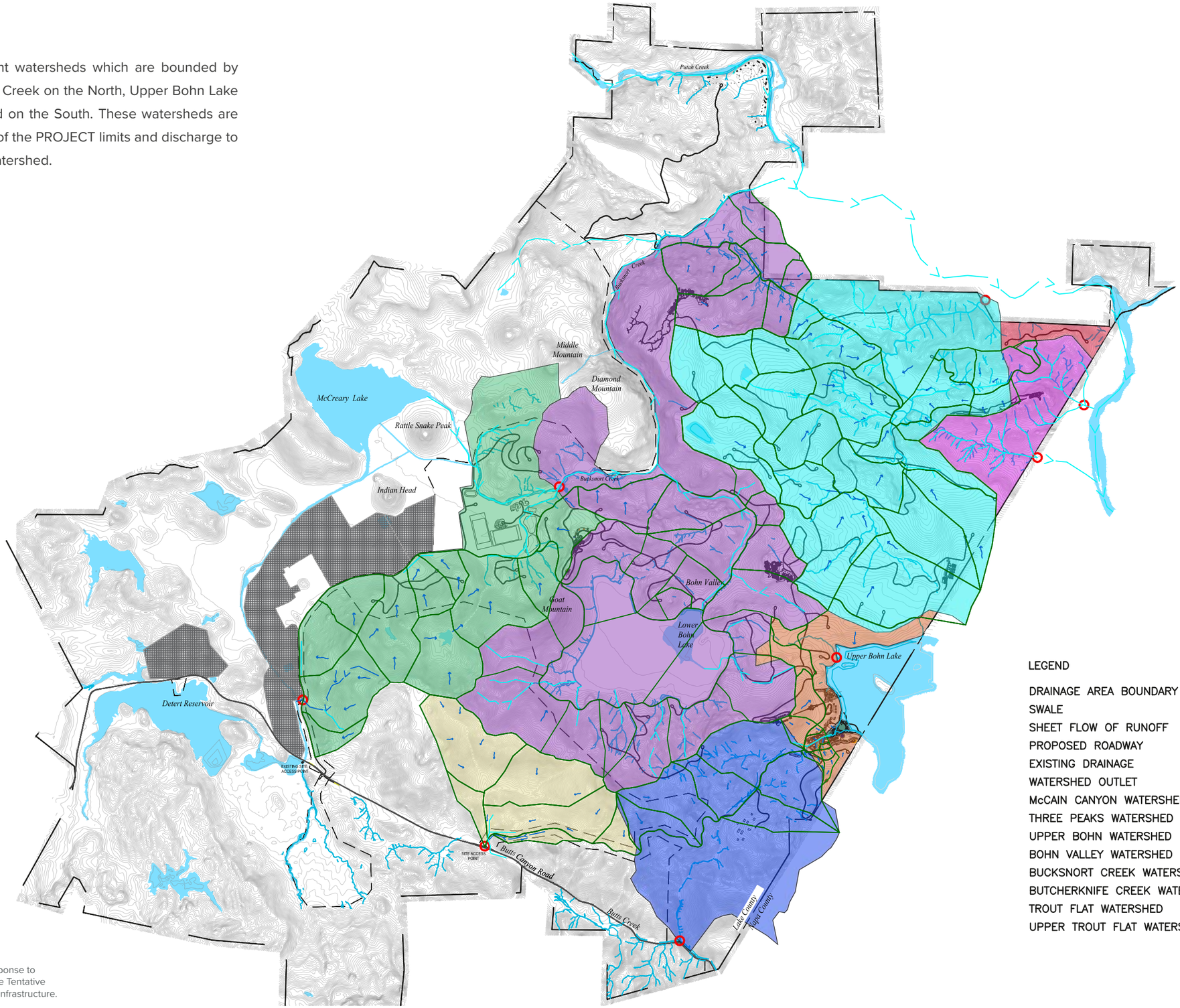
ROADWAYS THROUGH UNDEVELOPED LAND WITH RETAINING WALL [BELOW]

In areas where necessitated by cross slopes, new roadways will include retaining walls to limit the extents of disturbance. Cutoff swales will route run-on around new roads to preserve runoff quality and runoff collected from new impervious surfaces will be routed through site based elements that might mitigate for water quality and peak runoff rates.



WATERSHEDS

The Maha site is composed of eight watersheds which are bounded by Bucksnort Creek on the West, Putah Creek on the North, Upper Bohn Lake on the East, and Butts Canyon Road on the South. These watersheds are mainly contained within the bounds of the PROJECT limits and discharge to drainages and creeks within each watershed.



NOTE
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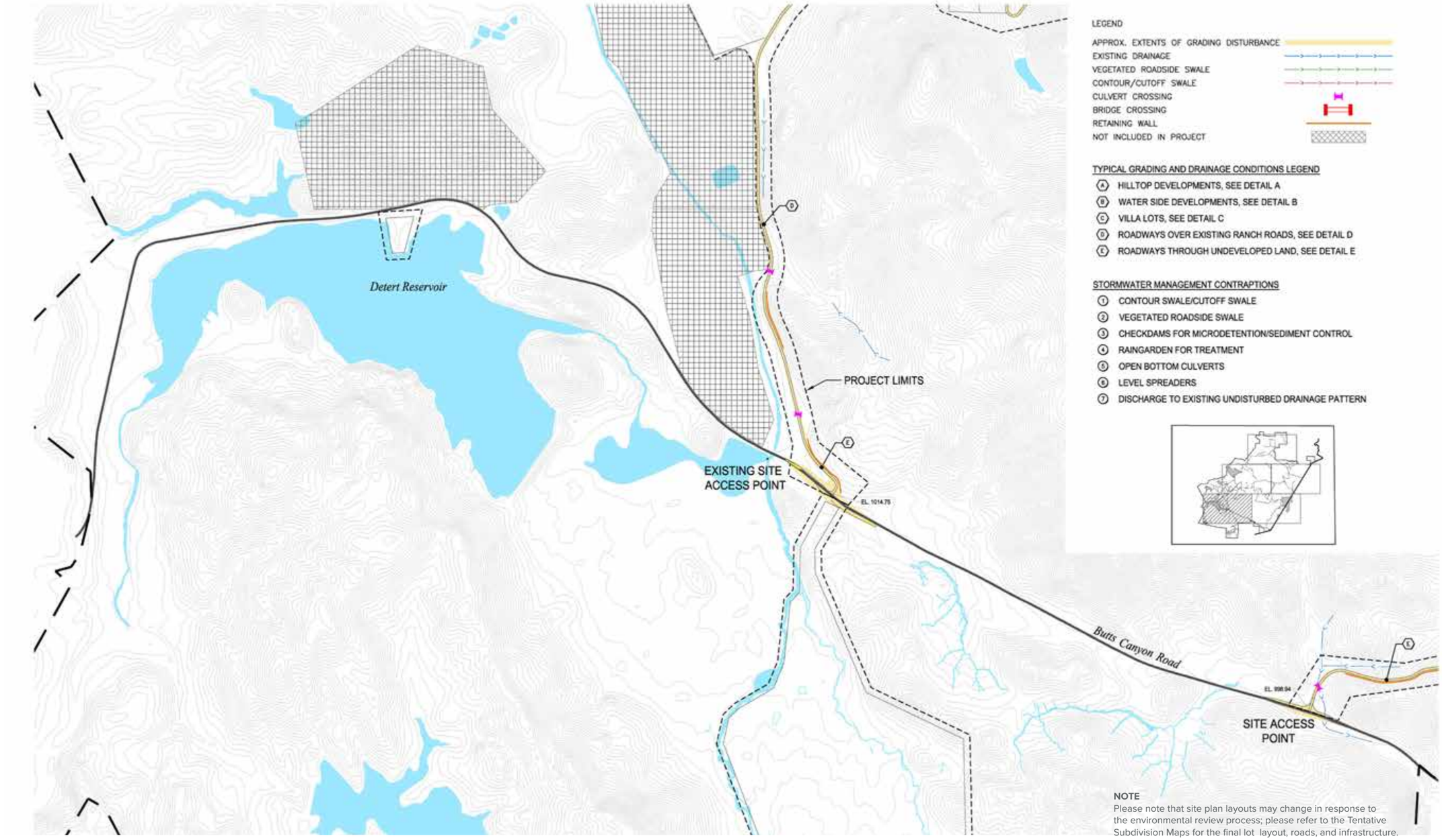
GRADING & DRAINAGE PLAN

Grading design for roads, structures, and site landscaping will be carefully laid out to work with existing contours, minimizing the disturbance to existing conditions and habitat as much as possible. Cut and fill conditions will be balanced across the site in as close proximity as possible in order to reduce truck traffic and overall disturbance. Drainage improvements will include new crossings and conveyances that accommodate the development while preserving and enhancing the site watersheds.



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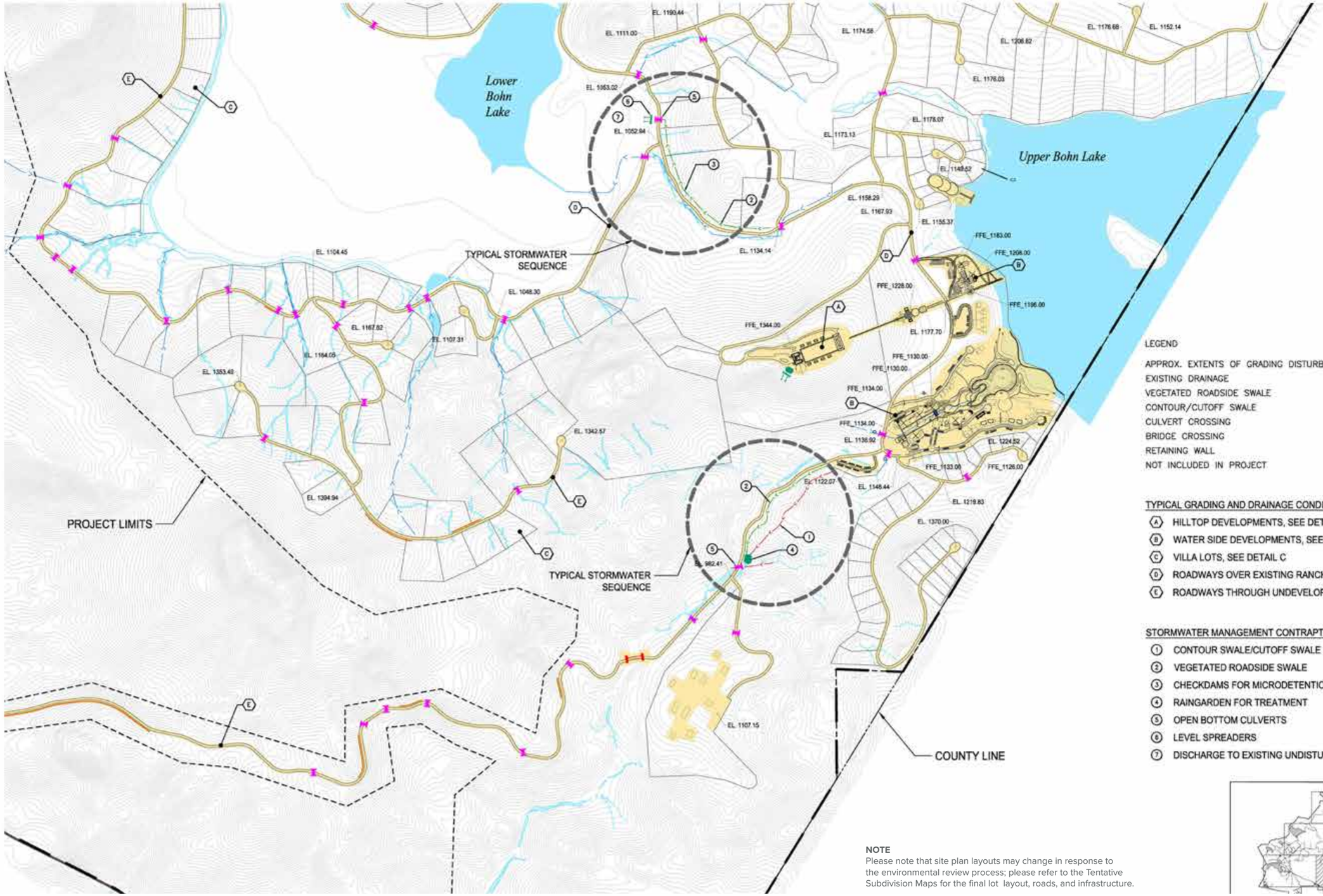

LEGEND

- APPROX. EXTENTS OF GRADING DISTURBANCE
- EXISTING DRAINAGE
- VEGETATED ROADSIDE SWALE
- CONTOUR/CUTOFF SWALE
- CULVERT CROSSING
- BRIDGE CROSSING
- RETAINING WALL
- NOT INCLUDED IN PROJECT

TYPICAL GRADING AND DRAINAGE CONDITIONS LEGEND

- (A) HILLTOP DEVELOPMENTS, SEE DETAIL A
- (B) WATER SIDE DEVELOPMENTS, SEE DETAIL B
- (C) VILLA LOTS, SEE DETAIL C
- (D) ROADWAYS OVER EXISTING RANCH ROADS, SEE DETAIL D
- (E) ROADWAYS THROUGH UNDEVELOPED LAND, SEE DETAIL E

STORMWATER MANAGEMENT CONTRAPTIONS

- (1) CONTOUR SWALE/CUTOFF SWALE
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- (3) CHECKDAMS FOR MICRODETENTION/SEDIMENT CONTROL
- (4) RAINGARDEN FOR TREATMENT
- (5) OPEN BOTTOM CULVERTS
- (6) LEVEL SPREADERS
- (7) DISCHARGE TO EXISTING UNDISTURBED DRAINAGE PATTERN

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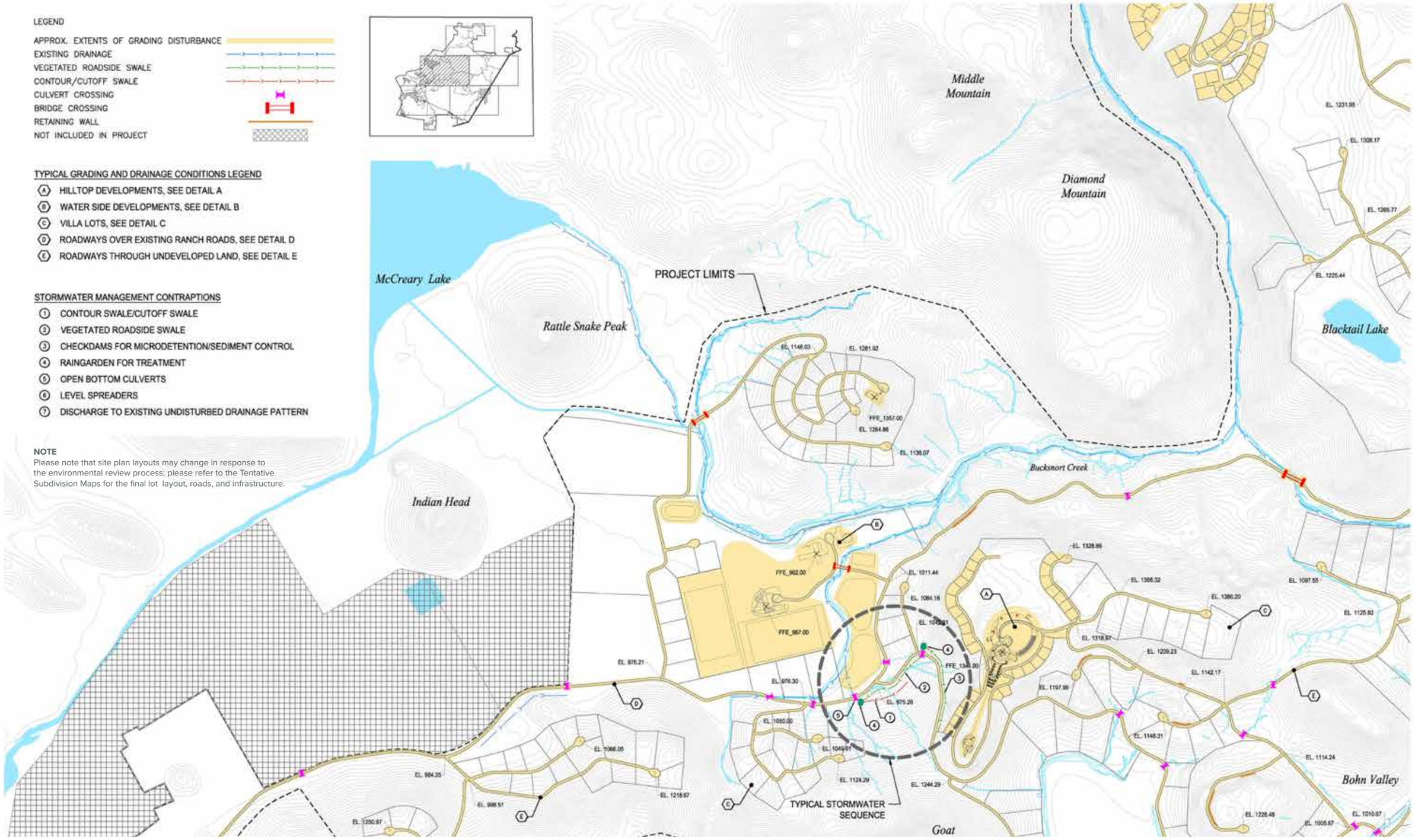

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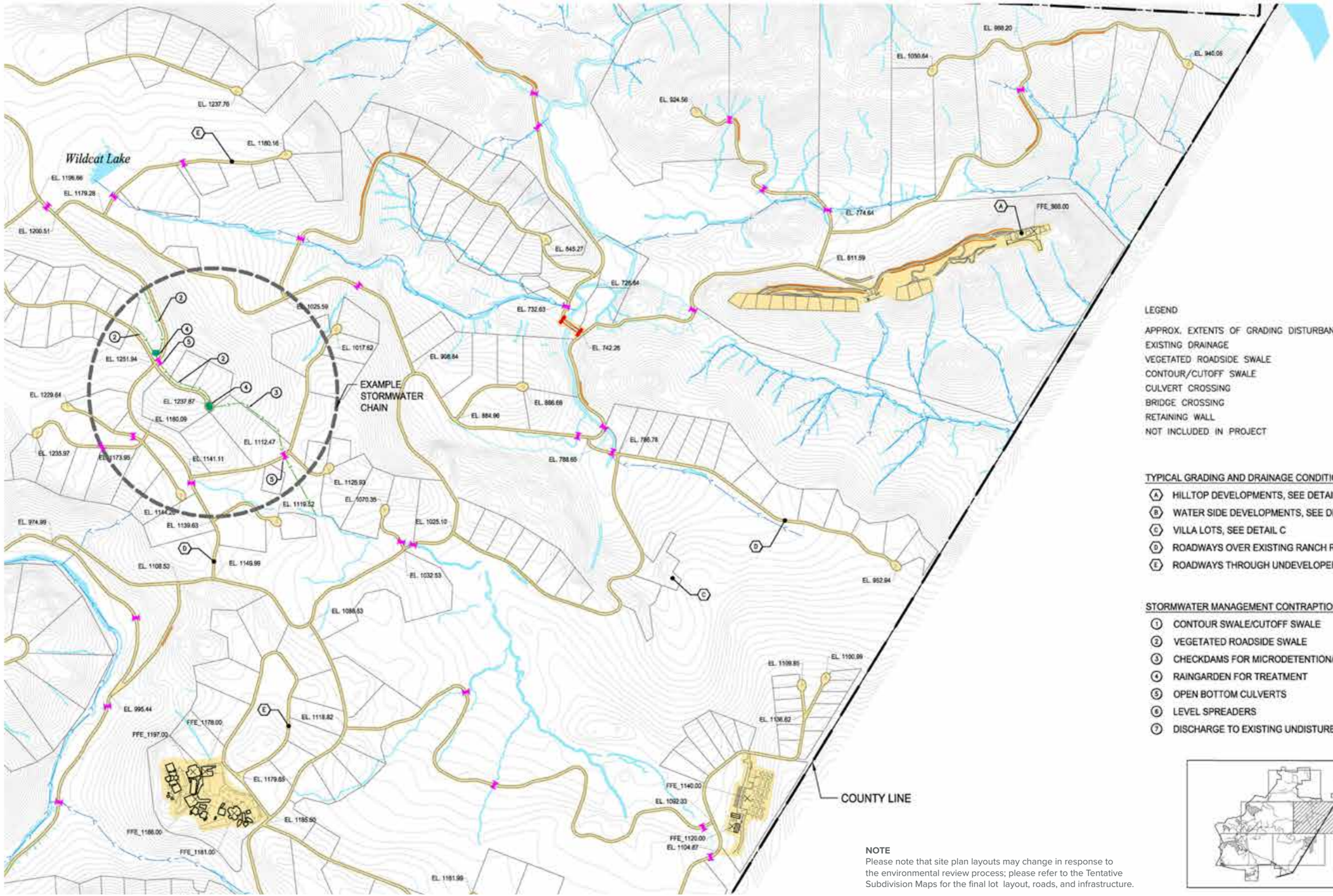

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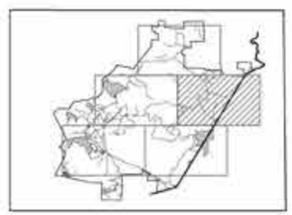

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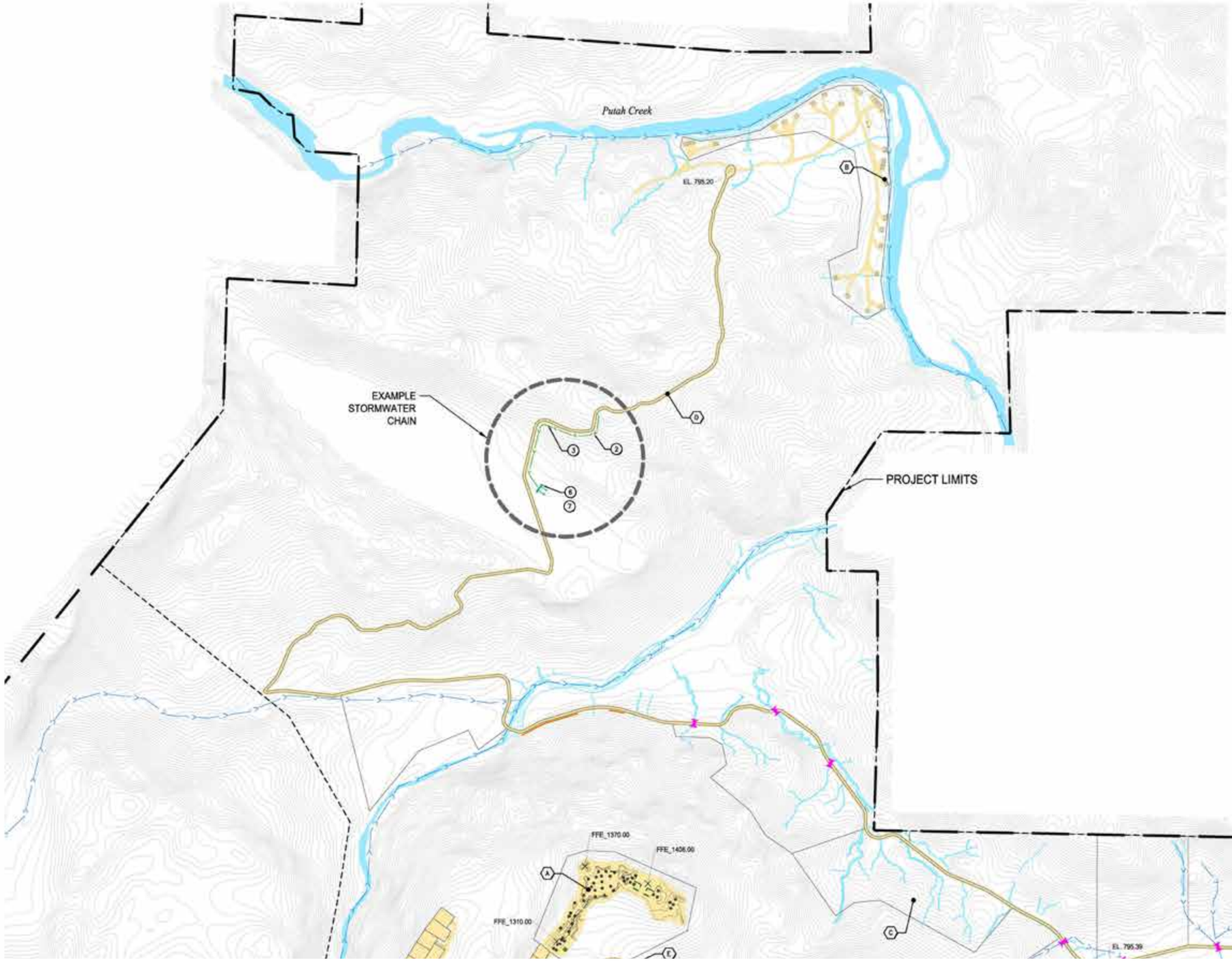

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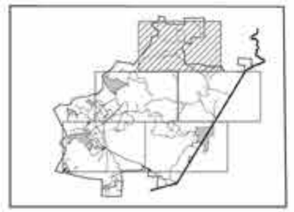

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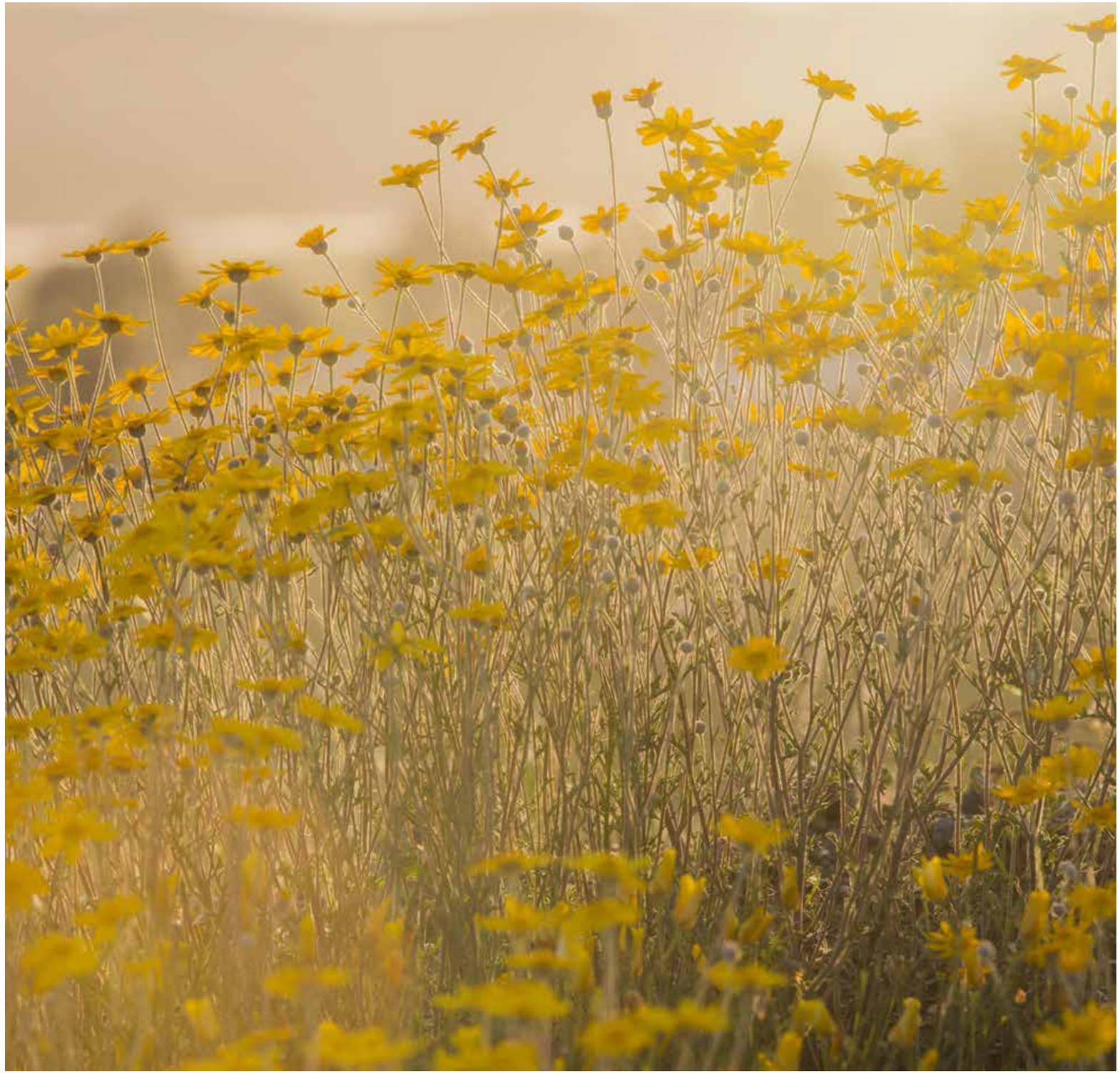
DRY UTILITIES

The availability and delivery of public services is an essential factor to consider in any new development. However, considering the scope, location, and long-term development period, it is proposed that the majority of the infrastructure will be privately owned and managed.

As narrated by the Middletown Area Plan Special Study Area No.3, innovative development and Smart Growth techniques are the ideal fit for development within Guenoc Valley. By “low impact development” and incorporating strategies that mimic and augment natural systems, the project will enhance the landscape’s resilience and adaptability throughout all phases of development.

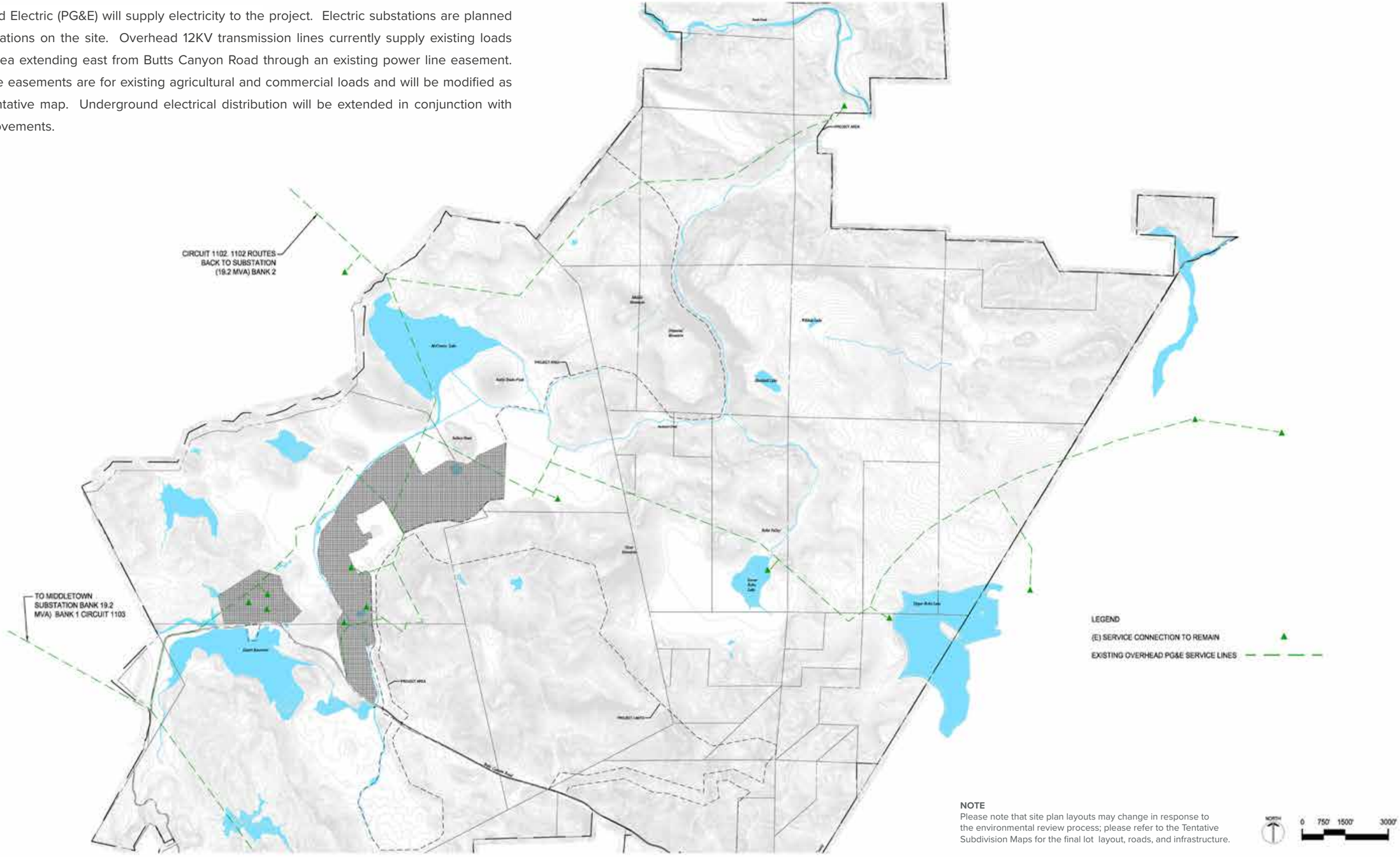
The GVD Specific Plan includes utility infrastructure required to serve the architectural clusters. Each component of the utility infrastructure system is designed to accommodate the build-out of the GVD area. Phasing of infrastructure improvements and funding obligations will be detailed in the Development Agreements. Utility infrastructure will be constructed, dedicated with public easements, as seen on the tentative subdivision map.

On and potential off-site, renewable energy generation and storage systems will be included in the development. The on-site renewables will be built in a mix of the architecture, centralized at one location on the site, and/or be clustered within developments.



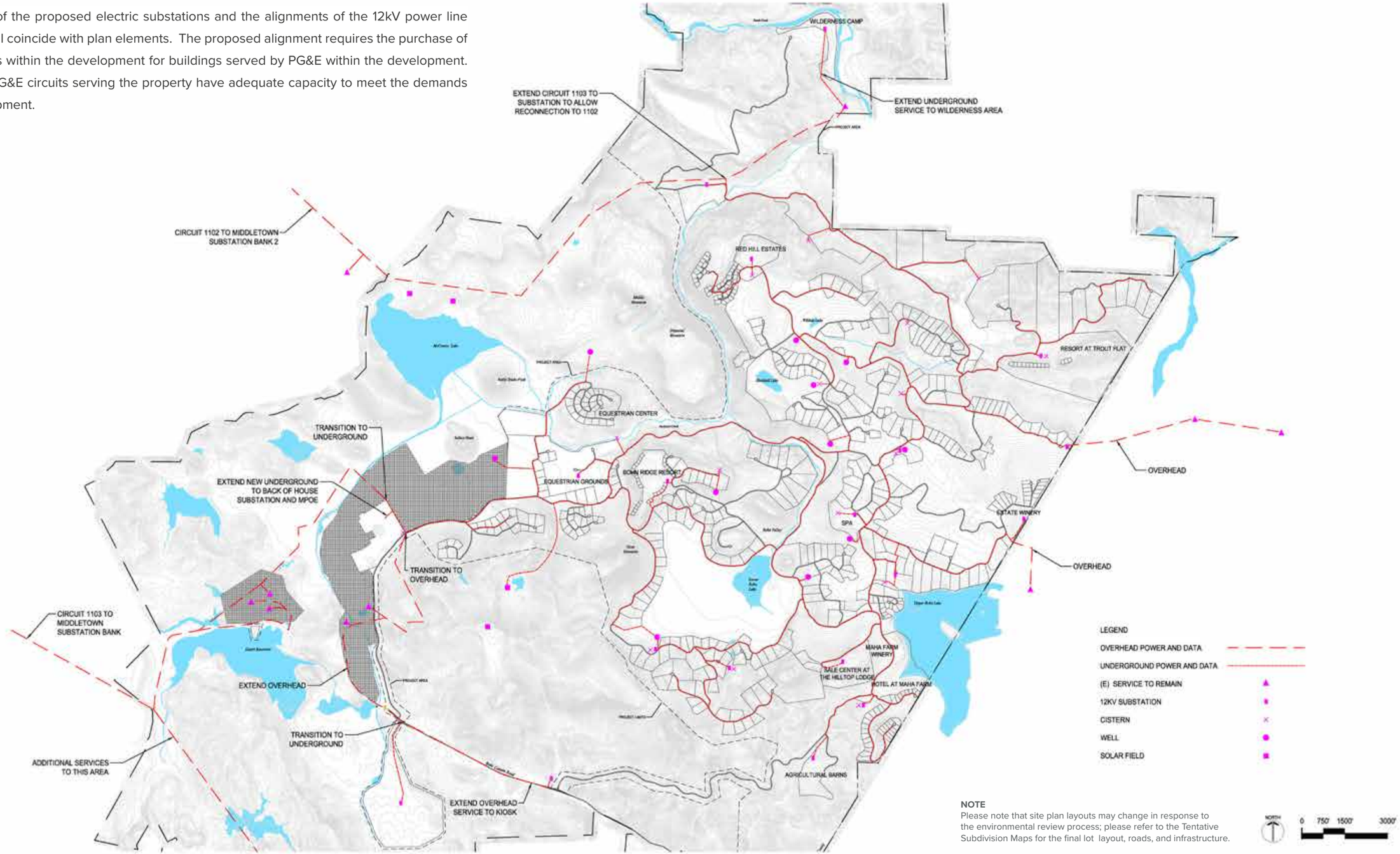
DRY UTILITIES EXISTING PG&E SERVICES

Pacific Gas and Electric (PG&E) will supply electricity to the project. Electric substations are planned at multiple locations on the site. Overhead 12KV transmission lines currently supply existing loads through the area extending east from Butts Canyon Road through an existing power line easement. The power line easements are for existing agricultural and commercial loads and will be modified as part of the tentative map. Underground electrical distribution will be extended in conjunction with roadway improvements.

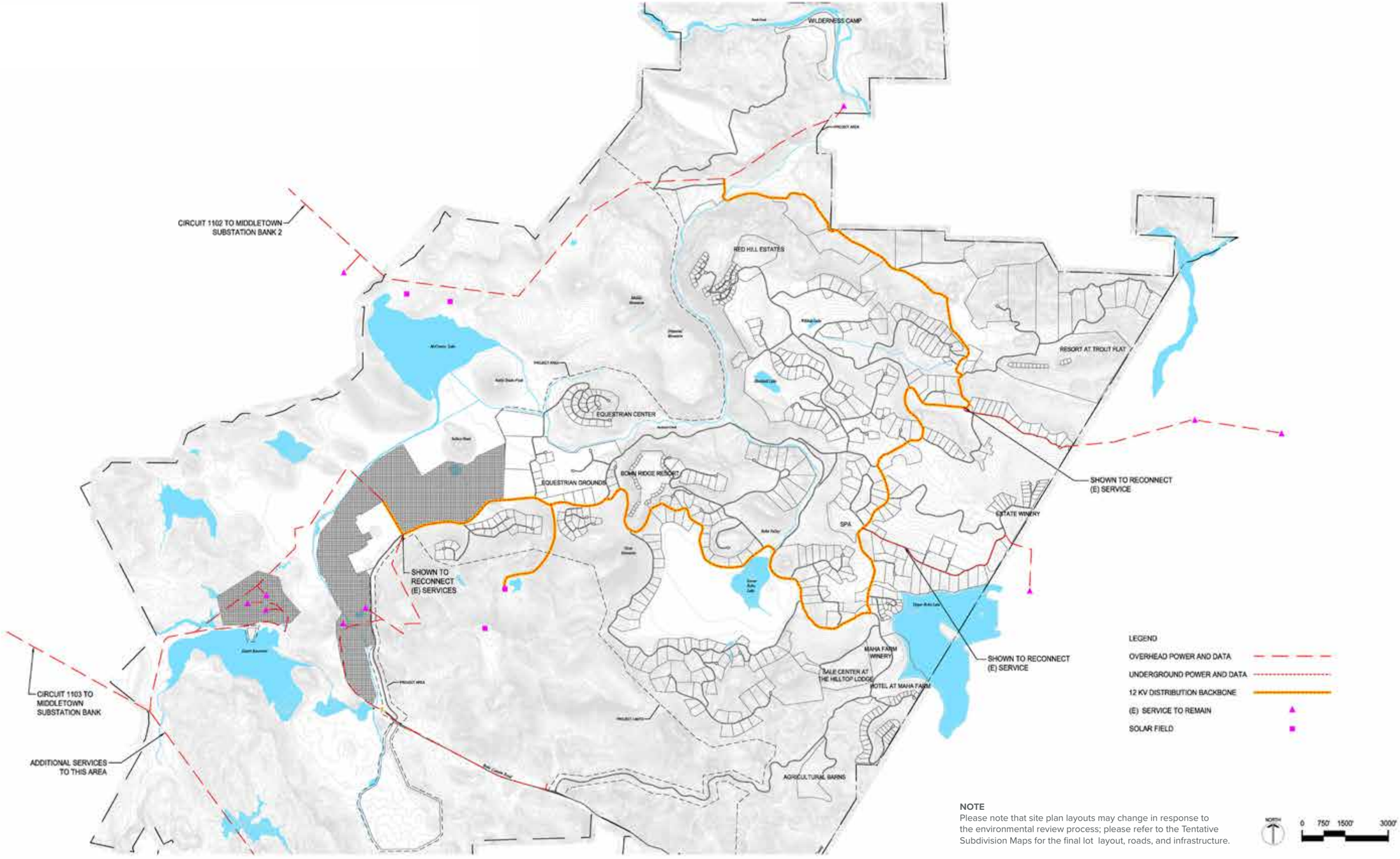


DRY UTILITIES PROPOSED 12KV DISTRIBUTION

The location of the proposed electric substations and the alignments of the 12kV power line easements will coincide with plan elements. The proposed alignment requires the purchase of PG&E facilities within the development for buildings served by PG&E within the development. The current PG&E circuits serving the property have adequate capacity to meet the demands of the development.



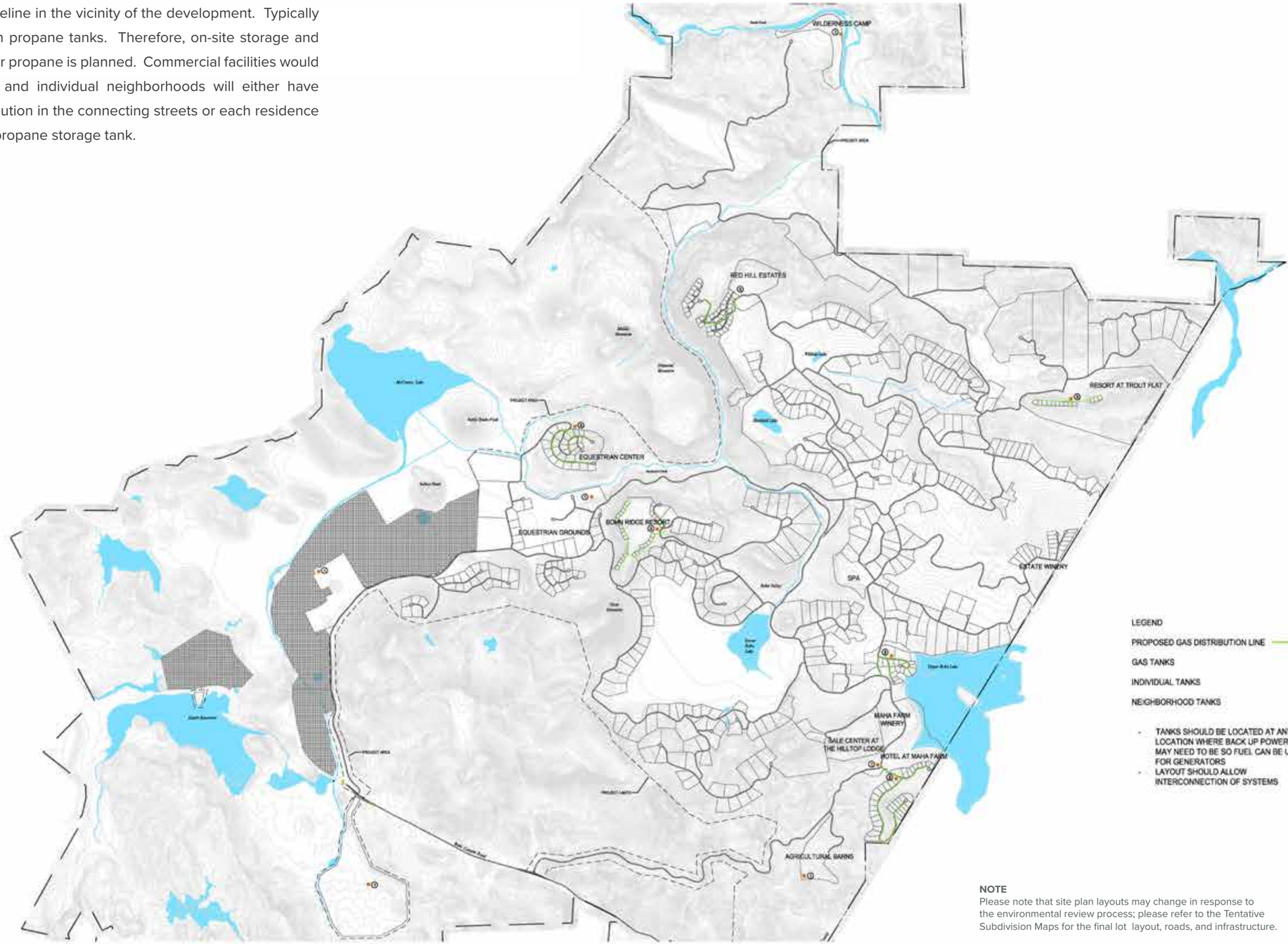
DRY UTILITIES PROPOSED 12KV UNDERGROUND BACKBONE



NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

DRY UTILITIES PROPOSED GAS DISTRIBUTION

There is no natural gas pipeline in the vicinity of the development. Typically rural developments rely on propane tanks. Therefore, on-site storage and distribution of natural gas or propane is planned. Commercial facilities would have centralized facilities and individual neighborhoods will either have central facilities with distribution in the connecting streets or each residence would be provided with a propane storage tank.

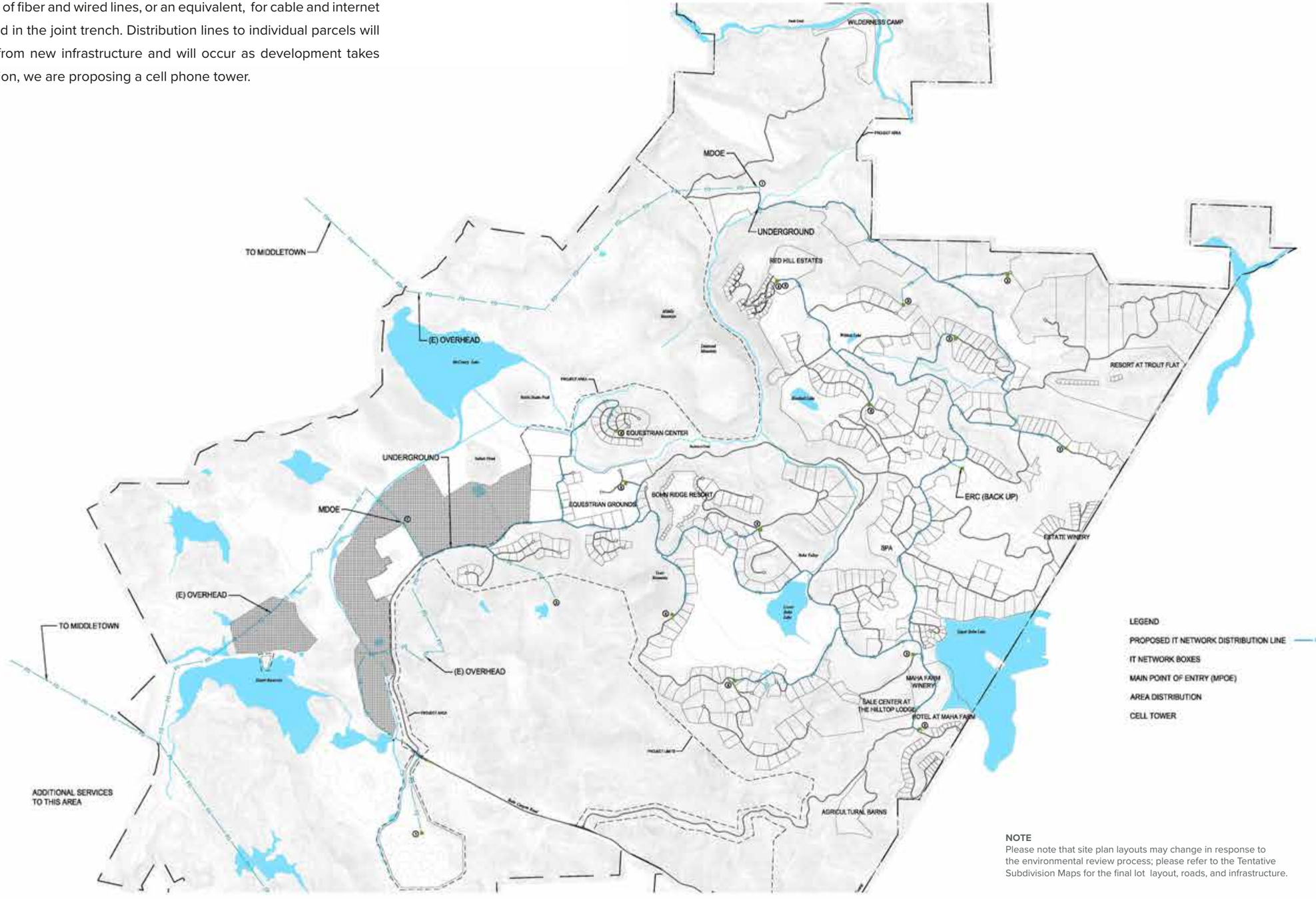


NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

NORTH 0 750' 1500' 3000'

COMMUNICATIONS PROPOSED IT NETWORK

A combination of fiber and wired lines, or an equivalent, for cable and internet will be included in the joint trench. Distribution lines to individual parcels will be extended from new infrastructure and will occur as development takes place. In addition, we are proposing a cell phone tower.



LEGEND

PROPOSED IT NETWORK DISTRIBUTION LINE

IT NETWORK BOXES

MAIN POINT OF ENTRY (MPOE) (1)

AREA DISTRIBUTION (2)

CELL TOWER (3)

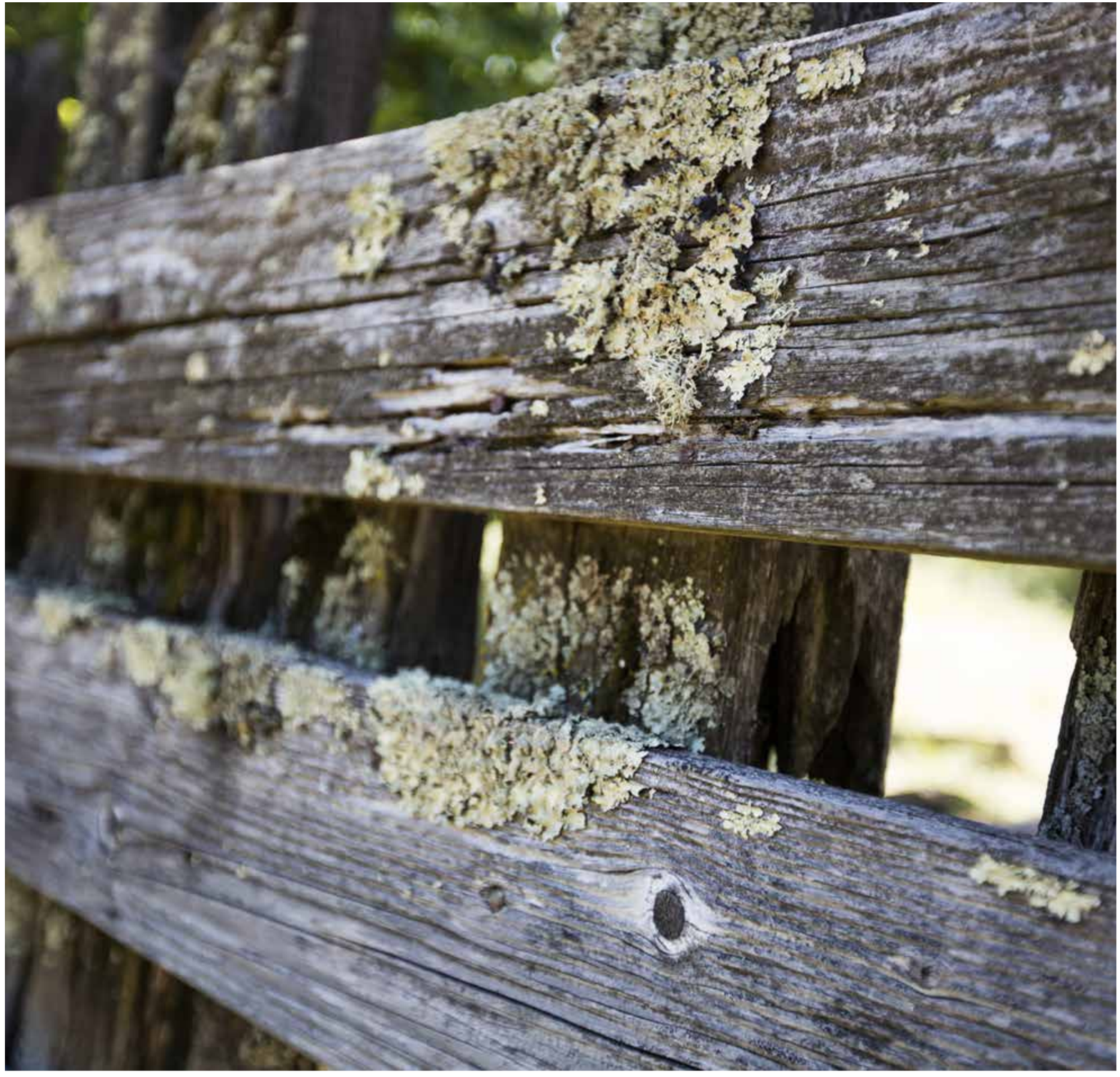
NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

NORTH 0 750' 1500' 3000'

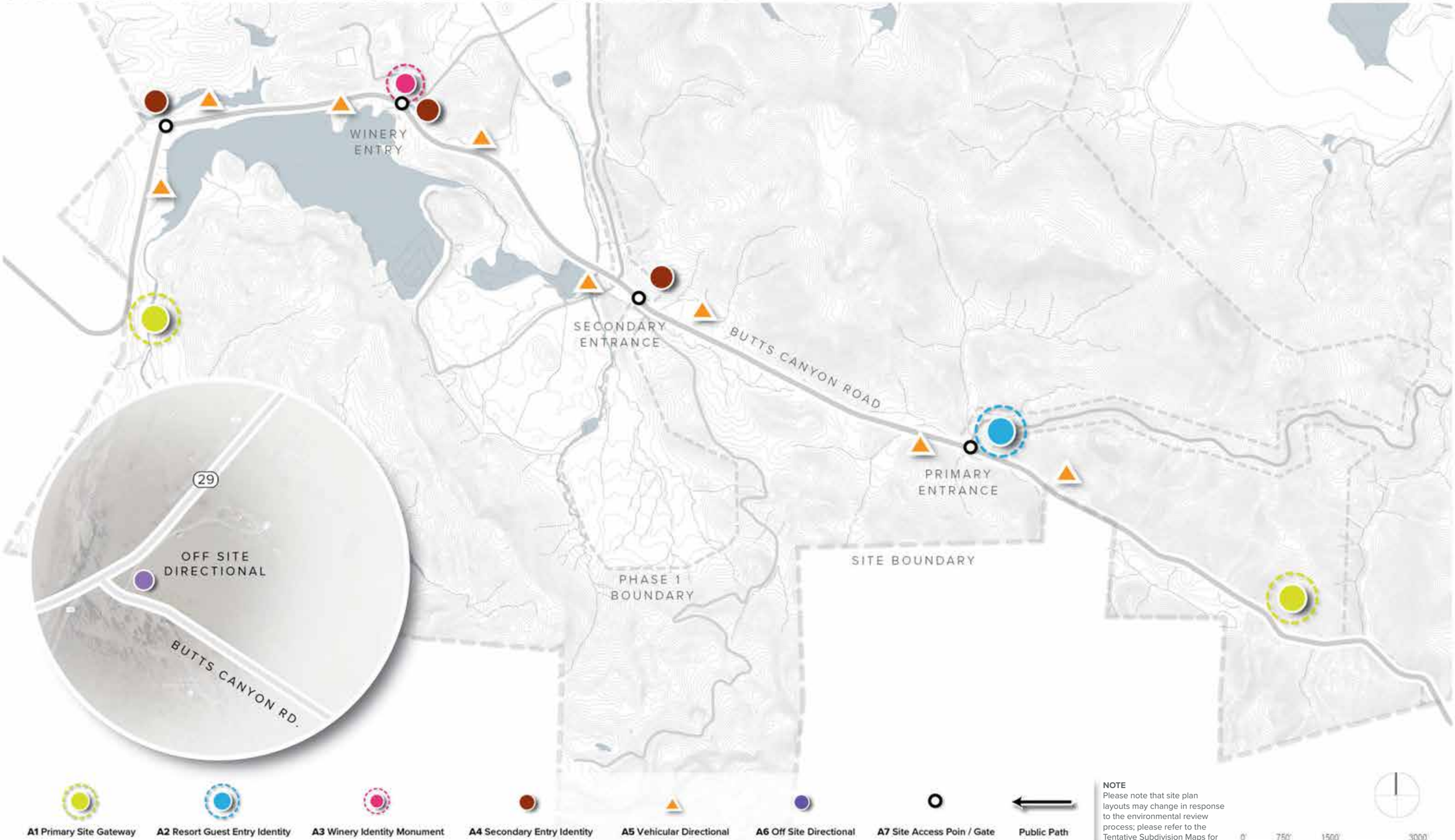
SECTION 6 PUBLIC STREETSCAPE

SIGNAGE & WAYFINDING AND FENCING

The following exhibits represent the project intentions on the aspects that are visible from the public right of way. Further detail for internal regulation of development, materials, intentions will be expanded within the Maha Design Guidelines for Guenoc Valley, forthcoming under separate cover. All fencing and signage visible to the public will adhere to the following concepts presented here.



SIGNAGE & WAYFINDING CONCEPTUAL LOCATION PLAN



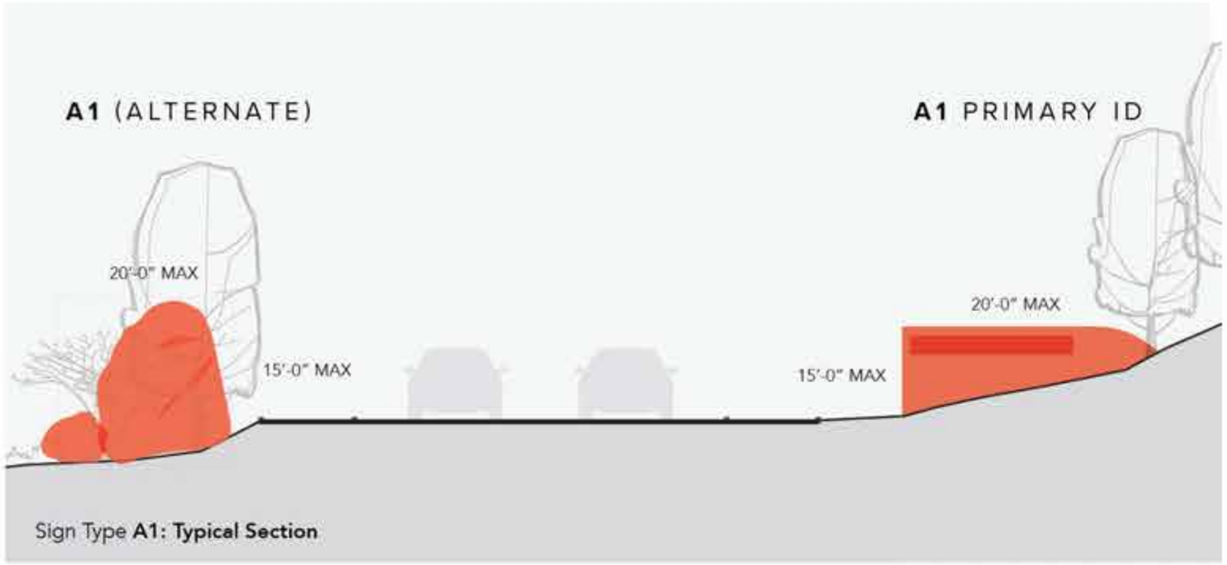
NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and

SIGNAGE & WAYFINDING SIGN SCHEDULE

SIGNAGE & WAYFINDING								CODE CONSIDERATIONS*	
Sign Type	**Name**	**Qty**	**Location**	**Max sqft**	**Max Dimensions**	**Illumination**	**Messaging**	**Applicable Code**	**Variance from Code**
A1	**Primary Site Entry Monument Sign / Sculpture**	2	Site boundaries along Butts Canyon Road	200 SqFt	Height: 10'-0" Width: 20'-0 Letter / Logo Height: Sculptural: 6'-0" Non-Sculptural: 3'-0"	Internal or External	Project Logo only.	**ZONING ARTICLE 45.12: (f)** A free-standing sign shall not exceed a height of twenty-five (25) feet at the front property line. This height may be increased to a maximum of thirty-five (35) feet by providing one (1) foot of setback for each additional foot in height.	No variance from code.
A2	**Resort Guest Entry**	1	Primary Guest Entrance to Resort	200 SqFt	Height: 10'-0" Width: 20'-0 Letter / Logo Height: Logo: 24" Address: 6"	Internal or External	Project Logo & Address only.	**ZONING ARTICLE 45.12: (f)** A free-standing sign shall not exceed a height of twenty-five (25) feet at the front property line. This height may be increased to a maximum of thirty-five (35) feet by providing one (1) foot of setback for each additional foot in height.	No variance from code.
A3	**Winery Identity**	1	Adjacent to Winery Entrance	TBD	Height: TBD Width: TBD Letter / Logo Height: Logo: 18" Address: 6"	Internal or External	Winery Logo & Address only.	**ZONING ARTICLE 45.12: (f)** A free-standing sign shall not exceed a height of twenty-five (25) feet at the front property line. This height may be increased to a maximum of thirty-five (35) feet by providing one (1) foot of setback for each additional foot in height.	As built conditions to remain. If new design is implemented, new sign must comply with code.
A4	**Secondary Entry Identity**	3	Adjacent to Secondary Entrances	36 SqFt	Height: 6'-0" Width: 6'-0 Letter / Logo Height: Logo: 18" Copy / Address: 6"	Internal or External	Project Logo, address, and / or directional copy & arrows.	**ZONING ARTICLE 45.12: (f)** A free-standing sign shall not exceed a height of twenty-five (25) feet at the front property line. This height may be increased to a maximum of thirty-five (35) feet by providing one (1) foot of setback for each additional foot in height.	No variance from code.
A5	**Vehicular Directional**	8	Precedes vehicular decision making points	24 SqFt	Height: 6'-0" Width: 4'-0 Directional Copy: 6" max.	Internal or External	Directional copy & arrows only.	**ZONING ARTICLE 45.12: (f)** A free-standing sign shall not exceed a height of twenty-five (25) feet at the front property line. This height may be increased to a maximum of thirty-five (35) feet by providing one (1) foot of setback for each additional foot in height.	No variance from code.
A6	**Off Site Identity / Directional**	1	Corner of Butts Canyon Road & Highway 29	100 SqFt	Height: 10'-0" Width: 10'-0 Letter / Logo Height: Logo: 18" Copy / Address: 8"	Internal or External	Project Logo and / or directional copy & arrows.	**ZONING ARTICLE 45 21-45.21:** One (1) outdoor advertising and off-site sign no larger than thirty-two (32) square feet in total surface area per face is permitted per lot in all districts except the "R1" and "O" base zoning districts and "SC" combining district. Temporary real estate signs not exceeding thirty-two (32) square feet are permitted in any district.	Proposed sign exceeds maximum Square Footage allowed, per Article 45.
A7	**Entry Gate**	4 (TBD)	50'-0"± from Butts Canyon Rd. at Primary Guest Entrance to Resort.	TBD	Height: 15'-0" Width: TBD Letter / Logo Height: Logo: 24" max. Copy / Address: 6" max.	External or Ambient	Project Logo and / or address.	TBD	TBD
	**** TOTAL QUANTITY:**	**16**	**** TOTAL SIGN AREA:**	**1,281 SqFt**				**ZONING ARTICLE 45 21-45.12: (a)** The total area of signing shall not exceed one (1) square foot in area for each linear foot of street or occupancy and lake frontage [...]. Lake frontage shall be used only in calculating sign areas for lake-oriented signs. All signs may be illuminated. **(e)** Notwithstanding any other provision of this section, for each individual occupancy, the total area of signs shall not exceed four hundred (400) square feet in area.	Proposed total sign area exceeds maximum total area of signs per Zoning Article 45.

* **CODE SECTIONS CONSIDERED: Zoning Article 45**
** **A7 Entry Gate not included in total quantity & total sign area.**

SIGNAGE & WAYFINDING PROJECT IDENTITY CONCEPTS

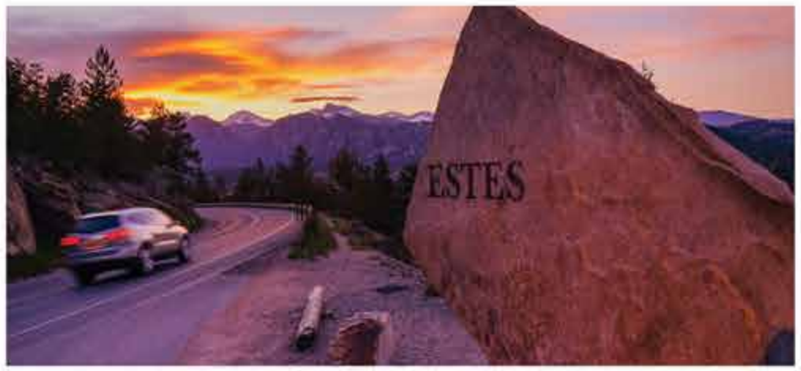


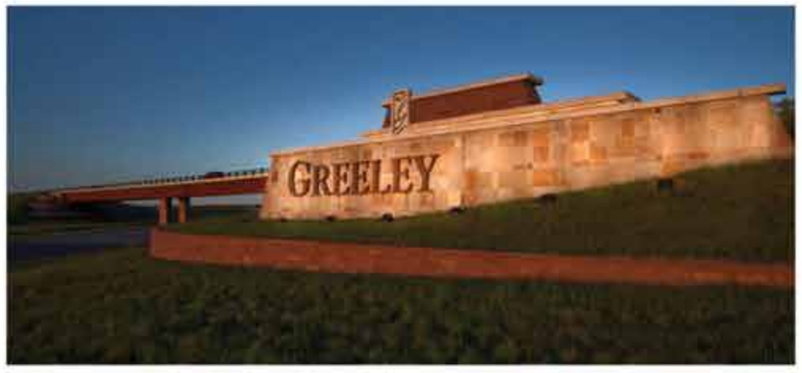
Sign Type **A1: Typical Section**

A1 PRIMARY SITE ENTRY

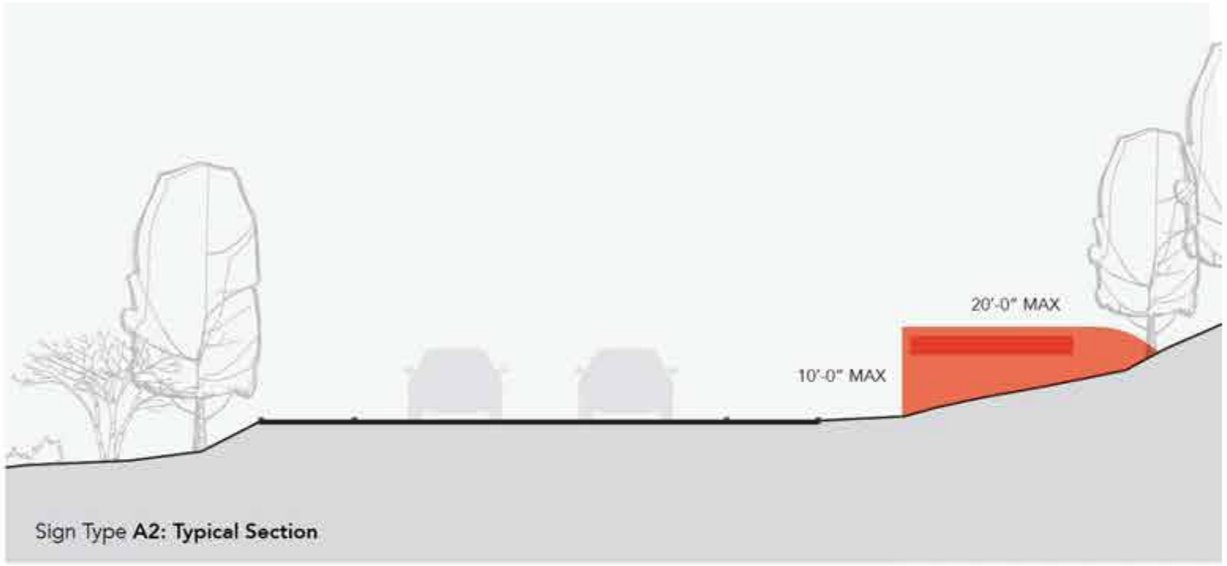
Height	15'-0" max
Width	20'-0" max
Area (SqFt)	200 SqFt max
Logo / Copy Ht.	Sculptural: 6'-0" max Non Sculptural: 3'-0" max
Quantity	2
Illumination	Internal or External

The Primary Site Entry signage acts as a welcoming identification for guests arriving to the site. Larger in scale, this project monumentation along Butts Canyon Road demarcates the project boundaries. These signs are the lead element in the hierarchy of graphics on site. Sign locations, that optimize visibility and impact, will be integrated into the roadway landscaping and topography. Materials, illumination, and other design details will relate directly to the brand vision and site architecture. A sculptural art program may also act as a series of landmarks, elevating the location and inviting the community to come enjoy.





SIGNAGE & WAYFINDING RESORT ENTRY IDENTITY CONCEPTS

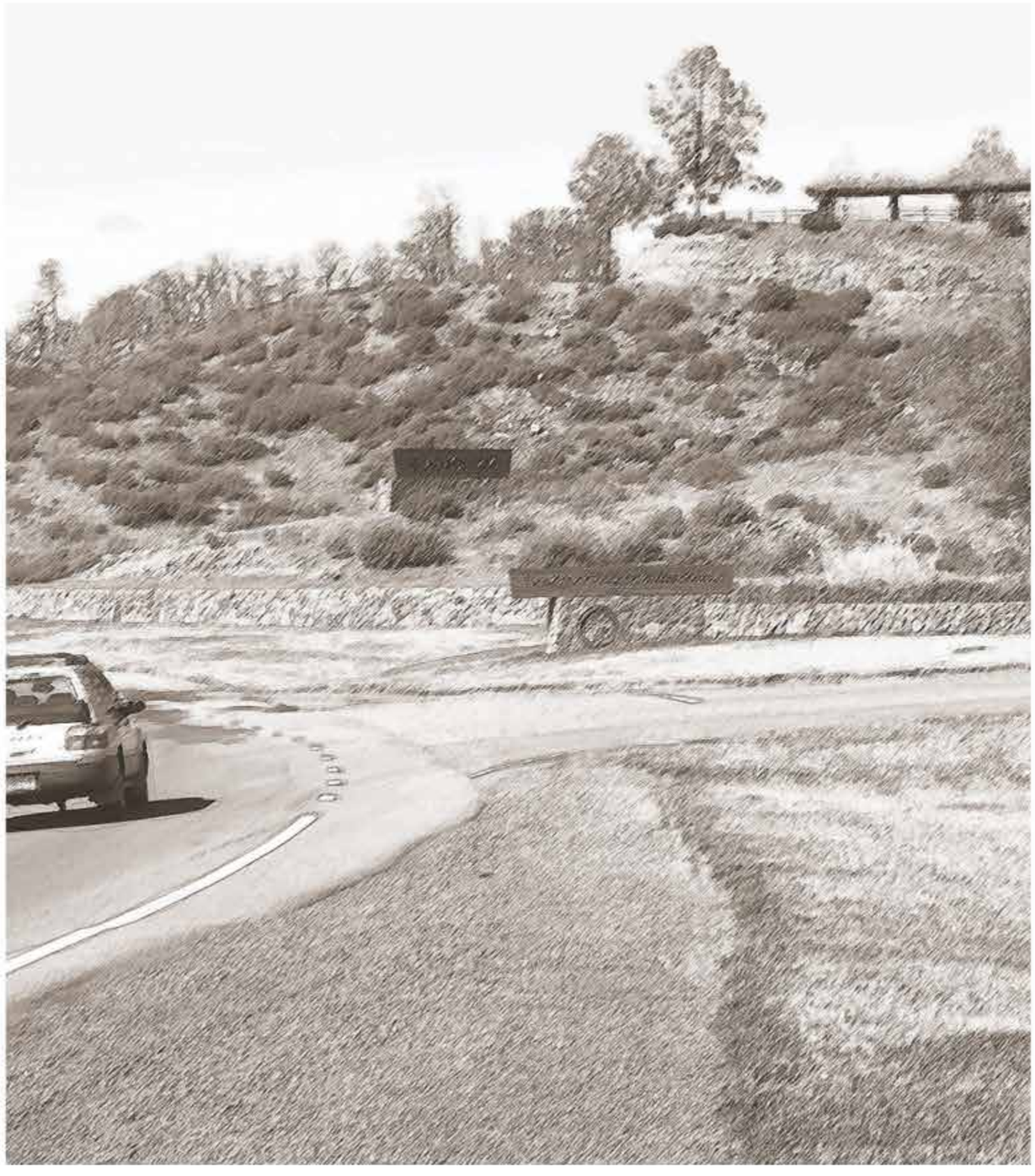


Sign Type **A2: Typical Section**

A2 RESORT GUEST ENTRY IDENTITY

Height	10'-0" max
Width	20'-0" max
Area (SqFt)	200 SqFt max
Logo / Copy Ht.	Logo: 24" max Address: 6" max
Quantity	1
Illumination	Internal or External

The Resort Guest Entry Identity sign is located at the main guest entry on Butts Canyon Road. This sign establishes a "sense of arrival" and clearly communicates the project identity and address, while establishing an expectation of quality.

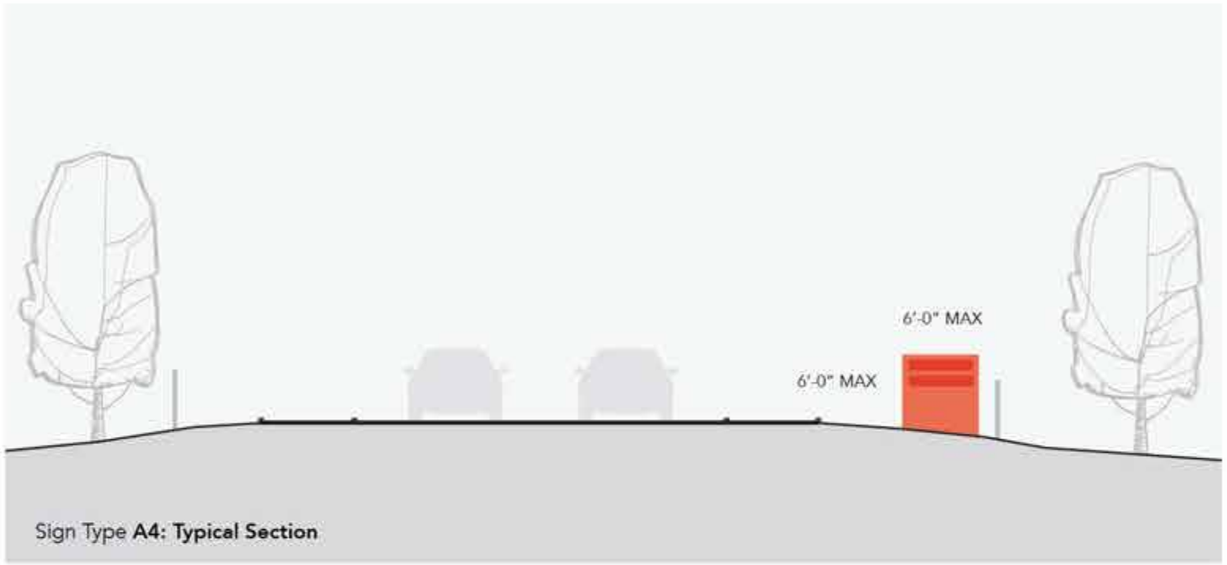


A3 WINERY ENTRY IDENTITY (EXISTING TO REMAIN)

Height	TBD
Width	TBD
Area (SqFt)	TBD
Logo / Copy Ht.	Logo: 18" max Address: 6" max
Quantity	1
Illumination	Internal or External

The existing Langtry Estate & Vineyards signage vocabulary is specific to the Langtry Estate and may differentiate the Vineyard as it's own entity within the broader Maha resort.

Project ownership to confirm, existing signage to remain, or signage will be redesigned consistent with the design vocabulary used throughout the Maha site signage.



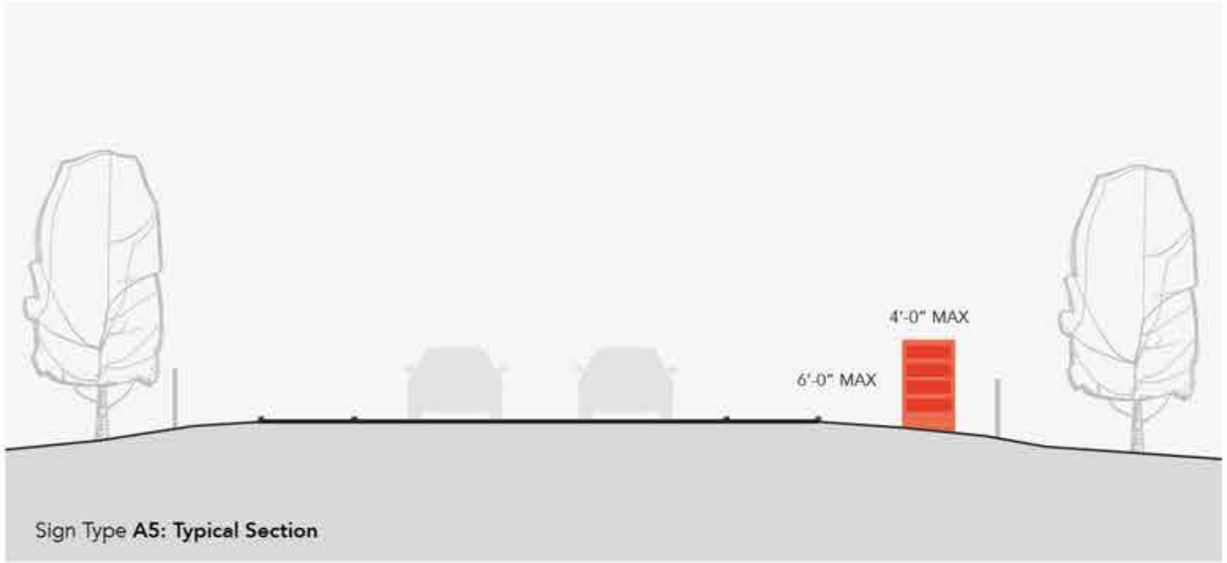
Sign Type **A4: Typical Section**

A4 SECONDARY ENTRY IDENTITY

Height	6'-0" max
Width	6'-0" max
Area (SqFt)	36 SqFt max
Logo / Copy Ht.	Logo: 18" max Copy / Address: 6" max
Quantity	3
Illumination	Internal or External

The Secondary Entry Identity is located at the alternate entrances to the resort property. It is understated when compared to the Primary Guest entrance and its primary function is to direct residents, deliveries, and staff to the proper points of entry.

SIGNAGE & WAYFINDING VEHICULAR DIRECTIONAL CONCEPTS



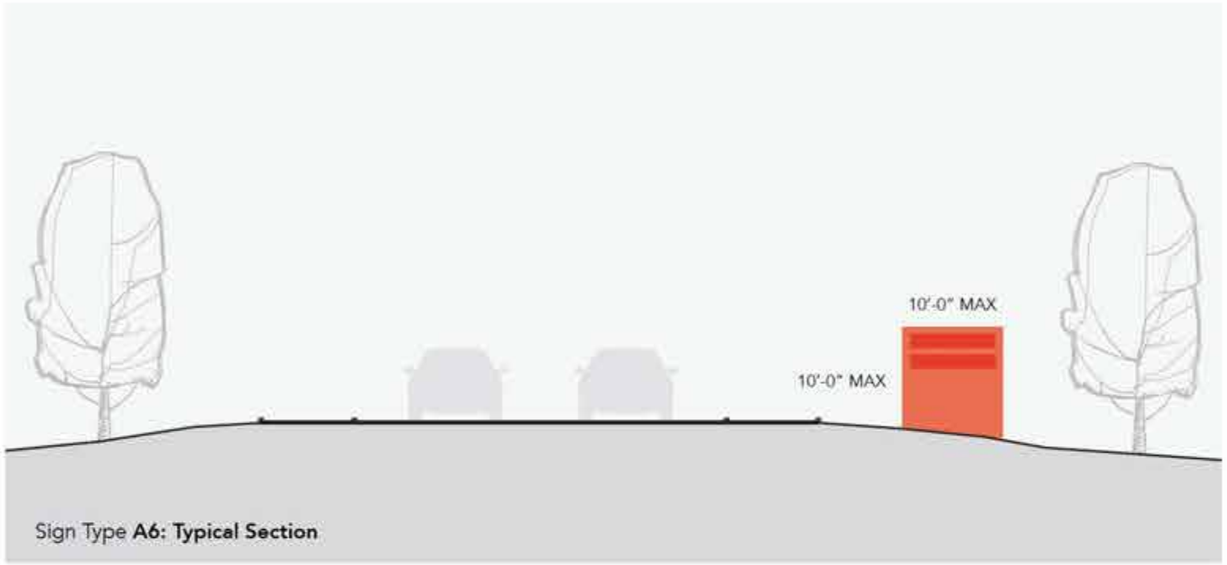
Sign Type **A5: Typical Section**

A5 VEHICULAR DIRECTIONAL

Height	6'-0" max
Width	4'-0" max
Area (SqFt)	24 SqFt max
Logo / Copy Ht.	Directional Copy: 6" max
Quantity	8
Illumination	Internal or External

The Vehicular Directional sign facilitates movement throughout the site by connecting important points along the primary path of arrival. Sign locations will anticipate decision making points, insuring that guests can read and have time to respond while driving. Strong legibility will be achieved through high contrast letter forms and appropriately sized text and arrows for the speed of travel along Butts Canyon Road.

SIGNAGE & WAYFINDING POTENTIAL OFF SITE DIRECTIONAL CONCEPTS



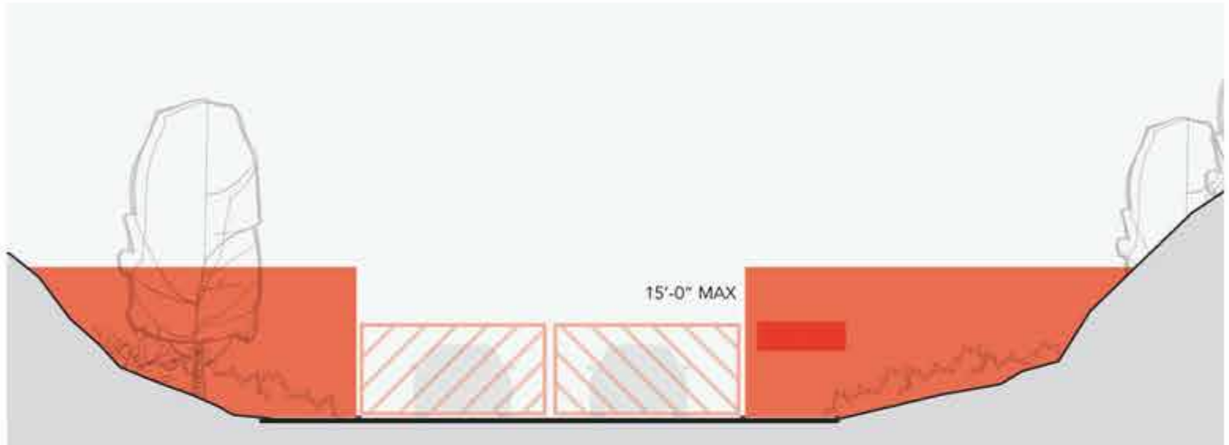
Sign Type **A6: Typical Section**

A6 OFF SITE DIRECTIONAL IDENTITY

Height	10'-0" max
Width	10'-0" max
Area (SqFt)	100 SqFt max
Logo / Copy Ht.	Logo: 18" max Directional Copy: 8" max
Quantity	1
Illumination	Internal or External

The Off Site Directional Identity acts as a welcoming signal for guests arriving to site. The primary purpose of this sign is to direct guests down Butts Canyon Road towards the resort entries. Larger in scale, this project identification and directional signage sits at the intersection of Butts Canyon Road and Highway 29.

SIGNAGE & WAYFINDING RESORT ENTRY GATE CONCEPT

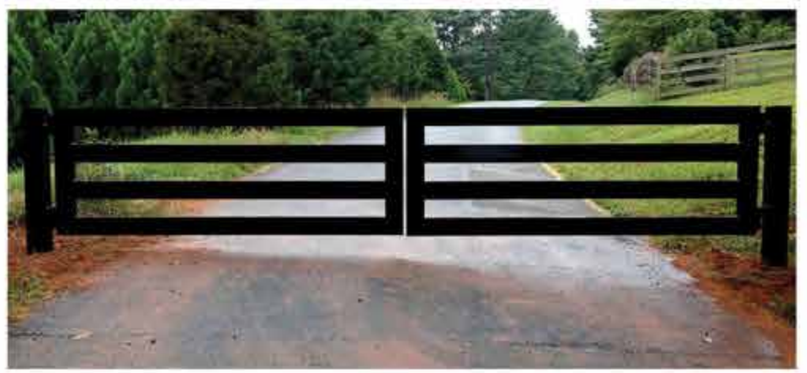


Sign Type **A7: Typical Section**

A7 RESORT GUEST ENTRY GATE

Height	15'-0" max
Width	TBD
Area (SqFt)	TBD
Logo / Copy Ht.	Logo: 24" max Address: 6" max
Quantity	1
Illumination	Internal or External

The Resort Entry Gate is located approximately 50'-0" from Butts Canyon Road at the main site entry. This gate establishes a "sense of arrival" and clearly communicates the project entry and complies with the code for a gated entry on private roads.



STREET SIGNS & REGULATORY

Street name and regulatory signs may be posted at intersections, and are usually perpendicularly oriented pairs identifying each of the crossing streets. Public streets must follow design requirements per city code.

MILE MARKERS & FIRE SAFETY

Mile Markers and Fire Safety signs will be posted as required per local code. These signs will be designed to fit within the overall brand vocabulary and are intended to assist motorists, pedestrians, and the Fire Authority.

FENCING CURRENT LOCATION & STYLE

EXISTING STONE FENCE

WINERY ENTRY

SECONDARY ENTRANCE

BUTTS CANYON ROAD

PRIMARY ENTRANCE

SITE BOUNDARY

PHASE 1 BOUNDARY

EXISTING STONE FENCE

EXISTING WHITE FENCE

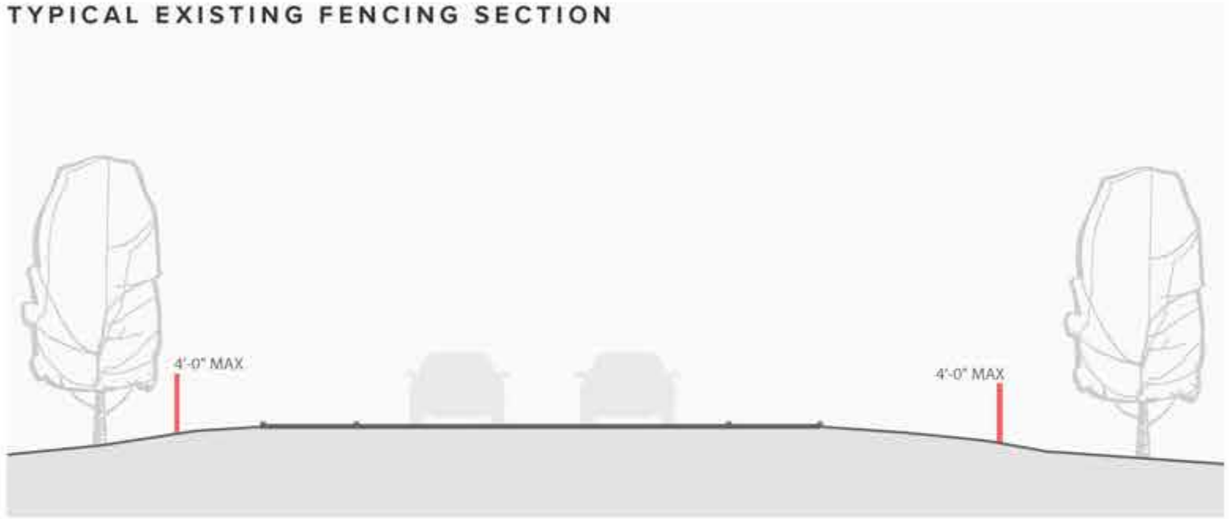
EXISTING WIRE FENCE

NOTE
Please note that site plan layouts may change in response to the environmental review process; please refer to the Tentative Subdivision Maps for the final lot layout, roads, and infrastructure.

0' 750' 1500' 3000'

FENCING POTENTIAL FENCE TYPES VISIBLE FROM THE PUBLIC STREETSCAPE

TYPICAL EXISTING FENCING SECTION



EXISTING AND POTENTIAL FENCING CONDTION

Three types of fence are currently visible along Butts Canyon Road within the project site: white fencing, wire fencing, and stone fencing. These fence edges currently offer a distinct demarcation of the project site.

These fences may remain or eventually be replaced by three potential fence types: post and rail fencing, wire fencing, and stone and landscape edging. Any fence replacement will be maximum 4 feet tall, which follows standards set by Lake County's Fences, Hedges and Walls code. Potential new fence locations and styles will be closely integrated with the existing landscape and topography along Butts Canyon Road. Any introduced changes to fencing will improve site identity for passerbys and the arrival experience for guests.

POTENTIAL FENCE TYPES VISIBLE FROM THE PUBLIC STREETSCAPE

POST AND RAIL FENCING

WIRE FENCING

STONE & LANDSCAPE EDGE

PROJECT TEAM ACKNOWLEDGEMENTS

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Renaissance Golf Design
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Verse Design LA
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APPENDIX STORMMID

STORMWATER DESIGN REPORT MIDDLETOWN

SHERWOOD
DESIGN ENGINEERS

STORMWATER DESIGN REPORT

21000 SANTA CLARA AVE

MIDDLETON, CA
COUNTY OF LAKE

December 12, 2019

Prepared by
Sherwood Design Engineers
2548 Mission Street
San Francisco, CA 94110
(415) 677-7300

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EXISTING SITE CONDITIONS AND FEATURES....3
PROPOSED SITE CONDITIONS AND TREATMENT....3
SUMMARY....4

Figure 1 – Project Treatment Facilities and Materials Figure

Table 1 – Watershed Area Table

APPENDICES

Appendix A – NOAA Precipitation Frequency Table

OBJECTIVE

The objective of this report (The Report) is to provide an overview of the stormwater management design criteria as related to the 21000 Santa Clara housing project and tentative subdivision (The Project). This report includes analysis of the development types, approximate quantities of proposed impervious area, and other stormwater design considerations. In addition, this Report includes a description of the existing site conditions and addresses methodology for meeting post-construction mitigation requirements in compliance with cuttent State and Federal requirements.

PRIMARY DESIGN CRITERIA

As of the writing of this Report, Lake County has not published approved Phase II, Municipal Separate Storm Sewer System (MS4) permit guidelines and in practice defers to State requirements associated with the General Construction Permit for post-construction stormwater mitigation. In meetings with representation of the Lake County Public Works Department, this Project is designed to the requirements the Bay Area Stormwater Management Agencies Association (BASMAA) guidelines, which have been adopted in neighboring Marin, Sonoma, Napa, and Solano Counties and comply with State and Federal NPDES requirements. Therefore, the following report references the Bay Area Stormwater Management Association (BASMAA) guidelines.

The Project's Goals:

- Comply with regionally adopted Phase II MS4 guidelines (BASMAA), and
- Show all runoff from impervious areas as routed to an engineered Low Impact Development (LID) treatment facility.

EXISTING SITE CONDITIONS AND FEATURES

The Project is located on an undeveloped and relatively flat approximately 12.75 acre parcel that is majorily covered in grassland. It is located to the east of Highway 175 in central Middletown within South Lake County. The area is bounded on the western edge by a perennial stream named Dry Creek, on the northern edge by undeveloped land, and on the south and east by medium density residential development. Although the site is mainly flat, it generally drains to the west and into Dry Creek.
The Project is located adjacent to the Floodway and within the flood zone. Western portions of the Project site are in Floodzone AE and the remainder of the Project is within Floodzone AO. All building finished floor elevations have been coordinated with the floodzone administrator to be set sufficiently above the flood elevation. See **Figure 1** for the existing site limits.

SITE CONDITIONS AND PROPOSED TREATMENT

The Project is a residential development with a total of 49 residential parcels resulting in 28 duplex and 21 single family residential units and a community center, for a total of a 50 lot subdivision. This Project will be connected with a single access road to create a loop, connecting all of the residential parcels. There will also be a parking lot associated with the community center.

To provide treatment of the stormwater there will be a series of LID facilities thoughout the development. These will consist of small raingardens, located adjacent to each residential parcel, and a few treatment/detention basins (See Figure 1). The raingardens will serve to treat the roof and residential driveway areas, and will slow down the flows from these portions of the site, allowing for a longer travel times . These raingardens will overflow into a gutter along the roadway prior to discharging into two treatment and detention basins, one located in the center and the other at the west end of the development. (See **Figure 1)**

See **Table 1/below** for hardscape and softscape acreage breakdown.

Table 1 - 2-year 24-hr Storm

Zone	C*	Area (sqft)	Area (acre)	Intensity** (in/hr)	Flow (cfs)	Flow (gpm)	Volume (gal)
Hardscape	0.98	281,854	6.47	0.19	1.23	551.51	794,168
Landscape	0.4	171,533	3.94	0.19	0.31	137.00	197,273
-Raingarden		14,147	0.32				
-Stormwater Treatment Basin		14,552	0.33				
Total Area		453,387	10.41		**1.54**	**688.50**	**991,441**

*** Runoff Coefficient**

**** Intensity per NOAA Rainfall Table see Appendix A**

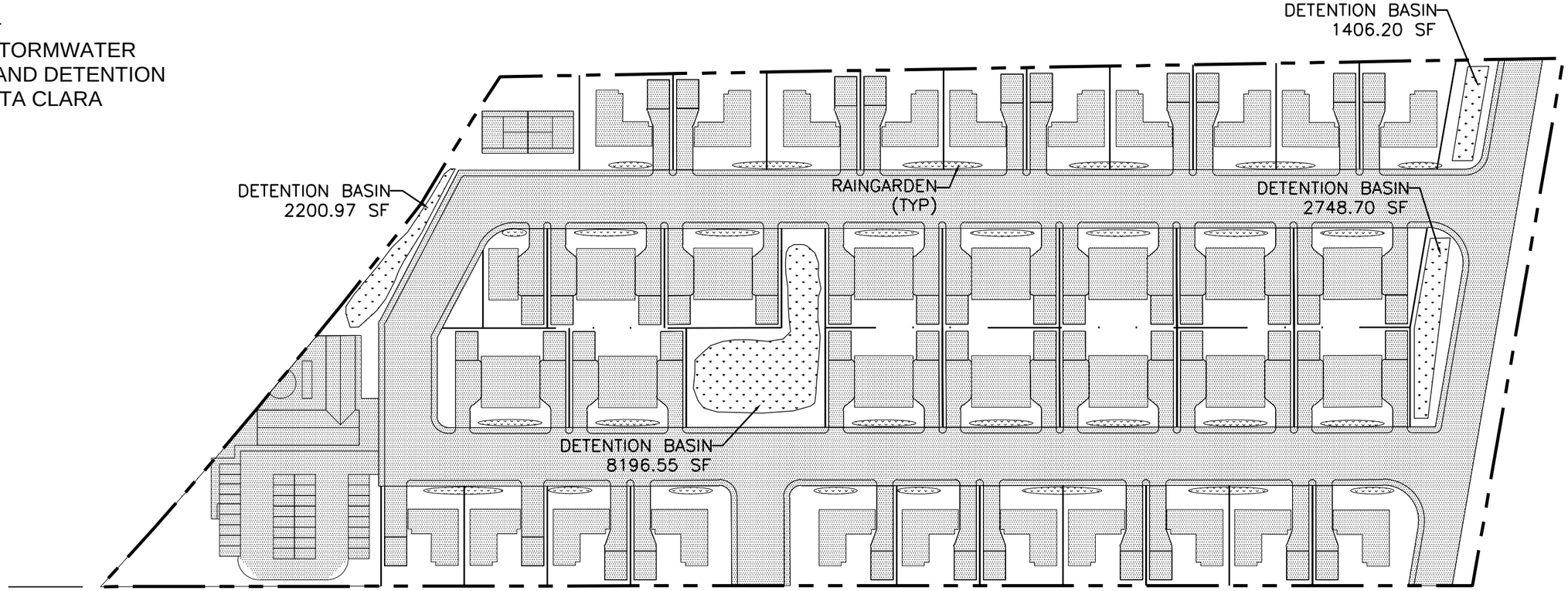
SUMMARY

The Project totals approximately 10.4 acres of which approximately 6.5 acres is impervious area within a 12.75 acre site. The site includes 0.33 acres of treatment and detention basins and 0.32 acres of raingardens. BASMAA requires the square footage treatment areas to total at least 4% of the new hardscape of within a site, which amounts to 0.26 acres of treatment for the Project. This treatment requirement is achieved through the treatment basins alone. To provide additional treatment, beyond the BASMAA requirements, raingardens will serve to collect and treat water from each of the residential parcels, including the roofs and portions of the driveways and hardscape, which account for approximately 3 acres of the total site hardscape. This combination of raingardens, treatment and detention facilities provides 2.5 times the required treatment area set by the regionally accepted BASMAA guidelines in compliance with Phase II MS4 permits.

FIGURE 1

FIGURE 1

PROPOSED STORMWATER
TREATMENT AND DETENTION
AT 21000 SANTA CLARA



Zone	C*	Area (sqft)	Area (acre)
Hardscape	0.98	281854.87	6.47
Landscape	0.4	171533.06	3.94
-Raingarden		14147.13	0.32
-Stormwater Treatment Basin		14552.42	0.33
Total Area		453387.93	10.41

*RUNOFF COEFFICIENT

LEGEND

LANDSCAPE

HARDSCAPE

RAINGARDEN

STORMWATER TREATMENT BASIN

APPROXIMATE BOUNDARY LINE

NORTH

0 50' 100' 200'

SHERWOOD
DESIGN ENGINEERS
2548 Mission Street
San Francisco, CA 94110
www.sherwoodengineers.com

PROPERTY OWNER:
SANTA CLARA INVESTMENTS

PRELIMINARY AREA TAKEOFF

SANTA CLARA SUBDIVISION
LAKE COUNTY, CALIFORNIA

December 12, 2019

APPENDIX A

PDF of NOAA Precipitation Frequency Data at 14000 Santa Clara Road:
P:\2018\18-016-06_Maha_Staff\03_Design\02_Exhibits\Hydrology Analysis\191211_Precipitation Frequency Data Server.pdf

PDS-based precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	1.96 (1.74-2.22)	2.41 (2.14-2.78)	3.01 (2.66-3.44)	3.50 (3.07-4.03)	4.16 (3.62-4.80)	4.68 (4.05-5.74)	5.21 (4.16-6.56)	5.75 (4.46-7.48)	6.48 (4.80-8.84)	7.07 (5.03-10.0)
10-min	1.40 (1.24-1.59)	1.73 (1.54-1.97)	2.16 (1.91-2.47)	2.51 (2.20-2.89)	2.99 (2.62-3.58)	3.35 (2.77-4.12)	3.73 (2.99-4.70)	4.12 (3.20-5.38)	4.65 (3.44-6.34)	5.06 (3.61-7.18)
15-min	1.15 (1.00-1.28)	1.39 (1.24-1.58)	1.74 (1.54-1.99)	2.02 (1.78-2.33)	2.41 (2.09-2.88)	2.70 (2.23-3.32)	3.01 (2.41-3.79)	3.32 (2.58-4.32)	3.75 (2.78-5.11)	4.08 (2.91-5.79)
30-min	0.808 (0.718-0.918)	0.998 (0.886-1.14)	1.25 (1.10-1.42)	1.45 (1.27-1.67)	1.73 (1.48-2.07)	1.94 (1.60-2.38)	2.15 (1.73-2.72)	2.38 (1.85-3.10)	2.69 (1.99-3.66)	2.93 (2.08-4.16)
60-min	0.572 (0.509-0.650)	0.707 (0.628-0.805)	0.884 (0.782-1.01)	1.03 (0.900-1.18)	1.22 (1.03-1.46)	1.37 (1.13-1.68)	1.53 (1.22-1.92)	1.69 (1.31-2.19)	1.90 (1.41-2.59)	2.07 (1.46-2.94)
2-hr	0.444 (0.394-0.504)	0.548 (0.486-0.623)	0.680 (0.602-0.776)	0.785 (0.686-0.904)	0.924 (0.780-1.11)	1.03 (0.848-1.26)	1.13 (0.908-1.43)	1.24 (0.962-1.61)	1.38 (1.02-1.88)	1.49 (1.06-2.11)
3-hr	0.384 (0.342-0.437)	0.473 (0.420-0.538)	0.584 (0.517-0.667)	0.673 (0.590-0.775)	0.789 (0.665-0.944)	0.875 (0.721-1.07)	0.960 (0.769-1.21)	1.05 (0.811-1.36)	1.16 (0.866-1.58)	1.24 (0.903-1.76)
6-hr	0.296 (0.263-0.336)	0.364 (0.323-0.414)	0.449 (0.396-0.513)	0.516 (0.452-0.594)	0.602 (0.508-0.720)	0.664 (0.547-0.815)	0.726 (0.581-0.915)	0.786 (0.610-1.02)	0.864 (0.639-1.16)	0.921 (0.666-1.31)
12-hr	0.213 (0.190-0.243)	0.268 (0.237-0.304)	0.334 (0.295-0.381)	0.385 (0.339-0.444)	0.451 (0.393-0.539)	0.498 (0.410-0.610)	0.543 (0.435-0.695)	0.588 (0.456-0.766)	0.644 (0.477-0.879)	0.685 (0.489-0.972)
24-hr	0.152 (0.136-0.172)	0.194 (0.174-0.221)	0.246 (0.221-0.281)	0.286 (0.255-0.329)	0.337 (0.292-0.397)	0.374 (0.318-0.448)	0.409 (0.341-0.500)	0.443 (0.361-0.555)	0.486 (0.383-0.631)	0.518 (0.396-0.691)
2-day	0.101 (0.090-0.114)	0.129 (0.116-0.147)	0.165 (0.148-0.188)	0.193 (0.171-0.221)	0.228 (0.197-0.269)	0.254 (0.216-0.304)	0.278 (0.232-0.341)	0.303 (0.247-0.379)	0.334 (0.263-0.433)	0.357 (0.273-0.477)
3-day	0.078 (0.070-0.089)	0.100 (0.090-0.114)	0.128 (0.115-0.146)	0.150 (0.133-0.172)	0.178 (0.154-0.210)	0.199 (0.169-0.238)	0.219 (0.182-0.267)	0.238 (0.194-0.299)	0.264 (0.208-0.342)	0.283 (0.216-0.378)
4-day	0.065 (0.059-0.074)	0.084 (0.075-0.096)	0.107 (0.096-0.122)	0.126 (0.112-0.144)	0.149 (0.129-0.176)	0.167 (0.142-0.200)	0.184 (0.153-0.225)	0.200 (0.163-0.251)	0.222 (0.175-0.288)	0.238 (0.182-0.318)
7-day	0.046 (0.041-0.052)	0.059 (0.053-0.067)	0.075 (0.067-0.086)	0.088 (0.078-0.101)	0.104 (0.090-0.123)	0.117 (0.099-0.140)	0.128 (0.107-0.157)	0.140 (0.114-0.179)	0.155 (0.122-0.201)	0.167 (0.127-0.222)
10-day	0.036 (0.033-0.041)	0.047 (0.042-0.053)	0.060 (0.053-0.068)	0.070 (0.062-0.080)	0.083 (0.071-0.097)	0.092 (0.078-0.110)	0.101 (0.084-0.124)	0.110 (0.090-0.138)	0.122 (0.096-0.158)	0.130 (0.100-0.174)
20-day	0.024 (0.022-0.027)	0.031 (0.028-0.035)	0.039 (0.035-0.045)	0.046 (0.041-0.053)	0.054 (0.047-0.064)	0.060 (0.051-0.072)	0.065 (0.055-0.080)	0.071 (0.058-0.089)	0.078 (0.061-0.101)	0.083 (0.063-0.110)
30-day	0.019 (0.017-0.022)	0.025 (0.022-0.028)	0.031 (0.028-0.036)	0.036 (0.032-0.042)	0.043 (0.037-0.050)	0.047 (0.040-0.056)	0.051 (0.043-0.063)	0.055 (0.045-0.069)	0.060 (0.047-0.078)	0.064 (0.049-0.085)
45-day	0.016 (0.014-0.018)	0.020 (0.018-0.023)	0.026 (0.023-0.029)	0.029 (0.026-0.034)	0.034 (0.030-0.040)	0.038 (0.032-0.045)	0.041 (0.034-0.050)	0.044 (0.036-0.055)	0.047 (0.037-0.061)	0.050 (0.038-0.066)
60-day	0.014 (0.013-0.016)	0.018 (0.016-0.020)	0.022 (0.020-0.025)	0.026 (0.023-0.029)	0.030 (0.026-0.035)	0.032 (0.027-0.039)	0.035 (0.029-0.043)	0.037 (0.030-0.047)	0.040 (0.031-0.052)	0.042 (0.032-0.056)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Estimates from the table in CSV format: Precipitation frequency estimates ▾ Submit

APPENDIX SW

STORMWATER DESIGN REPORT

SHERWOOD
DESIGN ENGINEERS

STORMWATER DESIGN REPORT
ADMINISTRATIVE DRAFT

MAHA

Revised: September 26, 2019

Prepared by
Sherwood Design Engineers
2548 Mission Street
San Francisco, CA 94110
(415) 677-7300

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Table 2 – Commercial Area Summary

APPENDICES

Appendix A – Commercial Area Drainage Management Areas (DMAs)

OBJECTIVE

The objective of this report is to provide an overview of the stormwater management design criteria as related to the first phase of the proposed MAHA Resort at the Guenoc Valley, as defined in the Specific Plan of Development ("The Project"). This report includes development types, approximate quantities of proposed impervious area, and other stormwater design considerations including descriptions of the existing site conditions and dominant drainage patterns and methodologies for meeting post-construction mitigation requirements in compliance with State and Federal requirements.

PRIMARY DESIGN CRITERIA

As of the writing of this report, Lake County has not adopted approved Phase II, Municipal Separate Storm Sewer System (MS4) permit guidelines and defers to State requirements associated with the General Construction Permit for post-construction stormwater mitigation. In meetings with representation of the Lake County Public Works Department, this project has proposed designing to the requirements the Bay Area Stormwater Management Agencies Association (BASMAA) guidelines[1], which have been adopted in neighboring Marin, Sonoma, Napa, and Solano Counties and comply with State and Federal NPDES requirements. Accordingly, the following references BASMAA guidelines.

In general, The Project will be designed to minimize disturbance to existing drainage patterns and to improve runoff quality at every opportunity. While the existing site is largely undeveloped, decades of livestock grazing and vineyard farming operations have created conditions that will benefit from improved runoff management strategies and restoration efforts associated with The Project.

The Project's Goals:

- Comply with regionally adopted Phase II MS4 guidelines (BASMAA)
- No Hydromodification - No increase in peak flow rate for up to the 2-year 24-hour storm.
- Minimize impact of development to receiving waters. Improve upon existing conditions where feasible.
- Mitigate impacts to existing drainages.

The above goals will be achieved through a range of strategies including:

- Selection of materials that encourage infiltration rather than runoff
- Improved runoff quality by flowing hardscape runoff through constructed bio-treatment areas prior to discharge to existing drainage pattern
- Use of undisturbed existing landscape and vegetation to treat runoff
- Design conveyances to return collected runoff to sheet flow over undisturbed landscape rather than concentrated discharges
- Continue to collect runoff in existing lakes/ponds for use in vineyard and landscape irrigation

1. Bay Area Stormwater Management Agencies Association (BASMAA), *BASMASS Post-Construction Manual: Design Guidance for Stormwater Treatment and Control for Projects in Marin, Sonoma, Napa, and Solono Counties,* January 2019.

EXISTING SITE CONDITIONS AND FEATURES

The Project, comprised of 49 assessor's parcels totaling approximately 16,000 acres within Guenoc Valley, is located three miles southeast of Middletown on the southeast border of Lake County, bordering Yolo and Napa Counties to the south and east with primary access along Butts Canyon Road. The area is broken into eight primary watersheds, which are bounded by Bucksnort Creek on the West, Putah Creek on the North, Upper Bohn Lake on the East, and Butts Canyon Road on the South. These watersheds are largely contained within the bounds of the project limits and discharge to ponds, drainages and creeks that eventually flow offsite to existing regional drainage patterns. See **Figure 1** for an overview of the overall watersheds that The Project will affect.

The Bucksnort Creek and Easter Peak Watersheds are composed of large areas of wooded hillsides which include drainages, gullies, and perennial streams. In addition, there are large areas of vineyards in the flat portion of Easter Peak Watershed. These drainages migrate water through the watersheds and into Bucksnort Creek. This creek starts on the southwest side of the property and flows north into McCreary Lake. From there Bucksnort Creek continues east through the site until it bends back north and eventually discharges into Putah Creek on the north edge of the property.

The Wilderness Watershed is located at the north tip of the property. This watershed is sparesly forested, hilly terrain which slopes steeply down to Putah Creek. Throughout this slope there are small drainages and multiple discharge points into the creek at the north of the watershed.

The Butcherknife Creek Watershed is located in the central and northern portions of the property. This watershed is composed primarily of grassed hills and oak woodlands, which sheet flow into a series of tributary drainages that converge in the center of the watershed at Butcherknife Creek. The creek flows north and discharges into Putah Creek.

The Trout Flat and Upper Trout Flat Watersheds are located at the east side of the property. They are composed of hillsides with loose soils and areas with erosion channels. These drainages generally flow from west to east and eventually discharge into Putah Creek beyond the eastern limits of the project.

The Upper Bohn Watershed is a half circle located in the center of the property on the east side. This small watershed flows into small drainages that discharge into Upper Bohn Lake.

The Bohn Valley watershed is located in the center of the property and drains to Lower Bohn Lake at the center. This roughly circular watershed is composed of medium to steep slopes which drain toward a vineyard planted at the flat basin above the lake. The slopes surrounding the watershed are heavily forested and have deep drainages.

The McCain Canyon and West McCain Canyon Watersheds are located in the southeast corner of the property. This watershed is domindated by steep slopes, which drain into McCain Creek. The creek flows south until it discharges into Butts Creek at the southern end of the property.

The Three Peaks and South Three Peaks Watersheds are located at the south and center of the property. This watershed is composed of steeply sloped and sparsely vegetated hillsides, which sheet flow into drainages throughout this portion of the property. The drainages converge at the south of the property and discharge into Butts Creek prior to flowing east.

The Bucksnort South Watershed is located on the south side of Butts Canyon Road. The main portion of this watershed is an abandoned golf course and is relatively flat. The south side of the watershed is a steep hillside that drains into small streams which flow through the old golf course area.

Lastly, there is a small watershed associated with the float plane dock. The Watershed for Float Plane Dock slopes from Butts Canyon Road into the Detert Reservoir.

PROPOSED SITE CONDITIONS

The Project will be a resort-residential clustered development dispersed across approximately 11,200 acres of land in Lake County, CA. The existing land use has primarily been farming and vineyard operations, which consist of large areas of planted vineyards and an extensive network of gravel ranch roads (approximately 61 acres). For the purposes of this analysis, the proposed development has been broken down into three types: roadways, residential villa parcels, and commercial areas. In order to minimize disturbance to the overall site hydrology, more intensive mitiation strategies will largely be focused at the denser commercial development sites rather than a network of conveyance and collection to large basins that treat multiple areas. By treating water close to the proposed development through land-based strategies, runoff is returned to the natural drainage pattern. See **Table 1** for watersheds and existing roads acreage breakdown.

Roadways

In order to minimize the impact to the undisturbed site, the roadway network being developed for the MAHA Resorts will primarily use the alignments of the existing network of ranch roads, upgrading and widening them to paved roads to meet County requirements. The proposed roadway network will have a total acreage of approximately 150 acres and is dispersed throughout the entire development, producing minimal increase to hardcape and runoff at any specific location. Runoff from roads will be collected into roadside swales and ditches which will convey stormwater to small sediment forebays prior to entering culvert crossings (where necessary) and being dispersed by level spreaders into the adjacent landscape, which will function as treatment measures that remove sediment and pollutants before returning runoff to the natural drainage pattern, consistent with BASMAA requirements. In the event the roadways are impacting an ephemeral stream, the same treatment methodologies will be implemented in order to provide runoff quality mitigation before that runoff is returned to the Waters of the State.

See **Table 1** for acreage of proposed roads per watershed.

Residential Villa Parcels

The proposed development includes 400 residential villa parcels and 141 resort residential parcels dispersed in clusters throughout the development. These parcels will each include a single family house with a driveway and exterior hardscape with an estimated 0.5-1.0 acres of impermeable area per parcel. Since the residential parcels represent a relatively small and non-contiguous portion of the project development and associated increase in runoff, each parcel will address stormwater mitigation within the parcel boundary through a range of strategies chosen to best fit the proposed residential design and site size, topography, and landscape design . Compliance with mitigation requirements will be demonstrated in the civil site construction documents and will be unique and integral to the layout of each residential site and proposed architectural and landscape design. The majority of residential parcels include significant undeveloped areas with ample opportunity to include stormwater management strategies, including:

- Green/living roofs
- Rainwater harvesting
- Rain Gardens and/or Flow-thru Planters
- Pervious hardscape materials that infiltrate runoff
- Landscape areas that serve as water quality mitigation for hardscape runoff
- Use of existing undisturbed landscape to treat hardscape runoff
- Disperal of treated runoff to existing drainage pattern via sheet flow

For more densely developed residential parcels adjacent to commercial zones, projects will achieve stormwater compliance through use of multiple strategies including:

- Green/living roofs
- Rainwater harvesting
- Pervious hardscape materials that infiltrate runoff
- Landscape areas that serve as water quality mitigation for hardscape runoff
- Use of existing undisturbed landscape to treat hardscape runoff
- Disperal of treated runoff to existing drainage pattern via sheet flow

These approaches are in conformance with the BASMAA guidelines for mitigation of water quality and are consistent with the intended development of the MAHA properties. Conformance with stormwater regulations will be demonstrated with the building and site permit application materials submitted for each residential parcel at the time of development. **Figure 1** displays the locations of the commercial areas which have a larger percentage of hardscape and more intensive stormwater management facilities to provide through treatment.

Commercial Areas

The project includes 14 proposed commercial zones. These zones are relatively densely developed and will contain a higher percentage of hardscape then the rest of the proposed site development. As such, these sites will use a combination of self-retaining landscape features and bio-retention areas to address stormwater runoff and comply with the post-construction requirements. Each of the commercial areas has multiple DMAs associated with it, which are cataloged in **Table 2** at the end of this report. A figure illustrating the layout of hardscape within commercial areas and conceptual locations of mitigation

strategies can be found in **Appendix A – Commercial Area Drainage Management Areas**. Location, size, and type of mitigation strategies shown are conceptual and will be refined during the detailed design process.

SUMMARY

Construction occurring within these watersheds within the proposed MAHA Development have total areas of approximately 11,200 acres. Throughout this 11,200 acreas there are approximately 80 acres of impervious commercial area, 151 acres of roads, and 263 acres estimated residential impervious area. The commercial areas and residential areas will utilize a range of stormwater conveyances and treatments to provide stormwater mitigation, and if necessary, hydraulic modification. Since the roadways have impervious area equl to approximately 1.5% of the area it encompasses, they will be treated as self treating area and will us the undisturbed adjacent landscape for treatment where feasible. Where necessary, constructed BMPs will be installed to meet or exceed mitigation requirements.

Because all runoff from the proposed development is routed through a self-retaining area, a bio-retention area, or a self treating area, there should be no net increase of stormwater leaving the site for the 2-year 24-hour storm, meeting the hydromodification requirements set by the regionally accepted BASMAA guidelines in compliance with Phase II MS4 permits.

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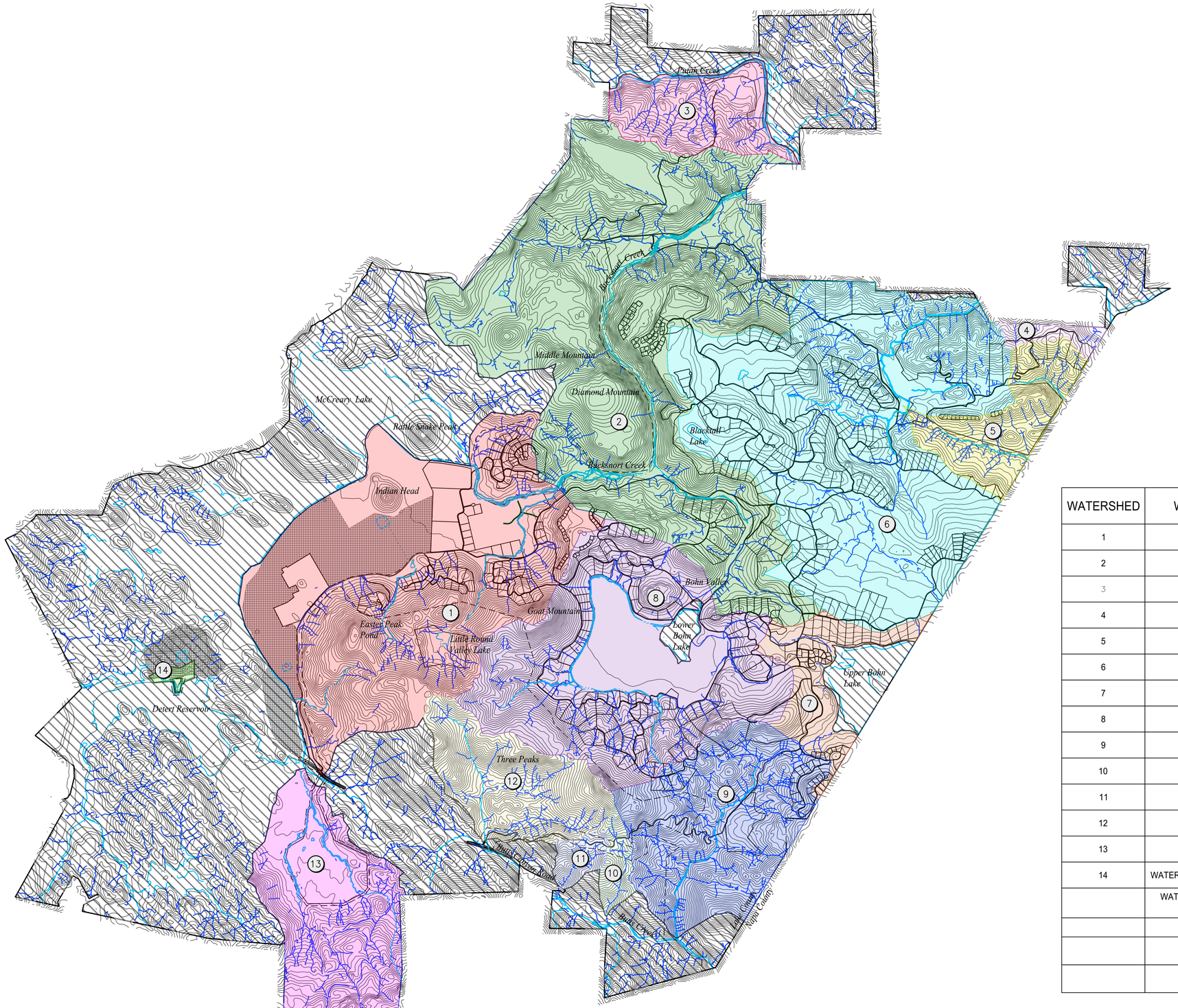


WATERSHED	WATERSHED NAME	WATERSHED HATCH	AREA (AC)
1	EASTER PEAK		1,933
2	BUCKSNORT CREEK		2,600
3	WILDERNESS		330
4	UPPER TROUT FLAT		54
5	TROUT FLAT		328
6	BUTCHERKNIFE		2,097
7	UPPER BOHN		263
8	BOHN VALLEY		1,383
9	MCCAIN CANYON		788
10	WEST MCCAIN CANYON		67
11	SOUTH THREE PEAKS		59
12	THREE PEAKS		445
13	BUCKSNORT SOUTH		775
14	WATERSHED FOR FLOAT PLANE DOCK		19
	WATERSHED AREAS BEYOND PH1 (WATERBODIES INCL.)		5,402
		TOTAL PH1 WATERSHED AREA	11,141
		TOTAL PROJECT BOUNDARY AREA	16,543

OVERALL SITE WATERSHEDS

MAHA
LAKE COUNTY, CA

SHERWOOD
DESIGN ENGINEERS
58 Maiden Lane, Third Floor
San Francisco, CA
94108
www.sherwoodengineers.com

September 18, 2019

0 900' 1800' 3600'

NORTH

P:\2018\18-016_Maha_MasterCivil\03_Design\02_Exhibits\01_STORMWATER Stormwater Analysis Support - Watersheds\CAD Stormwater Analysis Support - Watershed Areas.dwg Layout1, Pauline Nguyen,9/18/2019 4:47:32 PM,Letter (8.50 x 11.00 Inches),1:1

Stormwater Analysis: Pre- and Post- Road Runoff Calculations (100-Year Storm Frequency)

18-016 Maha

Stormwater: 100 year

PRE-DEVELOPMENT (EXISTING) CONDITIONS - ROADS ONLY

Watershed	Total Area (ac)	Road/Impervious Area (ac)	% Impervious	$C_{IMPERVIOUS}$	Pervious Area (ac)	$C_{PERVIOUS}$	$C_{WEIGHTED}$	I (in/hr)	A (ac)	Q (cfs)
Watershed #1	792	0.1	0.02%	0.9	792	0.3	0.30	2.12	792	504
Watershed #2	67	0	0.0%	0.9	67	0.3	0.30	2.12	67	42
Watershed #3	59	0	0.0%	0.9	59	0.3	0.30	2.12	59	37
Watershed #4	445	0	0.0%	0.9	445	0.3	0.30	2.12	445	283
Watershed #5	262	2	0.7%	0.9	260	0.3	0.30	2.12	262	169
Watershed #6	1,383	7	0.5%	0.9	1,376	0.3	0.30	2.12	1,383	889
Watershed #7	1,898	9	0.5%	0.9	1,890	0.3	0.30	2.12	1,898	1,218
Watershed #8	2,592	10	0.4%	0.9	2,582	0.3	0.30	2.12	2,592	1,661
Watershed #9	2,094	5	0.2%	0.9	2,089	0.3	0.30	2.12	2,094	1,338
Watershed #10	352	0.3	0.1%	0.9	352	0.3	0.30	2.12	352	225
Watershed #11	51	0	0.0%	0.9	51	0.3	0.30	2.12	51	32
Watershed #12	330	1	0.4%	0.9	329	0.3	0.30	2.12	330	212
Watershed #13	19	0	0.0%	0.9	19	0.3	0.30	2.12	19	12
Watershed #14	467	0	0.0%	0.9	467	0.3	0.30	2.12	467	297
TOTAL	**10,811**	**34**	**0.3%**							

Notes:

1. Intensity from NOAA (https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=ca). Assume 100 year storm, 30 minute intensity. This is a preliminary assumption, actual intensities will vary based on watershed time of concentration.
2. Rational Method used with its general assumptions.
3. Assumed avg. 0.9 C-value for impervious surfaces and 0.3 value for pervious surfaces.
4. Primary roadway width = 28 ft., secondary roadway width = 22 ft.
5. Existing Roads range from 18'-22', so an average of 20' used.

POST-DEVELOPMENT (PROPOSED) CONDITIONS - ROADS ONLY

Watershed	Total Area (ac)	Road/Impervious Area (ac)	% Impervious	$C_{IMPERVIOUS}$	Pervious Area (ac)	$C_{PERVIOUS}$	$C_{WEIGHTED}$	I (in/hr)	A (ac)	Q (cfs)	Increase in Road Area (ac)
Watershed #1	792	10	1.3%	0.9	782	0.3	0.31	2.12	792	516	10
Watershed #2	67	0.6	0.9%	0.9	66	0.3	0.31	2.12	67	43	1
Watershed #3	59	0.6	1.1%	0.9	58	0.3	0.31	2.12	59	38	1
Watershed #4	445	2	0.5%	0.9	442	0.3	0.30	2.12	445	286	2
Watershed #5	262	6	2.4%	0.9	256	0.3	0.31	2.12	262	175	5
Watershed #6	1,383	26	1.9%	0.9	1,357	0.3	0.31	2.12	1,383	913	19
Watershed #7	1,898	24	1.3%	0.9	1,874	0.3	0.31	2.12	1,898	1,238	15
Watershed #8	2,592	50	1.9%	0.9	2,542	0.3	0.31	2.12	2,592	1,712	40
Watershed #9	2,094	26	1.3%	0.9	2,068	0.3	0.31	2.12	2,094	1,365	21
Watershed #10	352	1	0.4%	0.9	351	0.3	0.30	2.12	352	226	1
Watershed #11	51	2	3.0%	0.9	49	0.3	0.32	2.12	51	34	2
Watershed #12	330	1	0.4%	0.9	329	0.3	0.30	2.12	330	212	0.1
Watershed #13	19	0	0.0%	0.9	19	0.3	0.30	2.12	19	12	0.0
Watershed #14	467	0	0.0%	0.9	467	0.3	0.30	2.12	467	297	0.0
TOTAL	**10,811**	**151**	**1.4%**								**116**

Table 1 - Watershed Drainage Management Areas and Roadway Summary

Stormwater Analysis: Commercial Site DMA Treatment Area Calculations

18-016 Maha

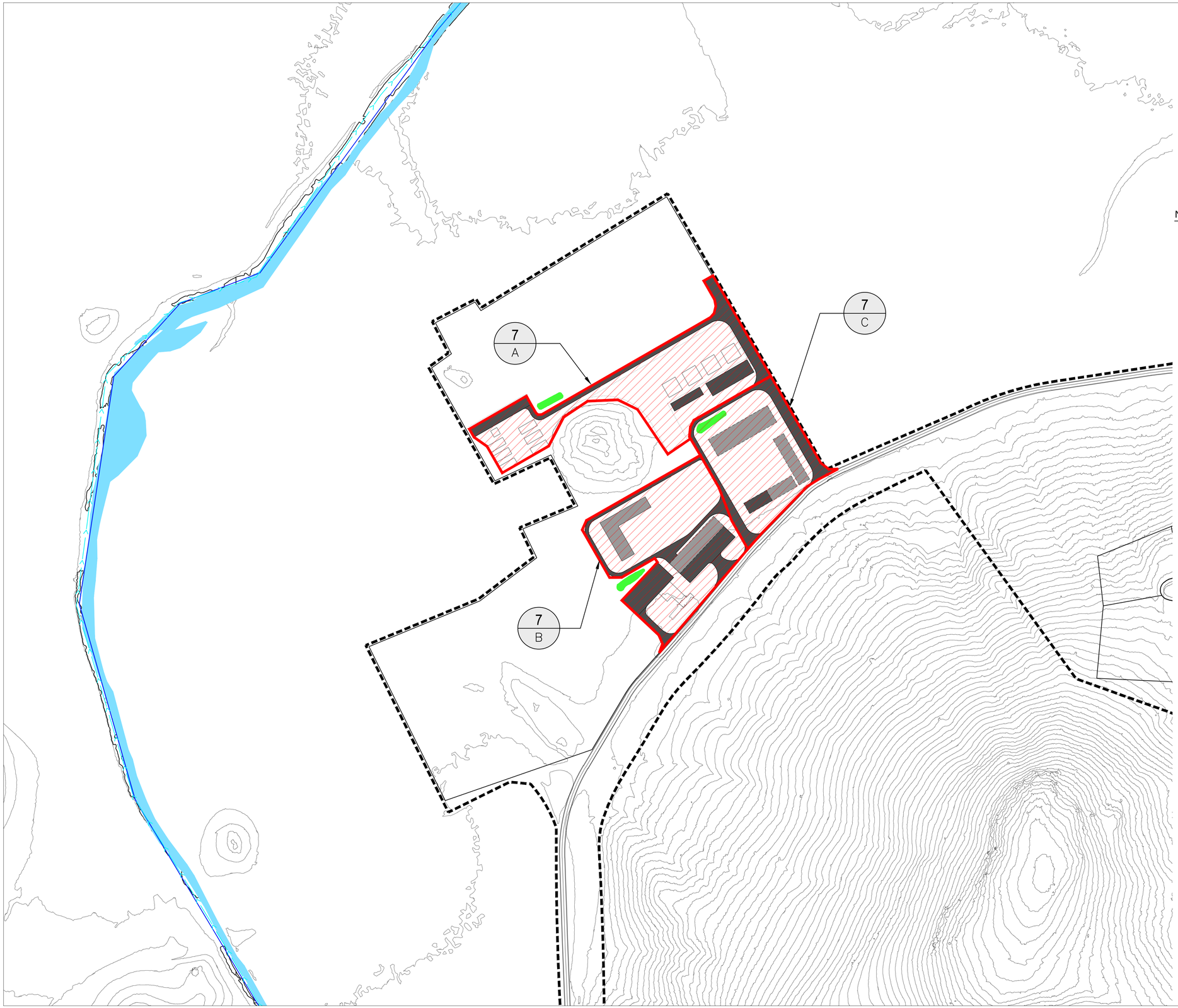
Site	DMA	DMA Area (ac)	Roof (ac)	Hardscape (ac)	Total New Impervious Area (ac)	Treatment Required	
						Type	Area (ac)
Back of House	7-A	6.7	0.0	1.6	1.6	Bioretention	0.1
Back of House	7-B	6.6	0.4	1.7	2.2	Bioretention	0.1
Back of House	7-C	5.1	0.9	1.1	2.0	Bioretention	0.1
Barns	1-A	6.8	1.0	0.7	1.6	Self Retaining	0.8
Maha Farms Parking Lot	1-C	0.8	0.0	0.5	0.5	Self Retaining	0.2
Sales Center	1-B	2.8	0.0	1.1	1.1	Bioretention	0.0
Sales Center	5-A	2.9	0.7	0.2	0.9	Bioretention	0.0
Maha Winery	5-B	2.0	0.3	0.3	0.7	Self Retaining	0.3
Maha Farms North Res.	5-C	5.5	1.5	0.1	1.6	Bioretention	0.1
Maha Farms	5-D	37.7	2.5	5.3	7.8	Bioretention	0.3
Maha Farms	5-E	4.0	0.4	1.5	1.8	Bioretention	0.1
Maha Farm South Resort Res	5-F	1.4	1.0	0.0	1.0	Bioretention	0.0
Maha Farm South Resort Res	5-G	3.2	1.2	0.0	1.2	Self Treatment	0.6
Maha Farm South Resort Res	1-D	2.4	1.4	0.0	1.4	Self Treatment	0.7
Estate Winery	9-A	4.3	1.3	0.9	2.2	Bioretention	0.1
Equestrian Lodge	7-I	5.7	0.5	0.1	0.7	Bioretention	0.0
Equestrian Lodge	8-A	0.3	0.3	0.0	0.3	Bioretention	0.0
Equestrian Center	7-E	1.7	0.6	0.5	1.1	Self Retaining	0.5
Equestrian Center	7-G	2.9	0.6	0.3	1.0	Self Retaining	0.5
Equestrian Center	7-H	1.1	0.1	0.4	0.5	Self Retaining	0.3
Equestrian Center	7-F	0.8	0.8	0.0	0.8	Bioretention	0.0
Equestrian Center	7-D	2.0	0.0	1.0	1.0	Self Retaining	0.5
Red Hill	8-B	12.7	4.2	1.6	5.8	Bioretention	0.2
Red Hill	8-C	3.3	1.6	0.0	1.6	Bioretention	0.1
Red Hill	8-D	3.4	1.5	0.0	1.5	Bioretention	0.1
Red Hill	8-E	7.6	2.3	0.0	2.3	Bioretention	0.1
1st Hole Clubhouse	9-B	0.5	0.1	0.3	0.4	Self Retaining	0.2
9th Hole Clubhouse	9-C	0.6	0.2	0.2	0.4	Self Retaining	0.2
18th Hole Clubhouse	9-E	0.6	0.1	0.2	0.4	Self Retaining	0.2
Golf Maintenance Bldg 1	9-D	0.3	0.1	0.2	0.3	Self Retaining	0.2
Golf Maintenance Bldg 2	9-F	1.1	0.5	0.5	1.1	Bioretention	0.0
Kerry Hill	9-H	14.8	3.9	2.8	6.7	Bioretention	0.3
Bohn Ridge	8-F	21.1	4.5	5.1	9.5	Bioretention	0.4
Spa	8-G	10.3	3.0	4.8	7.8	Bioretention	0.3
ERC/Entourage	9 -G	4.4	0.6	1.3	1.9	Bioretention	0.1
Wilderness Camp	12-A	4.3	0.9	3.2	4.1	Self Retaining	2.0
Staff Housing	13-A	4.7	0.6	2.5	3.1	Bioretention	0.1
Airplane Dock	14-A	1.9	0.0	0.4	0.5	Self Retaining	0.2
	TOTAL	**198**	**40**	**41**	**80**		**10**

Notes:
1. In accordance with BASMAA, limit ratio of impervious to pervious area to be 2:1 maximum for self-retaining treatment system areas.
2. In accordance with BASMAA, surface area of bioretention must be a minimum 4% of the tributary impervious area.
3. Natural drainage pattern for pervious portions of site is best maintained, thus flowing into a specific watershed outlet.

Table 2 - Commercial Area Summary

Appendix A

Commercial Area Drainage Management Areas



LEGEND

- DMA BOUNDARY
- WATERSHED BOUNDARY
- DMA COMMERCIAL SITE
- FLOW DIRECTION
- IMPERVIOUS - ROOF
- IMPERVIOUS - HARDSCAPE
- BIORETENTION
- SELF-RETAINING AREA

NOTES

1. IN ACCORDANCE WITH BASMAA, SURFACE AREAS OF BIORETENTION ARE TO BE A MINIMUM 4% OF THE TRIBUTARY IMPERVIOUS AREA.
2. IN ACCORDANCE WITH BASMAA, LIMIT RATIO OF IMPERVIOUS TO PERVIOUS AREA ARE TO BE 2:1 MAXIMUM.
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4. INDIVIDUAL RESIDENTIAL VILLA PARCELS ARE NOT INCLUDED IN THIS ANALYSIS SINCE THEY WILL EACH BE REQUIRED TO PROVIDE FULL TREATMENT AND DETENTION MEASURES IN COMPLIANCE WITH BASMAA REGULATIONS. SEPARATE STORMWATER MANAGEMENT PLANS WILL BE REQUIRED UPON SUBMITTAL OF BUILDING PERMIT FOR EACH PARCEL.

DMA		NEW IMPERVIOUS AREA (AC)	TREATMENT PROVIDED	
#	AREA (AC)		TYPE	AREA (AC)
7–A	6.7	1.6	BIORETENTION	0.07
7–B	6.6	2.2	BIORETENTION	0.09
7–C	5.1	2.0	BIORETENTION	0.09

0 100' 200' 400' NORTH

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MAHA GUENOC
LAKE COUNTY
CALIFORNIA

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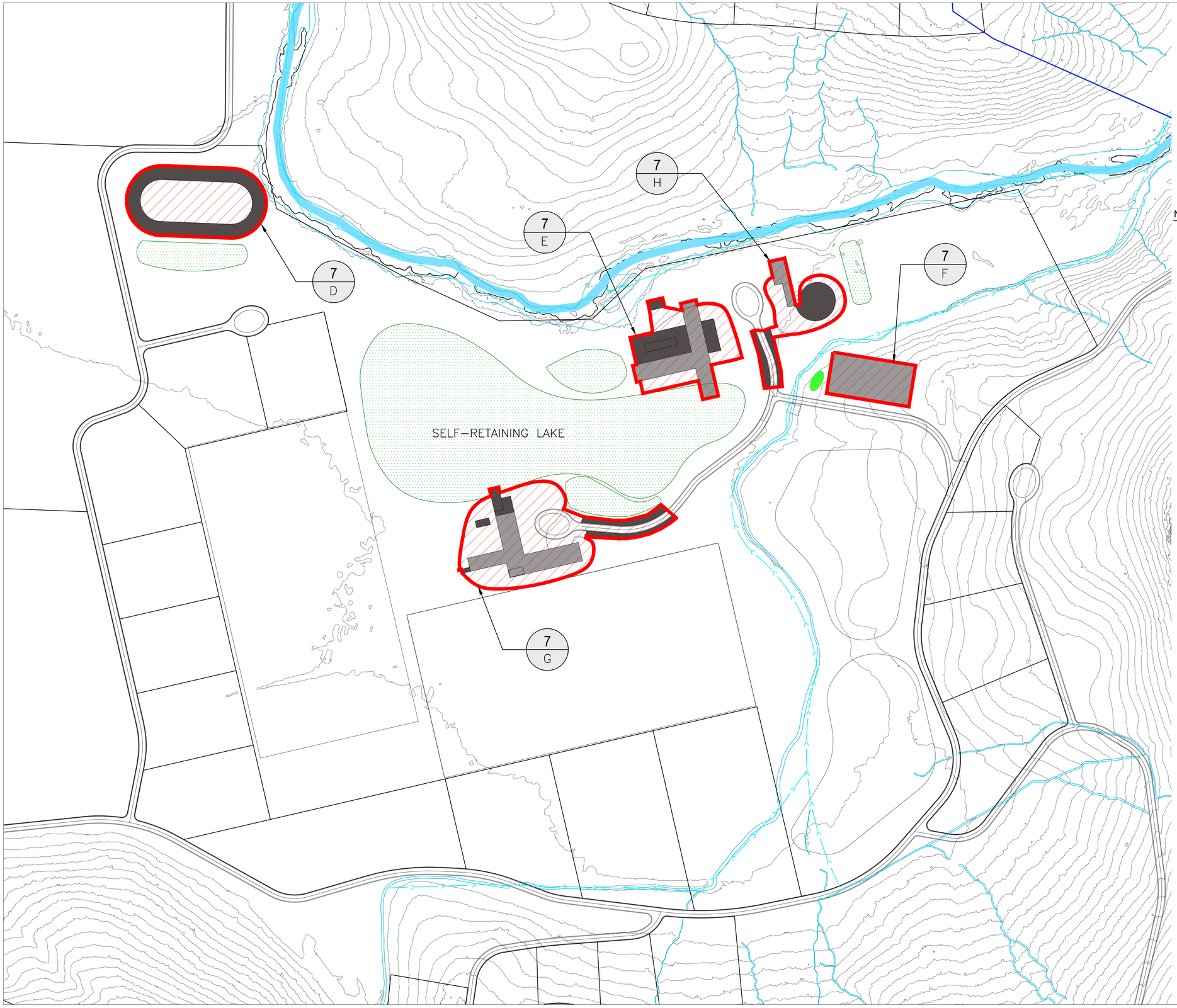
BACK OF HOUSE



LEGEND

- DMA BOUNDARY
- WATERSHED BOUNDARY
- DMA COMMERCIAL SITE
- FLOW DIRECTION
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DMA		NEW IMPERVIOUS AREA (AC)	TREATMENT PROVIDED	
#	AREA (AC)		TYPE	AREA (AC)
7–D	2.0	1.0	SELF–RETAINING	0.62
7–E	1.7	1.1	SELF–RETAINING	0.59
7–F	0.8	0.8	BIORETENTION	0.04
7–G	2.9	1.0	SELF–RETAINING	0.48
7–H	1.1	0.5	SELF–RETAINING	0.27

0 75' 150' 300' NORTH

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MAHA GUENOC
LAKE COUNTY
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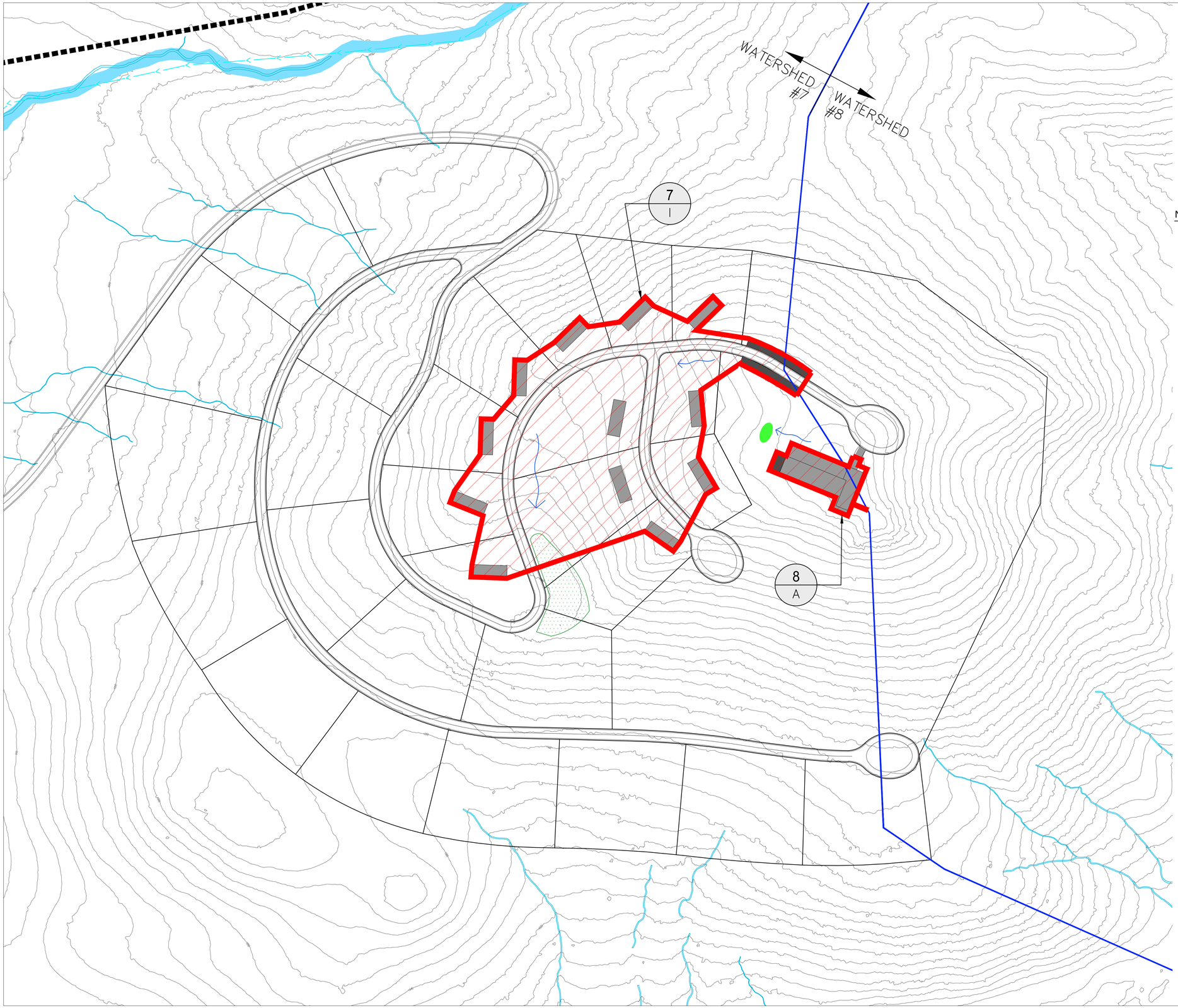
EQUESTRIAN CENTER



LEGEND

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- WATERSHED BOUNDARY
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DMA		NEW IMPERVIOUS AREA (AC)	TREATMENT PROVIDED	
#	AREA (AC)		TYPE	AREA (AC)
7–I	5.7	0.7	BIORETENTION	0.03
8–A	0.3	0.3	BIORETENTION	0.02

0 50' 100' 200' NORTH

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LAKE COUNTY
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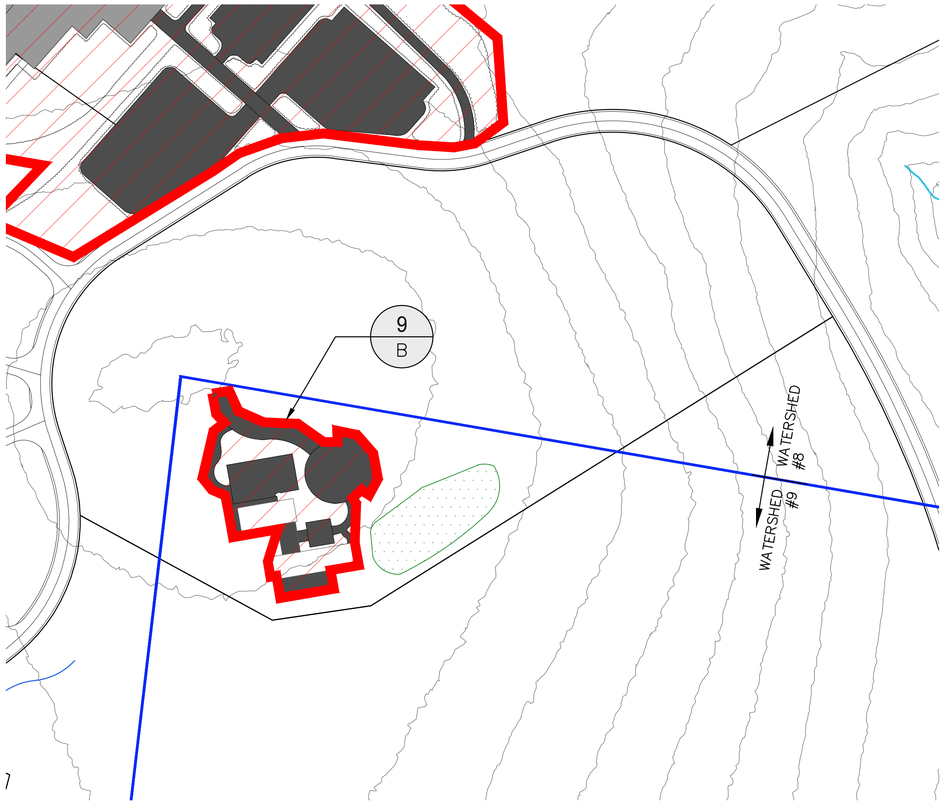
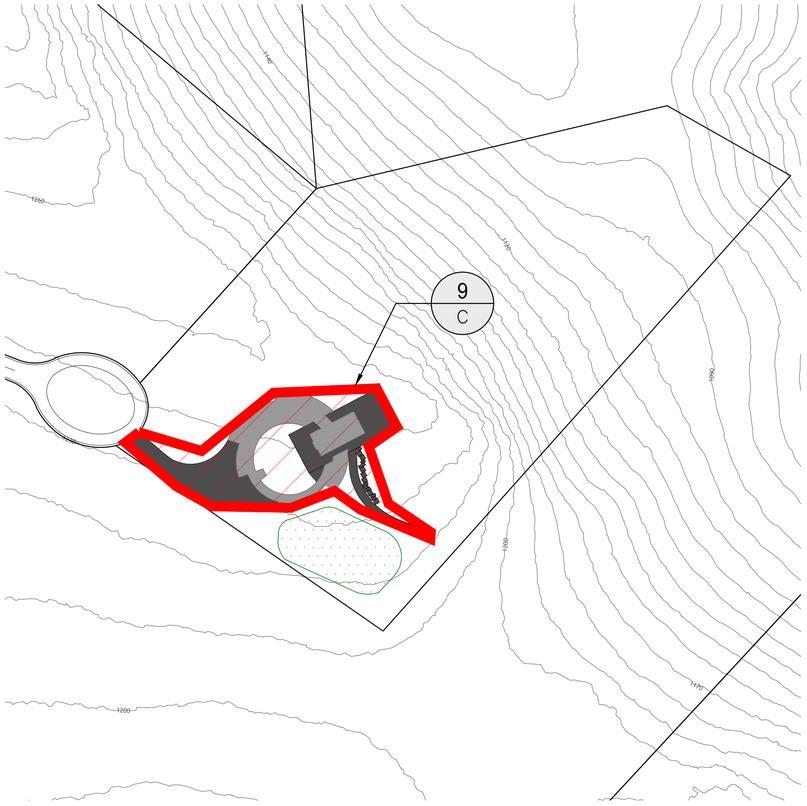
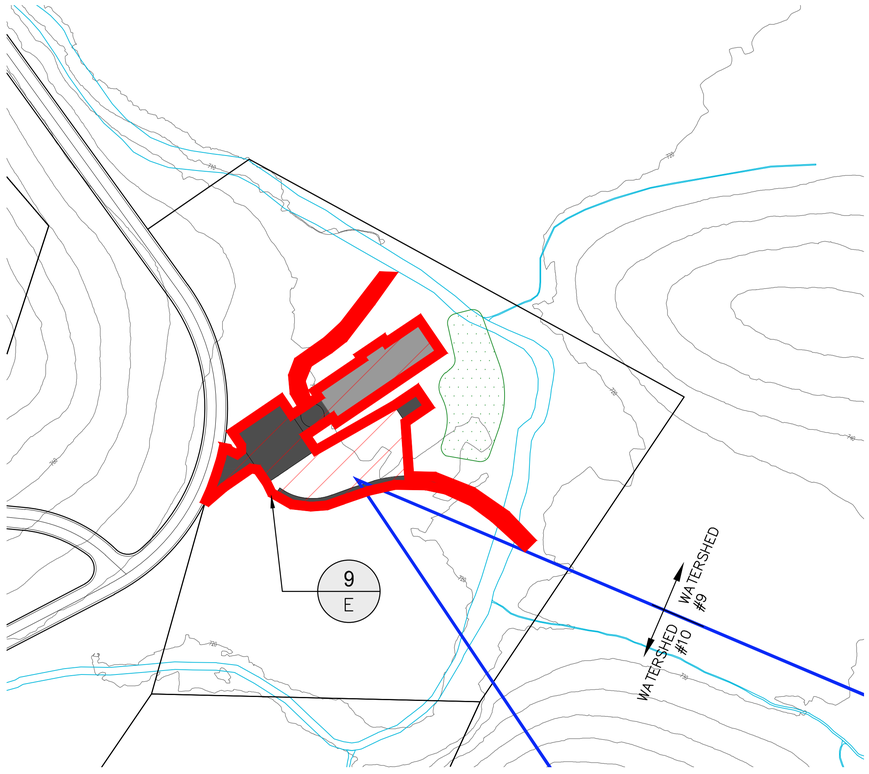
EQUESTRIAN LODGE







LEGEND

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- WATERSHED BOUNDARY
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- FLOW DIRECTION
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DMA		NEW IMPERVIOUS AREA (AC)	TREATMENT PROVIDED	
#	AREA (AC)		TYPE	AREA (AC)
9–B	0.5	0.4	SELF–RETAINING	0.20
9–C	0.6	0.4	SELF–RETAINING	0.19
9–E	0.6	0.4	SELF–RETAINING	0.19

0 40' 80' 160' NORTH

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MAHA GUENOC
LAKE COUNTY
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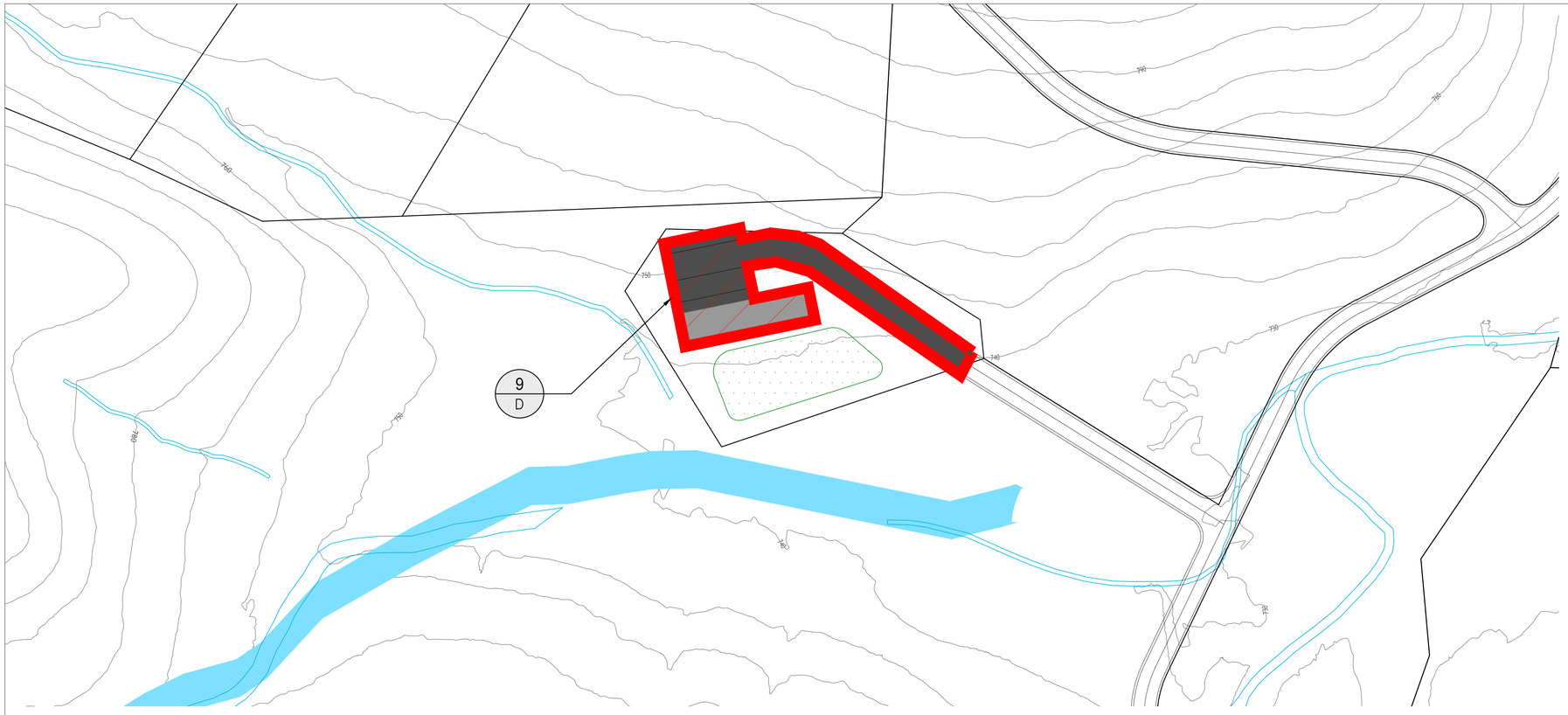
GOLF CLUBHOUSES



LEGEND

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- WATERSHED BOUNDARY
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DMA		NEW IMPERVIOUS AREA (AC)	TREATMENT PROVIDED	
#	AREA (AC)		TYPE	AREA (AC)
9–D	0.3	0.3	SELF–RETAINING	0.18
9–F	1.1	1.1	BIORETENTION	0.06

0 30' 60' 120' NORTH

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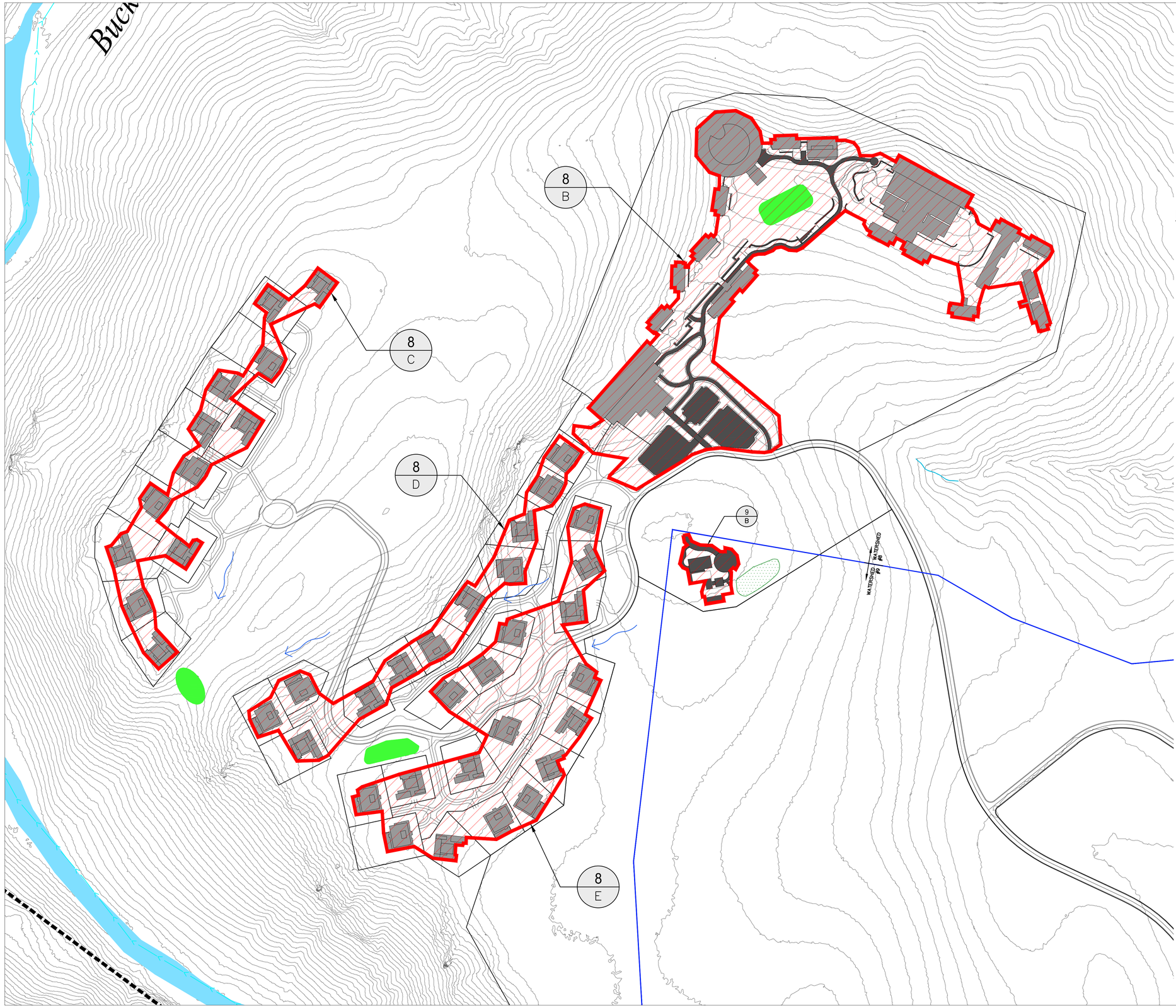
GOLF MAINTENANCE BUILDINGS



LEGEND

- DMA BOUNDARY
- WATERSHED BOUNDARY
- DMA COMMERCIAL SITE
- FLOW DIRECTION
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DMA		NEW IMPERVIOUS AREA (AC)	TREATMENT PROVIDED	
#	AREA (AC)		TYPE	AREA (AC)
8-B	12.7	5.8	BIORETENTION	0.29
8-C	3.3	0.6	BIORETENTION	0.17
8-D	3.4	1.5	BIORETENTION	0.17
8-E	7.6	2.3	BIORETENTION	0.20

0 75' 150' 300' NORTH

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LAKE COUNTY
CALIFORNIA

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RED HILL

LEGEND

- DMA BOUNDARY
- WATERSHED BOUNDARY
- DMA COMMERCIAL SITE
- FLOW DIRECTION
- IMPERVIOUS - ROOF
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DMA		NEW IMPERVIOUS AREA (AC)	TREATMENT PROVIDED	
#	AREA (AC)		TYPE	AREA (AC)
9-G	4.4	1.9	BIORETENTION	0.1

9
G

0 50' 100' 200'

NORTH

SHERWOOD
DESIGN ENGINEERS
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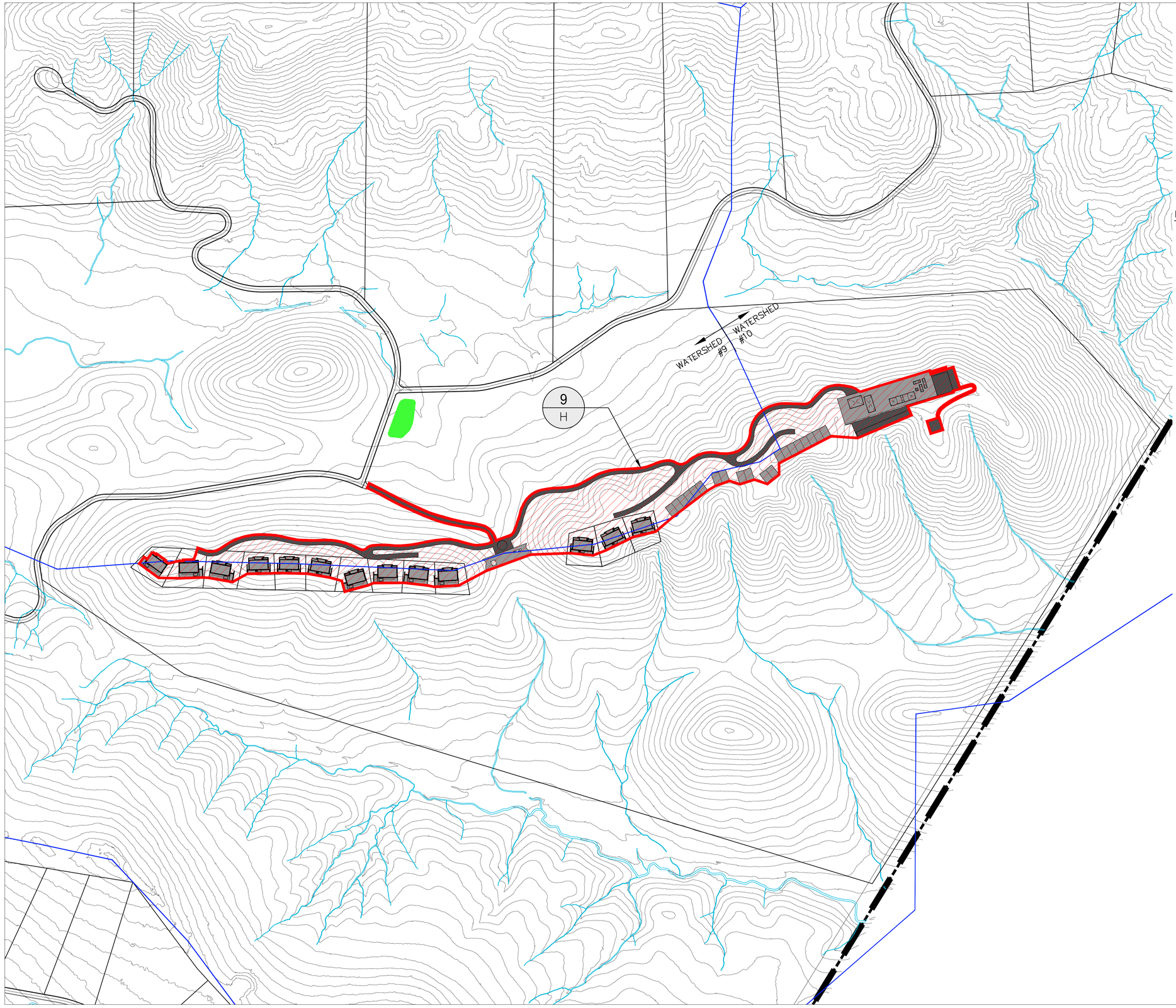
MAHA GUENOC
LAKE COUNTY
CALIFORNIA

EXHIBIT A
STORMEWATER MANAGEMENT PLAN

ERC/ENTOURAGE



LEGEND

- DMA BOUNDARY
- WATERSHED BOUNDARY
- DMA COMMERCIAL SITE
- FLOW DIRECTION
- IMPERVIOUS - ROOF
- IMPERVIOUS - HARDSCAPE
- BIORETENTION
- SELF-RETAINING AREA

NOTES

1. IN ACCORDANCE WITH BASMAA, SURFACE AREAS OF BIORETENTION ARE TO BE A MINIMUM 4% OF THE TRIBUTARY IMPERVIOUS AREA.
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DMA		NEW IMPERVIOUS AREA (AC)	TREATMENT PROVIDED	
#	AREA (AC)		TYPE	AREA (AC)
9–H	14.8	6.7	BIORETENTION	0.29

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LAKE COUNTY
CALIFORNIA

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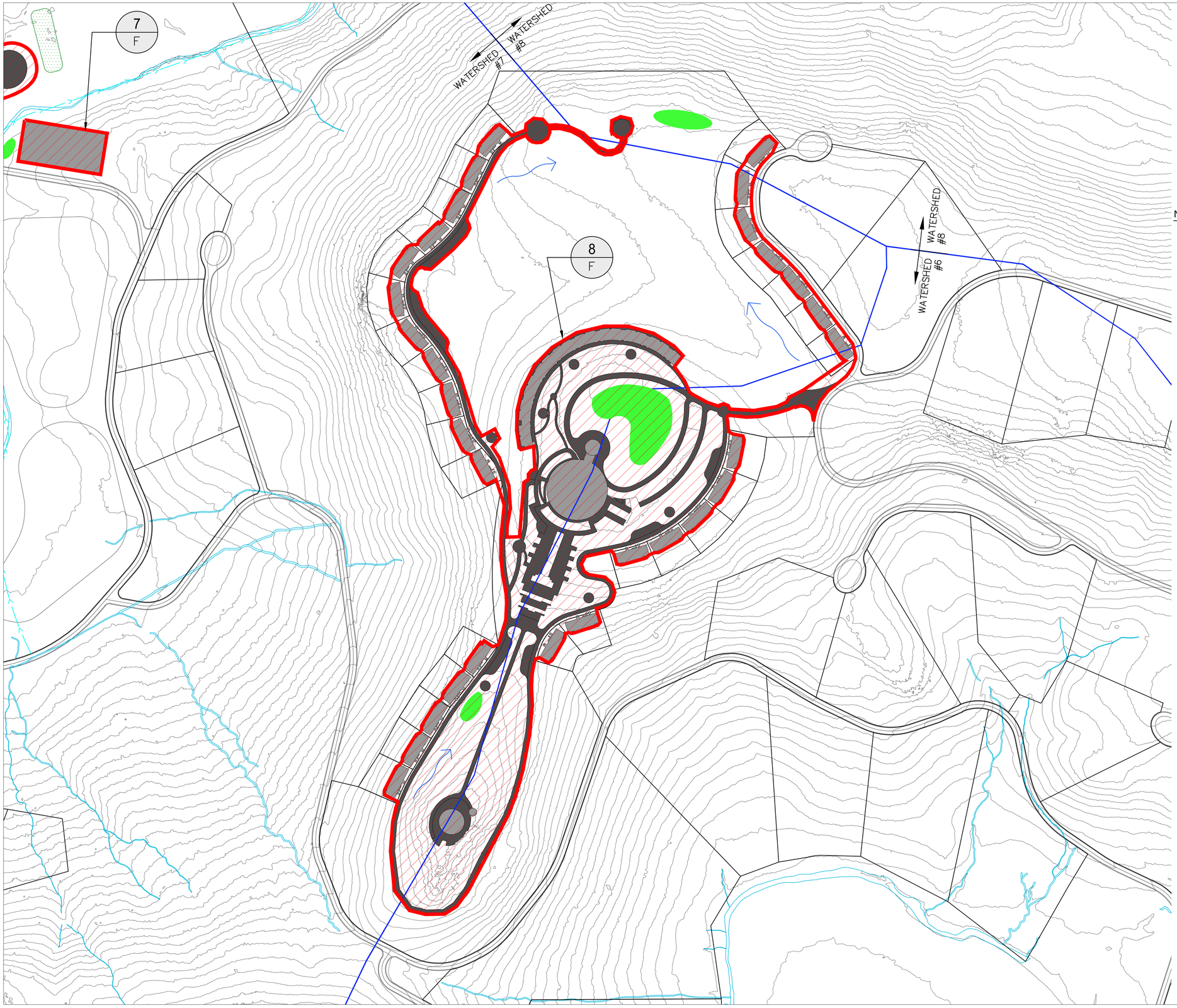
KERRY HILL



LEGEND

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DMA		NEW IMPERVIOUS AREA (AC)	TREATMENT PROVIDED	
#	AREA (AC)		TYPE	AREA (AC)
8-F	21.1	9.5	BIORETENTION	1.12

0 75' 150' 300' NORTH

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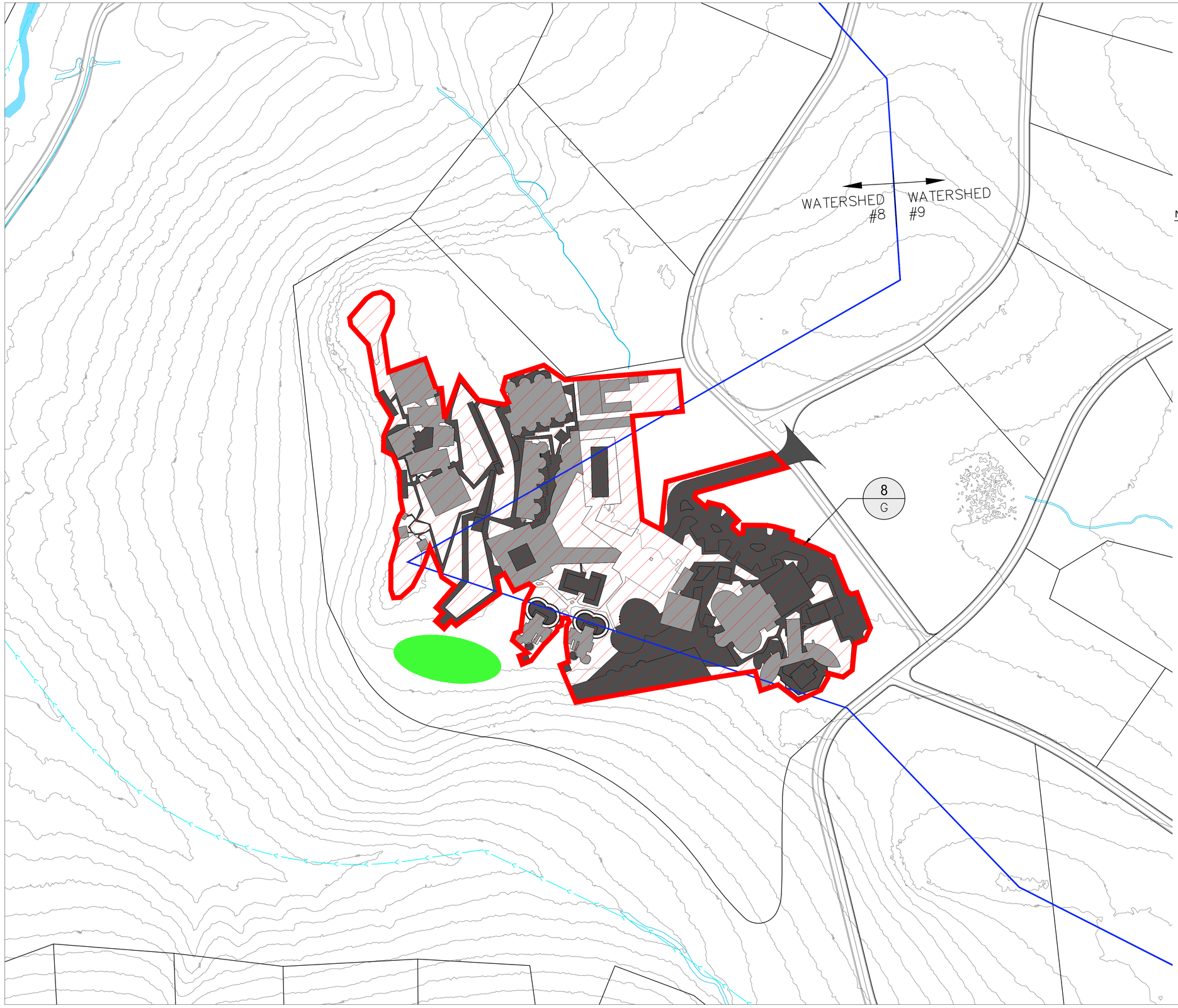
BOHN RIDGE



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DMA		NEW IMPERVIOUS AREA (AC)	TREATMENT PROVIDED	
#	AREA (AC)		TYPE	AREA (AC)
8-G	10.3	7.8	BIORETENTION	0.40

0 50' 100' 200' NORTH

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EXHIBIT A
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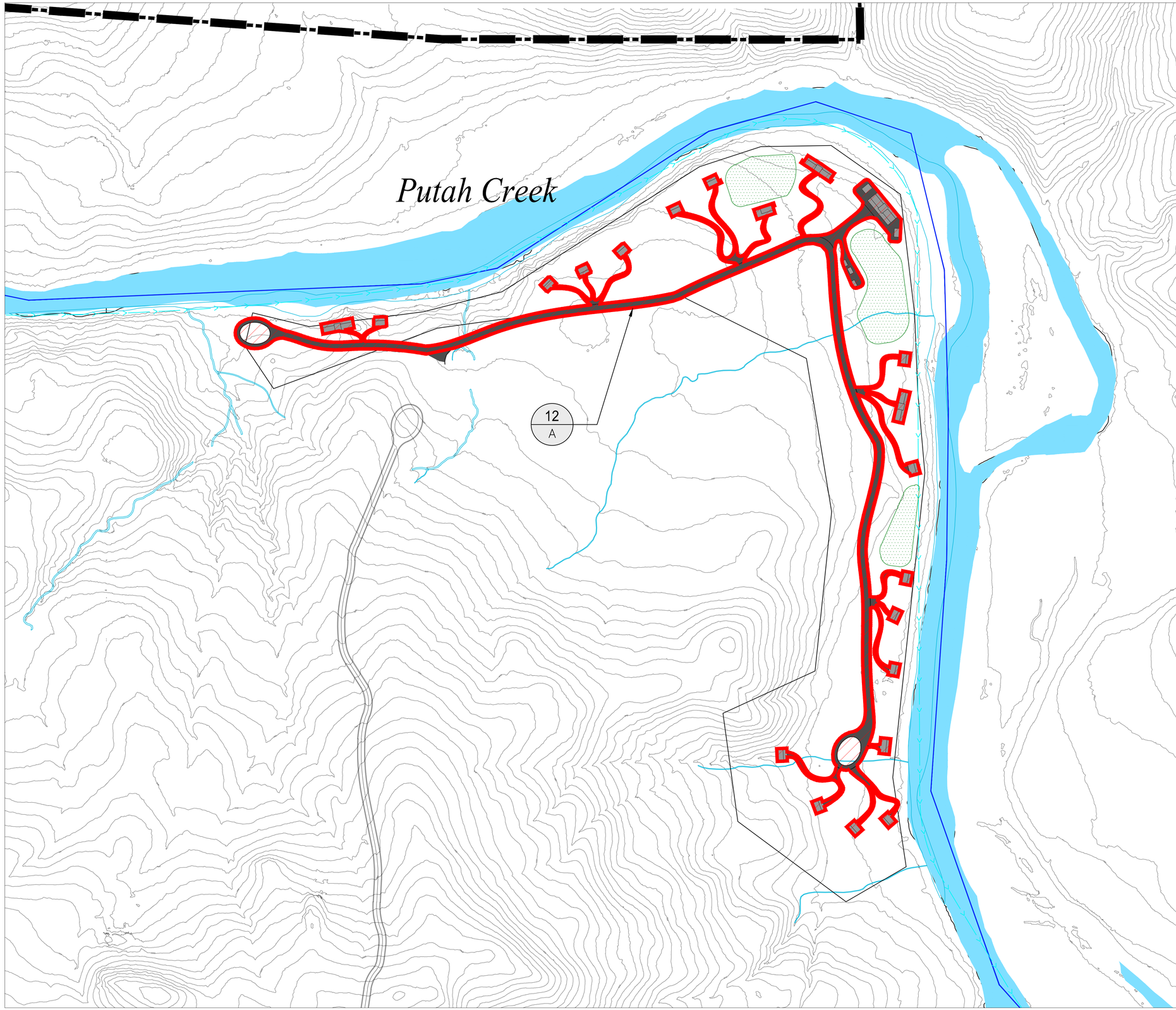
SPA

SHEET 10 OF 17



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DMA		NEW IMPERVIOUS AREA (AC)	TREATMENT PROVIDED	
#	AREA (AC)		TYPE	AREA (AC)
12–A	4.3	4.1	SELF–RETAINING	2.10

0 75' 150' 300'

NORTH

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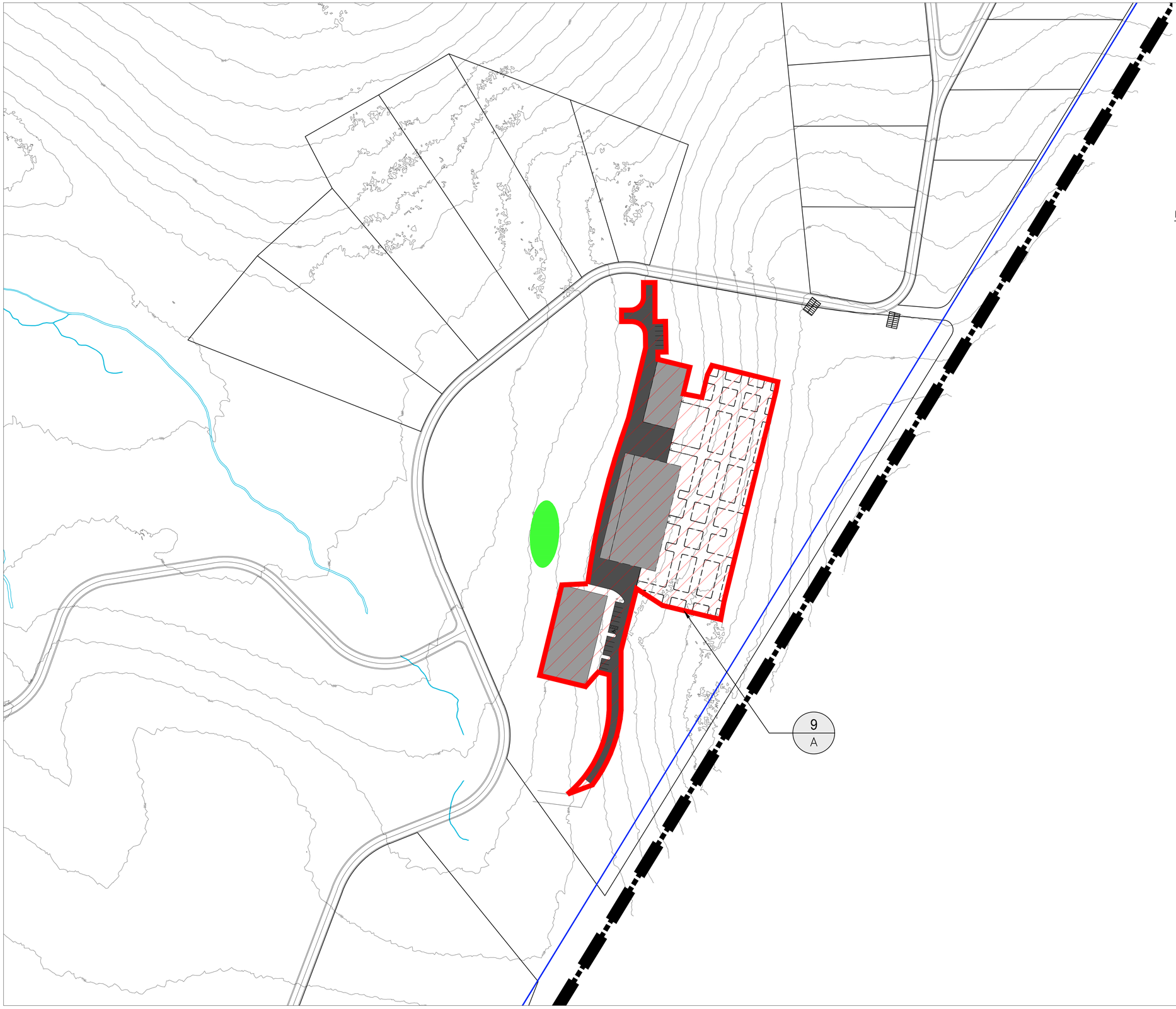
WILDERNESS CAMP



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DMA		NEW IMPERVIOUS AREA (AC)	TREATMENT PROVIDED	
#	AREA (AC)		TYPE	AREA (AC)
9–A	4.3	2.2	BIORETENTION	0.15

0 50' 100' 200'

NORTH

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CALIFORNIA

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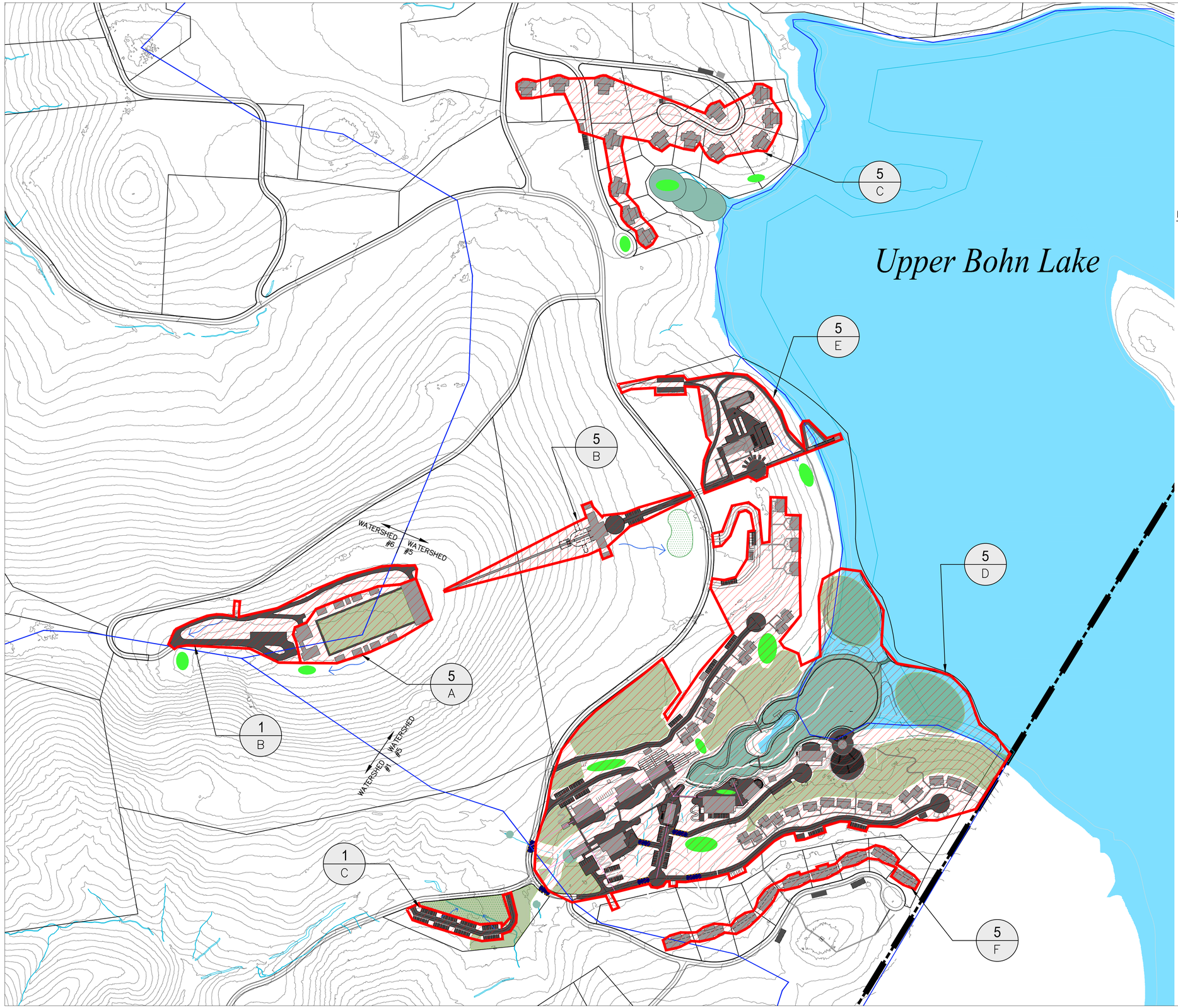
ESTATE WINERY



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DMA #	DMA AREA (AC)	NEW IMPERVIOUS AREA (AC)	TREATMENT PROVIDED TYPE	TREATMENT PROVIDED AREA (AC)
1–B	2.8	1.1	BIORETENTION	0.07
1–C	0.8	0.5	SELF–RETAINING	0.68
5–A	2.9	0.9	BIORETENTION	0.05
5–B	2.0	0.7	SELF–RETAINING	0.39
5–C	5.5	1.6	BIORETENTION	0.09
5–D	37.7	7.8	BIORETENTION	0.52
5–E	4.0	1.8	BIORETENTION	0.09
5–F	1.4	1.0	BIORETENTION	0.15

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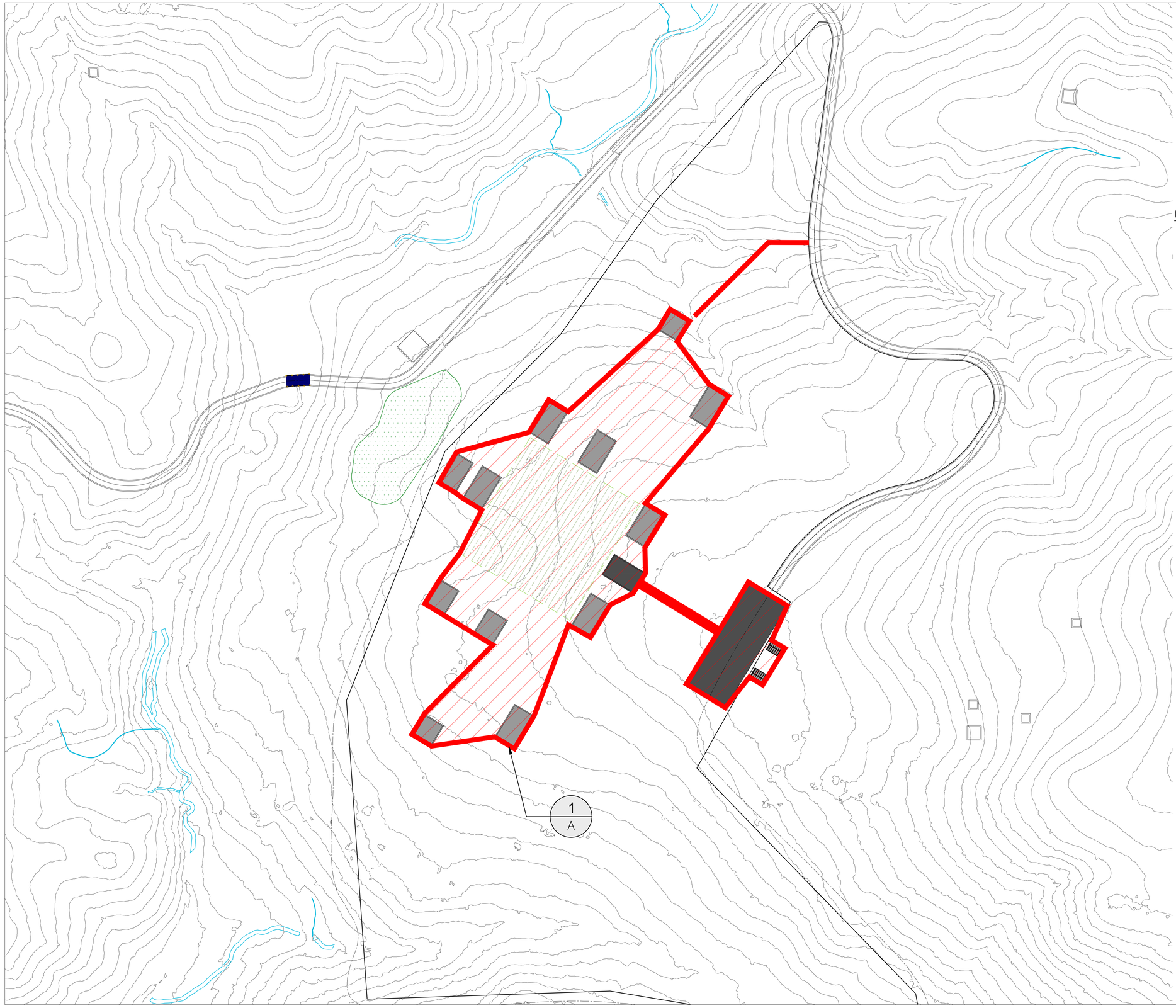
MAHA GUENOC
LAKE COUNTY
CALIFORNIA

EXHIBIT A STORMEWATER MANAGEMENT PLAN

MAHA FARMS
SALES CENTER



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DMA		NEW IMPERVIOUS AREA (AC)	TREATMENT PROVIDED	
#	AREA (AC)		TYPE	AREA (AC)
1–A	6.8	1.6	BIORETENTION	0.83

0 50' 100' 200' NORTH

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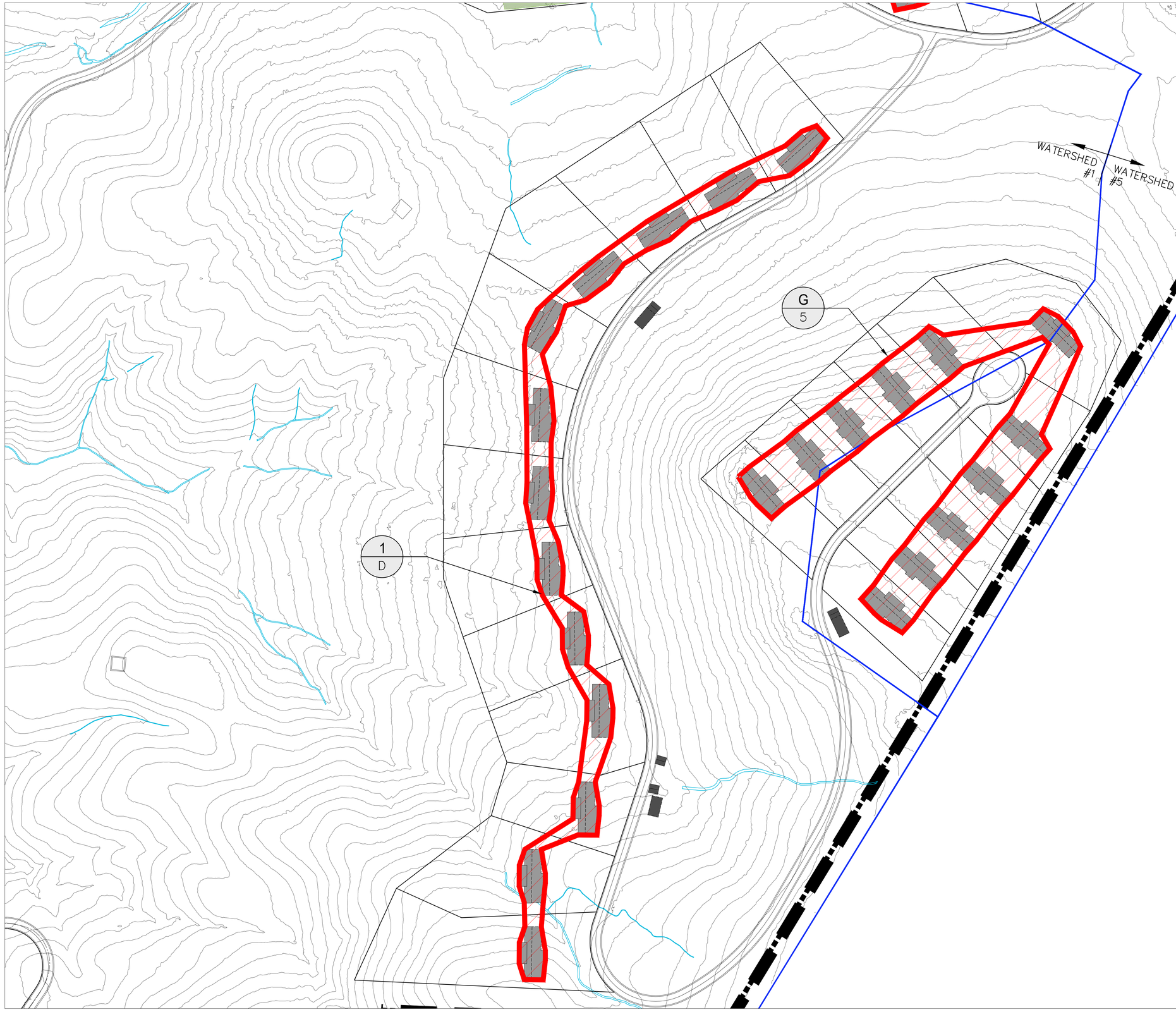
MAHA GUENOC
LAKE COUNTY
CALIFORNIA

EXHIBIT A
STORMEWATER MANAGEMENT PLAN

MAHA FARMS BARNS



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DMA		NEW IMPERVIOUS AREA (AC)	TREATMENT PROVIDED	
#	AREA (AC)		TYPE	AREA (AC)
1–D	2.4	1.4	SELF–TREATMENT	–
5–G	3.2	1.2	SELF–TREATMENT	–

0 50' 100' 200' NORTH

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MAHA GUENOC
LAKE COUNTY
CALIFORNIA

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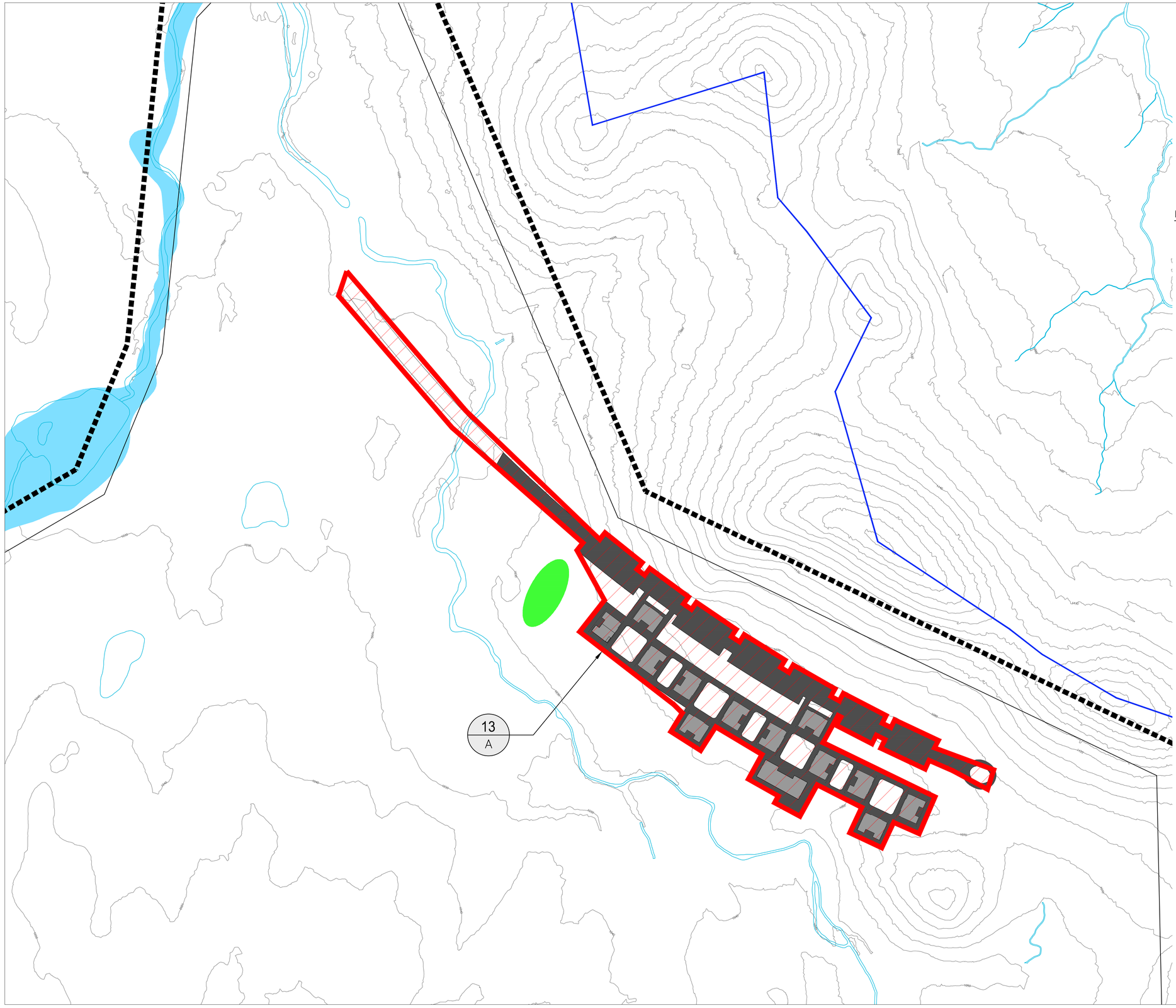
MAHA FARMS SOUTH



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#	AREA (AC)		TYPE	AREA (AC)
13–A	4.7	3.1	BIORETENTION	0.20

0 50' 100' 200' NORTH

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LAKE COUNTY
CALIFORNIA

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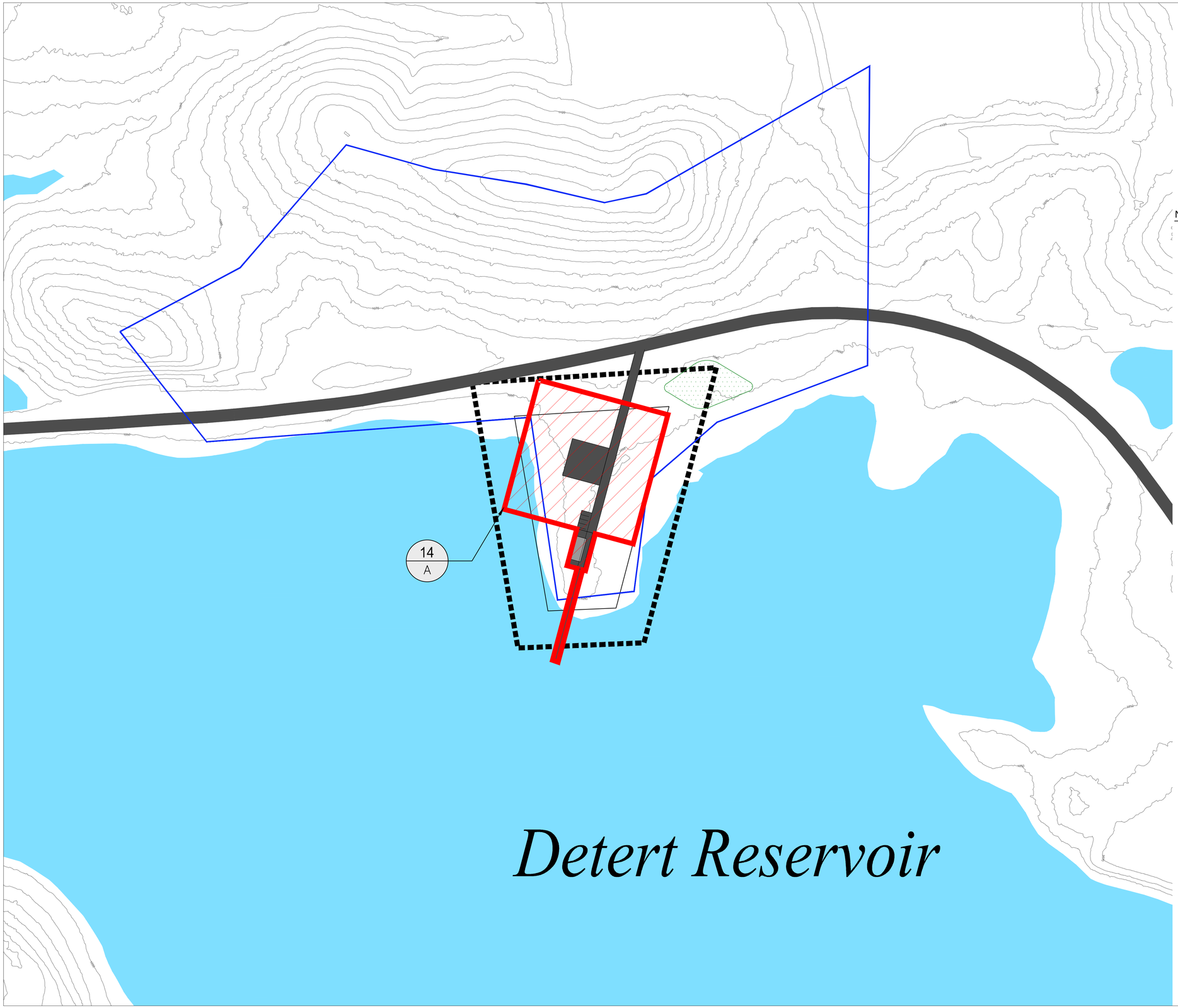
STAFF HOUSING

SHEET 16 OF 17



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DMA		NEW IMPERVIOUS AREA (AC)	TREATMENT PROVIDED	
#	AREA (AC)		TYPE	AREA (AC)
14–A	1.9	0.5	SELF–RETAINING	0.26

0 50' 100' 200' NORTH

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MAHA GUENOC
LAKE COUNTY
CALIFORNIA

EXHIBIT A
STORMEWATER MANAGEMENT PLAN

FLOAT PLANE DOCK

APPENDIX TIA

TRAFFIC IMPACT ANALYSIS

Transportation Impact Analysis

Maha Resort at Guenoc Valley

Lake County

Prepared by:
Abrams Associates
1875 Olympic Boulevard, Suite 210
Walnut Creek CA 94596

Abrams Associates
TRAFFIC ENGINEERING, INC.

February 7, 2020

Maha Resort at Guenoc Valley

Lake County

TRANSPORTATION IMPACT ANALYSIS

1) INTRODUCTION

This traffic impact study describes the existing and future conditions for transportation with and without the proposed project. The Guenoc Valley Mixed-Use Planned Development Project (Proposed Project) consists of the development of a master planned mixed-use resort and residential community within the 16,000-acre Guenoc Valley Ranch property in southeast Lake County. The project also includes off-site workforce co-housing located in central Middletown and associated infrastructure. This study also describes the regulatory setting; the criterion used for determining the significance of environmental impacts; and summarizes potential environmental impacts and appropriate mitigation measures. This study has been conducted in accordance with the requirements and methodologies set forth by Lake County, Napa County, Caltrans, and the applicable provisions of CEQA.

Summary of Required Mitigations and Recommended Improvement Measures - The following is a summary of the proposed mitigation measures to address the transportation impacts of the project. Based on a detailed analysis of traffic operations with and without each of the proposed mitigations, implementation of the following mitigation measures would reduce the project impacts to a *less-than-significant* level. The impacts at Intersections #20 and #21 in Napa County involve mitigations that cannot be guaranteed as the improvements would be outside the jurisdiction of Lake County. Therefore, the impacts at these two intersections (which occur under future phases only) would be considered *significant and unavoidable*.

Impact #1 Impacts to intersection operations - The project would contribute to LOS operations exceeding established standards at the following intersections:

State Route 29 at Spruce Grove Road South (Intersection #3)
State Route 29 at Hidden Valley Road (Intersection #4)
State Route 29 at Hartmann Road (Intersection #5)
State Route 29 at Butts Canyon Road (Intersection #7)
State Route 29 at Tubbs Lane (Intersection #20) – *Napa County*
State Route 128 at Tubbs Lane (Intersection #21) – *Napa County*

The addition of traffic from the proposed project would contribute to these six intersections exceeding the established LOS standards. However, without

implementation of the recommended mitigations below, the development of the proposed project would result in a potentially significant impact to the LOS and queuing at the above listed intersections. With the exception of Intersections #20 and #21 the following mitigation measures would reduce the impacts at these intersections to a less-than-significant level in all of the plus project scenarios.

Mitigation Measures

Prior to construction the project would mitigate the above-identified impacts by paying a proportionate share of the construction costs of the following improvement, subject to County approval. The intersection mitigations required for the project to meet the established LOS standards are:

MM 1 (a) *State Route 29 at Spruce Grove Road South – Installation of a three-way traffic signal with crosswalks. (Scenario 6 - Cumulative Plus Phase 1)*

MM 1 (b) *State Route 29 at Hidden Valley Road – Installation of a four-way traffic signal with crosswalks. (Scenario 6 - Cumulative Plus Phase 1)*

MM 1 (c) *State Route 29 at Hartmann Road – Expansion of the existing roundabout or installation of a three-way traffic signal. (Scenario 6 - Cumulative Plus Phase 1)*

MM 1 (d) *State Route 29 at Butts Canyon Road – Installation of a three-way traffic signal with crosswalks. (Scenario 2 - Existing Plus Phase 1)*

MM 1 (e) *State Route 29 at Tubbs Lane – Installation of a three-way traffic signal with crosswalks. (Scenario 7 - Cumulative Plus Future Phases)*

MM 1 (f) *State Route 128 at Tubbs Lane – Installation of a three-way traffic signal with crosswalks. (Scenario 7 - Cumulative Plus Future Phases)*

2) PROJECT DESCRIPTION

As noted above, the Guenoc Valley Mixed-Use Planned Development Project consists of the development of a master planned mixed-use resort and residential community within the 16,000-acre Guenoc Valley Ranch property. **Figure 1** shows the project location and the surrounding roadway network. **Figure 2** shows the proposed site plan for Phase 1.
The project also includes the development of 50 off-site workforce housing units located in central Middletown and associated infrastructure. Project components would be developed over

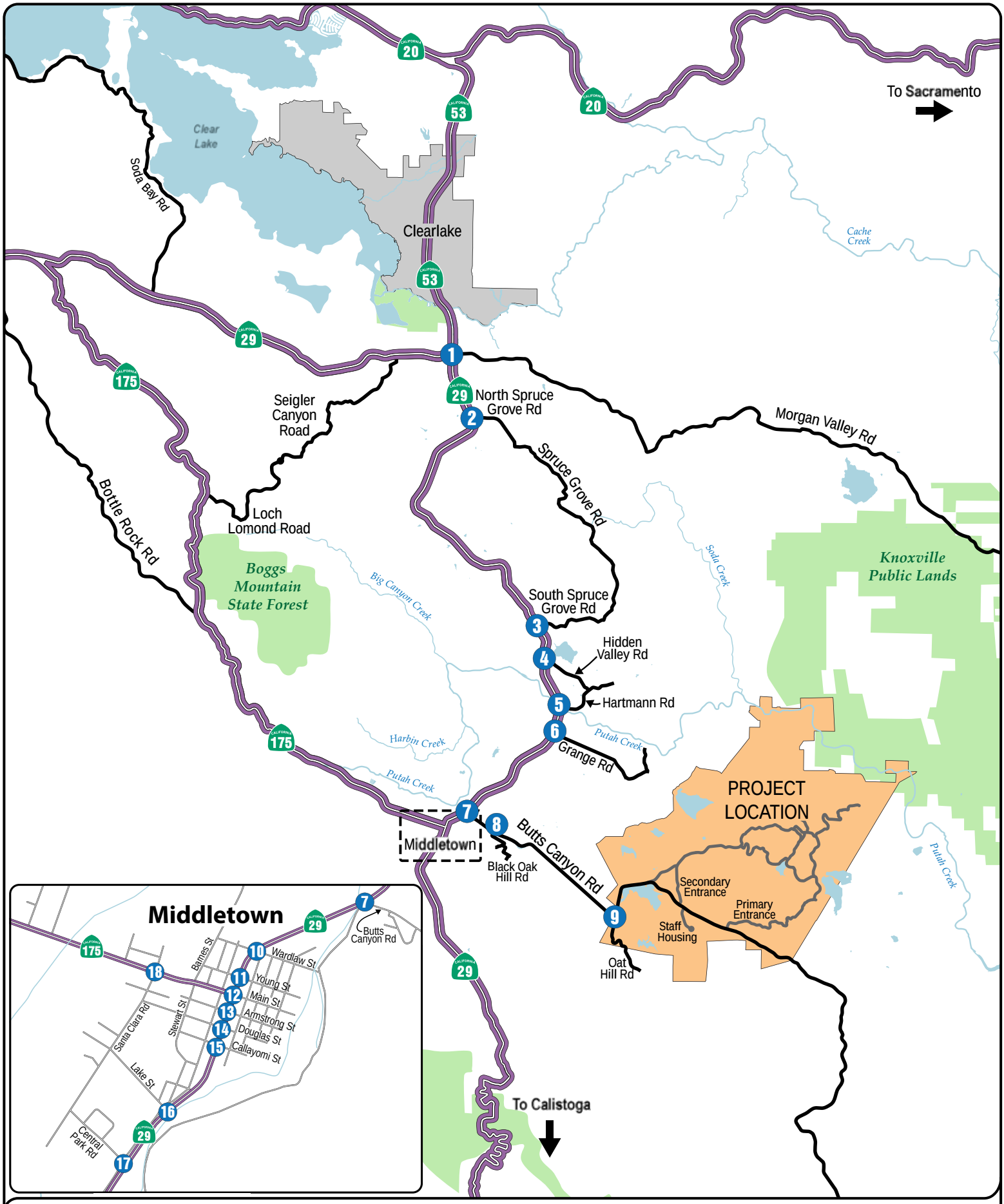

FIGURE 1 | PROJECT LOCATION & STUDY INTERSECTIONS
TRANSPORTATION IMPACT ANALYSIS
Maha Resort at Guenoc Valley
Lake County

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FIGURE 2 | SITE PLAN
TRANSPORTATION IMPACT ANALYSIS
Maha Resort at Guenoc Valley
Lake County

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multiple phases. The first phase (Phase 1) will be constructed in the near-term (approximately the next ten years) and future phases will be built out based on market demands. Phase 1 includes the development of a private resort within the Guenoc Valley Ranch Property consisting of: i) six boutique hotels with a combined total of i) 343 resort hotel units; ii) 411 residential estate villas; iii) up to 35 on-site workforce co-housing units; iv) resort amenities, including but not limited to outdoor entertainment area, spa and wellness amenities, sports fields, equestrian areas, a new golf course, camping area and commercial and retail facilities; v) agricultural production and support facilities; vi) essential accessory facilities, including back of house facilities, fire station and emergency response center, float plane dock, helipads; and vii) supporting infrastructure. At full buildout (Phase 1 plus the addition of future phases that could be developed under the proposed zoning district), the Proposed Project could result in the development of up to 900 hotel and resort residential units, 1400 residential villas, 300 workforce housing units, resort amenities, and accessory uses within the Project Site. For simplicity, future phases of development will be referred to as "future phases" in this document.

3) EXISTING CONDITIONS

This section of the report describes the roadways, traffic conditions and other existing transportation characteristics in the vicinity of the project. The primary basis of the analysis is the peak hour level of service for the key intersections. The hours identified as the "peak" hours are generally between 7:30 a.m. and 8:30 a.m. and 4:30 p.m. and 5:30 p.m. for the transportation facilities described, based on the intersection turning movement counts collected for this analysis. Throughout this report, these peak hours will be identified as the AM and PM peak hours, respectively.

3.1 Project Study Intersections

Based on the project's trip generation and the potential for traffic impacts a list of project study intersections was prepared in coordination with County staff. **Figure 1** shows the location of the project study intersections. Access to the site would be provided via two entrance roadways extending from Butts Canyon Road. The primary access to the Guenoc Valley Site for residents and guests would occur via a new roadway and intersection. There are two options for the primary access road. The Primary Access Road Option 1 entrance would be located approximately 2 miles south of the existing Langtry Winery Entrance. The Primary Access Road Option 2 would be located at McCain Canyon, about 2.6 miles south of the existing Langtry Winery Entrance. Secondary access would be provided through improvements to the existing intersection and roadway located a little less than a mile south of the Langtry Winery entrance. There are twenty-four additional off-site study intersections that were analyzed.

3.2 Traffic Analysis Scenarios

The study intersections were evaluated for the following seven scenarios:

- Scenario 1: *Existing Conditions* – Level of Service (LOS) based on existing peak hour volumes and existing intersection configurations.

- Scenario 2: *Existing Plus Phase 1* – Existing traffic volumes plus trips from Phase 1 of the proposed project.

- Scenario 3: *Baseline (No Project) Conditions* – The Baseline scenario is based on the existing volumes plus growth in background traffic (for three years) plus the traffic from all reasonably foreseeable developments that could substantially affect the volumes at the project study intersections.

- Scenario 4: *Baseline Plus Phase 1 Conditions* – This scenario is based on the Baseline volumes plus the trips from Phase 1 of the proposed project.

- Scenario 5: *Cumulative Conditions* – This scenario includes year 2040 cumulative volumes based on planned and approved projects, the Lake County Traffic Model, and the Napa-Solano Travel Demand Model.

- Scenario 6: *Cumulative Plus Phase 1 Conditions* – This scenario includes year 2040 cumulative volumes based on the Countywide Travel Demand Model plus the trips from Phase 1 of the proposed project.

- Scenario 7: *Cumulative Plus Future Phases* – This scenario includes year 2040 cumulative volumes based on the Countywide Travel Demand Model plus the trips from Phase 1 and planned future phases of the proposed project.

3.3 Existing Roadway Network

As discussed previously, the project location and the surrounding roadway network are illustrated in **Figure 1**. The following is a more detailed description of some of the main roadways in the area that could be affected by the project:

- **State Route 29 (SR 29)–** State Route (SR) 29 is long north-south highway between Vallejo in the south and Upper Lake in the north. Within Lake County it extends north through the community of Middletown, to the community of Lower Lake, then proceeds north-west through the community of Kelseyville and the County of Lakeport, terminating at the junction of Route 20 in the community of Upper Lake.

- **State Route 175 (SR 175)–** State Route (SR) is an east-west two-lane highway that extends west from SR 29 in Middletown. It continues west to terminate at U.S. 101 in Hopland.

- **Butts Canyon Road –** Butts Canyon Road is an east-west roadway that is designated by the Lake County General Plan as a major collector road. It extends east from SR 29 and eventually becomes Pope Valley Road in Napa County. Within the study area,

Butts Canyon Road has two travel lanes and a speed limit of 55 mph.

- **Spruce Grove Road –** Spruce Grove Road is designated by the Lake County General Plan as a major local road. It extends east from SR 29 on the north and eventually reconnects with SR 29 on the near the Hidden Valley Lake Community. Spruce Grove has two travel lanes and a speed limit of 35 mph.

- **Hidden Valley Road** – Hidden Valley Road is an east-west two-lane private roadway that serves the gated Hidden Valley Lake Community. It has two lanes and extends east from SR 29 on the north and terminates at Hartmann Road to the west.

- **Hartmann Road –** Hartmann Road is designated by the Lake County General Plan as a minor collector road. It extends east from SR 29 on the north and eventually reconnects with SR 29 on the near the Hidden Valley Lake Community. Hartmann Road has two travel lanes and a speed limit ranging from 30 to 35 mph.

- **Grange Road -** Grange Road is a two-lane east-west roadway that is designated by the Lake County General Plan as a local road. It extends east from SR 29 and terminates to the east near the project site.

3.4 Analysis Methodology

Existing operational conditions at the twenty-one (21) study intersections have been evaluated according to the requirements set forth by the Lake County General Plan. Analysis of traffic operations was conducted using the 6th Edition of the *Highway Capacity Manual* (*HCM*) Level of Service (LOS) methodology with Synchro software.[1] Level of service is an expression, in the form of a scale, of the relationship between the capacity of an intersection (or roadway segment) to accommodate the volume of traffic moving through it at any given time. The level of service scale describes traffic flow with six ratings ranging from A to F, with "A" indicating relatively free flow of traffic and "F" indicating stop-and-go traffic characterized by traffic jams. The traffic flow conditions that motorists experience rapidly deteriorate as the capacity of the intersection or roadway segment is reached. Under such conditions, there is general instability in the traffic flow, which means that relatively small incidents (e.g., momentary engine stall) can cause considerable fluctuations in speeds and delays that lead to traffic congestion. For signalized intersections, The *HCM* methodology determines the capacity of each lane group approaching the intersection. The LOS is then based on average control delay (in seconds per vehicle) for the various movements within the intersection. A combined weighted average control delay and LOS are presented for the intersection. A summary of the HCM results and copies of the detailed HCM LOS calculations are included in the appendix to this report. **Table 1** summarizes the relationship between LOS, average control delay, and the volume to capacity ratio at signalized intersections. **Table 2** summarizes the relationship between LOS and average control delay at unsignalized intersections.

[1] *6th Edition of Highway Capacity Manual*, Transportation Research Board, Washington D.C., 2016

TABLE 1
SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description of Operations	Average Delay (sec/veh)	Volume to Capacity Ratio
A	Insignificant Delays: No approach phase is fully used and no vehicle waits longer than one red indication.	≤ 10	< 0.60
B	Minimal Delays: An occasional approach phase is fully used. Drivers begin to feel restricted.	> 10 to 20	> 0.61 to 0.70
C	Acceptable Delays: Major approach phase may become fully used. Most drivers feel somewhat restricted.	> 20 to 35	> 0.71 to 0.80
D	Tolerable Delays: Drivers may wait through no more than one red indication. Queues may develop but dissipate rapidly without excessive delays.	> 35 to 55	> 0.81 to 0.90
E	Significant Delays: Volumes approaching capacity. Vehicles may wait through several signal cycles and long vehicle queues from upstream.	> 55 to 80	> 0.91 to 1.00
F	Excessive Delays: Represents conditions at capacity, with extremely long delays. Queues may block upstream intersections.	> 80	> 1.00

SOURCES: 6th Edition of the *Highway Capacity Manual*, Transportation Research Board, 2016.

TABLE 2
UNSIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description of Operations	Average Delay (seconds/vehicle)
A	No delay for stop-controlled approaches.	0 to 10
B	Operations with minor delays.	> 10 to 15
C	Operations with moderate delays.	> 15 to 25
D	Operations with some delays.	> 25 to 35
E	Operations with high delays and long queues.	> 35 to 50
F	Operation with extreme congestion, with very high delays and long queues unacceptable to most drivers.	> 50

SOURCE: 6th Edition of the *Highway Capacity Manual*, Transportation Research Board, 2016.

For unsignalized intersections (all-way stop controlled and two-way stop controlled) the average control delay and LOS operating conditions are calculated by approach (e.g., northbound) and by movement (e.g., northbound left-turn) for those movements that are subject to delay. In general, the operating conditions for unsignalized intersections are presented for the worst approach.

3.5 Existing Intersection Capacity Conditions (Scenario 1)

The existing intersection geometry at each of the project study intersections can be seen in **Figure 3** and the existing traffic volumes at each are presented in **Figure 4.** Traffic counts at the study intersections were conducted in May of 2019 at times when local schools were in session and additional counts were also conducted in June and July of 2019 to capture summer conditions. **Table 3** summarizes the associated LOS computation results for the existing weekday AM and PM peak hour conditions. Please note that the corresponding LOS analysis calculation sheets and information regarding the peak hour factors and signal timings are presented in the appendix to this report.

As shown in **Table 3**, all of the project study intersections currently have acceptable conditions (LOS D or better) during the weekday AM and PM peak hours with the exception of Intersection #20 (State Route 29 at Tubbs Lane) and Intersection #21 (State Route 128 at Tubbs Lane) which would both exceed the LOS D threshold established in Napa County's General Plan. See Section 3.8 for a description of the applicable intersection thresholds.

3.6 Pedestrian and Bicycle Facilities

Bicycle and pedestrian facilities in the project study area are currently very limited with no bike lanes or sidewalks provided in the vicinity of the project. Bicycle paths, lanes and routes are typical examples of bicycle transportation facilities, which are defined by Caltrans as being in one of the three classes:

Class I – Provides a completely separated facility designed for the exclusive use of bicyclists and pedestrians with crossing points minimized.

Class II – Provides a restricted right-of-way designated lane for the exclusive or semi-exclusive use of bicycles with through travel by motor vehicles or pedestrians prohibited, but with vehicle parking and cross-flows by pedestrians and motorists permitted.

Class III – Provides a route designated by signs or permanent markings and shared with pedestrians and motorists.

Class II bicycle lanes have been striped in downtown Middletown on State Route 29 (Calistoga Street) from Young Street to 350 feet south of Callayomi Street. It should be noted that Butts Canyon Road is also planned to be a Class III bikeway in the Lake County Regional Bikeway Plan.

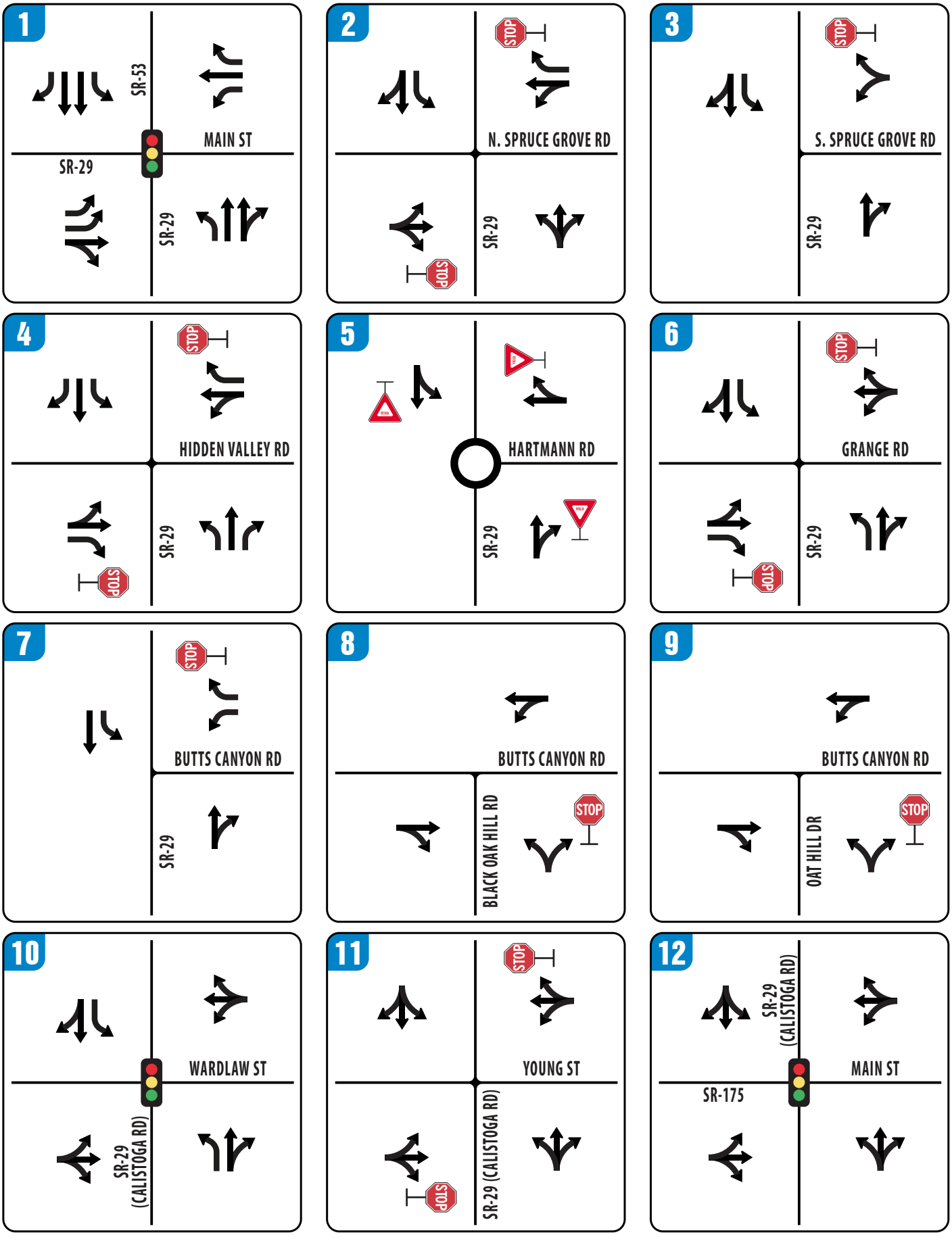

FIGURE 3 | EXISTING LANE CONFIGURATIONS – PAGE 1 OF 2

TRANSPORTATION IMPACT ANALYSIS

Maha Resort at Guenoc Valley

Lake County

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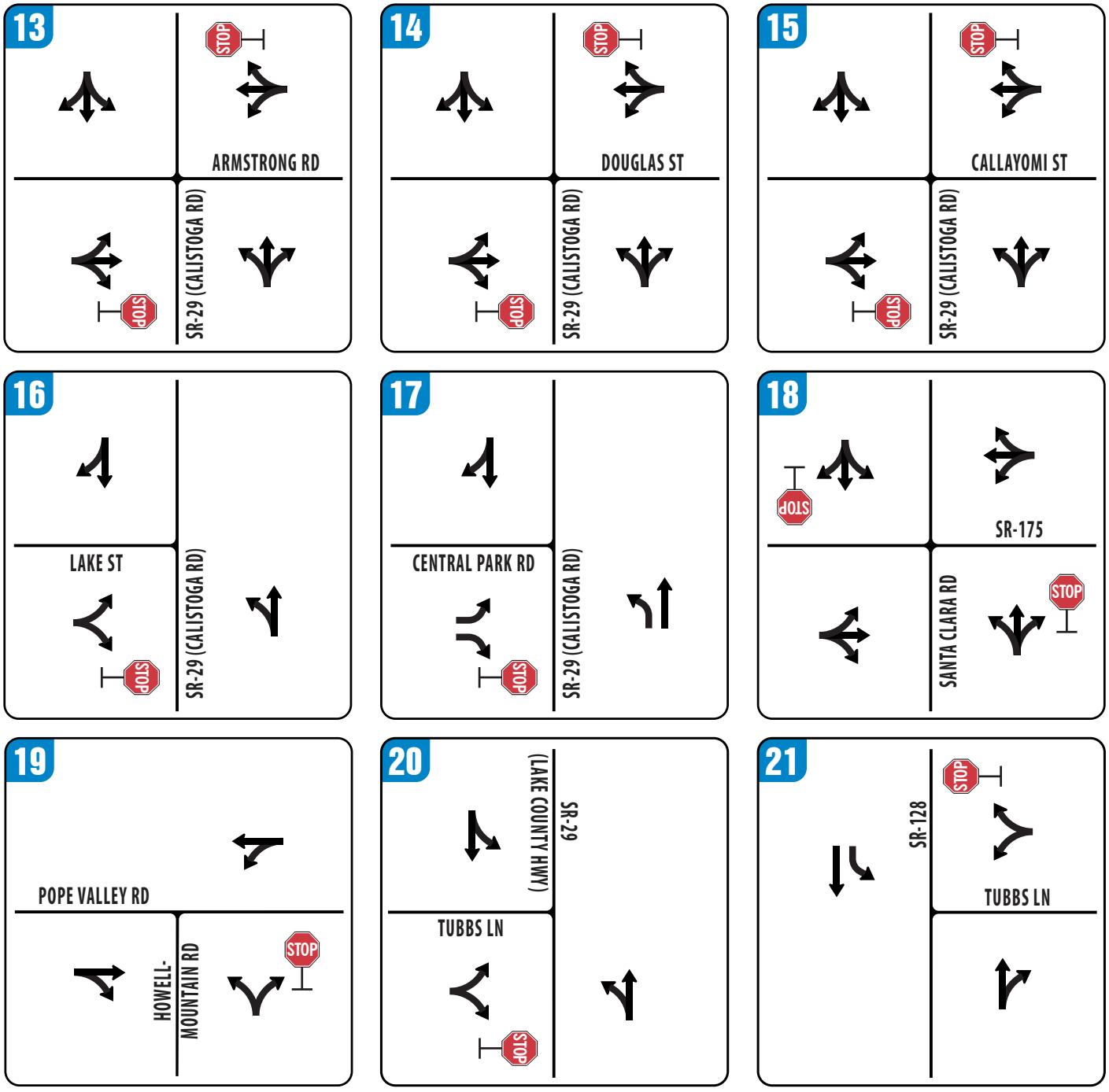

FIGURE 3 | EXISTING LANE CONFIGURATIONS – PAGE 2 OF 2
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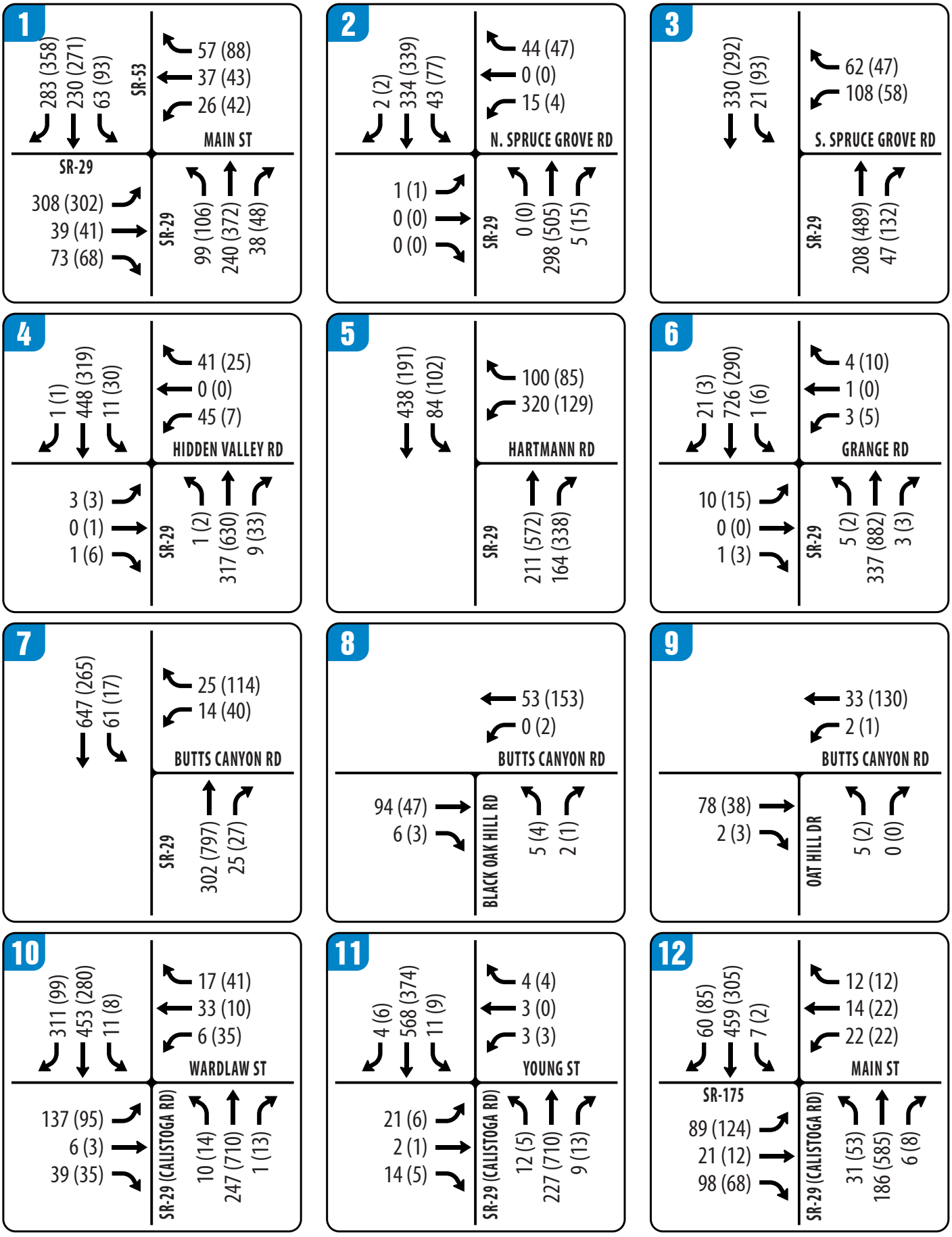

FIGURE 4 | EXISTING AM(PM) PEAK HOUR TRAFFIC VOLUMES – PAGE 1 OF 2

TRANSPORTATION IMPACT ANALYSIS

Maha Resort at Guenoc Valley

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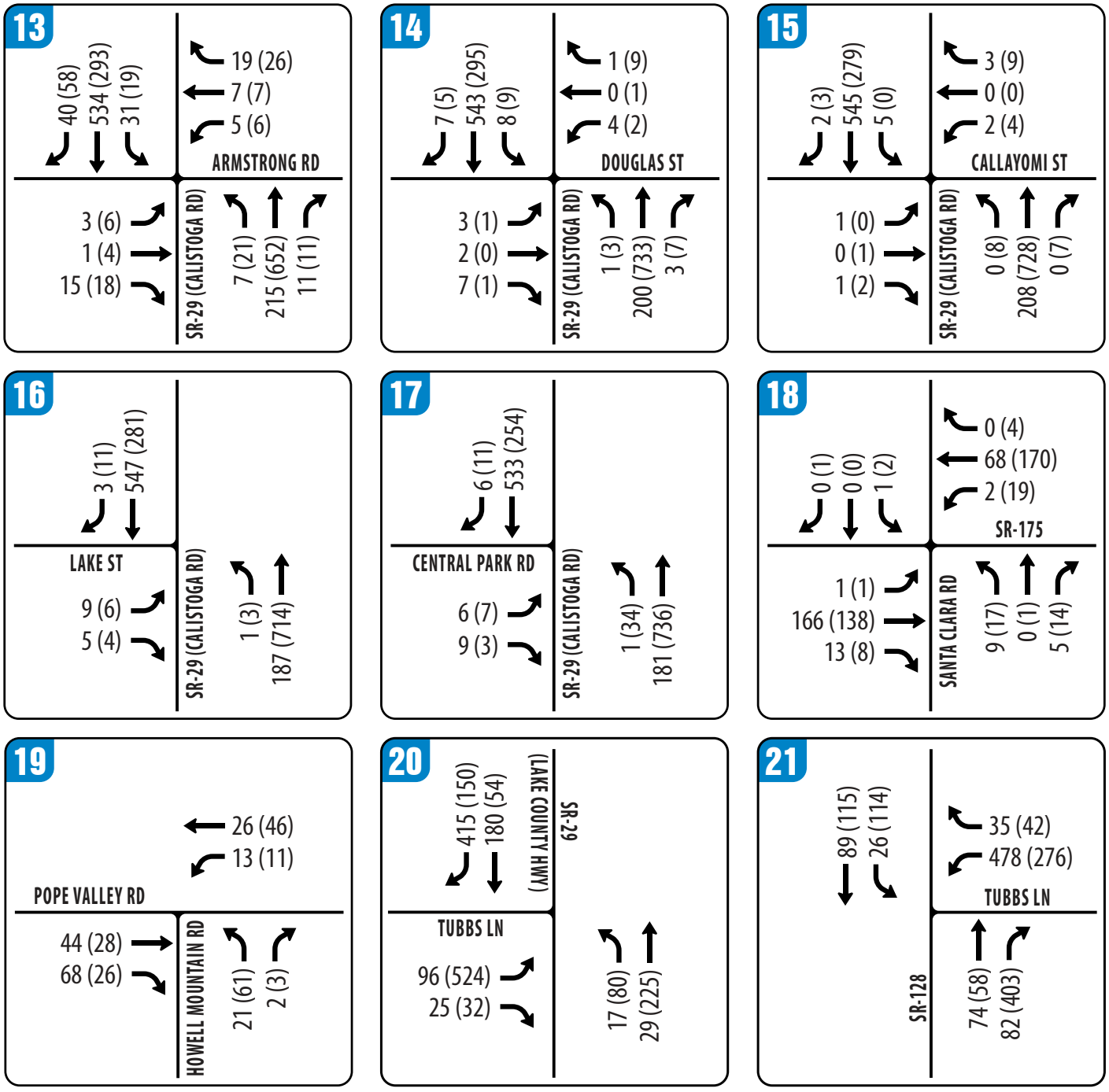

FIGURE 4 | EXISTING AM(PM) PEAK HOUR TRAFFIC VOLUMES – PAGE 2 OF 2

TRANSPORTATION IMPACT ANALYSIS

Maha Resort at Guenoc Valley

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TABLE 3
EXISTING INTERSECTION LEVEL OF SERVICE CONDITIONS – PAGE 1 OF 2

INTERSECTION		CONTROL	PEAK HOUR	EXISTING	
				Delay	LOS
1	STATE ROUTE 29 / STATE ROUTE 53 & MAIN STREET	Signalized	AM	17.6	B
			PM	19.0	B
2	STATE ROUTE 29 & SPRUCE GROVE ROAD (NORTH) *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	1.5 18.3	A C
			PM	1.4 28.2	A D
3	STATE ROUTE 29 & SPRUCE GROVE ROAD (SOUTH) *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	3.8 16.1	A C
			PM	3.4 27.1	A D
4	STATE ROUTE 29 & HIDDEN VALLEY ROAD *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	1.8 17.7	A C
			PM	0.9 16.8	A C
5	STATE ROUTE 29 & HARTMANN ROAD	Roundabout	AM	9.2	A
			PM	14.7	B
6	STATE ROUTE 29 & GRANGE ROAD *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.4 27.4	A D
			PM	0.8 31.8	A D
7	STATE ROUTE 29 & BUTTS CANYON ROAD *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	1.0 15.4	A C
			PM	2.9 22.9	A C
8	BUTTS CANYON ROAD & BLACK OAK HILL DRIVE *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.4 9.2	A A
			PM	0.3 9.5	A A
9	BUTTS CANYON ROAD & OAT HILL DRIVE *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.5 9.2	A A
			PM	0.2 9.5	A A
10	STATE ROUTE 29 (CALISTOGA ROAD) & WARDLAW STREET	Signalized	AM	8.7	A
			PM	6.6	A
11	STATE ROUTE 29 (CALISTOGA ROAD) & YOUNG STREET *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	1.2 18.8	A C
			PM	0.5 22.0	A C
12	STATE ROUTE 29 (CALISTOGA ROAD) & STATE ROUTE 175 / MAIN STREET	Signalized	AM	7.1	A
			PM	7.6	A
13	STATE ROUTE 29 (CALISTOGA ROAD) & ARMSTRONG ROAD *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	1.2 14.5	A B
			PM	1.4 20.1	A C
14	STATE ROUTE 29 (CALISTOGA ROAD) & DOUGLAS STREET *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.4 16.4	A C
			PM	0.3 18.5	A C
15	STATE ROUTE 29 (CALISTOGA ROAD) & CALLAYOMI STREET *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.2 14.9	A B
			PM	0.3 18.2	A C

SOURCE: Abrams Associates, 2019 **NOTE:** Delay results are presented in terms of seconds per vehicle.

TABLE 3
EXISTING INTERSECTION LEVEL OF SERVICE CONDITIONS – PAGE 2 OF 2

	INTERSECTION	CONTROL	PEAK HOUR	EXISTING	
				Delay	LOS
16	STATE ROUTE 29 (CALISTOGA ROAD) & LAKE STREET	Side Street Stop	AM	0.3	A
	OVERALL DELAY			14.5	B
	SIDE STREET DELAY		PM	0.2	A
				16.5	C
17	STATE ROUTE 29 (CALISTOGA ROAD) & CENTRAL PARK ROAD	Side Street Stop	AM	0.3	A
	OVERALL DELAY			13.4	B
	SIDE STREET DELAY		PM	0.4	A
				18.8	C
18	STATE ROUTE 175 & SANTA CLARA ROAD	Side Street Stop	AM	0.6	A
	OVERALL DELAY			10.3	B
	SIDE STREET DELAY		PM	1.4	A
				10.8	B
19	POPE VALLEY ROAD & HOWELL MOUNTAIN ROAD	Side Street Stop	AM	1.8	A
	OVERALL DELAY			9.3	A
	SIDE STREET DELAY		PM	3.9	A
				9.5	A
20	STATE ROUTE 29 & TUBBS LANE	Side Street Stop	AM	2.4	A
	OVERALL DELAY			13.7	B
	SIDE STREET DELAY		PM	**> 50.0**	**F**
				> 50.0	**F**
21	STATE ROUTE 128 & TUBBS LANE	Side Street Stop	AM	17.3	C
	OVERALL DELAY			26.0	D
	SIDE STREET DELAY		PM	15.8	B
				46.9	E

SOURCE: Abrams Associates, 2019 **NOTE:** Delay results are presented in terms of seconds per vehicle.

3.7 Transit Service

Bus transit service in the project area is provided by Lake Transit. Lake Transit operates local bus routes from Ukiah and Calistoga to Lake County and the Clear Lake area. The routes that run closest to the project site are Routes 2 and 3. Route 2 runs three buses per day from about 6:30 AM AM to 4:00 PM. It operates along Highway 175 from Kit's Corner to Middletown. Route 3 runs four buses per day from about 7:00 AM to 6:30 PM. It operates along State Route 29 from Clear Lake to the hospital on Deer Park Road in St. Helena. The nearest bus stop is located about six miles from the project site in Middletown.

3.8 Standards and Objectives

Existing policies, laws and regulations that apply to the proposed project are summarized below.

Caltrans - The California Department of Transportation (Caltrans) has jurisdiction over State highways. Therefore, Caltrans controls all construction, modification, and maintenance of State highways, such as SR 29. Any improvements to these roadways would require Caltrans' approval. The Guide for the Preparation of Traffic Impact Studies provides consistent guidance for Caltrans staff who review local development and land use change proposals. The Guide also

informs local agencies about the information needed for Caltrans to analyze the traffic impacts to state highway facilities.

Lake County General Plan - The Transportation and Circulation Element included in the Lake County General Plan was prepared pursuant to Section 65302(b) of the California Government Code. The Transportation and Circulation Element addresses the location and extent of existing and planned transportation routes, terminals, and other local public utilities and facilities. The General Plan identifies roadway and transit goals and policies that have been adopted to ensure that the transportation system of the County will have adequate capacity to serve planned growth. These goals and policies are intended to provide a plan and implementation measures for an integrated, multi-modal transportation system that will safely and efficiently meet the transportation needs of all economic and social segments of the County.

Significance Criteria - According to CEQA, a project would have a significant impact if it would:

- Conflict with an applicable program, plan, ordinance or policy establishing measures of effectiveness for the performance of addressing the circulation system, including transit, roadways, bicycle lanes and pedestrian facilities/paths?

  The goal of the Lake County is to maintain a Level of Service (LOS) C during the peak hours, according to the General Plan. The County does not have plans, ordinances, or policies establishing measures of effectiveness for the performance of other parts of its circulation system. Please note includes intersections under the jurisdiction of Napa County and Caltrans. The applicable measures of effectiveness are summarized below:

  Signalized Intersections - Project-related operational impacts on the signalized study intersections in the Lake County are considered significant if project-related traffic causes the Level of Service (LOS) rating to deteriorate from LOS C to LOS D, E or F. However, based on the Transportation Concept Report for State Route 29 (dated August 2013) the concept LOS for SR 29 between Calistoga and Lower Lake is LOS E. Project-related operational impacts on signalized study intersections in the Napa County are considered significant if project-related traffic causes the Level of Service (LOS) rating to deteriorate from LOS D to LOS E or F. In addition, in Napa County project impacts are also considered significant if a signalized intersection already operates at LOS E or F during one or more peak hours without project trips, and the addition of project trips increases the total entering volume by one percent or more.

  Unsignalized Intersections - Project-related operational impacts on unsignalized intersections in Lake County are considered significant if project generated traffic causes the average of all movements to deteriorate from LOS C or better to LOS D, E or F. For unsignalized intersections where the overall LOS would already exceed County standards (LOS C) it was considered a significant impact if Caltrans peak hour traffic signal warrants would be met. Project-related operational impacts on the unsignalized intersections in Napa County are considered significant if project generated traffic causes the average of all movements to deteriorate from LOS D or better to LOS E or F.

In addition, in Napa County project impacts are also considered significant if an unsignalized intersection already operates at LOS E or F during one or more peak hours without project trips and the project contributes either one percent or more of the total entering traffic for all-way stop-controlled intersections or ten percent or more of the traffic on a side-street approach for side-street stop-controlled intersections.

- Would the project conflict with or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)? This section states that vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the area compared to existing conditions also have a less than significant transportation impact.
- Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections).
- Result in inadequate emergency vehicle access.

4) TRANSPORTATION IMPACT ANALYSIS

4.1 Project Trip Generation

With full buildout of the planned future phases, the Proposed Project could result in the development of up to 900 hotel rooms and resort residential units, 1400 residential villas, 300 workforce housing units, as well as resort amenities and other accessory uses within the project site. However, analysis of existing and baseline impacts is based on Phase 1 and the resulting trip generation calculations are shown in **Table 4**, using trip generation rates from the Institute of Transportation Engineer's (ITE) Trip Generation Manual, 10th Edition. The total trip generation reflects all vehicle trips that would be counted at the project driveways. Since the project has various retail, restaurants and resort amenities that would be geared towards guests, adjustments were applied to account internal trips. It was also assumed that 40% of patrons and employees would arrive via private auto due to the planned use of airport shuttles and other buses. Please note the ITE trip generation rates are based on surveys of hotels that had an average occupancy rate of 88%. Based on data from the analytics firm STR, in Napa County the average hotel occupancy rate in 2017 was 71%. For this analysis it was assumed there would be similar occupancy levels for the proposed project. Therefore, based on the forecast occupancy rates a 19% reduction was applied to the ITE trip generation results. To be conservative, the trip generation also includes traffic from the proposed on-site work force housing as well as potential traffic from the alternative off-site housing in Middletown. For the purposes of determining the worst-case impacts on the surrounding streets, the trips generated by this proposed development are estimated for the peak commute hours of 7:30 a.m. and 8:30 a.m. and 4:30 p.m. and 5:30 p.m., which represent the peak of "*adjacent street traffic*".

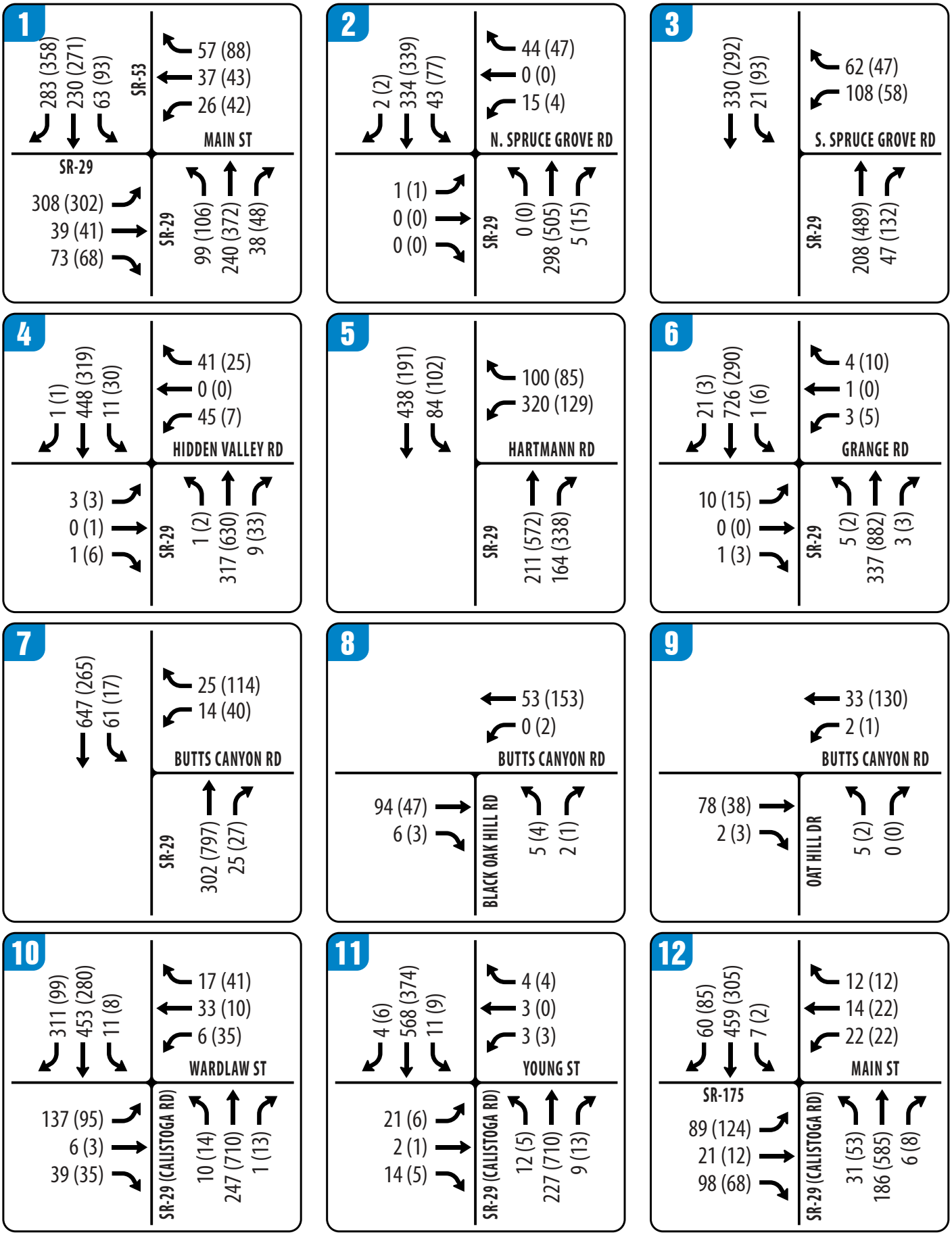

FIGURE 4 | EXISTING AM(PM) PEAK HOUR TRAFFIC VOLUMES – PAGE 1 OF 2

TRANSPORTATION IMPACT ANALYSIS

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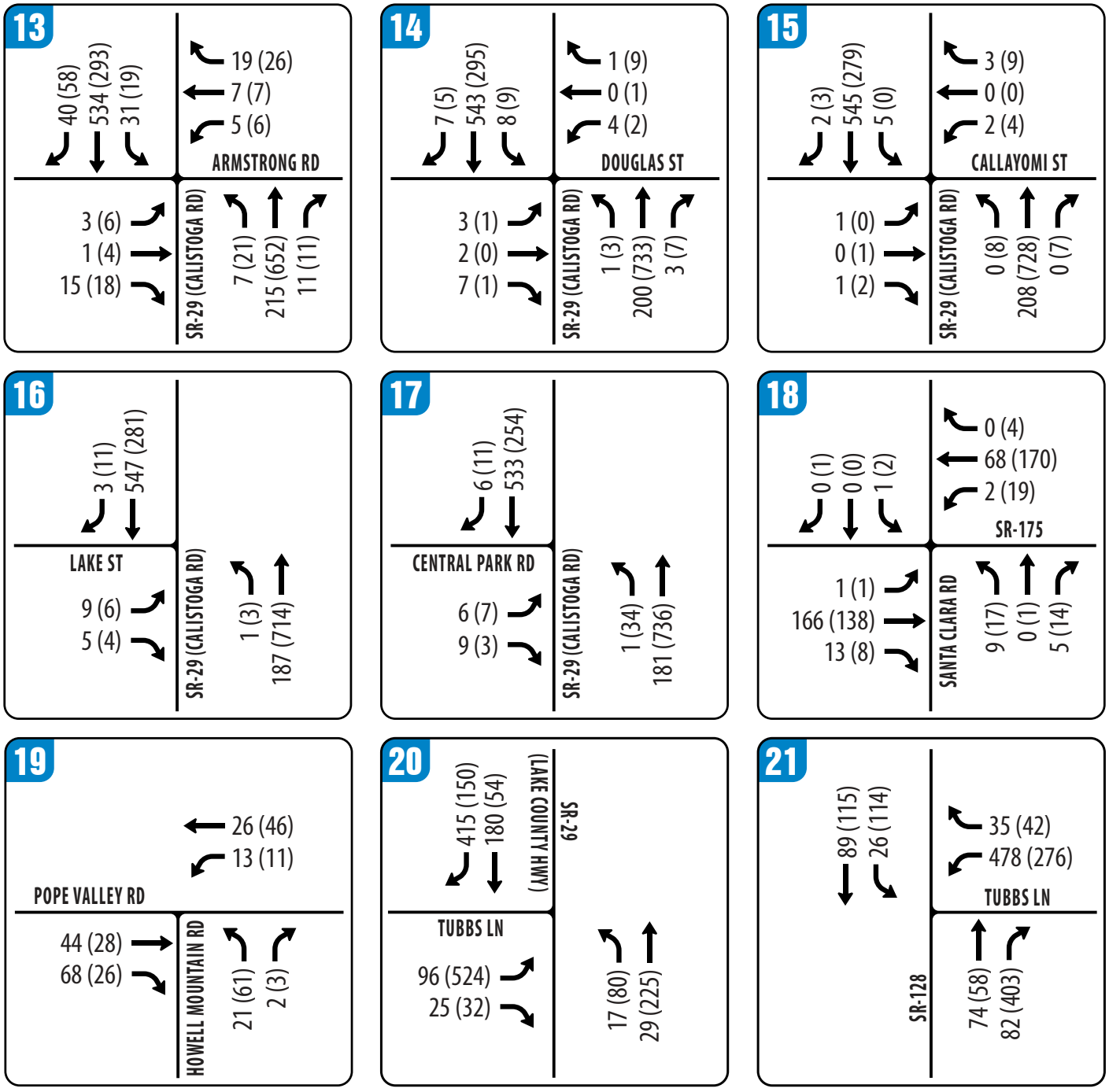

FIGURE 4 | EXISTING AM(PM) PEAK HOUR TRAFFIC VOLUMES – PAGE 2 OF 2

TRANSPORTATION IMPACT ANALYSIS

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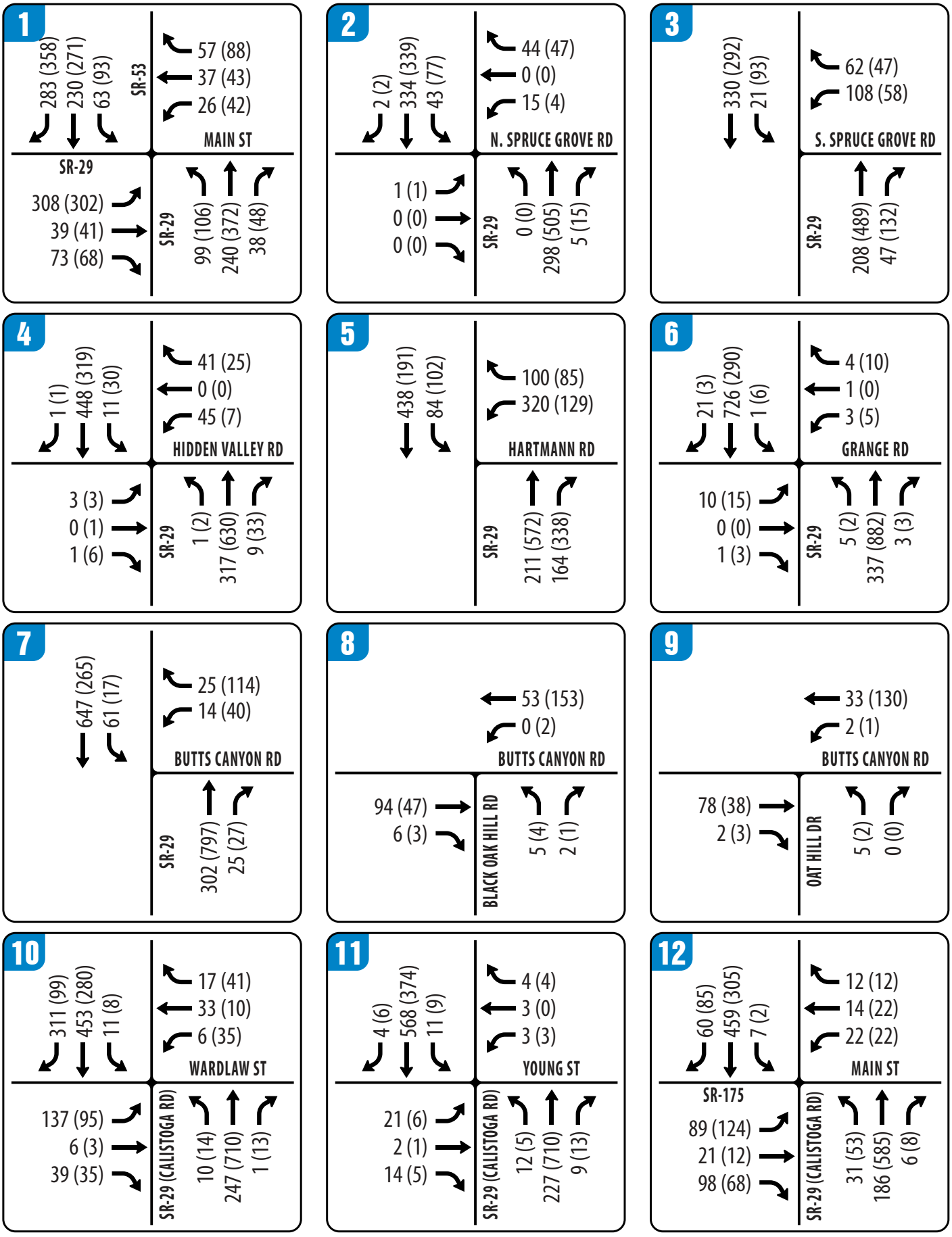

FIGURE 4 | EXISTING AM(PM) PEAK HOUR TRAFFIC VOLUMES – PAGE 1 OF 2

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Maha Resort at Guenoc Valley

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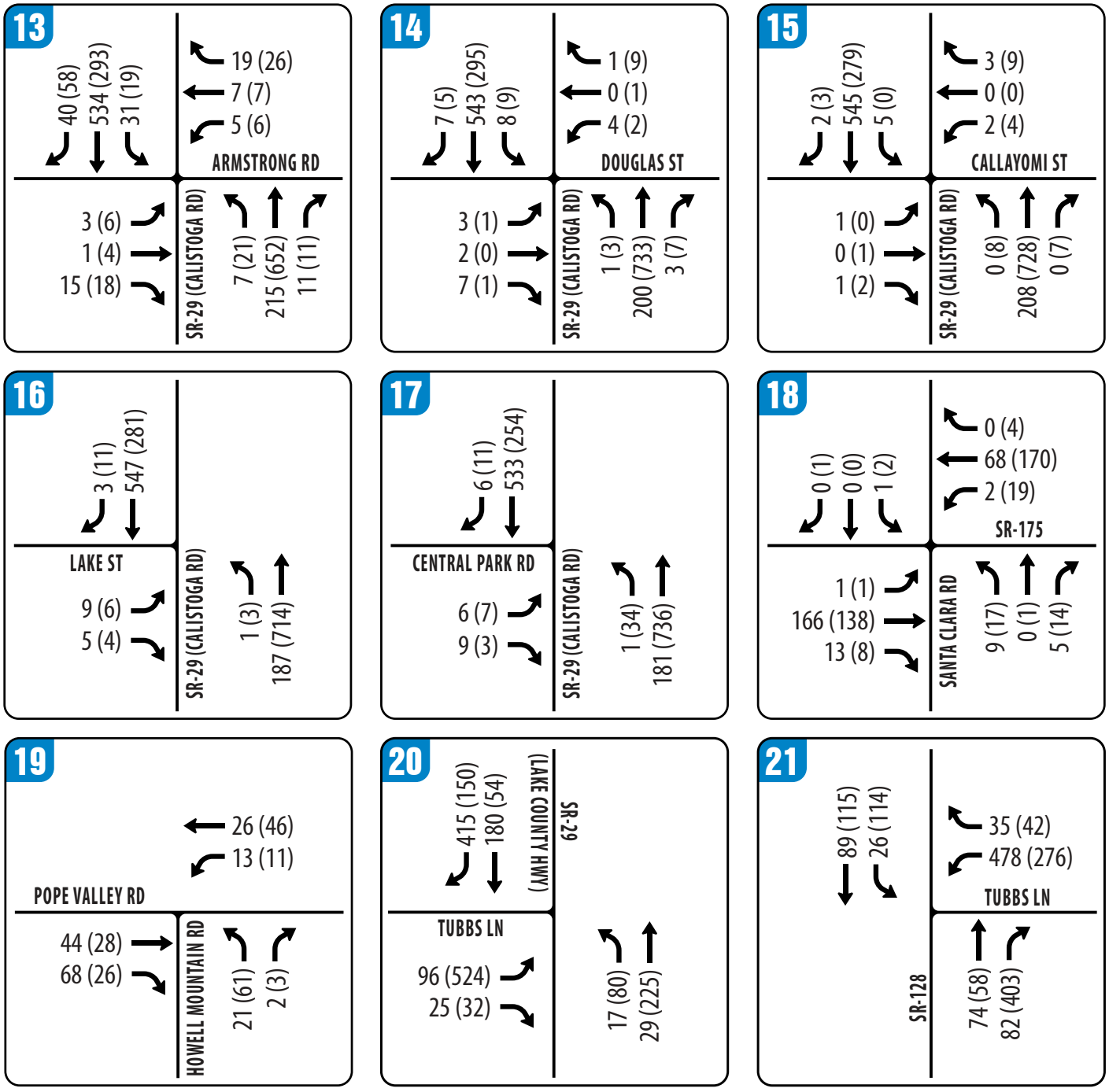

FIGURE 4 | EXISTING AM(PM) PEAK HOUR TRAFFIC VOLUMES – PAGE 2 OF 2

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4.2 Project Trip Distribution

The trip distribution assumptions have been based on the project's proximity to the access routes into Lake County, the existing directional split at nearby intersections, and the overall land use patterns in the area. The trip distribution percentages assumed in this analysis are presented in **Figure 5**. **Figure 6** shows the project traffic that would be added at each of the study intersections.

4.3 Existing Plus Phase 1 Traffic Capacity Conditions (Scenario 2)

This scenario evaluates the existing conditions with the addition of traffic from the proposed project. The traffic volumes for each of the study intersections for the Existing Plus Project scenario are shown in **Figure 7**. The capacity calculations for the Existing Plus Project scenario are shown in **Table 5**. The corresponding LOS analysis calculation sheets are presented in the appendix to this report. As shown in **Table 5**, all of the project study intersections would continue to have acceptable conditions (LOS D or better) during the weekday AM and PM peak hours with the exception of Intersection #7 (State Route 29 at Butts Canyon Road), Intersection #20 (State Route 29 at Tubbs Lane), and Intersection #21 (State Route 128 at Tubbs Lane) Please note that by degrading the intersection to LOS F the project would have a significant impact at the intersection of State Route 29 and Butts Canyon Road according to County standards. However, although intersections #20 and #21 would both exceed the LOS D threshold established in Napa County's General Plan, the proposed project would not increase the side street approach by more than 10 percent at either of these intersections and therefore the project's contribution to congestion at these intersections would be *less-than-significant*.

4.4 Baseline Traffic Capacity Conditions (Scenario 3)

The Baseline scenario evaluates the existing conditions with the addition of traffic from reasonably foreseeable projects in the area and general baseline growth in traffic. For this analysis the baseline volumes were developed based on the assumption that the project completion date would be 2022 with an average traffic growth of 1% per year. The trips added by near-term development during this time were based on the forecast trip generation for a list of approved projects identified by the County and include 54 homes being constructed in the Hidden Valley community and also another 500 homes that would potentially be located to the east of SR 29, south of the Hidden Valley area. These are projects anticipated to be completed in the next five years that could potentially effect the traffic volumes at the project study intersections. The traffic volumes for each of the study intersections for the Baseline scenario are shown in **Figure 8**. **Table 6** summarizes the associated LOS computation results for the Baseline weekday AM and PM peak hour conditions. As shown in **Table 6**, all of the study intersections would continue to have acceptable conditions under the Baseline scenario during the weekday AM and PM peak hours with the exception of Intersection #20 (State Route 29 at Tubbs Lane) and Intersection #21 (State Route 128 at Tubbs Lane) which would both continue to exceed their established thresholds.

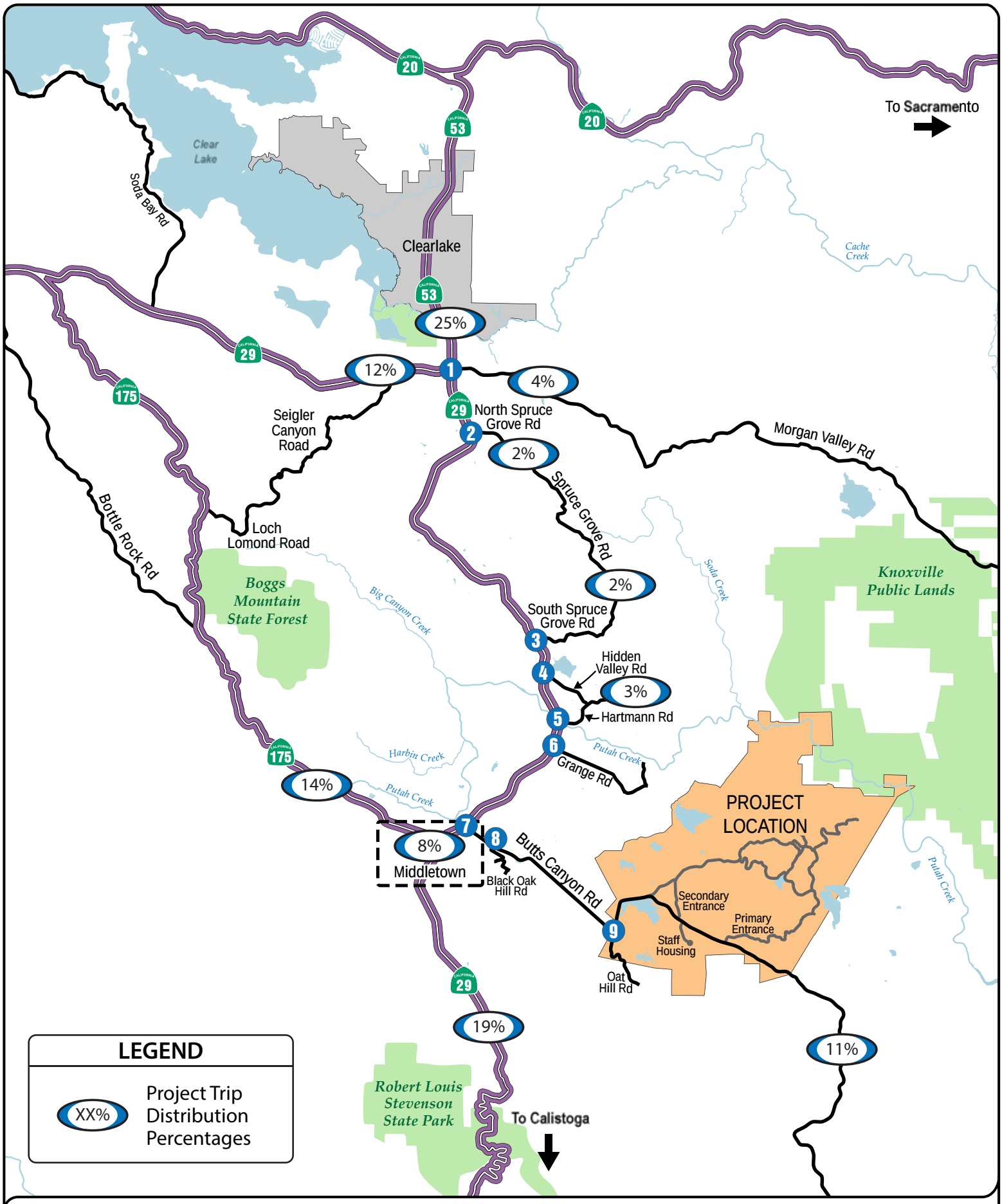

FIGURE 5 | PROJECT TRIP DISTRIBUTION
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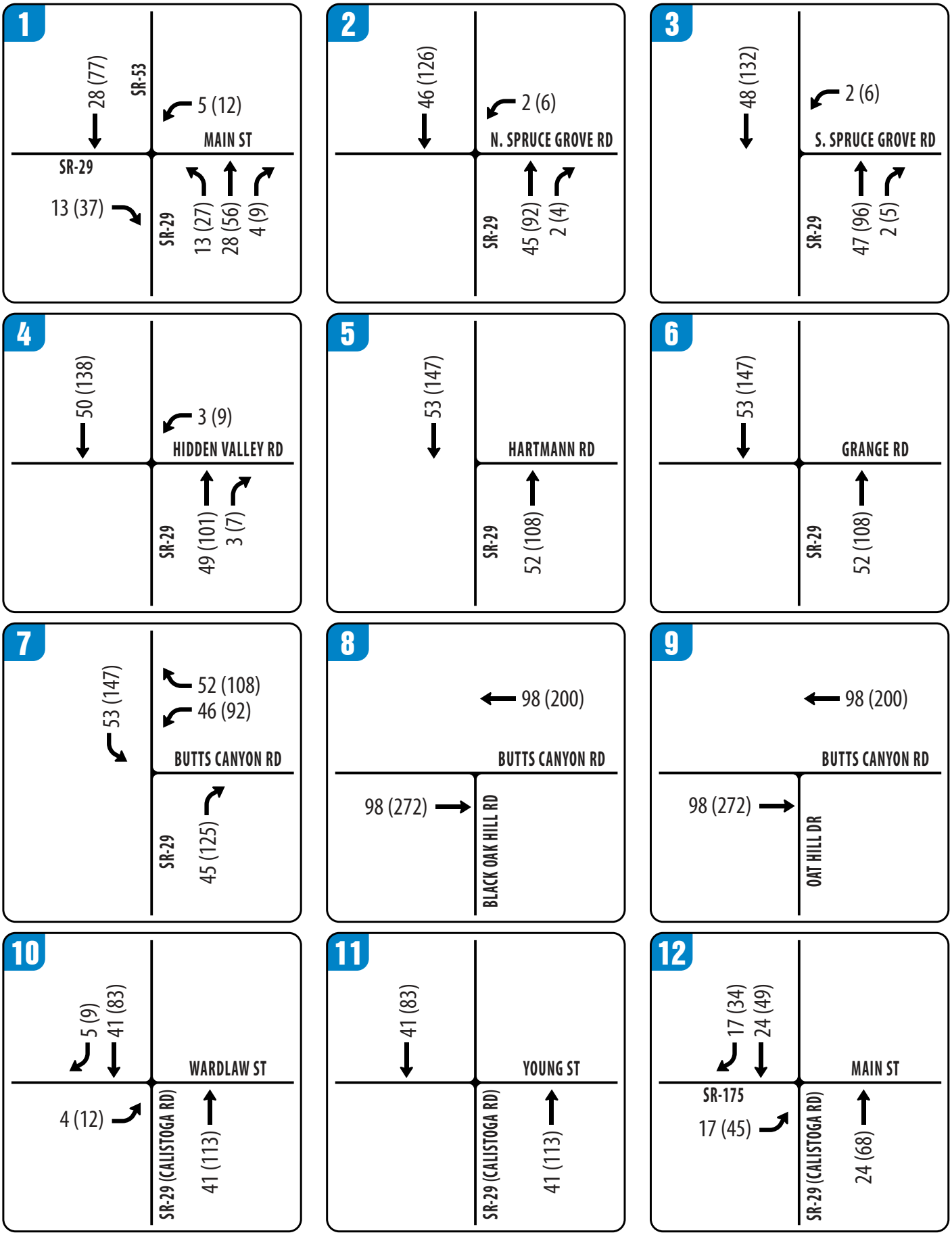

FIGURE 6 | PROJECT PHASE-1 AM(PM) PEAK HOUR TRIPS – PAGE 1 OF 2

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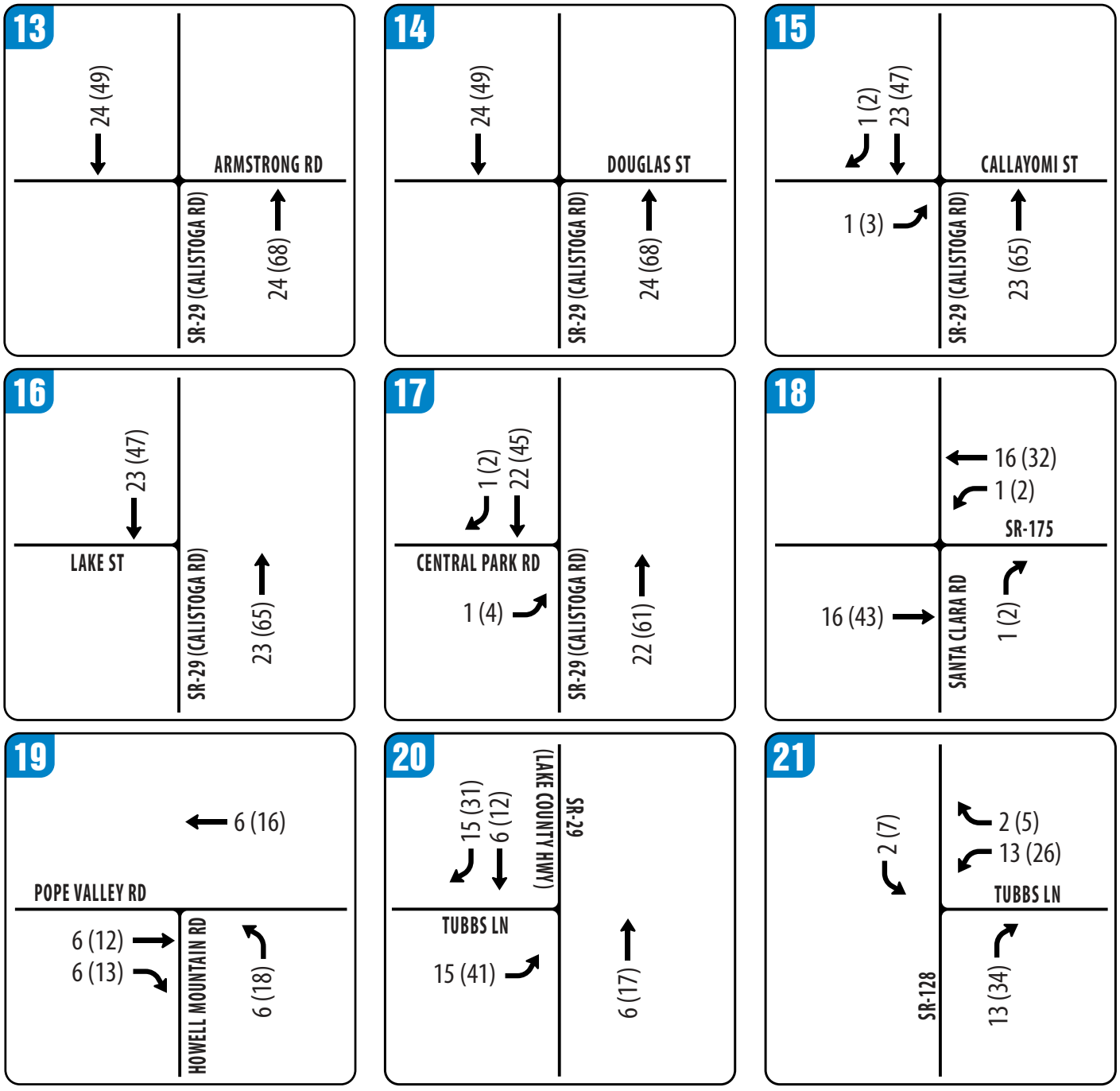

FIGURE 6 | PROJECT PHASE-1 AM(PM) PEAK HOUR TRIPS – PAGE 2 OF 2

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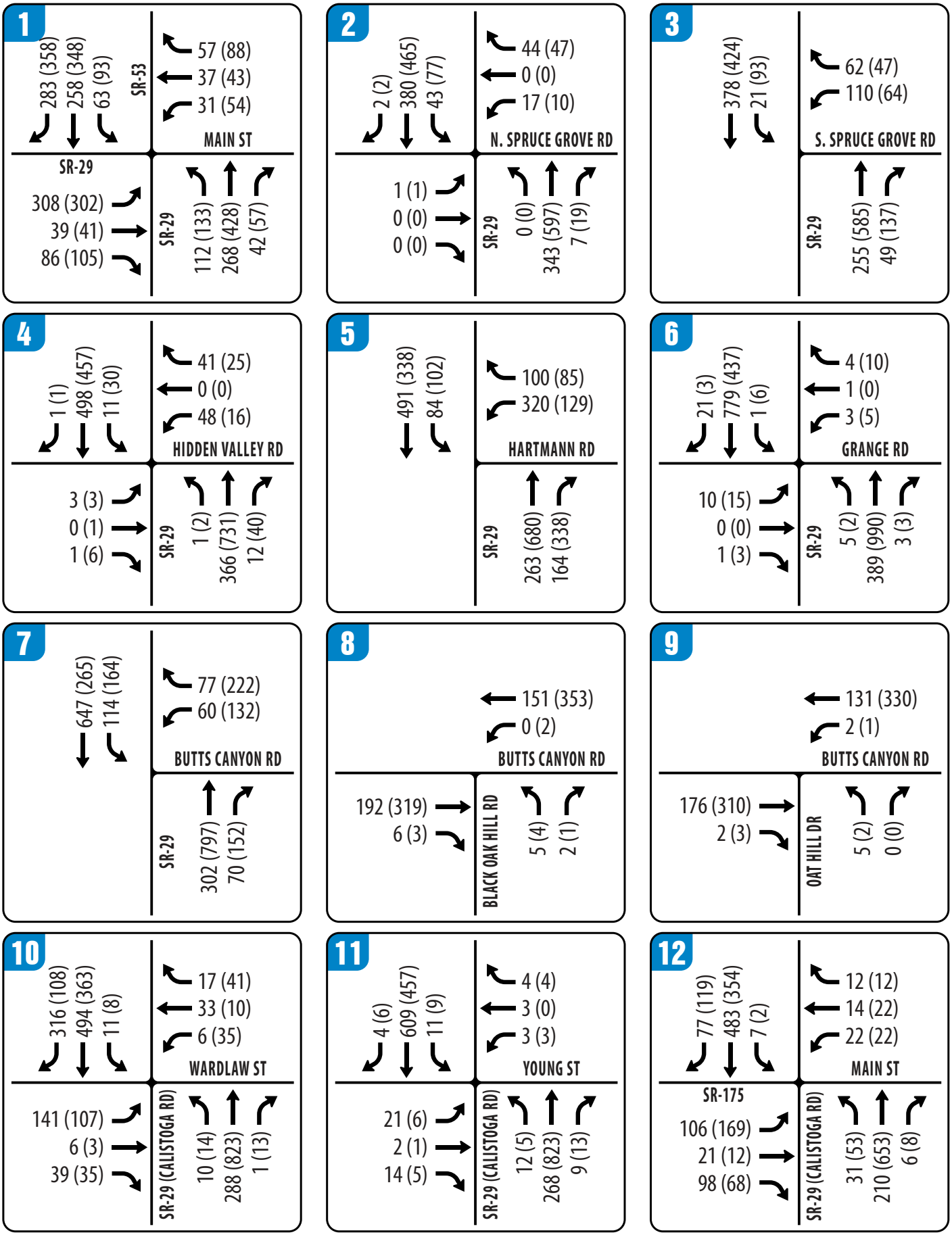

FIGURE 7 | EXISTING PLUS PROJECT AM(PM) PEAK HOUR TRAFFIC VOLUMES – PAGE 1 OF 2

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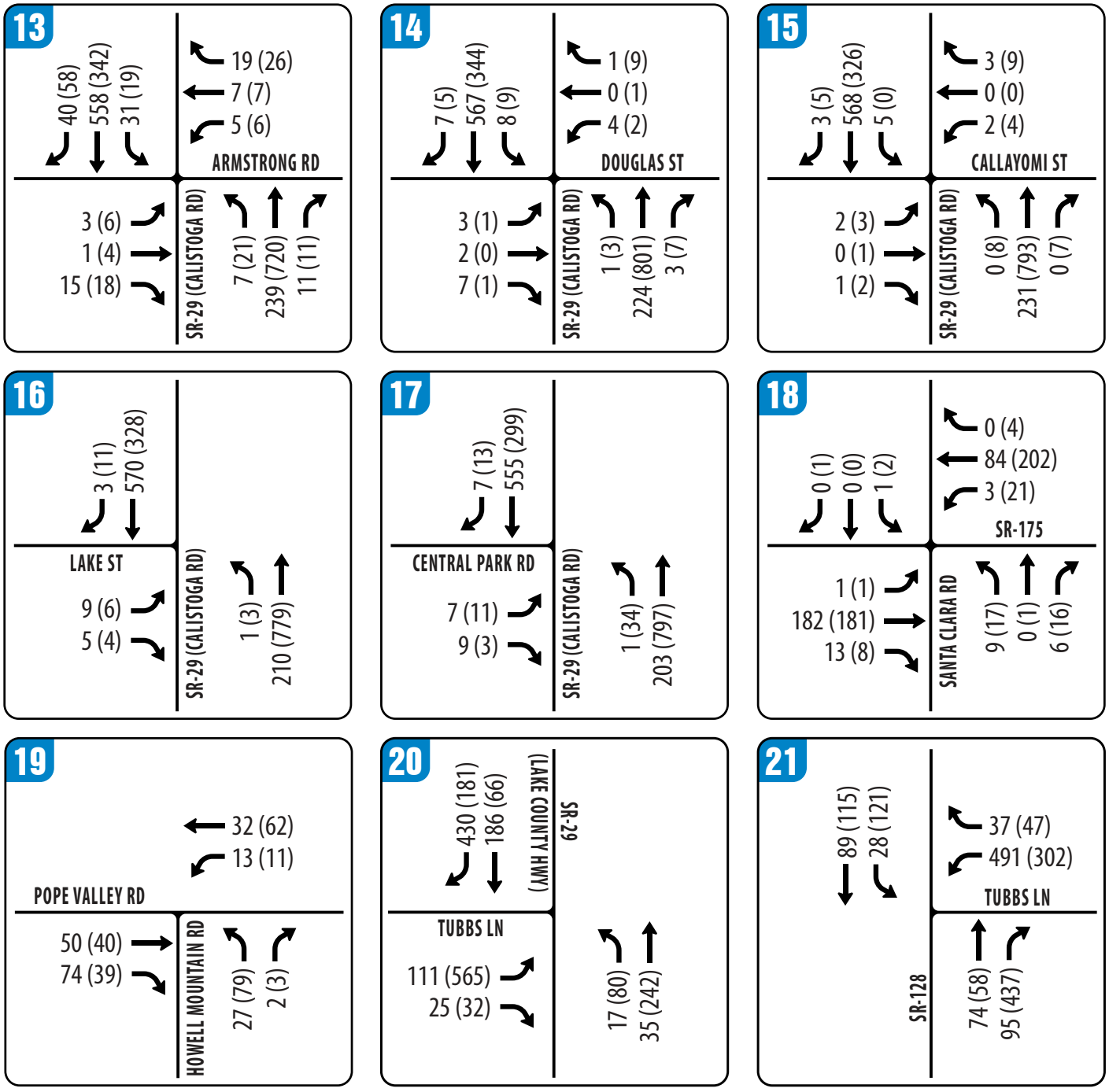

FIGURE 7 | EXISTING PLUS PROJECT AM(PM) PEAK HOUR TRAFFIC VOLUMES – PAGE 2 OF 2

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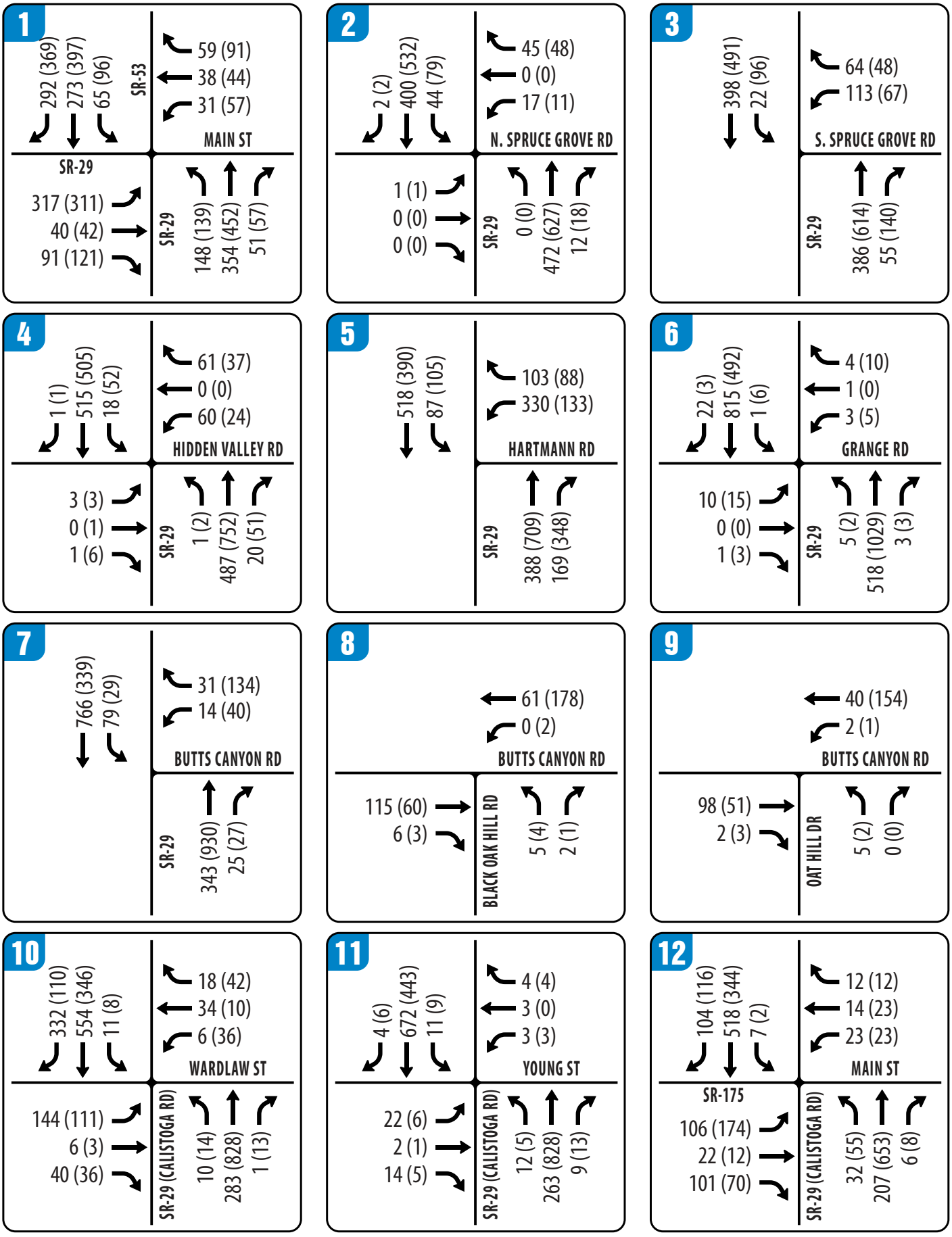

FIGURE 8 | BASELINE AM(PM) PEAK HOUR TRAFFIC VOLUMES – PAGE 1 OF 2

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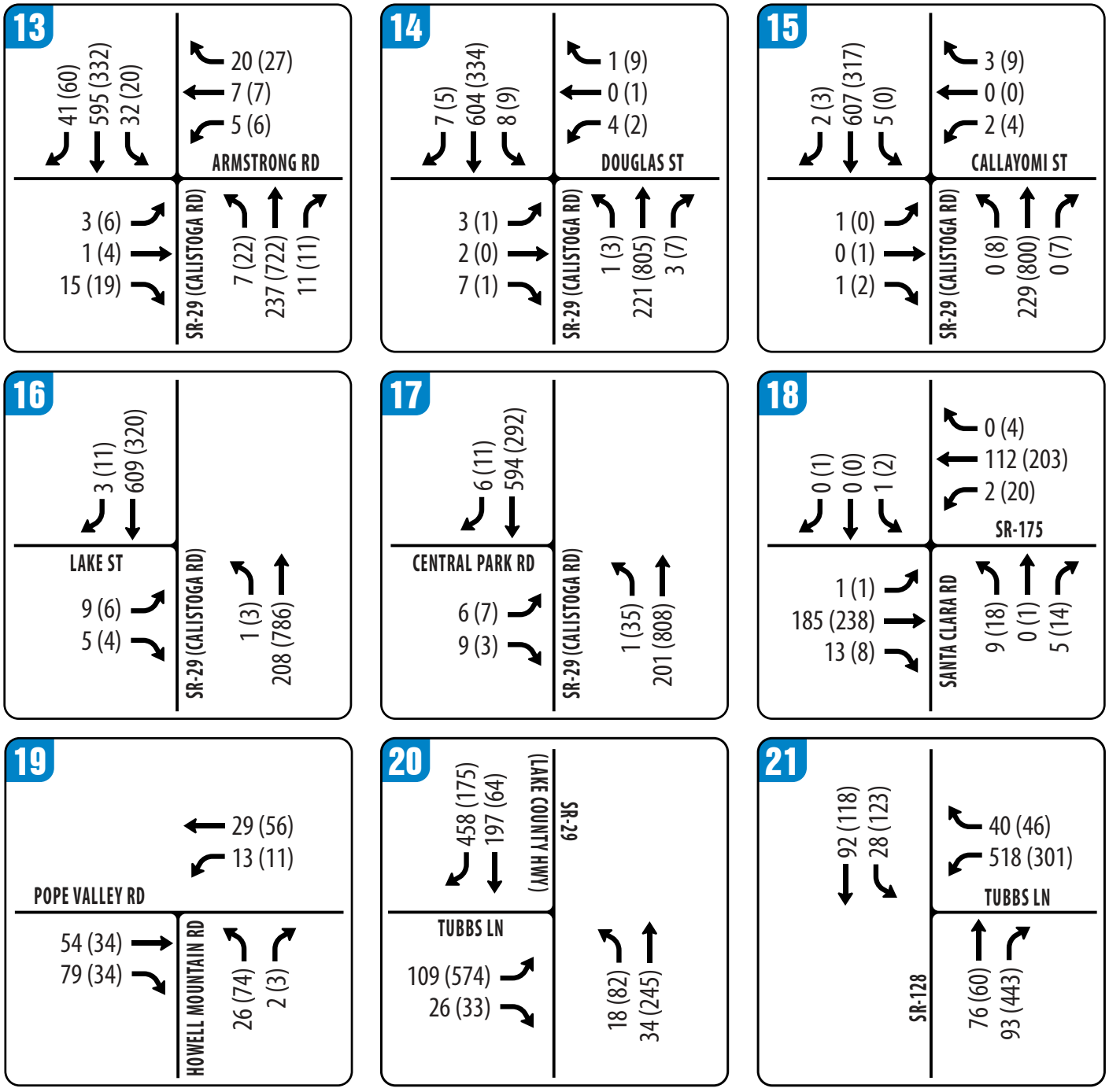

FIGURE 8 | BASELINE AM(PM) PEAK HOUR TRAFFIC VOLUMES – PAGE 2 OF 2

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Maha Resort at Guenoc Valley

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TABLE 5
EXISTING PLUS PROJECT INTERSECTION LEVEL OF SERVICE CONDITIONS – PAGE 1 OF 2

	INTERSECTION	CONTROL	PEAK HOUR	EXISTING		EXISTING PLUS PROJECT	
				Delay	LOS	Delay	LOS
1	STATE ROUTE 29 / STATE ROUTE 53 & MAIN STREET	Signalized	AM	17.6	B	17.9	B
			PM	19.0	B	19.7	B
2	STATE ROUTE 29 & SPRUCE GROVE ROAD (NORTH) *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	1.5 18.3	A C	1.4 20.7	A C
			PM	1.4 28.2	A D	1.5 40.0	A E
3	STATE ROUTE 29 & SPRUCE GROVE ROAD (SOUTH) *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	3.8 16.1	A C	3.9 18.7	A C
			PM	3.4 27.1	A D	4.7 48.5	A E
4	STATE ROUTE 29 & HIDDEN VALLEY ROAD *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	1.8 17.7	A C	1.9 20.0	A C
			PM	0.9 16.8	A C	1.2 25.0	A D
5	STATE ROUTE 29 & HARTMANN ROAD	Roundabout	AM	9.2	A	10.4	B
			PM	14.7	B	20.8	C
6	STATE ROUTE 29 & GRANGE ROAD *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.4 27.4	A D	0.5 32.1	A D
			PM	0.8 31.8	A D	0.9 49.5	A E
7	STATE ROUTE 29 & BUTTS CANYON ROAD *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	1.0 15.4	A C	3.5 25.5	A D
			PM	2.9 22.9	A C	**39.0** **> 50.0**	**E** **F**
8	BUTTS CANYON ROAD & BLACK OAK HILL DRIVE *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.4 9.2	A A	0.2 10.4	A B
			PM	0.3 9.5	A A	0.1 13.6	A B
9	BUTTS CANYON ROAD & OAT HILL DRIVE *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.5 9.2	A A	0.2 10.5	A B
			PM	0.2 9.5	A A	0.2 13.9	A B
10	STATE ROUTE 29 (CALISTOGA ROAD) & WARDLAW STREET	Signalized	AM	8.7	A	9.1	A
			PM	6.6	A	7.3	A
11	STATE ROUTE 29 (CALISTOGA ROAD) & YOUNG STREET *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	1.2 18.8	A C	1.2 21.1	A C
			PM	0.5 22.0	A C	0.5 28.7	A D
12	STATE ROUTE 29 (CALISTOGA ROAD) & STATE ROUTE 175 / MAIN STREET	Signalized	AM	7.1	A	7.7	A
			PM	7.6	A	9.3	A
13	STATE ROUTE 29 (CALISTOGA ROAD) & ARMSTRONG ROAD *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	1.2 14.5	A B	1.1 15.0	A C
			PM	1.4 20.1	A C	1.4 23.0	A C
14	STATE ROUTE 29 (CALISTOGA ROAD) & DOUGLAS STREET *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.4 16.4	A C	0.4 17.4	A C
			PM	0.3 18.5	A C	0.3 21.2	A C
15	STATE ROUTE 29 (CALISTOGA ROAD) & CALLAYOMI STREET *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.2 14.9	A B	0.2 16.6	A C
			PM	0.3 18.2	A C	0.4 23.2	A C

SOURCE: Abrams Associates, 2019 **NOTE:** Delay results are presented in terms of seconds per vehicle.

TABLE 5
EXISTING INTERSECTION LEVEL OF SERVICE CONDITIONS – PAGE 2 OF 2

	INTERSECTION	CONTROL	PEAK HOUR	EXISTING		EXISTING PLUS PROJECT	
				Delay	LOS	Delay	LOS
16	STATE ROUTE 29 (CALISTOGA ROAD) & LAKE STREET	Side Street Stop	AM	0.3	A	0.3	A
	OVERALL DELAY			14.5	B	15.1	C
	SIDE STREET DELAY		PM	0.2	A	0.2	A
				16.5	C	18.5	C
17	STATE ROUTE 29 (CALISTOGA ROAD) & CENTRAL PARK ROAD	Side Street Stop	AM	0.3	A	0.3	A
	OVERALL DELAY			13.4	B	13.9	B
	SIDE STREET DELAY		PM	0.4	A	0.5	A
				18.8	C	23.0	C
18	STATE ROUTE 175 & SANTA CLARA ROAD	Side Street Stop	AM	0.6	A	0.6	A
	OVERALL DELAY			10.3	B	10.7	B
	SIDE STREET DELAY		PM	1.4	A	1.3	A
				10.8	B	11.5	B
19	POPE VALLEY ROAD & HOWELL MOUNTAIN ROAD	Side Street Stop	AM	1.8	A	1.9	A
	OVERALL DELAY			9.3	A	9.5	A
	SIDE STREET DELAY		PM	3.9	A	3.8	A
				9.5	A	9.8	A
20	STATE ROUTE 29 & TUBBS LANE	Side Street Stop	AM	2.4	A	2.6	A
	OVERALL DELAY			13.7	B	14.4	B
	SIDE STREET DELAY		PM	**> 50.0**	**F**	**> 50.0**	**F**
				> 50.0	**F**	**> 50.0**	**F**
21	STATE ROUTE 128 & TUBBS LANE	Side Street Stop	AM	17.3	C	19.3	C
	OVERALL DELAY			26.0	D	29.3	D
	SIDE STREET DELAY		PM	15.8	B	25.4	D
				46.9	**E**	**> 50.0**	**F**

4.5 Baseline Plus Phase 1 Traffic Capacity Conditions (Scenario 4)

The Baseline plus proposed project traffic forecasts were developed by adding traffic from Phases 1 to the baseline traffic volumes. The traffic volumes for each of the study intersections for the Baseline Plus Project scenario are shown in **Figure 9**. **Table 8** summarizes the LOS results for the Baseline and Baseline Plus Project weekday AM and PM peak hour conditions. The corresponding LOS analysis calculation sheets are presented in the appendix to this report. As shown in **Table 8**, all of the study intersections would continue to have acceptable conditions under the Baseline Plus Project scenario during the weekday AM and PM peak hours with the exception of Intersection #7 (State Route 29 at Butts Canyon Road), Intersection #20 (State Route 29 at Tubbs Lane) and Intersection #21 (State Route 128 at Tubbs Lane) which would all exceed their established thresholds. The addition of project traffic at Intersection #7 would be considered a *significant impact*. Mitigations to improve the operations at these intersections are discussed in Section 5. At Intersections #20 and #21 in Napa County the proposed project would not increase the traffic on the side street approaches by more than 10 percent at either of these intersections and therefore the project's contribution to congestion at these intersections would be considered *less-than-significant*.

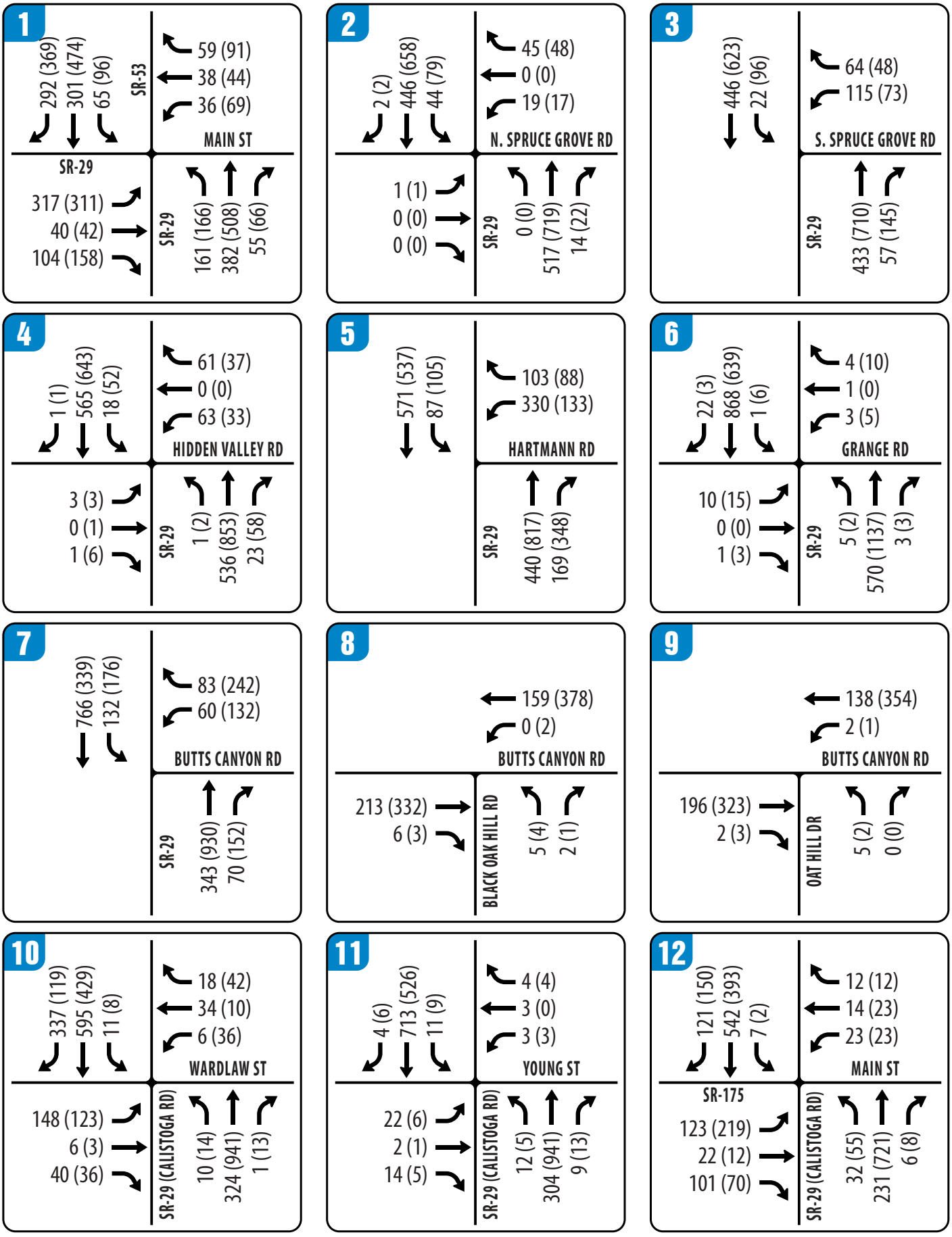

FIGURE 9 | BASELINE PLUS PROJECT AM(PM) PEAK HOUR TRAFFIC VOLUMES – PAGE 1 OF 2

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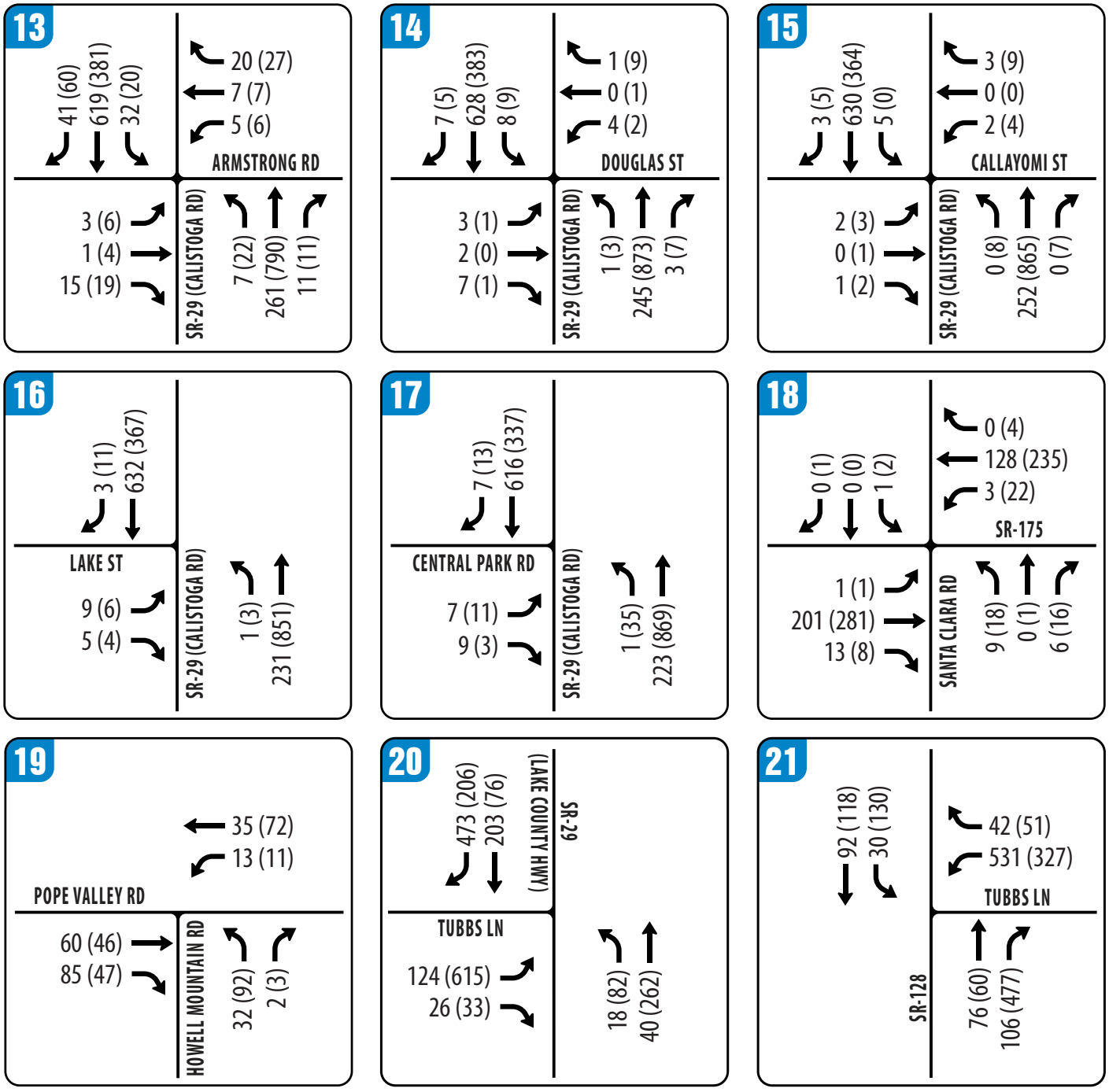

FIGURE 9 | BASELINE PLUS PROJECT AM(PM) PEAK HOUR TRAFFIC VOLUMES – PAGE 2 OF 2

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TABLE 6
BASELINE PLUS PROJECT INTERSECTION LEVEL OF SERVICE CONDITIONS – PAGE 1 OF 2

	INTERSECTION	CONTROL	PEAK HOUR	BASELINE		BASELINE PLUS PROJECT	
				Delay	LOS	Delay	LOS
1	STATE ROUTE 29 / STATE ROUTE 53 & MAIN STREET	Signalized	AM	18.7	B	19.0	B
			PM	20.3	C	21.5	C
2	STATE ROUTE 29 & SPRUCE GROVE ROAD (NORTH) *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	1.4 25.9	A D	1.4 29.7	A D
			PM	1.5 46.9	A E	1.9 > 50.0	A F
3	STATE ROUTE 29 & SPRUCE GROVE ROAD (SOUTH) *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	4.6 26.3	A D	5.4 33.5	A D
			PM	6.2 > 50.0	A F	14 > 50.0	B F
4	STATE ROUTE 29 & HIDDEN VALLEY ROAD *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	2.8 25.8	A D	3.2 30.9	A D
			PM	1.9 32.1	A D	3.4 > 50.0	A F
5	STATE ROUTE 29 & HARTMANN ROAD	Roundabout	AM	12.1	B	14.0	B
			PM	24.7	C	39.2	E
6	STATE ROUTE 29 & GRANGE ROAD *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.5 41.9	A E	0.6 > 50.0	A F
			PM	1.0 > 50.0	A F	1.5 > 50.0	A F
7	STATE ROUTE 29 & BUTTS CANYON ROAD *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	1.2 17.6	A C	4.5 37.9	A E
			PM	4.1 33.2	A D	**> 50.0** **> 50.0**	**F** **F**
8	BUTTS CANYON ROAD & BLACK OAK HILL DRIVE *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.3 9.4	A A	0.2 10.6	A B
			PM	0.3 9.7	A A	0.1 14.1	A B
9	BUTTS CANYON ROAD & OAT HILL DRIVE *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.4 9.3	A A	0.2 10.8	A B
			PM	0.1 9.7	A A	0.1 14.4	A B
10	STATE ROUTE 29 (CALISTOGA ROAD) & WARDLAW STREET	Signalized	AM	10.2	B	11.4	B
			PM	7.5	A	8.6	A
11	STATE ROUTE 29 (CALISTOGA ROAD) & YOUNG STREET *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	1.2 23.2	A C	1.2 26.3	A D
			PM	0.5 28.2	A D	0.5 37.7	A E
12	STATE ROUTE 29 (CALISTOGA ROAD) & STATE ROUTE 175 / MAIN STREET	Signalized	AM	8.2	A	8.9	A
			PM	9.5	A	12.0	B
13	STATE ROUTE 29 (CALISTOGA ROAD) & ARMSTRONG ROAD *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	1.1 15.7	A C	1.1 16.3	A C
			PM	1.5 22.9	A C	1.5 26.8	A D
14	STATE ROUTE 29 (CALISTOGA ROAD) & DOUGLAS STREET *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.4 18.2	A C	0.4 19.3	A C
			PM	0.3 21.0	A C	0.3 24.3	A C
15	STATE ROUTE 29 (CALISTOGA ROAD) & CALLAYOMI STREET *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.2 16.2	A C	0.2 18.3	A C
			PM	0.3 20.5	A C	0.4 26.9	A D

SOURCE: Abrams Associates, 2019 **NOTE:** Delay results are presented in terms of seconds per vehicle.

TABLE 6
BASELINE INTERSECTION LEVEL OF SERVICE CONDITIONS – PAGE 2 OF 2

	INTERSECTION	CONTROL	PEAK HOUR	BASELINE		BASELINE PLUS PROJECT	
				Delay	LOS	Delay	LOS
16	STATE ROUTE 29 (CALISTOGA ROAD) & LAKE STREET	Side Street Stop	AM	0.3	A	0.3	A
	OVERALL DELAY			16.6	C	17.3	C
	SIDE STREET DELAY		PM	0.2	A	0.2	A
				19.9	C	22.6	C
17	STATE ROUTE 29 (CALISTOGA ROAD) & CENTRAL PARK ROAD	Side Street Stop	AM	0.3	A	0.3	A
	OVERALL DELAY			14.9	B	15.7	C
	SIDE STREET DELAY		PM	0.4	A	0.5	A
				23.2	C	29.4	D
18	STATE ROUTE 175 & SANTA CLARA ROAD	Side Street Stop	AM	0.5	A	0.5	A
	OVERALL DELAY			11.2	B	11.6	B
	SIDE STREET DELAY		PM	1.1	A	1.1	A
				12.4	B	13.3	B
19	POPE VALLEY ROAD & HOWELL MOUNTAIN ROAD	Side Street Stop	AM	1.7	A	1.8	A
	OVERALL DELAY			9.7	A	9.9	A
	SIDE STREET DELAY		PM	3.9	A	3.9	A
				10.1	B	10.5	B
20	STATE ROUTE 29 & TUBBS LANE	Side Street Stop	AM	2.7	A	3.1	A
	OVERALL DELAY			15.9	C	17.0	C
	SIDE STREET DELAY		PM	**> 50.0**	**F**	**> 50.0**	**F**
				> 50.0	**F**	**> 50.0**	**F**
21	STATE ROUTE 128 & TUBBS LANE	Side Street Stop	AM	29.6	D	34.8	D
	OVERALL DELAY			**44.2**	**E**	**> 50.0**	**F**
	SIDE STREET DELAY		PM	**36.2**	**E**	**> 50.0**	**F**
				> 50.0	**F**	**> 50.0**	**F**

SOURCE: Abrams Associates, 2019 **NOTE:** Delay results are presented in terms of seconds per vehicle.

4.6 Cumulative Traffic Capacity Conditions (Scenario 5)

For the cumulative conditions, the intersection traffic volumes were based on the existing turning movements plus incremental growth in background traffic (0.66% per year) based on the Lake County Traffic Model and the Solano Napa County Travel Demand Model. **Figure 10** presents the cumulative build-out traffic volumes for the project study intersections. **Table 7** summarizes the LOS results for the Cumulative (Year 2040) traffic conditions at each of the project study intersections. As shown on this table, the project study intersections would continue to have acceptable conditions during the weekday AM and PM peak commute hours with the exception of Intersection #5 (State Route 29 at Hartmann Road), Intersection #20 (State Route 29 at Tubbs Lane) and Intersection #21 (State Route 128 at Tubbs Lane) which would all exceed their established thresholds.

4.7 Cumulative Plus Phase 1 Traffic Capacity Conditions (Scenario 6)

Table 7 summarizes the LOS results for the Cumulative Plus Project (Year 2040) traffic conditions at each of the project study intersection. **Figure 11** presents the cumulative build-out traffic volumes including the traffic from the proposed project. As shown on this table, all of the signalized study intersections would continue to have acceptable conditions during the weekday

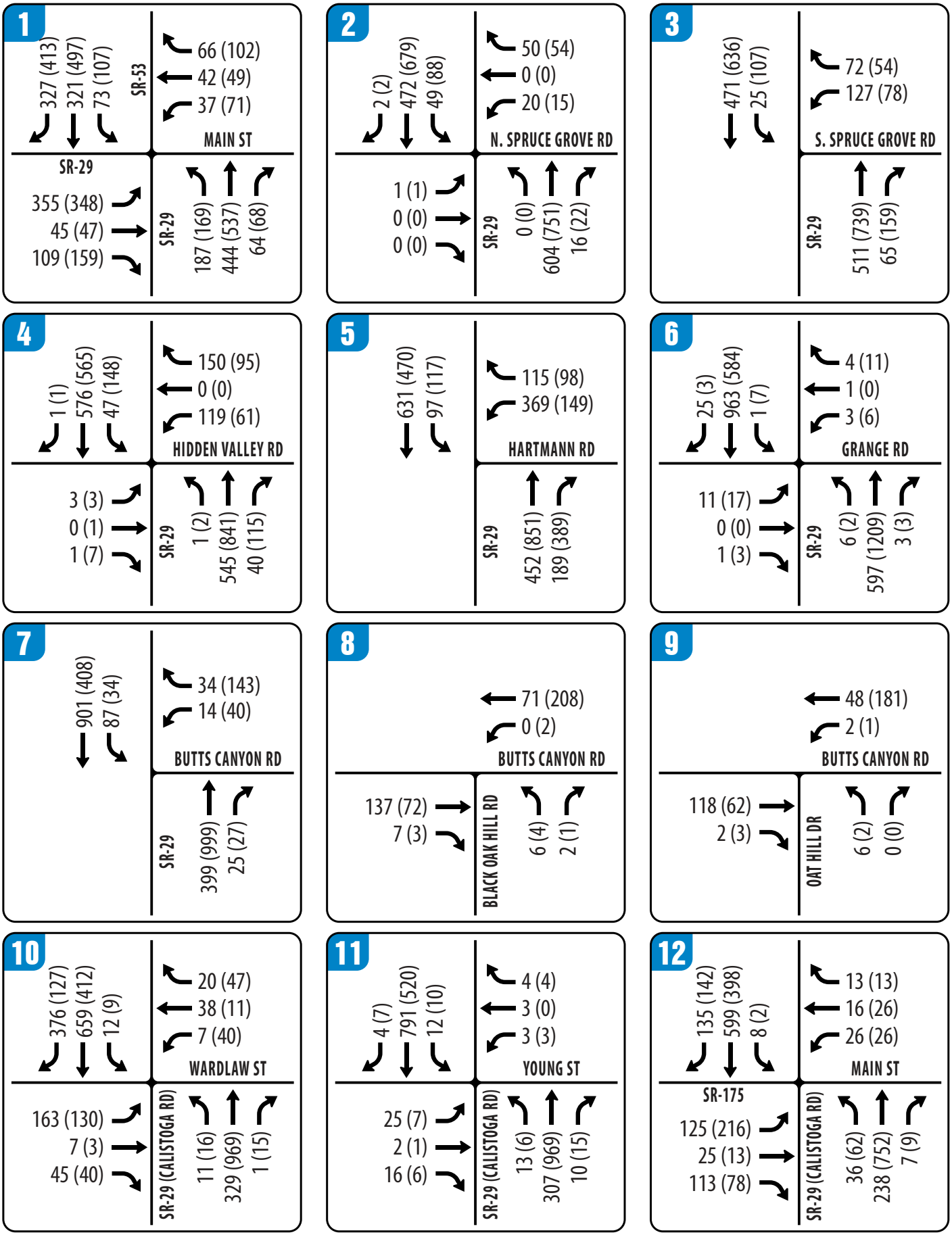

FIGURE 10 | CUMULATIVE AM(PM) PEAK HOUR TRAFFIC VOLUMES – PAGE 1 OF 2

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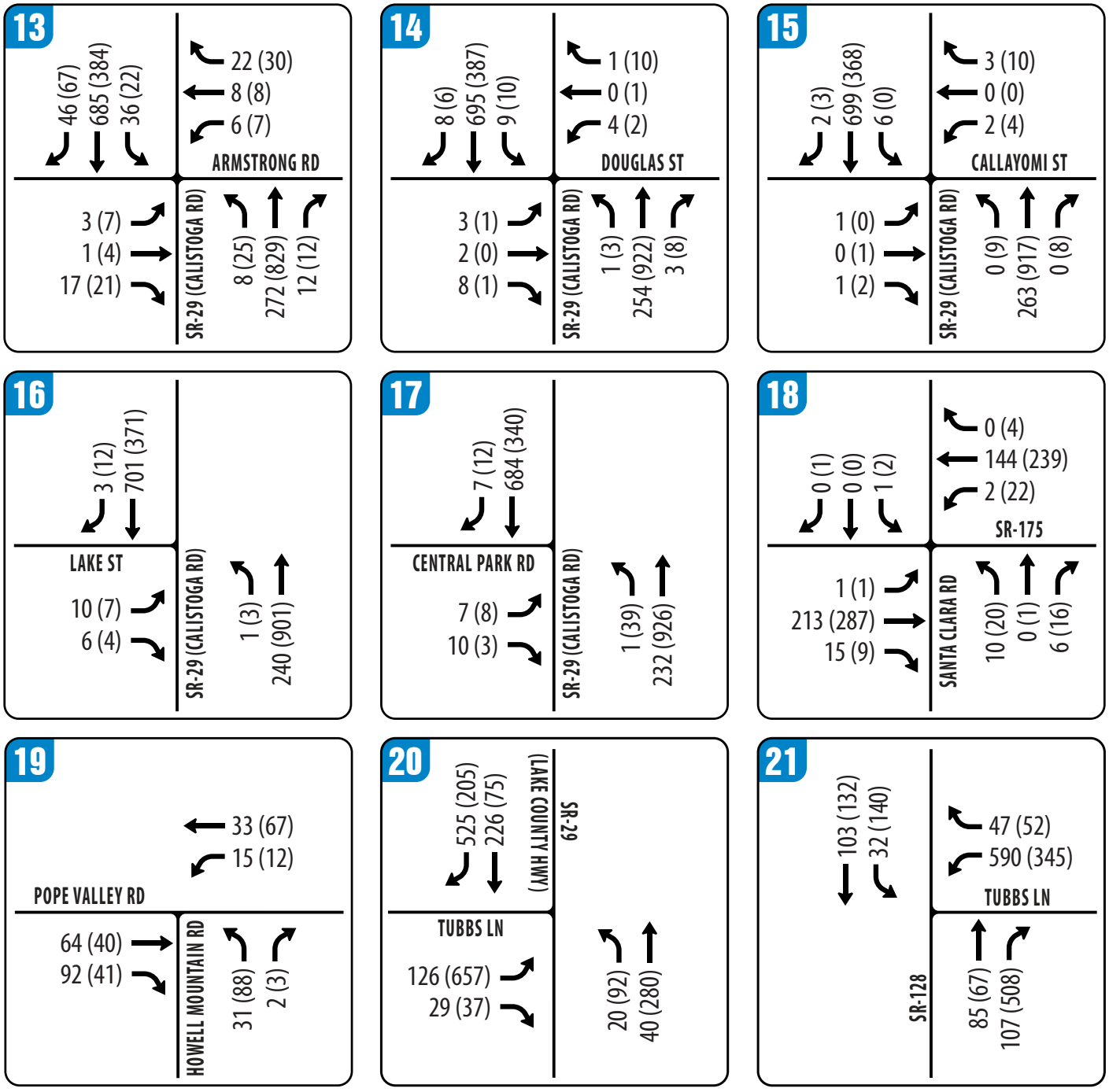

FIGURE 10 | CUMULATIVE AM(PM) PEAK HOUR TRAFFIC VOLUMES – PAGE 2 OF 2

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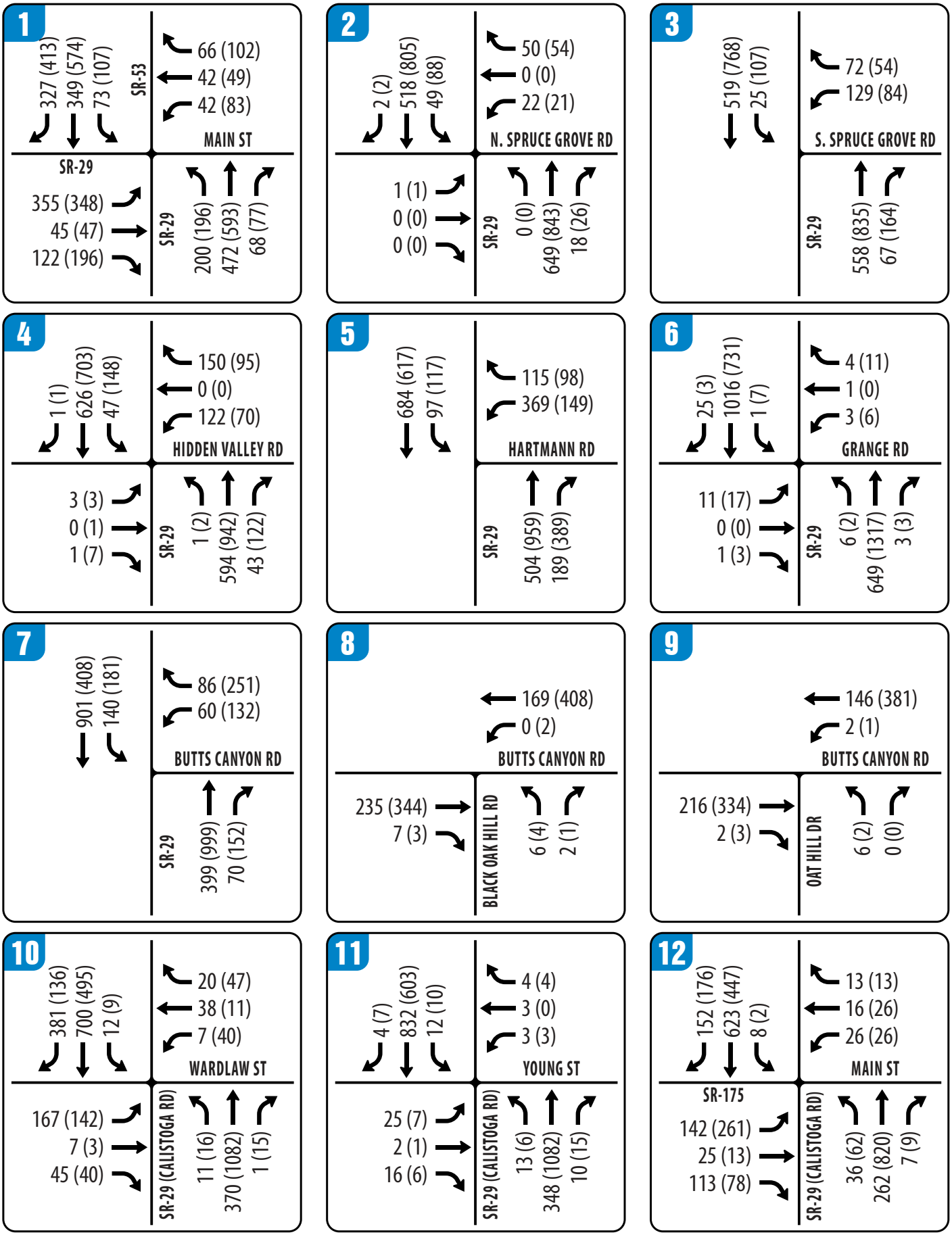

FIGURE 11 | CUMULATIVE PLUS PROJECT AM(PM) PEAK HOUR TRAFFIC VOLUMES – PAGE 1 OF 2

TRANSPORTATION IMPACT ANALYSIS

Maha Resort at Guenoc Valley

Lake County

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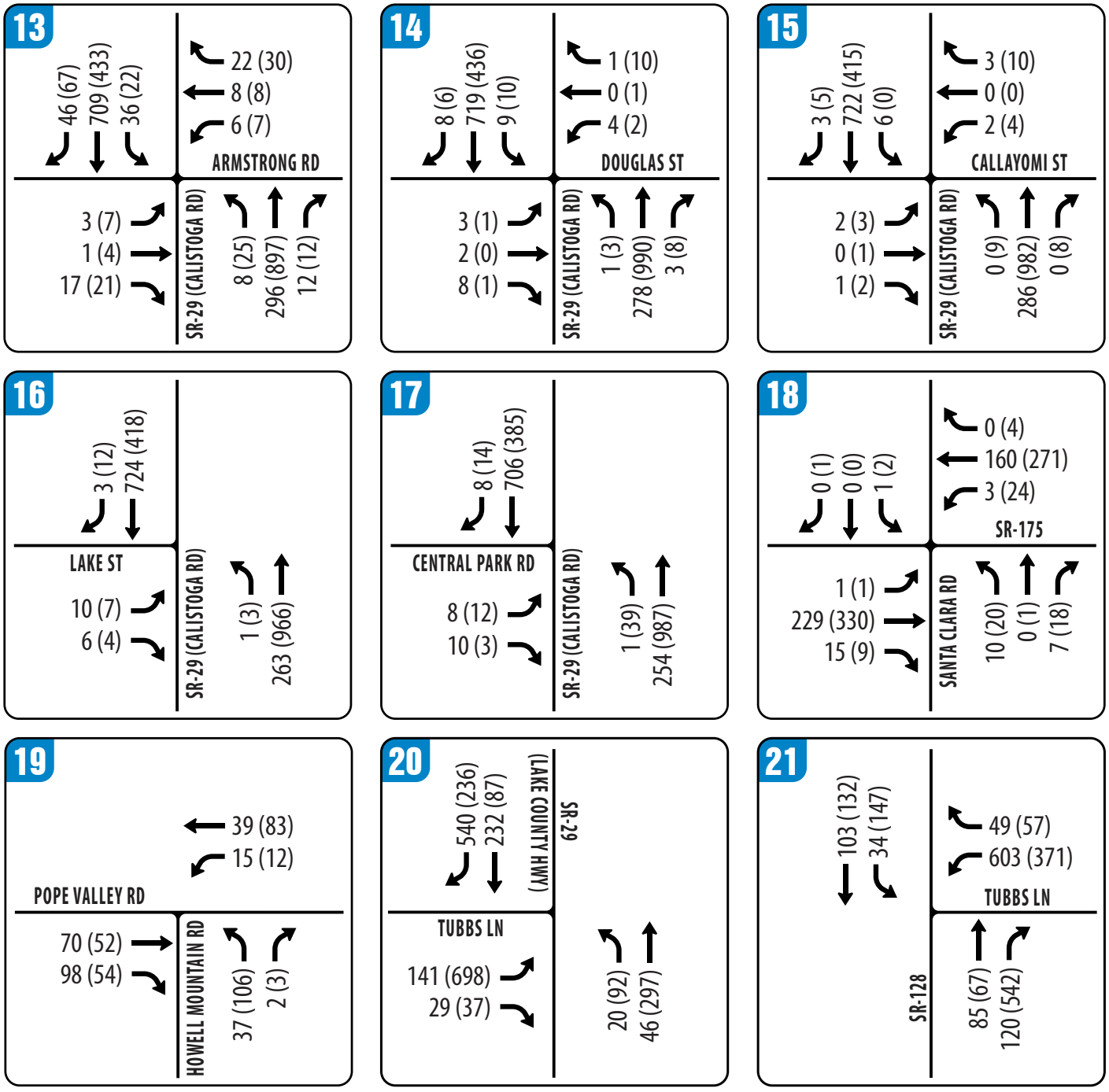


FIGURE 11 | CUMULATIVE PLUS PROJECT AM(PM) PEAK HOUR TRAFFIC VOLUMES – PAGE 2 OF 2

TRANSPORTATION IMPACT ANALYSIS

Maha Resort at Guenoc Valley

Lake County

Abrams Associates
TRAFFIC ENGINEERING, INC.

TABLE 7
CUMULATIVE PLUS PHASE 1 INTERSECTION LEVEL OF SERVICE CONDITIONS – PAGE 1 OF 2

	INTERSECTION	CONTROL	PEAK HOUR	CUMULATIVE		CUMULATIVE PLUS PROJECT	
				Delay	LOS	Delay	LOS
1	STATE ROUTE 29 / STATE ROUTE 53 & MAIN STREET	Signalized	AM	20.6	C	21.0	C
			PM	23.5	C	26.4	C
2	STATE ROUTE 29 & SPRUCE GROVE ROAD (NORTH) *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	1.6 36.9	A E	1.7 42.5	A E
			PM	2.0 > 50.0	A F	3.2 > 50.0	A F
3	STATE ROUTE 29 & SPRUCE GROVE ROAD (SOUTH) *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	9.1 > 50.0	A F	13.1 > 50.0	B F
			PM	21.7 > 50.0	C F	42.5 **> 50.0**	E **F**
4	STATE ROUTE 29 & HIDDEN VALLEY ROAD *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	14.1 > 50.0	B F	20.4 > 50.0	C F
			PM	17.8 > 50.0	C F	38.5 **> 50.0**	E **F**
5	STATE ROUTE 29 & HARTMANN ROAD	Roundabout	AM	19.5	C	24.5	C
			PM	**> 50.0**	**F**	**> 50.0**	**F**
6	STATE ROUTE 29 & GRANGE ROAD *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.7 > 50.0	A F	0.8 > 50.0	A F
			PM	1.9 > 50.0	A F	3.2 > 50.0	A F
7	STATE ROUTE 29 & BUTTS CANYON ROAD *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	1.2 21.3	A C	6.6 > 50.0	A F
			PM	5.0 42.9	A E	**> 50.0** **> 50.0**	**F** **F**
8	BUTTS CANYON ROAD & BLACK OAK HILL DRIVE *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.3 9.6	A A	0.2 11.0	A B
			PM	0.2 10.0	A B	0.1 14.6	A B
9	BUTTS CANYON ROAD & OAT HILL DRIVE *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.4 9.5	A A	0.2 11.0	A B
			PM	0.1 10.0	A B	0.1 15.0	A C
10	STATE ROUTE 29 (CALISTOGA ROAD) & WARDLAW STREET	Signalized	AM	17.9	B	21.8	C
			PM	9.4	A	13.3	B
11	STATE ROUTE 29 (CALISTOGA ROAD) & YOUNG STREET *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	1.5 31.7	A D	1.6 36.5	A E
			PM	0.7 40.0	A E	0.7 > 50.0	A F
12	STATE ROUTE 29 (CALISTOGA ROAD) & STATE ROUTE 175 / MAIN STREET	Signalized	AM	10.1	B	11.2	B
			PM	13.2	B	19.5	B
13	STATE ROUTE 29 (CALISTOGA ROAD) & ARMSTRONG ROAD *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	1.3 18.2	A C	1.3 19.3	A C
			PM	1.9 30.8	A D	2.0 37.7	A E
14	STATE ROUTE 29 (CALISTOGA ROAD) & DOUGLAS STREET *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.4 21.3	A C	0.4 22.8	A C
			PM	0.4 26.3	A D	0.3 30.9	A D
15	STATE ROUTE 29 (CALISTOGA ROAD) & CALLAYOMI STREET *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.2 18.6	A C	0.2 21.4	A C
			PM	0.4 24.6	A C	0.5 34.6	A D

SOURCE: Abrams Associates, 2019 **NOTE:** Delay results are presented in terms of seconds per vehicle.

TABLE 7
CUMULATIVE PLUS PHASE 1 INTERSECTION LEVEL OF SERVICE CONDITIONS – PAGE 2 OF 2

	INTERSECTION	CONTROL	PEAK HOUR	CUMULATIVE		CUMULATIVE PLUS PROJECT	
				Delay	LOS	Delay	LOS
16	STATE ROUTE 29 (CALISTOGA ROAD) & LAKE STREET	Side Street Stop	AM	0.3	A	0.3	A
	OVERALL DELAY			17.7	C	18.6	C
	SIDE STREET DELAY		PM	0.2	A	0.2	A
				22.8	C	26.2	D
17	STATE ROUTE 29 (CALISTOGA ROAD) & CENTRAL PARK ROAD	Side Street Stop	AM	0.3	A	0.3	A
	OVERALL DELAY			16.0	C	16.7	C
	SIDE STREET DELAY		PM	0.4	A	0.6	A
				27.1	D	34.1	D
18	STATE ROUTE 175 & SANTA CLARA ROAD	Side Street Stop	AM	0.5	A	0.5	A
	OVERALL DELAY			11.6	B	12.0	B
	SIDE STREET DELAY		PM	1.2	A	1.1	A
				13.1	B	14.1	B
19	POPE VALLEY ROAD & HOWELL MOUNTAIN ROAD	Side Street Stop	AM	1.8	A	1.9	A
	OVERALL DELAY			9.7	A	9.9	A
	SIDE STREET DELAY		PM	4.0	A	3.9	A
				10.0	B	10.4	B
20	STATE ROUTE 29 & TUBBS LANE	Side Street Stop	AM	3.0	A	3.4	A
	OVERALL DELAY			17.4	C	18.8	C
	SIDE STREET DELAY		PM	**> 50.0**	**F**	**> 50.0**	**F**
				> 50.0	**F**	**> 50.0**	**F**
21	STATE ROUTE 128 & TUBBS LANE	Side Street Stop	AM	**48.8**	**E**	**> 50.0**	**F**
	OVERALL DELAY			**> 50.0**	**F**	**> 50.0**	**F**
	SIDE STREET DELAY		PM	**> 50.0**	**F**	**> 50.0**	**F**
				> 50.0	**F**	**> 50.0**	**F**

SOURCE: Abrams Associates, 2019 **NOTE:** Delay results are presented in terms of seconds per vehicle.

AM and PM peak commute hours with the exception of Intersection #3 (State Route 29 at Spruce Grove Road South), Intersection #4 (State Route 29 at Hidden Valley Road), Intersection #5 (State Route 29 at Hartmann Road), Intersection #7 (State Route 29 at Butts Canyon Road), Intersection #20 (State Route 29 at Tubbs Lane) and Intersection #21 (State Route 128 at Tubbs Lane) which would all exceed their established thresholds. The addition of project traffic Intersections #3, #4, #5, and #7 would be considered *significant impacts*. Mitigations to improve the operations at these intersections are discussed in Section 5. At Intersections #20 and #21 in Napa County the proposed project would not increase the traffic on the side streets by more than 10 percent at either of these intersections and therefore the project's contribution at these intersections would be considered *less-than-significant*.

4.8 Cumulative Plus Future Phases Traffic Capacity Conditions (Scenario 7)

Table 9 summarizes the LOS results for the Cumulative Plus Project (Year 2040) traffic conditions at each of the project study intersection with the addition of traffic from Phase 1 and also planned future phases of the project. The resulting project trip generation with the planned future phases as well as the cumulative build-out traffic volumes including future phases of the proposed project are included in the technical appendix to this report. As shown in **Table 8**, all of the signalized study intersections would continue to have acceptable conditions during the weekday AM and PM peak commute hours with the exception of Intersection #3 (State Route

TABLE 8
CUMULATIVE PLUS FUTURE PHASES INTERSECTION LEVEL OF SERVICE – PAGE 1 OF 2

	INTERSECTION	CONTROL	PEAK HOUR	CUMULATIVE		CUMULATIVE PLUS PHASE 2	
				Delay	LOS	Delay	LOS
1	STATE ROUTE 29 / STATE ROUTE 53 & MAIN STREET	Signalized	AM	20.6	C	22.2	C
			PM	23.5	C	35.5	D
2	STATE ROUTE 29 & SPRUCE GROVE ROAD (NORTH) *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	1.6 36.9	A E	2.3 > 50.0	A F
			PM	2.0 > 50.0	A F	11.5 > 50.0	B F
3	STATE ROUTE 29 & SPRUCE GROVE ROAD (SOUTH) *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	9.1 > 50.0	A F	34.4 > 50.0	D F
			PM	21.7 > 50.0	C F	**> 50.0** **> 50.0**	**F** **F**
4	STATE ROUTE 29 & HIDDEN VALLEY ROAD *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	14.1 > 50.0	B F	**49.1** **> 50.0**	**E** **F**
			PM	17.8 > 50.0	C F	**> 50.0** **> 50.0**	**F** **F**
5	STATE ROUTE 29 & HARTMANN ROAD	Roundabout	AM	19.5	C	**43.4**	**E**
			PM	**> 50.0**	**F**	**> 50.0**	F
6	STATE ROUTE 29 & GRANGE ROAD *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.7 > 50.0	A F	1.2 > 50.0	A F
			PM	1.9 > 50.0	A F	7.5 > 50.0	A F
7	STATE ROUTE 29 & BUTTS CANYON ROAD *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	1.2 21.3	A C	**> 50.0** **> 50.0**	**F** **F**
			PM	5.0 42.9	A E	**11.9** **> 50.0**	**B** **F**
8	BUTTS CANYON ROAD & BLACK OAK HILL DRIVE *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.3 9.6	A A	0.1 17.6	A C
			PM	0.2 10.0	A B	0.1 36.1	A E
9	BUTTS CANYON ROAD & OAT HILL DRIVE *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.4 9.5	A A	0.1 18.8	A C
			PM	0.1 10.0	A B	0.1 37.8	A E
10	STATE ROUTE 29 (CALISTOGA ROAD) & WARDLAW STREET	Signalized	AM	17.9	B	46.3	D
			PM	9.4	A	33.0	C
11	STATE ROUTE 29 (CALISTOGA ROAD) & YOUNG STREET *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	1.5 31.7	A D	2.1 > 50.0	A F
			PM	0.7 40.0	A E	1.1 > 50.0	A F
12	STATE ROUTE 29 (CALISTOGA ROAD) & STATE ROUTE 175 / MAIN STREET	Signalized	AM	10.1	B	17.5	B
			PM	13.2	B	41.9	D
13	STATE ROUTE 29 (CALISTOGA ROAD) & ARMSTRONG ROAD *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	1.3 18.2	A C	1.2 23.2	A C
			PM	1.9 30.8	A D	2.6 > 50.0	A F
14	STATE ROUTE 29 (CALISTOGA ROAD) & DOUGLAS STREET *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.4 21.3	A C	0.4 27.7	A D
			PM	0.4 26.3	A D	0.4 41.4	A E
15	STATE ROUTE 29 (CALISTOGA ROAD) & CALLAYOMI STREET *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.2 18.6	A C	0.3 27.7	A D
			PM	0.4 24.6	A C	0.8 > 50.0	A F

SOURCE: Abrams Associates, 2019 **NOTE:** Delay results are presented in terms of seconds per vehicle.

TABLE 8
CUMULATIVE PLUS FUTURE PHASES INTERSECTION LEVEL OF SERVICE – PAGE 2 OF 2

	INTERSECTION	CONTROL	PEAK HOUR	CUMULATIVE		CUMULATIVE + FUTURE PHASES	
				Delay	LOS	Delay	LOS
16	STATE ROUTE 29 (CALISTOGA ROAD) & LAKE STREET *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.3 17.7	A C	0.3 21.5	A C
			PM	0.2 22.8	A C	0.2 33.3	A D
17	STATE ROUTE 29 (CALISTOGA ROAD) & CENTRAL PARK ROAD *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.3 16.0	A C	0.4 19.6	A C
			PM	0.4 27.1	A D	0.9 > 50.0	A F
18	STATE ROUTE 175 & SANTA CLARA ROAD *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	0.5 11.6	A B	0.5 13.2	A B
			PM	1.2 13.1	A B	1.2 16.2	A C
19	POPE VALLEY ROAD & HOWELL MOUNTAIN ROAD *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	1.8 9.7	A A	2.0 10.3	A B
			PM	4.0 10.0	A B	4.1 11.3	A B
20	STATE ROUTE 29 & TUBBS LANE *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	3.0 17.4	A C	4.4 23.8	A C
			PM	**> 50.0** **> 50.0**	**F** **F**	**> 50.0** **> 50.0**	**F** **F**
21	STATE ROUTE 128 & TUBBS LANE *OVERALL DELAY* *SIDE STREET DELAY*	Side Street Stop	AM	**48.8** **> 50.0**	**E** **F**	**> 50.0** **> 50.0**	**F** **F**
			PM	**> 50.0** **> 50.0**	**F** **F**	**> 50.0** **> 50.0**	**F** **F**

29 at Spruce Grove Road South), Intersection #4 (State Route 29 at Hidden Valley Road), Intersection #5 (State Route 29 at Hartmann Road), Intersection #7 (State Route 29 at Butts Canyon Road), Intersection #20 (State Route 29 at Tubbs Lane) and Intersection #21 (State Route 128 at Tubbs Lane) which would all exceed their established thresholds. The addition of project traffic Intersections #3, #4, #5, and #7 would be considered *significant impacts*. Mitigations to improve the operations at these intersections are discussed in Section 5. With the planned future phases the project would increase the side street approaches by more than 10 percent at Intersections #20 and #21 in Napa County which is considered a *significant impact*.

4.9 Transit Impacts

The project would not result in degradation of the level of service (or a significant increase in delay) on any roadway segments currently being utilized by bus transit in the area and, as such, no significant impacts to bus transit are expected. The proposed project not be expected to significantly impact the operating capacity any existing Lake Transit bus routes. The proposed project could potentially help support existing bus services with additional transit ridership and would not conflict with any transit plans or goals of the County or Lake Transit. Although the proposed project does have the potential to increase patronage on bus lines in the area, no significant effects on transit capacity are anticipated given that the additional ridership would be added primarily in the non-peak directions. As a result, the project would not be expected to result in any significant impacts to bus transit service in the area.

4.10 Pedestrians, Bicycles and Non-Motorized Vehicular Travel

The County does not have level of service standards for pedestrian or bicycle facilities. Nevertheless, use of existing facilities by the users of the project would not be expected to overcrowd those facilities or decrease their performance or safety. The project will add some pedestrians and bicyclists in the area but the volumes added would not be expected to significantly impact any existing facilities. In relation to the existing conditions, the proposed project would not cause substantial changes to the pedestrian or bicycle traffic in the area and would not significantly impact or require changes to the design of any existing bicycle or pedestrian facilities. However, consistent with the County and County General Plans, the project could be asked to contribute to additional pedestrian and bicycle improvement measures in the vicinity of the project.

4.11 Site Access and Circulation

No site circulation or access issues have been identified that would cause a traffic safety problem or any unusual traffic congestion or delay. Detailed LOS calculations for each of the proposed entrances under all plus project scenarios are included in the appendix. The existing intersections that would provide access to the project are forecast to continue to have acceptable operations with the existing side street stop controls. There are two options for a proposed new main primary entrance intersection: The Primary Access Road Option 1 entrance would be located approximately 2 miles south of the existing Langtry Winery Entrance. The Primary Access Road Option 2 would be located at McCain Canyon, approximately 2.6 miles south of the existing Langtry Winery Entrance.

Both options are forecast to have acceptable operations with side-street stop control. However, please note it is recommended that separate eastbound left turn pockets be provided all three resort entrances to ensure safe traffic operations. A review of the locations and designs for the proposed new main entrance intersection (under both access options) indicated the intersection would operate safely as designed with the proposed widening for the right and left-turn auxiliary lanes and the associated shoulder improvements. Both locations would meet the established sight distance standards, in part due to the proposed grading and vegetation removal adjacent to the roadway which would be associated with the planned widening for the intersection turn lanes. As an additional improvement measure for the entrance intersection under Primary Access Road Option 2 it is recommended that intersection warning signs be placed on both of the Butts Canyon Road approaches. As per the California Manual of Uniform Traffic Control Devices (CAMUTCD) the sign code for a T-intersection warning sign is W2-2. To further ensure motorists have advance warning of the new intersection, the intersection warning signs could be supplemented with the optional flashing yellow beacons, as specified in the CAMUTCD.

4.12 Parking

Parking shortages are not considered to be a significant impact under CEQA and any analysis of parking is provided for planning and informational purposes only. The proposed project would provide an adequate supply of off-street parking based on the County's requirements. The project is currently proposing to meet the County's parking requirements and subject to final County approval of the proposed parking plan there would be no significant parking impacts expected to the surrounding properties.

4.13 Vehicle Miles Traveled

One performance measure that can be used to quantify the travel from a project is vehicle miles traveled (VMT). VMT is a particularly useful metric for evaluating the impacts of growth on greenhouse gas (GHG) emissions because it can be used to estimate fuel consumption by motor vehicles. Increases in VMT cause proportional increases in greenhouse gas emissions and air pollution. This section presents the extent of the VMT-related impacts caused by the Project. The County does not currently have adopted CEQA thresholds for VMT analysis; therefore, this information is provided for informational purposes only.

One limitation of VMT measurements is they cannot be easily observed or measured and therefore must be estimated. Methods do not exist that can reliably measure the trip distances of all vehicles on a given day. VMT is typically an output from area wide travel demand models and is calculated based on the number of vehicles multiplied by the distance traveled by each vehicle. As such, the VMT estimate is dependent on the level of detail in the travel demand model. The volume of traffic and distance traveled depends on land use types, density, and location as well as the supporting transportation system, including availability of various travel modes. A travel demand model attempts to represent this relationship when forecasting vehicle trips and VMT. This analysis uses the Metropolitan Transportation Commission (MTC) Travel Model to estimate VMT per capita for the project. Neighborhoods within various jurisdictions are expressed geographically in transportation analysis zones, or TAZs. TAZs are used in transportation planning models for transportation analysis and other planning purposes.

Based on the MTC Travel Model, the Bay Area regional average daily VMT per capita is estimated to be 15.0 in the year 2020 and 13.8 in the year 2040. Because the homes built by the project would be similar to other residential developments in the area, project residents are estimated to have similar travel behavior as other residents in the TAZ closest to the project; thus, the VMT per capita estimated by the MTC Model for the TAZ closest to the project site would represent the approximate VMT per capita that would be generated by the project.

Table 9 summarizes the 2020 and 2040 VMT for TAZ 1312, the TAZ which is closest where to the project is located, and provides a comparison to regional and county wide averages. It is expected that, as shown for the TAZ, the project would have a higher VMT per capita than the the Lake County or Bay Area region averages under both 2020 and 2040 conditions because,

TABLE 9
DAILY VEHICLE MILES TRAVELED PER CAPITA

Area	*2020*	*2040*
TAZ 1312 (Project)	37.5	34.6
Lake County	31.1	30.1
Bay Area	15.0	13.8

SOURCE: MTC Model results at analytics.mtc.ca.gov/foswiki/Main/PlanBayAreaVmtPerCapita; accessed September, 2019.

as stated above, the homes built by the project would be similar to existing developments in the area. The VMT would also be higher because of the nature of the project site. For example, the project site is lacking in commercial and retail services for residents within walking distance and the project site is not located close to bus stops served by public transit. The VMT generated by the Project could be substantially reduced by implementation of the required Transportation Demand Management (TDM) program.

4.14 Transportation Demand Management Program

In September 2010, the California Air Resources Board (ARB or Board) set passenger vehicle greenhouse gas (GHG) emission reduction targets for 2020 and 2035 for each of the 18 Metropolitan Planning Organization (MPO) regions in California under the Sustainable Communities and Climate Protection Act of 2008 (SB 375). Lake County supports these goals by implementing policies that require new projects achieve a reduction in the number of peak hour drive-alone commute vehicle trips. The project transportation demand management (TDM) program requested by the County is intended to reduce the total vehicle miles traveled (VMT) by motorists in the project area. Please note that reductions in VMT are generally considered to translate directly into reduced GHG's.

Proposed TDM Strategies - The following is a summary of strategies that are recommend to be incorporated into the project:

Private Shuttle Service – There are currently no plans for Lake Transit to run buses along Butts Canyon Road near the project site and the nearest bus stops are about six miles away in Middletown. While it is possible Lake Transit might consider adding a stop on Butts Canyon Road in the future to serve project employees, it is our understanding that there is no funding available for it at this time. Alternatively, the project could potentially provide a frequent direct

weekday shuttle service specifically for employees during the peak morning and evening commute periods. This could operate between the project site any and off-site work force housing with a stop at the Lake Transit bus transfer point in Middletown. Please note shuttles would need be fully accessible to passengers using wheelchairs. It is recommended the applicant also explore providing a real-time smart-phone app that tracks arrivals to make shuttle use more reliable and convenient. Bus service for patrons of the project has been assumed as part of this analysis. The current assumption is that regular bus service to and from San Francisco and Sacramento will accommodate approximately 40% of resort patrons.

Carpool and Ride-Matching Assistance Program – The management shall offer personalized ride-matching assistance to pair employees interested in forming commute carpools. As an enhancement, management may consider using specific services such as ZimRide, TwoGo by SAP, Enterprise RideShare, or 511.org RideShare.

Preferential Parking for Carpoolers – The management shall offer preferential carpool parking for eligible commuters. To be eligible for carpool parking, the carpool shall consist of three or more people. The management shall monitor and provide adequate carpool spaces to meet or exceed potential demand.

Dedicated Parking Spaces for Car Share Services – Setting aside parking spaces to be dedicated for use by car share services to serve employees. This could reduce parking demand and GHG emissions associated with the project by providing more flexibility for employees who otherwise utilize alternate modes. The availability of car share services within a project can potentially reduce the demand for employees to own their own cars. A review of over 25 studies from Europe and the U.S. where car sharing services are available, found that in North America, on average, 20% of respondents gave up a privately owned vehicle and 40% avoided purchasing one, which results in an average of five privately owned vehicles replaced per every car sharing vehicle.[2] However, it should be noted that this data is for residential projects and the effects, while still significant, would most likely be less for a commercial project.

On Site Sales of Transit Passes – The building management shall offer direct on-site sales of transit passes purchased and sold at a bulk group rate.

TDM Coordinator – Management shall designate a "*TDM coordinator*" to coordinate, monitor and publicize TDM activities. The effectiveness of providing a TDM Coordinator on automobile ownership is not known at this time. It is assumed the applicant may instruct the management company to designate their on-site manager as the TDM coordinator.

[2] *Car Sharing: Where and How it Succeeds, TCRP Report 108*, Transportation Cooperative Research Program, Washington D.C., 2005.

Transportation and Commute Information Kiosks - An information board or kiosk will be located in a common gathering area (e.g., lobby, employee entrance, break, or lunch room). The kiosk will contain transportation information, such as Emergency Ride Home (ERH), transit schedules, bike maps, and 511 ride-matching. Information will be updated periodically by the designated Transportation Coordinator (TC).

Tenant Performance and Lease Language – TDM Requirements - For all tenants, the applicant will draft lease language or side agreements that require the identification of a designated contact responsible for compliance and implementation of the TDM program.

Tenant/Employer Commute Program Training - As needed and applicable, the applicant or property management will provide individual tenants of the project with initial TDM (and commute) program training, commute program start-up assistance. The overarching goals of this support function are to reduce commute trips for employees and assist with employee marketing and outreach.

Employee Transportation Brochure - At the time of occupancy, all employees will be provided with an Employee Transportation Brochure regarding the Commute Program. This brochure will include (but not be limited to) information about shuttle service, carpool parking, transit opportunities, ride-matching services, bicycle routes, and emergency rides home.

5) MITIGATION

The following is a list of project impacts and proposed mitigation measures to address the transportation impacts of the project. Based on a detailed analysis of traffic operations with and without each of the proposed mitigations, implementation of the following mitigation measures would reduce the project impacts to a *less-than-significant* level. Detailed LOS calculations and a summary table verifying the mitigations would reduce the impacts to a less than significant level are included in the appendix to this report. The impacts at Intersections #20 and #21 in Napa County involve mitigations that cannot be guaranteed as the improvements would be outside the jurisdiction of Lake County. Therefore, the impacts at these two intersections (which occur under future phases only) would be considered *significant and unavoidable*.

Impact #1 Impacts to intersection operations - The project would contribute to LOS operations exceeding the established standards at the following six intersections:

State Route 29 at Spruce Grove Road South (Intersection #3)
State Route 29 at Hidden Valley Road (Intersection #4)
State Route 29 at Hartmann Road (Intersection #5)
State Route 29 at Butts Canyon Road (Intersection #7)
State Route 29 at Tubbs Lane (Intersection #20) – *Napa County*
State Route 128 at Tubbs Lane (Intersection #21) – *Napa County*

The addition of traffic from the proposed project would contribute to these six intersections exceeding the established LOS standards. However, without implementation of the recommended mitigations below, the development of the proposed project would result in a potentially significant impact to the LOS and queuing at the above listed intersections. With the exception of Intersections #20 and #21 the following mitigation measures would reduce the impacts at these intersections to a less-than-significant level in all of the plus project scenarios.

Mitigation Measures

Prior to construction the project would mitigate the above-identified impacts by paying a proportionate share of the construction costs of the following improvement, subject to County approval. The intersection mitigations required for the project to meet the established LOS standards are:

MM 1 (a) State Route 29 at Spruce Grove Road South – Installation of a three-way traffic signal with crosswalks. (Scenario 6 - Cumulative Plus Phase 1)

MM 1 (b) *State Route 29 at Hidden Valley Road – Installation of a four-way traffic signal with crosswalks.*
(Scenario 6 - Cumulative Plus Phase 1)

MM 1 (c) *State Route 29 at Hartmann Road – Expansion of the existing roundabout or installation of a three-way traffic signal.*
(Scenario 6 - Cumulative Plus Phase 1)

MM 1 (d) *State Route 29 at Butts Canyon Road – Installation of a three-way traffic signal with crosswalks.*
(Scenario 2 - Existing Plus Phase 1)

MM 1 (e) *State Route 29 at Tubbs Lane – Installation of a three-way traffic signal with crosswalks.*
(Scenario 7 - Cumulative Plus Future Phases)

MM 1 (f) *State Route 128 at Tubbs Lane – Installation of a three-way traffic signal with crosswalks.*
(Scenario 7 - Cumulative Plus Future Phases)

Impact #2 Impacts related to conflicts with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or potential decreases to the performance or safety of such facilities.

The project would not result in degradation of the level of service (or a significant increase in delay) on any roadway segments currently being utilized by bus transit in the area and would not increase ridership beyond existing capacity. As such, no significant impacts to bus transit are expected. In addition, the project would not significantly impact or change the design of any existing transportation facility or create any new safety problems in the area. Therefore, based on the County's significance criteria the project's impacts on alternative transportation would be considered less than significant and no mitigations would be required.

Mitigation Measure(s)
None required.

Impact #3 Demolition and construction activities associated with the proposed project would result in an increase in traffic to and from the site and could lead to unsafe conditions near the project site.

The increase in traffic as a result of demolition and construction activities associated with the proposed project has been quantified assuming a worst-case single phase construction period of 36 months.

Heavy Equipment

Approximately twenty pieces of heavy equipment are estimated to be transported on and off the site each month throughout the demolition and construction of the proposed project. Heavy equipment transport to and from the site could cause traffic impacts in the vicinity of the project site during construction. However, each load would be required to obtain all necessary permits, which would include conditions. Prior to issuance of grading and building permits, the project applicant would be required to submit a Traffic Control Plan.

The requirements within the Traffic Control Plan include, but are not limited to, the following: truck drivers would be notified of and required to use the most direct routes , as determined by the County Engineering Department; all site ingress and egress would occur only at the main driveways to the project site and construction activities may require installation of temporary (or ultimate) traffic signals as determined by the County Engineer; specifically designated travel routes for large vehicles would be monitored and controlled by flaggers for large construction vehicle ingress and egress; warning signs indicating frequent truck entry and exit would be posted on Butts Canyon Road; and any debris and mud on nearby streets caused by trucks would be monitored daily and may require instituting a street cleaning program. In addition, the ten loads of heavy equipment being hauled to and from the site each month would be short-term and temporary.

Employees

The weekday work is expected to begin around 7:00 AM and end around 4:00 PM. The construction worker arrival peak would occur between 6:30 AM and 7:30 AM, and the departure peak would occur between 4:00 PM and 5:00 PM. These peak hours are slightly before the countywide commute peaks. It should be noted that the number of trips generated during construction would not only be temporary, but would also be substantially less than the proposed project at buildout. Based on past construction of similar projects, construction workers could require parking for up to 250 vehicles during the peak construction period. Additionally, deliveries, visits, and other activities may generate peak non-worker parking demand of 20 to 25 trucks and automobiles per day. Therefore, up to 275 vehicle parking spaces may be required during the peak construction period for the construction employees. Furthermore, the Traffic Control Plan requires construction employee parking be provided on the project site to eliminate conflicts with nearby residential areas. Because the construction of the project can be staggered so that employee parking demand is met by using on-site parking, the impacts of construction-related employee traffic and parking are considered less-than-significant.

Construction Material Import/Export

The project would also require removal of existing debris as well as the importation of construction material, including raw materials for the building pads, the buildings, the parking area, and landscaping. During the maximum peak construction period, it is estimated material import and export could generate approximately 150 truck trips per day. Furthermore, under the provisions of the Traffic Control Plan, if importation and exportation of material becomes a traffic nuisance, then the County Engineer may limit the hours the activities can take place.

Traffic Control Plan

The Traffic Control Plan would indicate how parking for construction workers would be provided during construction and ensure a safe flow of traffic in the project area during construction. This analysis assumed construction of the entire project in one phase to identify the potential worst-case traffic effects. If the project is built in phases over time, the effects of each phase will be the same or less. Each phase will be subject to a Traffic Control Plan and oversight by the County Engineer. The last phase may require added worker parking measures, depending on the circumstances, as there will not be any remaining vacant land for parking. Therefore, the demolition and construction activities associated with the proposed project or its individual phases would not lead to noticeable congestion in the vicinity of the site or the perception of decreased traffic safety resulting in a ***less-than-significant*** impact.

Mitigation Measure(s)
None required.

Impact #4 Impacts related to site access and circulation.

The proposed project would have its main entrance Butts Canyon Road. Two secondary access points will also be provided. The secondary entrance would be located to the west of the main entrance. As discussed above, the proposed mitigation for the project's potential safety impacts at the main access intersection and the secondary entrances is the installation of separate left turn pockets. Based on a review of the proposed site plan it was determined that the site circulation should function well and would not cause any safety or operational problems. The project site design has been required to conform to County design standards and is not expected to create any significant impacts to pedestrians, bicyclists or traffic operations. Therefore, impacts related to site access and circulation to the proposed project would be ***less-than-significant*** with implementation of the following mitigation measure.

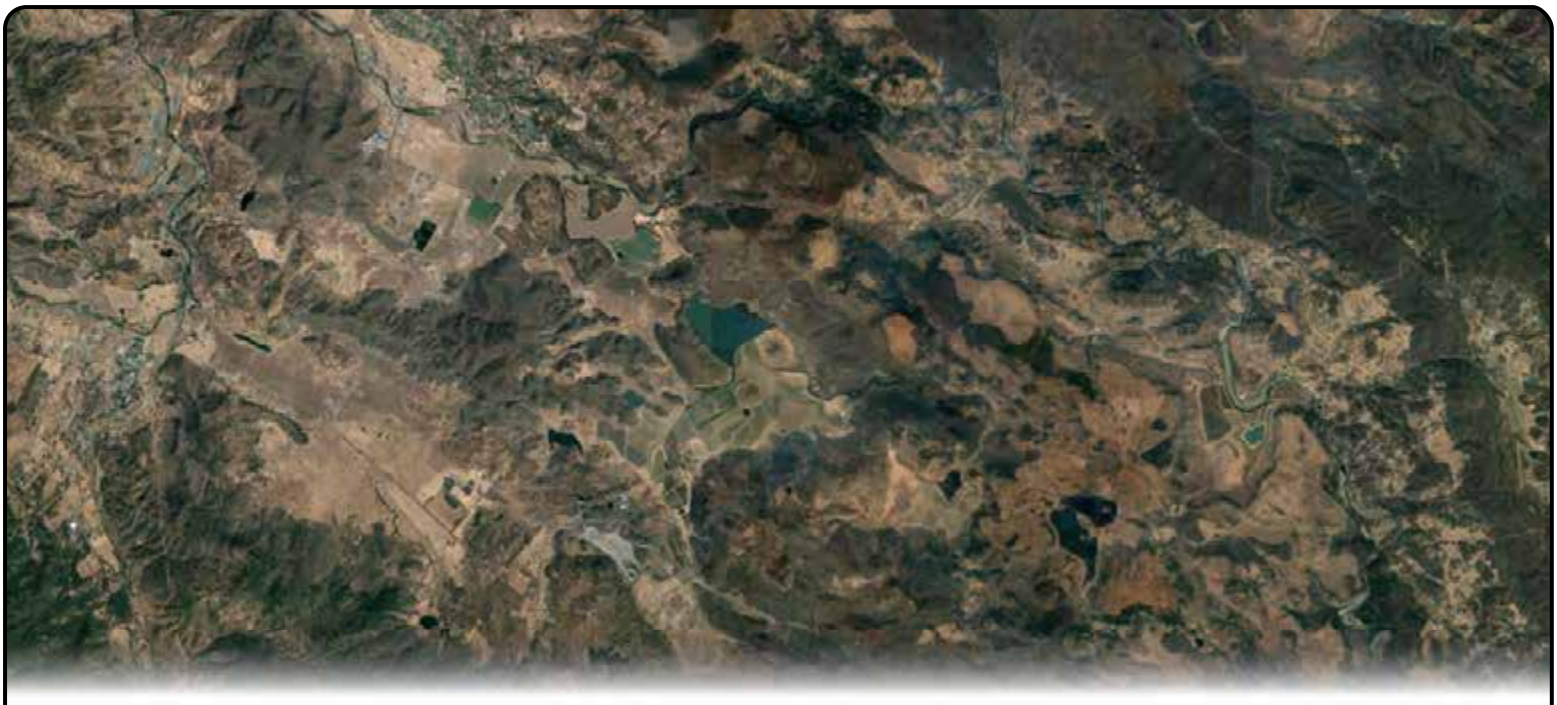
Mitigation Measure

MM 1 (a) Butts Canyon Road at the Three Project Entrances – Installation of 250-foot-long left turn pockets at all three project entrances.

Impact #5 Impacts regarding emergency vehicle access on and surrounding the proposed project site.

Sufficient emergency access is determined by factors such as number of access points, roadway width, and proximity to fire stations. The land use plan for the proposed project would include three entrances on Butts Canyon Road. All lane widths within the project would meet the minimum width that can accommodate an emergency vehicle; therefore, the width of the internal roadways would be adequate. In addition, with the proposed mitigations the addition of traffic from project traffic would not result in any significant changes to emergency vehicle response times in the area. Therefore, development of the project is expected to have ***less-than-significant*** impacts regarding emergency vehicle access.

Mitigation Measure(s)
None required.



Transportation Impact Analysis Technical Appendix

Maha Resort at Guenoc Valley

Lake County

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February 7, 2020

APPENDIX TIA

TRAFFIC IMPACT ANALYSIS

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5.) Figure A2 – Cumulative Plus Future Phases Traffic Volumes

6.) HCM 6th Edition Level of Service Results

7.) Mitigated LOS Results

TABLE A1
CUMULATIVE PLUS PHASE 1 MITIGATED LEVEL OF SERVICE CONDITIONS

INTERSECTION		CONTROL	PEAK HOUR	CUMULATIVE PLUS PHASE 1	
				Delay	LOS
3	STATE ROUTE 29 & SPRUCE GROVE ROAD (SOUTH)	Signalized	AM	7.3	A
			PM	8.4	A
4	STATE ROUTE 29 & HIDDEN VALLEY ROAD	Signalized	AM	14.9	B
			PM	24.9	C
5	STATE ROUTE 29 & HARTMANN ROAD	Signalized	AM	15.0	B
			PM	16.1	B
7	STATE ROUTE 29 & BUTTS CANYON ROAD	Signalized	AM	8.6	A
			PM	34.2	C
20	STATE ROUTE 29 & TUBBS LANE	Signalized	AM	9.1	A
			PM	25.0	C
21	STATE ROUTE 128 & TUBBS LANE	Signalized	AM	9.8	B
			PM	18.2	B

SOURCE: Abrams Associates, 2019
NOTES: Intersection LOS is based on delay which is presented in terms of seconds per vehicle.

TABLE A2
CUMULATIVE PLUS PHASE 2 MITIGATED LEVEL OF SERVICE CONDITIONS

INTERSECTION		CONTROL	PEAK HOUR	CUMULATIVE PLUS PHASE 2	
				Delay	LOS
3	STATE ROUTE 29 & SPRUCE GROVE ROAD (SOUTH)	Signalized	AM	8.3	A
			PM	14.3	B
4	STATE ROUTE 29 & HIDDEN VALLEY ROAD	Signalized	AM	16.4	B
			PM	40.4	D
5	STATE ROUTE 29 & HARTMANN ROAD	Signalized	AM	19.2	B
			PM	24.4	C
7	STATE ROUTE 29 & BUTTS CANYON ROAD	Signalized	AM	14.6	B
			PM	78.6	E
20	STATE ROUTE 29 & TUBBS LANE	Signalized	AM	11.1	B
			PM	47.1	D
21	STATE ROUTE 128 & TUBBS LANE	Signalized	AM	11.0	B
			PM	30.2	C

SOURCE: Abrams Associates, 2019
NOTES: Intersection LOS is based on delay which is presented in terms of seconds per vehicle.

FIGURE A1 | ACCIDENT DATA FOR BUTTS CANYON ROAD (2014-2019) – PAGE 1 of 3
TRANSPORTATION IMPACT ANALYSIS
Maha Resort at Guenoc Valley
Lake County

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FIGURE A1 | ACCIDENT DATA FOR BUTTS CANYON ROAD (2014-2019) – PAGE 2 of 3
TRANSPORTATION IMPACT ANALYSIS
Maha Resort at Guenoc Valley
Lake County

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FIGURE A1 | ACCIDENT DATA FOR BUTTS CANYON ROAD (2014-2019) – PAGE 3 of 3
TRANSPORTATION IMPACT ANALYSIS
Maha Resort at Guenoc Valley
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Butts Canyon Road Accident Summary **2019-2014**

CASE ID	COLLISION DATE	COLLISION TIME	PRIMARY RD	SECONDARY RD	DISTANCE	DIRECTION	INTERSECTION	WEATHER 1	TYPE OF COLLISION	COLLISION SEVERITY	NUMBER KILLED	NUMBER INJURED	PCF VIOLATION CATEGORY	MOTOR VEHICLE INVOLVED WITH	ALCOHOL INVOLVED
2019															
90920438	20190126	1530	BUTTS CANYON RD	GUENOC RD	14256	E	N	Clear	Overturned	Injury (Complaint of Pain)	0	1	Improper Turning	Non-Collision	0
90920576	20190126	1531	BUTTS CANYON RD	GUENOC RD	14256	E	N	Clear	Overturned	Injury (Complaint of Pain)	0	1	Improper Turning	Non-Collision	Y
90980477	20190426	2500	BUTTS CANYON RD	SR-29	3168	E	N	Clear	Hit Object	Property Damage Only	0	0	Improper Turning	Fixed Object	0
90984418	20190427	1042	BUTTS CANYON RD	NAPA COUNTY LINE	2640	N	N	Clear	Overturned	Property Damage Only	0	0	Improper Turning	Non-Collision	0
90989183	20190506	100	BUTTS CANYON RD	SR-29	2112	E	N	Clear	Other	Property Damage Only	0	0	Unsafe Speed	Animal	0
90994211	20190511	1130	BUTTS CANYON ROAI	OAT HILL ROAD	80	W	N	Clear	Hit Object	Injury (Other Visible)	0	1	Improper Turning	Fixed Object	0
2018															
90784855	20180803	556	BUTTS CANYON RD.	NAPA CO. LN.	2640	W	N	Clear	Hit Object	Injury (Complaint of Pain)	0	1	Improper Turning	Fixed Object	0
90848041	20181007	2500	BUTTS CANYON RD	OAT HILL ROAD	3168	E	N	Clear	Hit Object	Property Damage Only	0	0	Improper Turning	Fixed Object	0
90860257	20181105	1630	BUTTS CANYON RD.	SNELL VALLEY RD.	10032	W	N	Clear	Hit Object	Injury (Severe)	0	1	Improper Turning	Fixed Object	0

Butts Canyon Road Accident Summary **2019-2014**

CASE ID	COLLISION DATE	COLLISION TIME	PRIMARY RD	SECONDARY RD	DISTANCE	DIRECTION	INTERSECTION	WEATHER 1	TYPE OF COLLISION	COLLISION SEVERITY	NUMBER KILLED	NUMBER INJURED	PCF VIOLATION CATEGORY	MOTOR VEHICLE INVOLVED WITH	ALCOHOL INVOLVED
2017															
90370358	20170111	558	BUTTS CANYON RD.	OAT HILL RD.	2640	W	N	Cloudy	Hit Object	Property Damage Only	0	0	Improper Turning	Fixed Object	0
90395825	20170213	1010	BUTTS CANYON ROAI	OAT HILL ROAD	21120	E	N	Clear	Hit Object	Injury (Complaint of Pain)	0	1	Unsafe Speed	Fixed Object	0
90447553	20170423	35	BUTTS CANYON RD	OAT HILL ROAD	60	W	N	Clear	Hit Object	Property Damage Only	0	0	Improper Turning	Fixed Object	0
90457032	20170508	1515	BUTTS CANYON ROAI	OAT HILL ROAD	11616	E	N	Clear	Hit Object	Property Damage Only	0	0	Improper Turning	Fixed Object	0
90462708	20170519	2330	BUTTS CANYON RD	SNELL VALLEY RD	5280	N	N	Clear	Hit Object	Property Damage Only	0	0	Improper Turning	Fixed Object	0
90486684	20170617	1735	BUTTS CANYON ROAI	SR-29	6336	E	N	Clear	Hit Object	Injury (Severe)	0	1	Driving or Bicycling Under the Influence of Alcohol or Drug	Fixed Object	Y
90499737	20170708	1515	BUTTS CANYON ROAI	OAT HILL ROAD	19536	E	N	Clear	Overturned	Property Damage Only	0	0	Improper Turning	Non-Collision	0
90513667	20170615	2056	BUTTS CANYON RD	SR-29	8448	E	N	Clear	Hit Object	Fatal	1	0	Driving or Bicycling Under the Influence of Alcohol or Drug	Fixed Object	Y
90517663	20170722	1921	BUTTS CANYON RD	BLACK OAK DR	4459	E	N	Clear	Hit Object	Property Damage Only	0	0	Driving or Bicycling Under the Influence of Alcohol or Drug	Fixed Object	Y
90536897	20170823	1555	BUTTS CANYON RD	GUENOC RD	2640	E	N	Clear	Hit Object	Property Damage Only	0	0	Improper Turning	Fixed Object	0
90541984	20170901	2200	BUTTS CANYON ROAI	OAT HILL ROAD	100	W	N	Clear	Hit Object	Property Damage Only	0	0	Improper Turning	Fixed Object	0
90548100	20170907	758	BUTTS CANYON RD	LAKE / NAPA COUNT	2112	W	N	Cloudy	Overturned	Injury (Severe)	0	1	Improper Turning	Non-Collision	0
90553319	20170916	1250	BUTTS CANYON RD	OAT HILL ROAD	3696	W	N	Clear	Hit Object	Fatal	1	0	Improper Turning	Fixed Object	0
90632174	20171229	1308	BUTTS CANYON ROAI	OAT HILL ROAD	14784	E	N	Clear	Overturned	Property Damage Only	0	0	Driving or Bicycling Under the Influence of Alcohol or Drug	Non-Collision	Y
2016															
90144782	20160318	1300	BUTTS CANYON RD	SNELL VALLEY ROAD	8448	W	N	Clear	Overturned	Injury (Severe)	0	1	Unsafe Speed	Non-Collision	0
90207412	20160612	2357	BUTTS CANYON RD	GUENOC RD	10560	E	N	Clear	Overturned	Property Damage Only	0	0	Driving or Bicycling Under the Influence of Alcohol or Drug	Non-Collision	Y
90217867	20160629	1053	BUTTS CANYON RD	OAT HILL ROAD	27984	E	N	Clear	Overturned	Injury (Other Visible)	0	1	Improper Turning	Non-Collision	0
90218528	20160704	1938	BUTTS CANYON RD	OAT HILL RD	528	S	N	Clear	Hit Object	Property Damage Only	0	0	Improper Turning	Fixed Object	Y

Butts Canyon Road Accident Summary **2019-2014**

CASE ID	COLLISION DATE	COLLISION TIME	PRIMARY RD	SECONDARY RD	DISTANCE	DIRECTION	INTERSECTION	WEATHER 1	TYPE OF COLLISION	COLLISION SEVERITY	NUMBER KILLED	NUMBER INJURED	PCF VIOLATION CATEGORY	MOTOR VEHICLE INVOLVED WITH	ALCOHOL INVOLVED
2015															
6959205	20150614	1033	BUTTS CANYON RD	OAK HILL RD	2112	W	N	Clear	Rear End	Injury (Severe)	0	1	Unsafe Speed	Other Motor Vehicle	0
6962838	20150607	613	BUTTS CANYON RD	LOCONOMI RD	5280	E	N	Clear	Overturned	Property Damage Only	0	0	Improper Turning	Non-Collision	0
6982200	20150704	900	BUTTS CANYON RD	NAPA COUNTY LINE	5280	N	N	Clear	Overturned	Property Damage Only	0	0	Improper Turning	Non-Collision	0
90015363	20150827	600	BUTTS CANYON RD	OAT HILL ROAD	2640	E	N	Clear	Hit Object	Property Damage Only	0	0	Improper Turning	Fixed Object	0
90035870	20150927	1800	BUTTS CANYON ROAI	GUENOC ROAD	7392	E	N	Clear	Hit Object	Property Damage Only	0	0	Driving or Bicycling Under the Influence of Alcohol or Drug	Fixed Object	Y
90090746	20151223	1345	BUTTS CANYON ROAI	OAT HILL ROAD	2640	E	N	Clear	Hit Object	Property Damage Only	0	0	Improper Turning	Fixed Object	0
2014															
6430351	20140318	1520	BUTTS CANYON RD	OAT HILL RD	3168	E	N	Clear	Overturned	Injury (Complaint of Pain)	0	1	Unsafe Speed	Non-Collision	0
6461779	20140415	1535	BUTTS CANYON RD	GUENOC WINERY RD	8448	E	N	Clear	Hit Object	Property Damage Only	0	0	Improper Turning	Fixed Object	0
6562404	20140630	1655	BUTTS CANYON RD	LOCONOMI RD	528	W	N	Clear	Hit Object	Property Damage Only	0	0	Unsafe Speed	Fixed Object	0
6599867	20140802	1800	BUTTS CANYON RD	BLACK OAK HILL DR	1056	E	N	Clear	Rear End	Injury (Complaint of Pain)	0	2	Unsafe Speed	Other Motor Vehicle	Y

Table A-3
MAHA RESORT AT GUENOC VALLEY
Trip Generation Calculations for Future Phases

Land Use	ITE Code	Size	ADT	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Retail Trip Rates	820		37.75	0.58	0.36	0.94	1.83	1.98	3.81
Retail Trip Generation		16,000 sq. ft.	604	9	6	15	29	32	61
Reduction for Internal Trips (50%)			302	5	3	8	14	16	30
Net New Off-Site Retail Trips			302	5	3	8	15	16	31
Restaurant Trip Rates	931		2.60	0.08	0.07	0.15	0.19	0.10	0.29
Restaurant Trip Generation		50 seats	130	4	4	8	10	5	15
Reduction for Internal Trips (50%)			65	2	2	4	4	3	7
Net New Off-Site Restaurant Trips			65	2	2	4	6	2	8
Resort Hotel Trip Rates	330		5.71	0.23	0.09	0.32	0.18	0.23	0.41
Resort Hotel Trip Generation		565 units[1]	3,226	130	51	181	102	130	232
Reduction for Arrivals by Shuttle (45%)[2]			1,452	58	23	81	46	58	104
Reduction for Forecast Occupancy Rates (19%)[3]			337	14	5	19	11	13	24
Net New Off-Site Hotel and Villa Trips			1,437	58	23	81	45	59	104
Winery Trip Rates	970		45.96	1.45	0.62	2.07	3.66	3.65	7.31
Winery Trip Generation		5,000 sq. ft.	230	7	3	10	18	18	37
Reduction for Internal Trips (50%)			115	3	2	5	9	9	18
Net New Off-Site Winery Trips			115	4	1	5	9	9	18
Agricultural Trip Rates	110		4.96	0.62	0.08	0.70	0.08	0.55	0.63
Agricultural Trip Generation		25,000 sq. ft.	124	15	3	18	2	14	16
Reduction for Internal and Shuttle Trips (66%)			82	10	2	12	1	9	10
Net New Off-Site Agricultural Trips			42	5	1	6	1	5	6
Golf Course Trip Rates	430		30.38	1.39	0.37	1.76	1.54	1.37	2.91
Golf Course Trip Generation		18 holes	547	25	7	32	28	25	53
Reduction for Internal Trips (66%)			361	17	4	21	19	16	35
Net New Off-Site Golf Course Trips			186	9	2	11	9	9	18
Single Family Home Rates			8.42	0.18	0.53	0.71	0.60	0.36	0.96
Single Family Home Trips		1,000 units	8,420	180	530	710	600	360	960
Reduction for Internal Trips (30%)			2,526	55	159	213	180	108	288
Net New Single Family Trips			5,894	125	371	496	420	252	672
Subtotals for the Second Phase			***8,041***	***208***	***402***	***610***	***505***	***352***	***857***
ON-SITE WORK FORCE HOUSING									
ITE Low-Rise Apartment Trip Rates (per unit)	220		7.32	0.11	0.35	0.46	0.35	0.21	0.56
Work Force Housing Trip Generation		200 units[4]	732	11	35	46	35	21	56
Reduction for Internal Trips (66%)			483	7	23	30	23	14	37
Net New Off-Site Work Force Housing Trips			249	4	12	16	12	7	19
SUBTOTALS FOR THE SECOND PHASE			***8,290***	***212***	***414***	***626***	***517***	***359***	***876***
SUBTOTALS FOR THE FIRST PHASE			***6,493***	***110***	***110***	***220***	***306***	***225***	***531***
TOTAL TRIPS FROM BOTH PHASES			**14,783**	**322**	**524**	**846**	**823**	**584**	**1,407**

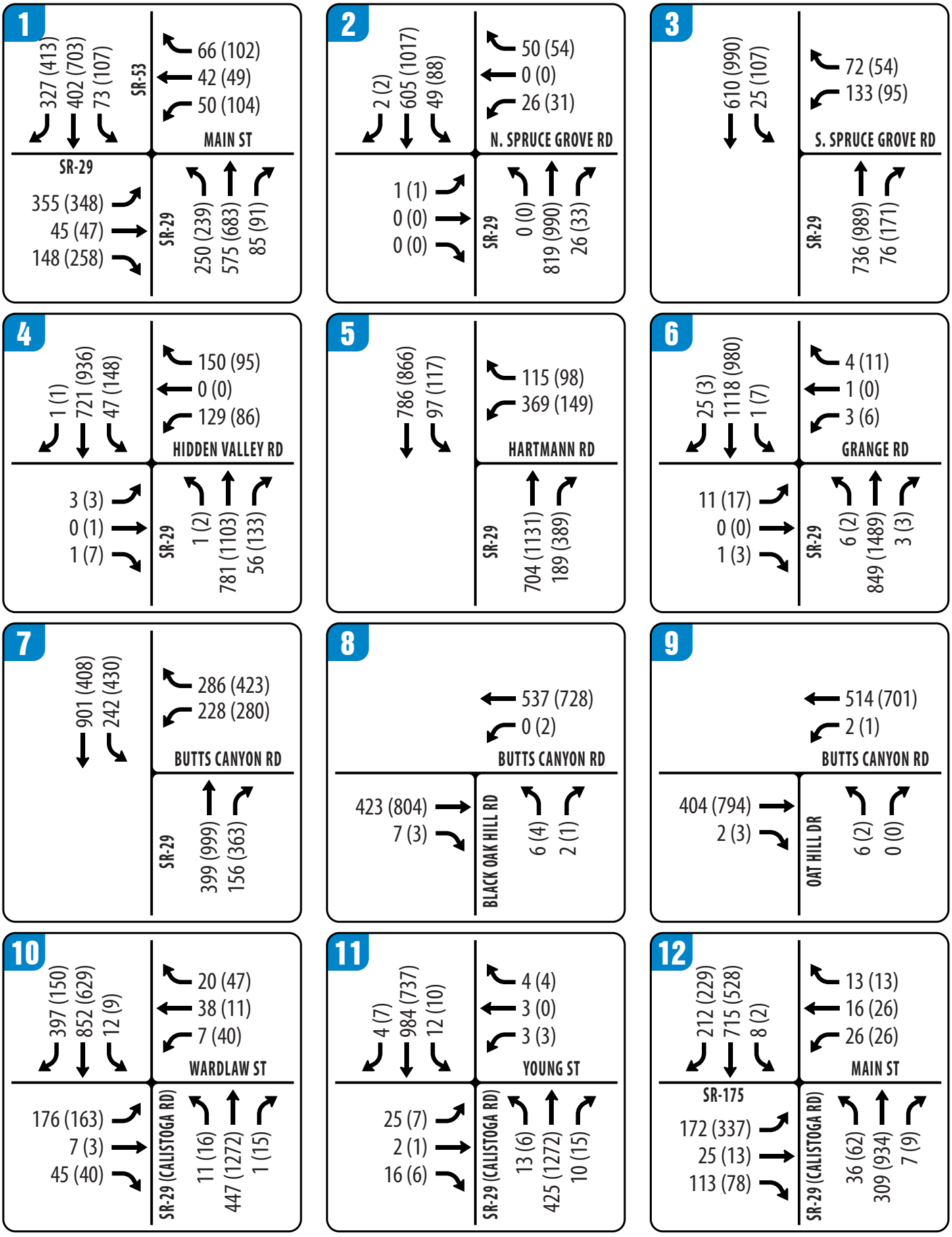

FIGURE A2 | CUMULATIVE PLUS FUTURE PHASES AM(PM) PEAK HOUR TRAFFIC VOLUMES – PAGE 1 OF 2
TRANSPORTATION IMPACT ANALYSIS
Maha Resort at Guenoc Valley
Lake County

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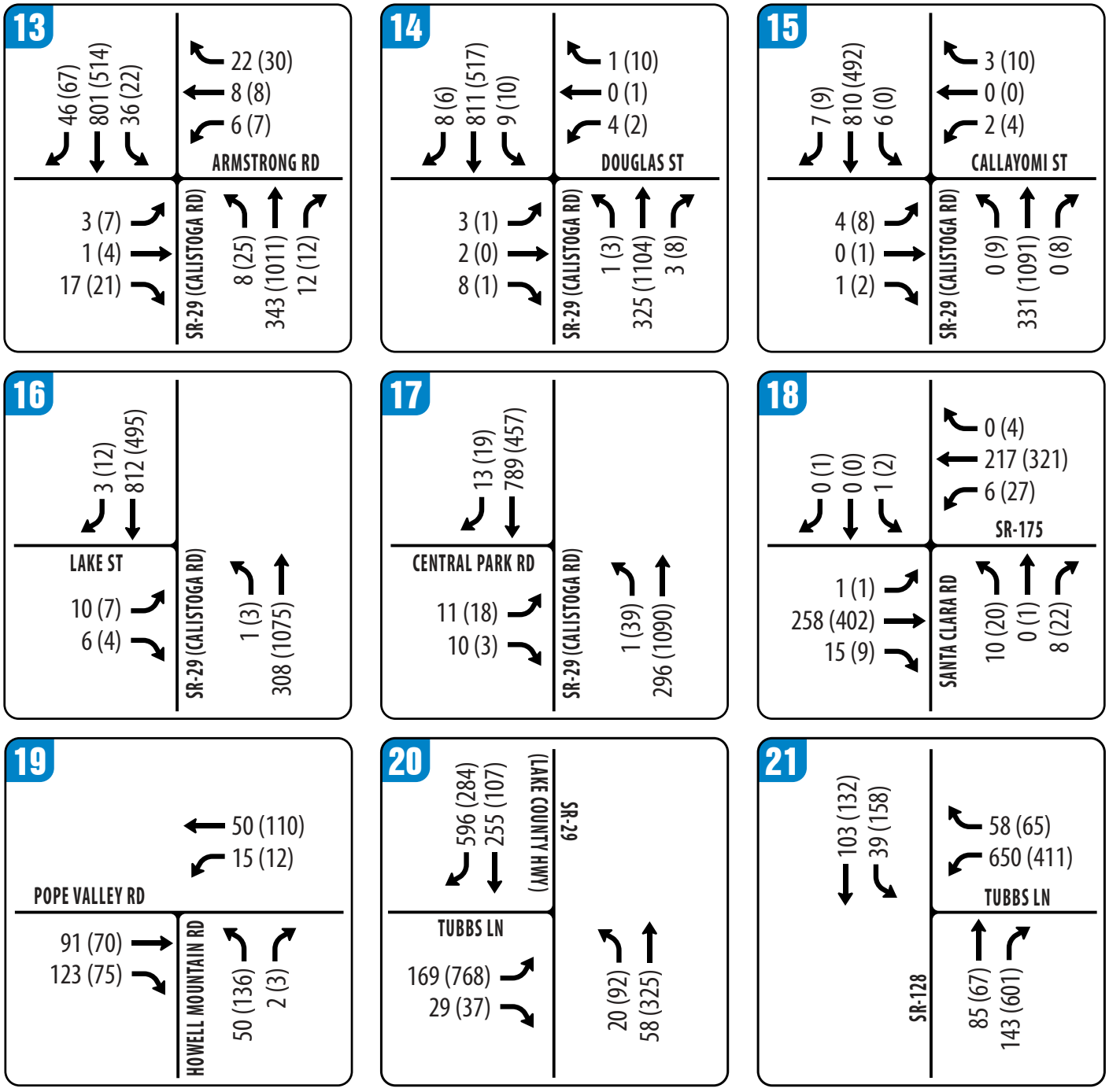

FIGURE A2 | CUMULATIVE PLUS FUTURE PHASES AM(PM) PEAK HOUR TRAFFIC VOLUMES – PAGE 2 OF 2
TRANSPORTATION IMPACT ANALYSIS
Maha Resort at Guenoc Valley
Lake County

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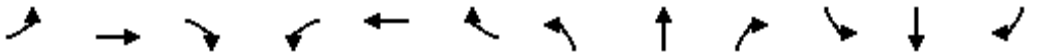


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	308	39	73	26	37	57	99	240	38	63	230	283
Future Volume (veh/h)	308	39	73	26	37	57	99	240	38	63	230	283
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	335	42	79	28	40	62	108	261	41	68	250	308
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	535	131	246	58	192	262	144	909	141	112	984	439
Arrive On Green	0.15	0.23	0.23	0.03	0.10	0.10	0.08	0.29	0.29	0.06	0.28	0.28
Sat Flow, veh/h	3456	581	1093	1781	1870	1585	1781	3083	478	1781	3554	1585
Grp Volume(v), veh/h	335	0	121	28	40	62	108	149	153	68	250	308
Grp Sat Flow(s),veh/h/ln	1728	0	1674	1781	1870	1585	1781	1777	1784	1781	1777	1585
Q Serve(g_s), s	4.2	0.0	2.8	0.7	0.9	1.6	2.8	3.0	3.1	1.7	2.6	8.2
Cycle Q Clear(g_c), s	4.2	0.0	2.8	0.7	0.9	1.6	2.8	3.0	3.1	1.7	2.6	8.2
Prop In Lane	1.00		0.65	1.00		1.00	1.00		0.27	1.00		1.00
Lane Grp Cap(c), veh/h	535	0	377	58	192	262	144	524	526	112	984	439
V/C Ratio(X)	0.63	0.00	0.32	0.48	0.21	0.24	0.75	0.28	0.29	0.61	0.25	0.70
Avail Cap(c_a), veh/h	1810	0	1234	362	780	760	781	1652	1659	552	2849	1271
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.5	0.0	15.1	22.2	19.2	16.9	21.0	12.7	12.7	21.4	13.2	15.2
Incr Delay (d2), s/veh	1.2	0.0	0.5	6.1	0.5	0.5	7.7	0.3	0.3	5.3	0.1	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	1.0	0.4	0.4	0.5	1.4	1.1	1.1	0.8	0.9	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.7	0.0	15.6	28.3	19.8	17.4	28.7	13.0	13.0	26.6	13.3	17.2
LnGrp LOS	B	A	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		456			130			410			626	
Approach Delay, s/veh		18.6			20.5			17.1			16.7	
Approach LOS		B			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.4	18.3	6.0	15.0	8.3	17.5	11.7	9.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.5	43.5	9.5	34.5	20.5	37.5	24.5	19.5
Max Q Clear Time (g_c+I1), s	3.7	5.1	2.7	4.8	4.8	10.2	6.2	3.6
Green Ext Time (p_c), s	0.1	1.9	0.0	0.7	0.2	2.8	1.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	17.6
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	0	15	0	44	0	298	5	43	334	2
Future Vol, veh/h	1	0	0	15	0	44	0	298	5	43	334	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	-	-	-	375	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	0	16	0	48	0	324	5	47	363	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	809	787	364	785	786	327	365	0	0	329	0	0
Stage 1	458	458	-	327	327	-	-	-	-	-	-	-
Stage 2	351	329	-	458	459	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	299	324	681	310	324	714	1194	-	-	1231	-	-
Stage 1	583	567	-	686	648	-	-	-	-	-	-	-
Stage 2	666	646	-	583	566	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	271	312	681	301	312	714	1194	-	-	1231	-	-
Mov Cap-2 Maneuver	271	312	-	301	312	-	-	-	-	-	-	-
Stage 1	583	545	-	686	648	-	-	-	-	-	-	-
Stage 2	621	646	-	561	544	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.3	12.2	0	0.9
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1194	-	-	271	301	714	1231	-	-
HCM Lane V/C Ratio	-	-	-	0.004	0.054	0.067	0.038	-	-
HCM Control Delay (s)	0	-	-	18.3	17.6	10.4	8	-	-
HCM Lane LOS	A	-	-	C	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	3.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	108	62	208	47	21	330
Future Vol, veh/h	108	62	208	47	21	330
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	117	67	226	51	23	359

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	657	252	0	0	277	0
Stage 1	252	-	-	-	-	-
Stage 2	405	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	430	787	-	-	1286	-
Stage 1	790	-	-	-	-	-
Stage 2	673	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	422	787	-	-	1286	-
Mov Cap-2 Maneuver	422	-	-	-	-	-
Stage 1	790	-	-	-	-	-
Stage 2	661	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.1	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	508	1286	-
HCM Lane V/C Ratio	-	-	0.364	0.018	-
HCM Control Delay (s)	-	-	16.1	7.8	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	1.6	0.1	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	1	45	0	41	1	317	9	11	448	1
Future Vol, veh/h	3	0	1	45	0	41	1	317	9	11	448	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	50	275	-	275	375	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	1	49	0	45	1	345	10	12	487	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	886	868	487	859	859	345	488	0	0	355	0	0
Stage 1	511	511	-	347	347	-	-	-	-	-	-	-
Stage 2	375	357	-	512	512	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	265	290	581	277	294	698	1075	-	-	1204	-	-
Stage 1	545	537	-	669	635	-	-	-	-	-	-	-
Stage 2	646	628	-	545	536	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	246	287	581	274	291	698	1075	-	-	1204	-	-
Mov Cap-2 Maneuver	246	287	-	274	291	-	-	-	-	-	-	-
Stage 1	544	532	-	668	634	-	-	-	-	-	-	-
Stage 2	604	627	-	539	531	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.7	16	0	0.2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1075	-	-	246	581	274	698	1204	-	-
HCM Lane V/C Ratio	0.001	-	-	0.013	0.002	0.179	0.064	0.01	-	-
HCM Control Delay (s)	8.4	-	-	19.8	11.2	21	10.5	8	-	-
HCM Lane LOS	A	-	-	C	B	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0.6	0.2	0	-	-

Intersection	
Intersection Delay, s/veh	9.2
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	457	407	567
Demand Flow Rate, veh/h	466	416	579
Vehicles Circulating, veh/h	234	93	355
Vehicles Exiting, veh/h	275	841	345
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	8.0	6.0	12.5
Approach LOS	A	A	B

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	466	416	579
Cap Entry Lane, veh/h	1087	1255	961
Entry HV Adj Factor	0.981	0.979	0.980
Flow Entry, veh/h	457	407	567
Cap Entry, veh/h	1066	1229	942
V/C Ratio	0.429	0.331	0.603
Control Delay, s/veh	8.0	6.0	12.5
LOS	A	A	B
95th %tile Queue, veh	2	1	4

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	1	3	1	4	5	337	3	1	726	21
Future Vol, veh/h	10	0	1	3	1	4	5	337	3	1	726	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	-	125	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	0	1	3	1	4	5	366	3	1	789	23

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1183	1182	801	1181	1192	368	812	0	0	369	0	0
Stage 1	803	803	-	378	378	-	-	-	-	-	-	-
Stage 2	380	379	-	803	814	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	166	190	384	167	187	677	814	-	-	1190	-	-
Stage 1	377	396	-	644	615	-	-	-	-	-	-	-
Stage 2	642	615	-	377	391	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	163	189	384	166	186	677	814	-	-	1190	-	-
Mov Cap-2 Maneuver	163	189	-	166	186	-	-	-	-	-	-	-
Stage 1	375	396	-	640	611	-	-	-	-	-	-	-
Stage 2	633	611	-	376	391	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	27.4	18.6	0.1	0
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	814	-	-	163	384	273	1190	-	-
HCM Lane V/C Ratio	0.007	-	-	0.067	0.003	0.032	0.001	-	-
HCM Control Delay (s)	9.5	-	-	28.7	14.4	18.6	8	-	-
HCM Lane LOS	A	-	-	D	B	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	0.1	0	-	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	25	302	25	61	647
Future Vol, veh/h	14	25	302	25	61	647
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	325	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	27	328	27	66	703

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1177	342	0	0	355	0
Stage 1	342	-	-	-	-	-
Stage 2	835	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	211	701	-	-	1204	-
Stage 1	719	-	-	-	-	-
Stage 2	426	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	199	701	-	-	1204	-
Mov Cap-2 Maneuver	199	-	-	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	403	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.4	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	199	701	1204	-
HCM Lane V/C Ratio	-	-	0.076	0.039	0.055	-
HCM Control Delay (s)	-	-	24.6	10.3	8.2	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.1	0.2	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	94	6	0	53	5	2
Future Vol, veh/h	94	6	0	53	5	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	102	7	0	58	5	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	109	0	164	106
Stage 1	-	-	-	-	106	-
Stage 2	-	-	-	-	58	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1481	-	827	948
Stage 1	-	-	-	-	918	-
Stage 2	-	-	-	-	965	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1481	-	827	948
Mov Cap-2 Maneuver	-	-	-	-	827	-
Stage 1	-	-	-	-	918	-
Stage 2	-	-	-	-	965	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	858	-	-	1481	-
HCM Lane V/C Ratio	0.009	-	-	-	-
HCM Control Delay (s)	9.2	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	78	2	2	33	5	0
Future Vol, veh/h	78	2	2	33	5	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	85	2	2	36	5	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	87	0	126	86
Stage 1	-	-	-	-	86	-
Stage 2	-	-	-	-	40	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1509	-	869	973
Stage 1	-	-	-	-	937	-
Stage 2	-	-	-	-	982	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1509	-	868	973
Mov Cap-2 Maneuver	-	-	-	-	868	-
Stage 1	-	-	-	-	937	-
Stage 2	-	-	-	-	981	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	868	-	-	1509	-
HCM Lane V/C Ratio	0.006	-	-	0.001	-
HCM Control Delay (s)	9.2	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	137	6	39	6	33	17	10	247	1	11	453	311
Future Volume (veh/h)	137	6	39	6	33	17	10	247	1	11	453	311
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	149	7	42	7	36	18	11	268	1	12	492	338
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	343	19	58	110	214	96	330	1124	4	766	623	428
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.60	0.60	0.60	0.60	0.60	0.60
Sat Flow, veh/h	1055	104	312	84	1157	520	661	1862	7	1110	1033	710
Grp Volume(v), veh/h	198	0	0	61	0	0	11	0	269	12	0	830
Grp Sat Flow(s),veh/h/ln	1470	0	0	1761	0	0	661	0	1869	1110	0	1743
Q Serve(g_s), s	4.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	2.8	0.2	0.0	15.3
Cycle Q Clear(g_c), s	5.3	0.0	0.0	1.2	0.0	0.0	15.8	0.0	2.8	3.0	0.0	15.3
Prop In Lane	0.75		0.21	0.11		0.30	1.00		0.00	1.00		0.41
Lane Grp Cap(c), veh/h	420	0	0	419	0	0	330	0	1128	766	0	1052
V/C Ratio(X)	0.47	0.00	0.00	0.15	0.00	0.00	0.03	0.00	0.24	0.02	0.00	0.79
Avail Cap(c_a), veh/h	913	0	0	1017	0	0	839	0	2568	1621	0	2394
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.1	0.0	0.0	14.6	0.0	0.0	12.4	0.0	3.9	4.6	0.0	6.4
Incr Delay (d2), s/veh	0.8	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	0.0	0.4	0.0	0.0	0.1	0.0	0.6	0.0	0.0	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.0	0.0	0.0	14.8	0.0	0.0	12.4	0.0	4.0	4.6	0.0	7.7
LnGrp LOS	B	A	A	B	A	A	B	A	A	A	A	A
Approach Vol, veh/h		198			61			280			842	
Approach Delay, s/veh		17.0			14.8			4.3			7.7	
Approach LOS		B			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		30.1		12.3		30.1		12.3				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		58.3		22.7		58.3		22.7				
Max Q Clear Time (g_c+I1), s		17.8		7.3		17.3		3.2				
Green Ext Time (p_c), s		1.8		1.0		8.3		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			8.7									
HCM 6th LOS			A									

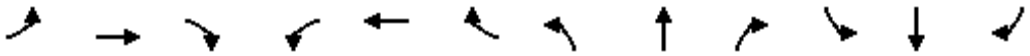
Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	21	2	14	3	3	4	12	227	9	11	568	4
Future Vol, veh/h	21	2	14	3	3	4	12	227	9	11	568	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	23	2	15	3	3	4	13	247	10	12	617	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	925	926	619	930	923	252	621	0	0	257	0	0
Stage 1	643	643	-	278	278	-	-	-	-	-	-	-
Stage 2	282	283	-	652	645	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	250	269	489	248	270	787	960	-	-	1308	-	-
Stage 1	462	468	-	728	680	-	-	-	-	-	-	-
Stage 2	725	677	-	457	467	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	241	261	489	233	262	787	960	-	-	1308	-	-
Mov Cap-2 Maneuver	241	261	-	233	262	-	-	-	-	-	-	-
Stage 1	455	461	-	716	669	-	-	-	-	-	-	-
Stage 2	706	666	-	435	460	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.8	15.9	0.4	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	960	-	-	300	340	1308	-	-
HCM Lane V/C Ratio	0.014	-	-	0.134	0.032	0.009	-	-
HCM Control Delay (s)	8.8	0	-	18.8	15.9	7.8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0.1	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	21	98	22	14	12	31	186	6	7	459	60
Future Volume (veh/h)	89	21	98	22	14	12	31	186	6	7	459	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	97	23	107	24	15	13	34	202	7	8	499	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	298	61	161	296	164	92	191	739	23	130	753	97
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.47	0.47	0.47	0.47	0.47	0.47
Sat Flow, veh/h	540	279	730	511	744	418	103	1583	50	7	1613	208
Grp Volume(v), veh/h	227	0	0	52	0	0	243	0	0	572	0	0
Grp Sat Flow(s),veh/h/ln	1548	0	0	1673	0	0	1736	0	0	1829	0	0
Q Serve(g_s), s	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.8	0.0	0.0	0.7	0.0	0.0	2.3	0.0	0.0	7.0	0.0	0.0
Prop In Lane	0.43		0.47	0.46		0.25	0.14		0.03	0.01		0.11
Lane Grp Cap(c), veh/h	520	0	0	552	0	0	953	0	0	980	0	0
V/C Ratio(X)	0.44	0.00	0.00	0.09	0.00	0.00	0.26	0.00	0.00	0.58	0.00	0.00
Avail Cap(c_a), veh/h	1633	0	0	1636	0	0	3171	0	0	3513	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.2	0.0	0.0	9.0	0.0	0.0	4.7	0.0	0.0	5.9	0.0	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	0.2	0.0	0.0	0.4	0.0	0.0	1.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.7	0.0	0.0	9.1	0.0	0.0	4.8	0.0	0.0	6.5	0.0	0.0
LnGrp LOS	B	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		227			52			243			572	
Approach Delay, s/veh		10.7			9.1			4.8			6.5	
Approach LOS		B			A			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		17.9		10.8		17.9		10.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		53.5		27.5		53.5		27.5				
Max Q Clear Time (g_c+I1), s		4.3		5.8		9.0		2.7				
Green Ext Time (p_c), s		1.7		1.3		4.5		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			7.1									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	3	1	15	5	7	19	7	215	11	31	534	40
Future Vol, veh/h	3	1	15	5	7	19	7	215	11	31	534	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	1	16	5	8	21	8	234	12	34	580	43

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	941	932	602	934	947	240	623	0	0	246	0	0
Stage 1	670	670	-	256	256	-	-	-	-	-	-	-
Stage 2	271	262	-	678	691	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	243	266	500	246	261	799	958	-	-	1320	-	-
Stage 1	446	455	-	749	696	-	-	-	-	-	-	-
Stage 2	735	691	-	442	446	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	222	253	500	228	248	799	958	-	-	1320	-	-
Mov Cap-2 Maneuver	222	253	-	228	248	-	-	-	-	-	-	-
Stage 1	442	437	-	742	689	-	-	-	-	-	-	-
Stage 2	701	684	-	409	428	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.5	14.3	0.3	0.4
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	958	-	-	400	419	1320	-	-
HCM Lane V/C Ratio	0.008	-	-	0.052	0.08	0.026	-	-
HCM Control Delay (s)	8.8	0	-	14.5	14.3	7.8	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	3	2	7	4	0	1	1	200	3	8	543	7
Future Vol, veh/h	3	2	7	4	0	1	1	200	3	8	543	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	2	8	4	0	1	1	217	3	9	590	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	833	834	594	838	837	219	598	0	0	220	0	0
Stage 1	612	612	-	221	221	-	-	-	-	-	-	-
Stage 2	221	222	-	617	616	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	288	304	505	286	303	821	979	-	-	1349	-	-
Stage 1	480	484	-	781	720	-	-	-	-	-	-	-
Stage 2	781	720	-	477	482	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	285	301	505	278	300	821	979	-	-	1349	-	-
Mov Cap-2 Maneuver	285	301	-	278	300	-	-	-	-	-	-	-
Stage 1	480	479	-	780	719	-	-	-	-	-	-	-
Stage 2	779	719	-	463	477	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.6	16.4	0	0.1
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	979	-	-	387	320	1349	-	-
HCM Lane V/C Ratio	0.001	-	-	0.034	0.017	0.006	-	-
HCM Control Delay (s)	8.7	0	-	14.6	16.4	7.7	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	0	1	2	0	3	0	208	0	5	545	2
Future Vol, veh/h	1	0	1	2	0	3	0	208	0	5	545	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	1	2	0	3	0	226	0	5	592	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	831	829	593	830	830	226	594	0	0	226	0	0
Stage 1	603	603	-	226	226	-	-	-	-	-	-	-
Stage 2	228	226	-	604	604	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	289	306	506	289	306	813	982	-	-	1342	-	-
Stage 1	486	488	-	777	717	-	-	-	-	-	-	-
Stage 2	775	717	-	485	488	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	286	304	506	287	304	813	982	-	-	1342	-	-
Mov Cap-2 Maneuver	286	304	-	287	304	-	-	-	-	-	-	-
Stage 1	486	485	-	777	717	-	-	-	-	-	-	-
Stage 2	772	717	-	481	485	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.9	12.8	0	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	982	-	-	365	469	1342	-	-
HCM Lane V/C Ratio	-	-	-	0.006	0.012	0.004	-	-
HCM Control Delay (s)	0	-	-	14.9	12.8	7.7	0	-
HCM Lane LOS	A	-	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	5	1	187	547	3
Future Vol, veh/h	9	5	1	187	547	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	5	1	203	595	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	802	597	598	0	-	0
Stage 1	597	-	-	-	-	-
Stage 2	205	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	353	503	979	-	-	-
Stage 1	550	-	-	-	-	-
Stage 2	829	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	353	503	979	-	-	-
Mov Cap-2 Maneuver	353	-	-	-	-	-
Stage 1	549	-	-	-	-	-
Stage 2	829	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	979	-	395	-	-
HCM Lane V/C Ratio	0.001	-	0.039	-	-
HCM Control Delay (s)	8.7	0	14.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	9	1	181	533	6
Future Vol, veh/h	6	9	1	181	533	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	275	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	10	1	197	579	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	782	583	586	0	-	0
Stage 1	583	-	-	-	-	-
Stage 2	199	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	363	512	989	-	-	-
Stage 1	558	-	-	-	-	-
Stage 2	835	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	363	512	989	-	-	-
Mov Cap-2 Maneuver	363	-	-	-	-	-
Stage 1	557	-	-	-	-	-
Stage 2	835	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	989	-	363	512	-	-
HCM Lane V/C Ratio	0.001	-	0.018	0.019	-	-
HCM Control Delay (s)	8.6	-	15.1	12.2	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	166	13	2	68	0	9	0	5	1	0	0
Future Vol, veh/h	1	166	13	2	68	0	9	0	5	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	180	14	2	74	0	10	0	5	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	74	0	0	194	0	0	267	267	187	270	274	74
Stage 1	-	-	-	-	-	-	189	189	-	78	78	-
Stage 2	-	-	-	-	-	-	78	78	-	192	196	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1526	-	-	1379	-	-	686	639	855	683	633	988
Stage 1	-	-	-	-	-	-	813	744	-	931	830	-
Stage 2	-	-	-	-	-	-	931	830	-	810	739	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1526	-	-	1379	-	-	685	637	855	677	631	988
Mov Cap-2 Maneuver	-	-	-	-	-	-	685	637	-	677	631	-
Stage 1	-	-	-	-	-	-	812	743	-	930	828	-
Stage 2	-	-	-	-	-	-	929	828	-	804	738	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	10	10.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	737	1526	-	-	1379	-	-	677
HCM Lane V/C Ratio	0.021	0.001	-	-	0.002	-	-	0.002
HCM Control Delay (s)	10	7.4	0	-	7.6	0	-	10.3
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	44	68	13	26	21	2
Future Vol, veh/h	44	68	13	26	21	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	74	14	28	23	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	122	0	141	85
Stage 1	-	-	-	-	85	-
Stage 2	-	-	-	-	56	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1465	-	852	974
Stage 1	-	-	-	-	938	-
Stage 2	-	-	-	-	967	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1465	-	843	974
Mov Cap-2 Maneuver	-	-	-	-	843	-
Stage 1	-	-	-	-	938	-
Stage 2	-	-	-	-	957	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.5	9.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	853	-	-	1465	-
HCM Lane V/C Ratio	0.029	-	-	0.01	-
HCM Control Delay (s)	9.3	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	96	25	17	29	180	415
Future Vol, veh/h	96	25	17	29	180	415
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	104	27	18	32	196	451

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	490	422	647	0	-	0
Stage 1	422	-	-	-	-	-
Stage 2	68	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	537	632	939	-	-	-
Stage 1	662	-	-	-	-	-
Stage 2	955	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	526	632	939	-	-	-
Mov Cap-2 Maneuver	526	-	-	-	-	-
Stage 1	649	-	-	-	-	-
Stage 2	955	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.7	3.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	939	-	545	-	-
HCM Lane V/C Ratio	0.02	-	0.241	-	-
HCM Control Delay (s)	8.9	0	13.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.9	-	-

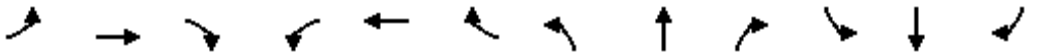
Intersection	
Int Delay, s/veh	17.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	478	35	74	82	26	89
Future Vol, veh/h	478	35	74	82	26	89
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	520	38	80	89	28	97

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	278	125	0	0	169	0
Stage 1	125	-	-	-	-	-
Stage 2	153	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	712	926	-	-	1409	-
Stage 1	901	-	-	-	-	-
Stage 2	875	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	698	926	-	-	1409	-
Mov Cap-2 Maneuver	698	-	-	-	-	-
Stage 1	901	-	-	-	-	-
Stage 2	858	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	26	0	1.7
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	710	1409	-
HCM Lane V/C Ratio	-	-	0.785	0.02	-
HCM Control Delay (s)	-	-	26	7.6	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	7.8	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	302	41	68	42	43	88	106	372	48	93	271	358
Future Volume (veh/h)	302	41	68	42	43	88	106	372	48	93	271	358
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	328	45	74	46	47	96	115	404	52	101	295	389
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	505	126	207	83	184	274	153	1065	136	133	1155	515
Arrive On Green	0.15	0.20	0.20	0.05	0.10	0.10	0.09	0.34	0.34	0.07	0.32	0.32
Sat Flow, veh/h	3456	636	1046	1781	1870	1585	1781	3169	405	1781	3554	1585
Grp Volume(v), veh/h	328	0	119	46	47	96	115	225	231	101	295	389
Grp Sat Flow(s),veh/h/ln	1728	0	1682	1781	1870	1585	1781	1777	1797	1781	1777	1585
Q Serve(g_s), s	4.7	0.0	3.2	1.3	1.2	2.8	3.3	5.0	5.1	2.9	3.2	11.5
Cycle Q Clear(g_c), s	4.7	0.0	3.2	1.3	1.2	2.8	3.3	5.0	5.1	2.9	3.2	11.5
Prop In Lane	1.00		0.62	1.00		1.00	1.00		0.23	1.00		1.00
Lane Grp Cap(c), veh/h	505	0	333	83	184	274	153	597	604	133	1155	515
V/C Ratio(X)	0.65	0.00	0.36	0.55	0.26	0.35	0.75	0.38	0.38	0.76	0.26	0.76
Avail Cap(c_a), veh/h	1490	0	983	393	699	711	666	1481	1498	563	2758	1230
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	0.0	18.1	24.3	21.8	19.0	23.3	13.2	13.2	23.7	13.0	15.8
Incr Delay (d2), s/veh	1.4	0.0	0.6	5.7	0.7	0.8	7.3	0.4	0.4	8.6	0.1	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	1.2	0.6	0.5	1.0	1.6	1.8	1.8	1.4	1.1	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.4	0.0	18.7	30.0	22.5	19.8	30.6	13.6	13.6	32.3	13.1	18.0
LnGrp LOS	C	A	B	C	C	B	C	B	B	C	B	B
Approach Vol, veh/h		447			189			571			785	
Approach Delay, s/veh		21.4			22.9			17.0			18.0	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.4	22.0	6.9	14.8	9.0	21.5	12.1	9.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	43.5	11.5	30.5	19.5	40.5	22.5	19.5
Max Q Clear Time (g_c+I1), s	4.9	7.1	3.3	5.2	5.3	13.5	6.7	4.8
Green Ext Time (p_c), s	0.2	3.0	0.0	0.6	0.2	3.5	1.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	19.0
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	0	4	0	47	0	505	15	77	339	2
Future Vol, veh/h	1	0	0	4	0	47	0	505	15	77	339	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	-	-	-	375	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	0	4	0	51	0	549	16	84	368	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1120	1102	369	1094	1095	557	370	0	0	565	0	0
Stage 1	537	537	-	557	557	-	-	-	-	-	-	-
Stage 2	583	565	-	537	538	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	184	212	677	191	214	530	1189	-	-	1007	-	-
Stage 1	528	523	-	515	512	-	-	-	-	-	-	-
Stage 2	498	508	-	528	522	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	156	194	677	179	196	530	1189	-	-	1007	-	-
Mov Cap-2 Maneuver	156	194	-	179	196	-	-	-	-	-	-	-
Stage 1	528	480	-	515	512	-	-	-	-	-	-	-
Stage 2	450	508	-	484	479	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	28.2	13.5	0	1.6
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1189	-	-	156	179	530	1007	-	-
HCM Lane V/C Ratio	-	-	-	0.007	0.024	0.096	0.083	-	-
HCM Control Delay (s)	0	-	-	28.2	25.6	12.5	8.9	-	-
HCM Lane LOS	A	-	-	D	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0.3	0.3	-	-

Intersection	
Int Delay, s/veh	3.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	58	47	489	132	93	292
Future Vol, veh/h	58	47	489	132	93	292
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	63	51	532	143	101	317

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1123	604	0	0	675	0
Stage 1	604	-	-	-	-	-
Stage 2	519	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	227	498	-	-	916	-
Stage 1	546	-	-	-	-	-
Stage 2	597	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	202	498	-	-	916	-
Mov Cap-2 Maneuver	202	-	-	-	-	-
Stage 1	546	-	-	-	-	-
Stage 2	531	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	27.1	0	2.3
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	275	916	-
HCM Lane V/C Ratio	-	-	0.415	0.11	-
HCM Control Delay (s)	-	-	27.1	9.4	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	1.9	0.4	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1	6	7	0	25	2	630	33	30	319	1
Future Vol, veh/h	3	1	6	7	0	25	2	630	33	30	319	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	50	275	-	275	375	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	1	7	8	0	27	2	685	36	33	347	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1134	1138	347	1107	1103	685	348	0	0	721	0	0
Stage 1	413	413	-	689	689	-	-	-	-	-	-	-
Stage 2	721	725	-	418	414	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	180	201	696	188	211	448	1211	-	-	881	-	-
Stage 1	616	594	-	436	446	-	-	-	-	-	-	-
Stage 2	419	430	-	612	593	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	164	193	696	180	203	448	1211	-	-	881	-	-
Mov Cap-2 Maneuver	164	193	-	180	203	-	-	-	-	-	-	-
Stage 1	615	572	-	435	445	-	-	-	-	-	-	-
Stage 2	393	429	-	582	571	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.8	16.3	0	0.8
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1211	-	-	170	696	180	448	881	-	-
HCM Lane V/C Ratio	0.002	-	-	0.026	0.009	0.042	0.061	0.037	-	-
HCM Control Delay (s)	8	-	-	26.7	10.2	25.9	13.6	9.2	-	-
HCM Lane LOS	A	-	-	D	B	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0.1	0.2	0.1	-	-

Intersection	
Intersection Delay, s/veh	14.7
Intersection LOS	B

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	232	989	319
Demand Flow Rate, veh/h	237	1008	325
Vehicles Circulating, veh/h	634	113	143
Vehicles Exiting, veh/h	487	355	728
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	9.2	18.9	5.6
Approach LOS	A	C	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	237	1008	325
Cap Entry Lane, veh/h	723	1230	1193
Entry HV Adj Factor	0.979	0.981	0.981
Flow Entry, veh/h	232	989	319
Cap Entry, veh/h	708	1206	1170
V/C Ratio	0.328	0.820	0.273
Control Delay, s/veh	9.2	18.9	5.6
LOS	A	C	A
95th %tile Queue, veh	1	10	1

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	0	3	5	0	10	2	882	3	6	290	3
Future Vol, veh/h	15	0	3	5	0	10	2	882	3	6	290	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	-	125	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	0	3	5	0	11	2	959	3	7	315	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1301	1297	317	1297	1297	961	318	0	0	962	0	0
Stage 1	331	331	-	965	965	-	-	-	-	-	-	-
Stage 2	970	966	-	332	332	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	138	162	724	139	162	311	1242	-	-	715	-	-
Stage 1	682	645	-	306	333	-	-	-	-	-	-	-
Stage 2	304	333	-	681	644	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	132	160	724	137	160	311	1242	-	-	715	-	-
Mov Cap-2 Maneuver	132	160	-	137	160	-	-	-	-	-	-	-
Stage 1	681	639	-	305	332	-	-	-	-	-	-	-
Stage 2	293	332	-	671	638	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	31.8	22.8	0	0.2
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1242	-	-	132	724	218	715	-	-
HCM Lane V/C Ratio	0.002	-	-	0.124	0.005	0.075	0.009	-	-
HCM Control Delay (s)	7.9	-	-	36.1	10	22.8	10.1	-	-
HCM Lane LOS	A	-	-	E	B	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0	0.2	0	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	40	114	797	27	17	265
Future Vol, veh/h	40	114	797	27	17	265
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	325	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	124	866	29	18	288

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1205	881	0	0	895	0
Stage 1	881	-	-	-	-	-
Stage 2	324	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	203	346	-	-	758	-
Stage 1	405	-	-	-	-	-
Stage 2	733	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	198	346	-	-	758	-
Mov Cap-2 Maneuver	198	-	-	-	-	-
Stage 1	405	-	-	-	-	-
Stage 2	715	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.9	0	0.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	198	346	758	-
HCM Lane V/C Ratio	-	-	0.22	0.358	0.024	-
HCM Control Delay (s)	-	-	28.2	21.1	9.9	-
HCM Lane LOS	-	-	D	C	A	-
HCM 95th %tile Q(veh)	-	-	0.8	1.6	0.1	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	47	3	2	153	4	1
Future Vol, veh/h	47	3	2	153	4	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	51	3	2	166	4	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	54	0	223	53
Stage 1	-	-	-	-	53	-
Stage 2	-	-	-	-	170	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1551	-	765	1014
Stage 1	-	-	-	-	970	-
Stage 2	-	-	-	-	860	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1551	-	764	1014
Mov Cap-2 Maneuver	-	-	-	-	764	-
Stage 1	-	-	-	-	970	-
Stage 2	-	-	-	-	859	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	804	-	-	1551	-
HCM Lane V/C Ratio	0.007	-	-	0.001	-
HCM Control Delay (s)	9.5	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	38	3	1	130	2	0
Future Vol, veh/h	38	3	1	130	2	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	3	1	141	2	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	44	0	186	43
Stage 1	-	-	-	-	43	-
Stage 2	-	-	-	-	143	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1564	-	803	1027
Stage 1	-	-	-	-	979	-
Stage 2	-	-	-	-	884	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1564	-	802	1027
Mov Cap-2 Maneuver	-	-	-	-	802	-
Stage 1	-	-	-	-	979	-
Stage 2	-	-	-	-	883	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	802	-	-	1564	-
HCM Lane V/C Ratio	0.003	-	-	0.001	-
HCM Control Delay (s)	9.5	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	95	3	35	35	10	41	14	710	13	8	280	99
Future Volume (veh/h)	95	3	35	35	10	41	14	710	13	8	280	99
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	103	3	38	38	11	45	15	772	14	9	304	108
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	343	8	59	228	50	115	665	1070	19	411	770	274
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.58	0.58	0.58	0.58	0.58	0.58
Sat Flow, veh/h	1084	53	407	521	350	800	974	1831	33	689	1318	468
Grp Volume(v), veh/h	144	0	0	94	0	0	15	0	786	9	0	412
Grp Sat Flow(s),veh/h/ln	1544	0	0	1672	0	0	974	0	1864	689	0	1786
Q Serve(g_s), s	1.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	10.0	0.3	0.0	4.1
Cycle Q Clear(g_c), s	2.7	0.0	0.0	1.6	0.0	0.0	4.4	0.0	10.0	10.3	0.0	4.1
Prop In Lane	0.72		0.26	0.40		0.48	1.00		0.02	1.00		0.26
Lane Grp Cap(c), veh/h	409	0	0	393	0	0	665	0	1089	411	0	1043
V/C Ratio(X)	0.35	0.00	0.00	0.24	0.00	0.00	0.02	0.00	0.72	0.02	0.00	0.39
Avail Cap(c_a), veh/h	1079	0	0	1113	0	0	1876	0	3407	1267	0	3264
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.2	0.0	0.0	12.8	0.0	0.0	4.9	0.0	4.9	8.7	0.0	3.7
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	0.5	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.7	0.0	0.0	13.1	0.0	0.0	4.9	0.0	5.9	8.7	0.0	4.0
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		144			94			801			421	
Approach Delay, s/veh		13.7			13.1			5.8			4.1	
Approach LOS		B			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.8		9.3		23.8		9.3				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		60.5		20.5		60.5		20.5				
Max Q Clear Time (g_c+I1), s		12.0		4.7		12.3		3.6				
Green Ext Time (p_c), s		7.3		0.6		3.1		0.4				

Intersection Summary												
HCM 6th Ctrl Delay			6.6									
HCM 6th LOS			A									

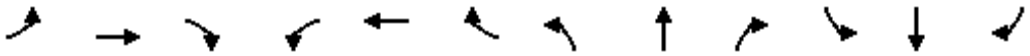
Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	6	1	5	3	0	4	5	710	13	9	374	6
Future Vol, veh/h	6	1	5	3	0	4	5	710	13	9	374	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1	5	3	0	4	5	772	14	10	407	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1222	1227	411	1223	1223	779	414	0	0	786	0	0
Stage 1	431	431	-	789	789	-	-	-	-	-	-	-
Stage 2	791	796	-	434	434	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	156	178	641	156	179	396	1145	-	-	833	-	-
Stage 1	603	583	-	384	402	-	-	-	-	-	-	-
Stage 2	383	399	-	600	581	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	151	174	641	151	175	396	1145	-	-	833	-	-
Mov Cap-2 Maneuver	151	174	-	151	175	-	-	-	-	-	-	-
Stage 1	598	574	-	381	399	-	-	-	-	-	-	-
Stage 2	376	396	-	584	572	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22	20.9	0.1	0.2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1145	-	-	225	234	833	-	-
HCM Lane V/C Ratio	0.005	-	-	0.058	0.033	0.012	-	-
HCM Control Delay (s)	8.2	0	-	22	20.9	9.4	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	124	12	68	22	22	12	53	585	8	2	305	85
Future Volume (veh/h)	124	12	68	22	22	12	53	585	8	2	305	85
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	135	13	74	24	24	13	58	636	9	2	332	92
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	340	39	105	235	195	77	155	894	12	105	745	206
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.53	0.53	0.53	0.53	0.53	0.53
Sat Flow, veh/h	818	183	501	425	928	367	80	1689	23	1	1409	388
Grp Volume(v), veh/h	222	0	0	61	0	0	703	0	0	426	0	0
Grp Sat Flow(s),veh/h/ln	1502	0	0	1720	0	0	1791	0	0	1798	0	0
Q Serve(g_s), s	3.7	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	4.7	0.0	0.0	1.0	0.0	0.0	10.1	0.0	0.0	5.0	0.0	0.0
Prop In Lane	0.61		0.33	0.39		0.21	0.08		0.01	0.00		0.22
Lane Grp Cap(c), veh/h	484	0	0	507	0	0	1061	0	0	1056	0	0
V/C Ratio(X)	0.46	0.00	0.00	0.12	0.00	0.00	0.66	0.00	0.00	0.40	0.00	0.00
Avail Cap(c_a), veh/h	1167	0	0	1234	0	0	3022	0	0	3083	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.5	0.0	0.0	11.2	0.0	0.0	6.2	0.0	0.0	5.0	0.0	0.0
Incr Delay (d2), s/veh	0.7	0.0	0.0	0.1	0.0	0.0	0.7	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	0.0	0.3	0.0	0.0	2.0	0.0	0.0	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.2	0.0	0.0	11.3	0.0	0.0	6.9	0.0	0.0	5.3	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		222			61			703			426	
Approach Delay, s/veh		13.2			11.3			6.9			5.3	
Approach LOS		B			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		22.8		11.8		22.8		11.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		57.5		23.5		57.5		23.5				
Max Q Clear Time (g_c+I1), s		12.1		6.7		7.0		3.0				
Green Ext Time (p_c), s		6.2		1.2		3.1		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			7.6									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	6	4	18	6	7	26	21	652	11	19	293	58
Future Vol, veh/h	6	4	18	6	7	26	21	652	11	19	293	58
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	4	20	7	8	28	23	709	12	21	318	63

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1171	1159	350	1165	1184	715	381	0	0	721	0	0
Stage 1	392	392	-	761	761	-	-	-	-	-	-	-
Stage 2	779	767	-	404	423	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	170	196	693	171	189	431	1177	-	-	881	-	-
Stage 1	633	606	-	398	414	-	-	-	-	-	-	-
Stage 2	389	411	-	623	588	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	146	184	693	155	177	431	1177	-	-	881	-	-
Mov Cap-2 Maneuver	146	184	-	155	177	-	-	-	-	-	-	-
Stage 1	612	587	-	385	400	-	-	-	-	-	-	-
Stage 2	345	397	-	582	570	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.6	20.1	0.2	0.5
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1177	-	-	315	281	881	-	-
HCM Lane V/C Ratio	0.019	-	-	0.097	0.151	0.023	-	-
HCM Control Delay (s)	8.1	0	-	17.6	20.1	9.2	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.5	0.1	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	0	1	2	1	9	3	733	7	9	295	5
Future Vol, veh/h	1	0	1	2	1	9	3	733	7	9	295	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	1	2	1	10	3	797	8	10	321	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1157	1155	324	1151	1153	801	326	0	0	805	0	0
Stage 1	344	344	-	807	807	-	-	-	-	-	-	-
Stage 2	813	811	-	344	346	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	173	197	717	175	197	384	1234	-	-	819	-	-
Stage 1	671	637	-	375	394	-	-	-	-	-	-	-
Stage 2	372	393	-	671	635	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	165	193	717	172	193	384	1234	-	-	819	-	-
Mov Cap-2 Maneuver	165	193	-	172	193	-	-	-	-	-	-	-
Stage 1	668	627	-	374	392	-	-	-	-	-	-	-
Stage 2	360	391	-	660	625	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.5	17.6	0	0.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1234	-	-	268	298	819	-	-
HCM Lane V/C Ratio	0.003	-	-	0.008	0.044	0.012	-	-
HCM Control Delay (s)	7.9	0	-	18.5	17.6	9.4	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	1	2	4	0	9	8	728	7	0	279	3
Future Vol, veh/h	0	1	2	4	0	9	8	728	7	0	279	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	2	4	0	10	9	791	8	0	303	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1123	1122	305	1119	1119	795	306	0	0	799	0	0
Stage 1	305	305	-	813	813	-	-	-	-	-	-	-
Stage 2	818	817	-	306	306	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	183	206	735	184	207	388	1255	-	-	824	-	-
Stage 1	705	662	-	372	392	-	-	-	-	-	-	-
Stage 2	370	390	-	704	662	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	177	203	735	181	204	388	1255	-	-	824	-	-
Mov Cap-2 Maneuver	177	203	-	181	204	-	-	-	-	-	-	-
Stage 1	696	662	-	367	387	-	-	-	-	-	-	-
Stage 2	356	385	-	701	662	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.3	18.2	0.1	0
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1255	-	-	392	287	824	-	-
HCM Lane V/C Ratio	0.007	-	-	0.008	0.049	-	-	-
HCM Control Delay (s)	7.9	0	-	14.3	18.2	0	-	-
HCM Lane LOS	A	A	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	4	3	714	281	11
Future Vol, veh/h	6	4	3	714	281	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	4	3	776	305	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1093	311	317	0	-	0
Stage 1	311	-	-	-	-	-
Stage 2	782	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	237	729	1243	-	-	-
Stage 1	743	-	-	-	-	-
Stage 2	451	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	236	729	1243	-	-	-
Mov Cap-2 Maneuver	236	-	-	-	-	-
Stage 1	740	-	-	-	-	-
Stage 2	451	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1243	-	324	-	-
HCM Lane V/C Ratio	0.003	-	0.034	-	-
HCM Control Delay (s)	7.9	0	16.5	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	3	34	736	254	11
Future Vol, veh/h	7	3	34	736	254	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	275	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	3	37	800	276	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1156	282	288	0	-	0
Stage 1	282	-	-	-	-	-
Stage 2	874	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	217	757	1274	-	-	-
Stage 1	766	-	-	-	-	-
Stage 2	408	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	211	757	1274	-	-	-
Mov Cap-2 Maneuver	211	-	-	-	-	-
Stage 1	744	-	-	-	-	-
Stage 2	408	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.8	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1274	-	211	757	-	-
HCM Lane V/C Ratio	0.029	-	0.036	0.004	-	-
HCM Control Delay (s)	7.9	-	22.7	9.8	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	138	8	19	170	4	17	1	14	2	0	1
Future Vol, veh/h	1	138	8	19	170	4	17	1	14	2	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	150	9	21	185	4	18	1	15	2	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	189	0	0	159	0	0	387	388	155	394	390	187
Stage 1	-	-	-	-	-	-	157	157	-	229	229	-
Stage 2	-	-	-	-	-	-	230	231	-	165	161	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1385	-	-	1420	-	-	572	547	891	566	545	855
Stage 1	-	-	-	-	-	-	845	768	-	774	715	-
Stage 2	-	-	-	-	-	-	773	713	-	837	765	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1385	-	-	1420	-	-	563	537	891	548	535	855
Mov Cap-2 Maneuver	-	-	-	-	-	-	563	537	-	548	535	-
Stage 1	-	-	-	-	-	-	844	767	-	773	703	-
Stage 2	-	-	-	-	-	-	759	701	-	821	764	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.7	10.7	10.8
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	670	1385	-	-	1420	-	-	623
HCM Lane V/C Ratio	0.052	0.001	-	-	0.015	-	-	0.005
HCM Control Delay (s)	10.7	7.6	0	-	7.6	0	-	10.8
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	3.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	28	26	11	46	61	3
Future Vol, veh/h	28	26	11	46	61	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	28	12	50	66	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	58	0	118	44
Stage 1	-	-	-	-	44	-
Stage 2	-	-	-	-	74	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1546	-	878	1026
Stage 1	-	-	-	-	978	-
Stage 2	-	-	-	-	949	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1546	-	871	1026
Mov Cap-2 Maneuver	-	-	-	-	871	-
Stage 1	-	-	-	-	978	-
Stage 2	-	-	-	-	941	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	877	-	-	1546	-
HCM Lane V/C Ratio	0.079	-	-	0.008	-
HCM Control Delay (s)	9.5	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection	
Int Delay, s/veh	92.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	524	32	80	225	54	150
Future Vol, veh/h	524	32	80	225	54	150
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	570	35	87	245	59	163

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	560	141	222	0	-	0
Stage 1	141	-	-	-	-	-
Stage 2	419	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	~ 489	907	1347	-	-	-
Stage 1	886	-	-	-	-	-
Stage 2	664	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 452	907	1347	-	-	-
Mov Cap-2 Maneuver	~ 452	-	-	-	-	-
Stage 1	820	-	-	-	-	-
Stage 2	664	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	175.4	2.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1347	-	465	-	-
HCM Lane V/C Ratio	0.065	-	1.3	-	-
HCM Control Delay (s)	7.9	0	175.4	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0.2	-	26.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

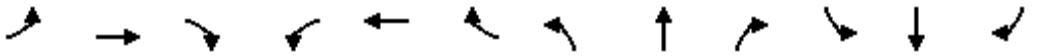
Intersection	
Int Delay, s/veh	15.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	276	42	58	403	114	115
Future Vol, veh/h	276	42	58	403	114	115
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	300	46	63	438	124	125

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	655	282	0	0	501	0
Stage 1	282	-	-	-	-	-
Stage 2	373	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	431	757	-	-	1063	-
Stage 1	766	-	-	-	-	-
Stage 2	696	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	381	757	-	-	1063	-
Mov Cap-2 Maneuver	381	-	-	-	-	-
Stage 1	766	-	-	-	-	-
Stage 2	615	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	46.9	0	4.4
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	408	1063	-
HCM Lane V/C Ratio	-	-	0.847	0.117	-
HCM Control Delay (s)	-	-	46.9	8.8	-
HCM Lane LOS	-	-	E	A	-
HCM 95th %tile Q(veh)	-	-	8.1	0.4	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	308	39	86	31	37	57	112	268	42	63	258	283
Future Volume (veh/h)	308	39	86	31	37	57	112	268	42	63	258	283
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	335	42	93	34	40	62	122	291	46	68	280	308
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	531	112	249	68	190	259	163	947	148	111	989	441
Arrive On Green	0.15	0.22	0.22	0.04	0.10	0.10	0.09	0.31	0.31	0.06	0.28	0.28
Sat Flow, veh/h	3456	518	1146	1781	1870	1585	1781	3079	481	1781	3554	1585
Grp Volume(v), veh/h	335	0	135	34	40	62	122	166	171	68	280	308
Grp Sat Flow(s),veh/h/ln	1728	0	1664	1781	1870	1585	1781	1777	1784	1781	1777	1585
Q Serve(g_s), s	4.4	0.0	3.3	0.9	0.9	1.6	3.2	3.4	3.5	1.8	3.0	8.3
Cycle Q Clear(g_c), s	4.4	0.0	3.3	0.9	0.9	1.6	3.2	3.4	3.5	1.8	3.0	8.3
Prop In Lane	1.00		0.69	1.00		1.00	1.00		0.27	1.00		1.00
Lane Grp Cap(c), veh/h	531	0	361	68	190	259	163	547	549	111	989	441
V/C Ratio(X)	0.63	0.00	0.37	0.50	0.21	0.24	0.75	0.30	0.31	0.61	0.28	0.70
Avail Cap(c_a), veh/h	1765	0	1197	353	760	743	799	1649	1655	501	2704	1206
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.0	0.0	16.0	22.6	19.8	17.5	21.3	12.7	12.7	21.9	13.6	15.5
Incr Delay (d2), s/veh	1.2	0.0	0.6	5.7	0.5	0.5	6.7	0.3	0.3	5.4	0.2	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	1.2	0.5	0.4	0.6	1.5	1.2	1.2	0.8	1.0	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.3	0.0	16.6	28.3	20.3	17.9	28.0	13.0	13.0	27.4	13.7	17.5
LnGrp LOS	C	A	B	C	C	B	C	B	B	C	B	B
Approach Vol, veh/h		470			136			459			656	
Approach Delay, s/veh		19.2			21.2			17.0			16.9	
Approach LOS		B			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.5	19.3	6.3	14.9	8.9	17.8	11.9	9.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.5	44.5	9.5	34.5	21.5	36.5	24.5	19.5
Max Q Clear Time (g_c+I1), s	3.8	5.5	2.9	5.3	5.2	10.3	6.4	3.6
Green Ext Time (p_c), s	0.1	2.1	0.0	0.8	0.3	3.0	1.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	17.9
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	0	17	0	44	0	343	7	43	380	2
Future Vol, veh/h	1	0	0	17	0	44	0	343	7	43	380	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	-	-	-	375	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	0	18	0	48	0	373	8	47	413	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	909	889	414	885	886	377	415	0	0	381	0	0
Stage 1	508	508	-	377	377	-	-	-	-	-	-	-
Stage 2	401	381	-	508	509	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	256	282	638	266	284	670	1144	-	-	1177	-	-
Stage 1	547	539	-	644	616	-	-	-	-	-	-	-
Stage 2	626	613	-	547	538	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	230	271	638	258	273	670	1144	-	-	1177	-	-
Mov Cap-2 Maneuver	230	271	-	258	273	-	-	-	-	-	-	-
Stage 1	547	517	-	644	616	-	-	-	-	-	-	-
Stage 2	581	613	-	525	516	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.7	13.4	0	0.8
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1144	-	-	230	258	670	1177	-	-
HCM Lane V/C Ratio	-	-	-	0.005	0.072	0.071	0.04	-	-
HCM Control Delay (s)	0	-	-	20.7	20	10.8	8.2	-	-
HCM Lane LOS	A	-	-	C	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	3.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	110	62	255	49	21	378
Future Vol, veh/h	110	62	255	49	21	378
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	120	67	277	53	23	411

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	761	304	0	0	330	0
Stage 1	304	-	-	-	-	-
Stage 2	457	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	373	736	-	-	1229	-
Stage 1	748	-	-	-	-	-
Stage 2	638	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	366	736	-	-	1229	-
Mov Cap-2 Maneuver	366	-	-	-	-	-
Stage 1	748	-	-	-	-	-
Stage 2	626	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.7	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	447	1229	-
HCM Lane V/C Ratio	-	-	0.418	0.019	-
HCM Control Delay (s)	-	-	18.7	8	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	2	0.1	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	1	48	0	41	1	366	12	11	498	1
Future Vol, veh/h	3	0	1	48	0	41	1	366	12	11	498	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	50	275	-	275	375	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	1	52	0	45	1	398	13	12	541	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	994	978	541	966	966	398	542	0	0	411	0	0
Stage 1	565	565	-	400	400	-	-	-	-	-	-	-
Stage 2	429	413	-	566	566	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	224	250	541	234	255	652	1027	-	-	1148	-	-
Stage 1	510	508	-	626	602	-	-	-	-	-	-	-
Stage 2	604	594	-	509	507	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	207	247	541	231	252	652	1027	-	-	1148	-	-
Mov Cap-2 Maneuver	207	247	-	231	252	-	-	-	-	-	-	-
Stage 1	509	503	-	625	601	-	-	-	-	-	-	-
Stage 2	562	593	-	503	502	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20	18.6	0	0.2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1027	-	-	207	541	231	652	1148	-	-
HCM Lane V/C Ratio	0.001	-	-	0.016	0.002	0.226	0.068	0.01	-	-
HCM Control Delay (s)	8.5	-	-	22.7	11.7	25.1	10.9	8.2	-	-
HCM Lane LOS	A	-	-	C	B	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0.8	0.2	0	-	-

Intersection	
Intersection Delay, s/veh	10.4
Intersection LOS	B

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	457	464	625
Demand Flow Rate, veh/h	466	474	638
Vehicles Circulating, veh/h	292	93	355
Vehicles Exiting, veh/h	275	900	403
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	8.8	6.6	14.4
Approach LOS	A	A	B

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	466	474	638
Cap Entry Lane, veh/h	1024	1255	961
Entry HV Adj Factor	0.981	0.979	0.980
Flow Entry, veh/h	457	464	625
Cap Entry, veh/h	1005	1229	942
V/C Ratio	0.455	0.378	0.664
Control Delay, s/veh	8.8	6.6	14.4
LOS	A	A	B
95th %tile Queue, veh	2	2	5

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	1	3	1	4	5	389	3	1	779	21
Future Vol, veh/h	10	0	1	3	1	4	5	389	3	1	779	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	-	125	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	0	1	3	1	4	5	423	3	1	847	23

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1298	1297	859	1296	1307	425	870	0	0	426	0	0
Stage 1	861	861	-	435	435	-	-	-	-	-	-	-
Stage 2	437	436	-	861	872	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	139	162	356	139	160	629	775	-	-	1133	-	-
Stage 1	350	372	-	600	580	-	-	-	-	-	-	-
Stage 2	598	580	-	350	368	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	136	161	356	138	159	629	775	-	-	1133	-	-
Mov Cap-2 Maneuver	136	161	-	138	159	-	-	-	-	-	-	-
Stage 1	348	372	-	596	577	-	-	-	-	-	-	-
Stage 2	589	577	-	349	368	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	32.1	21	0.1	0
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	775	-	-	136	356	233	1133	-	-
HCM Lane V/C Ratio	0.007	-	-	0.08	0.003	0.037	0.001	-	-
HCM Control Delay (s)	9.7	-	-	33.8	15.1	21	8.2	-	-
HCM Lane LOS	A	-	-	D	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0	0.1	0	-	-

Intersection	
Int Delay, s/veh	3.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	60	77	302	70	114	647
Future Vol, veh/h	60	77	302	70	114	647
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	325	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	65	84	328	76	124	703

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1317	366	0	0	404	0
Stage 1	366	-	-	-	-	-
Stage 2	951	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	174	679	-	-	1155	-
Stage 1	702	-	-	-	-	-
Stage 2	375	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	155	679	-	-	1155	-
Mov Cap-2 Maneuver	155	-	-	-	-	-
Stage 1	702	-	-	-	-	-
Stage 2	335	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	25.5	0	1.3
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	155	679	1155	-
HCM Lane V/C Ratio	-	-	0.421	0.123	0.107	-
HCM Control Delay (s)	-	-	44.1	11	8.5	-
HCM Lane LOS	-	-	E	B	A	-
HCM 95th %tile Q(veh)	-	-	1.9	0.4	0.4	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	192	6	0	151	5	2
Future Vol, veh/h	192	6	0	151	5	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	209	7	0	164	5	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	216	0	377	213
Stage 1	-	-	-	-	213	-
Stage 2	-	-	-	-	164	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1354	-	625	827
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	865	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1354	-	625	827
Mov Cap-2 Maneuver	-	-	-	-	625	-
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	865	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	672	-	-	1354	-
HCM Lane V/C Ratio	0.011	-	-	-	-
HCM Control Delay (s)	10.4	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	176	2	2	131	5	0
Future Vol, veh/h	176	2	2	131	5	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	191	2	2	142	5	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	193	0	338	192
Stage 1	-	-	-	-	192	-
Stage 2	-	-	-	-	146	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1380	-	658	850
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	881	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1380	-	657	850
Mov Cap-2 Maneuver	-	-	-	-	657	-
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	879	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	657	-	-	1380	-
HCM Lane V/C Ratio	0.008	-	-	0.002	-
HCM Control Delay (s)	10.5	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	141	6	39	6	33	17	10	288	1	11	494	316
Future Volume (veh/h)	141	6	39	6	33	17	10	288	1	11	494	316
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	153	7	42	7	36	18	11	313	1	12	537	343
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	332	18	56	101	213	96	306	1160	4	737	664	424
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.62	0.62	0.62	0.62	0.62	0.62
Sat Flow, veh/h	1068	96	306	81	1161	520	631	1863	6	1066	1067	681
Grp Volume(v), veh/h	202	0	0	61	0	0	11	0	314	12	0	880
Grp Sat Flow(s),veh/h/ln	1469	0	0	1763	0	0	631	0	1869	1066	0	1748
Q Serve(g_s), s	4.6	0.0	0.0	0.0	0.0	0.0	0.6	0.0	3.5	0.2	0.0	17.8
Cycle Q Clear(g_c), s	5.9	0.0	0.0	1.3	0.0	0.0	18.4	0.0	3.5	3.8	0.0	17.8
Prop In Lane	0.76		0.21	0.11		0.30	1.00		0.00	1.00		0.39
Lane Grp Cap(c), veh/h	406	0	0	410	0	0	306	0	1164	737	0	1088
V/C Ratio(X)	0.50	0.00	0.00	0.15	0.00	0.00	0.04	0.00	0.27	0.02	0.00	0.81
Avail Cap(c_a), veh/h	799	0	0	886	0	0	721	0	2394	1439	0	2239
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.8	0.0	0.0	16.0	0.0	0.0	13.7	0.0	4.0	4.8	0.0	6.7
Incr Delay (d2), s/veh	0.9	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	0.0	0.5	0.0	0.0	0.1	0.0	0.8	0.0	0.0	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.7	0.0	0.0	16.2	0.0	0.0	13.7	0.0	4.1	4.8	0.0	8.2
LnGrp LOS	B	A	A	B	A	A	B	A	A	A	A	A
Approach Vol, veh/h		202			61			325			892	
Approach Delay, s/veh		18.7			16.2			4.4			8.1	
Approach LOS		B			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		33.4		13.0		33.4		13.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		59.5		21.5		59.5		21.5				
Max Q Clear Time (g_c+I1), s		20.4		7.9		19.8		3.3				
Green Ext Time (p_c), s		2.2		0.9		9.1		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			9.1									
HCM 6th LOS			A									

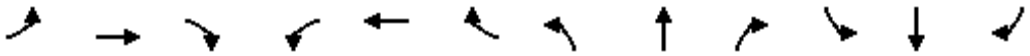
Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	21	2	14	3	3	4	12	268	9	11	609	4
Future Vol, veh/h	21	2	14	3	3	4	12	268	9	11	609	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	23	2	15	3	3	4	13	291	10	12	662	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1014	1015	664	1019	1012	296	666	0	0	301	0	0
Stage 1	688	688	-	322	322	-	-	-	-	-	-	-
Stage 2	326	327	-	697	690	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	217	238	461	215	239	743	923	-	-	1260	-	-
Stage 1	436	447	-	690	651	-	-	-	-	-	-	-
Stage 2	687	648	-	431	446	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	208	230	461	201	231	743	923	-	-	1260	-	-
Mov Cap-2 Maneuver	208	230	-	201	231	-	-	-	-	-	-	-
Stage 1	429	440	-	678	640	-	-	-	-	-	-	-
Stage 2	668	637	-	408	439	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.1	17.5	0.4	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	923	-	-	264	300	1260	-	-
HCM Lane V/C Ratio	0.014	-	-	0.152	0.036	0.009	-	-
HCM Control Delay (s)	9	0	-	21.1	17.5	7.9	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0.1	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	21	98	22	14	12	31	210	6	7	483	77
Future Volume (veh/h)	106	21	98	22	14	12	31	210	6	7	483	77
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	115	23	107	24	15	13	34	228	7	8	525	84
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	306	62	157	292	168	98	173	775	22	118	758	120
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.48	0.48	0.48	0.48	0.48	0.48
Sat Flow, veh/h	600	266	672	542	719	420	94	1603	45	7	1567	248
Grp Volume(v), veh/h	245	0	0	52	0	0	269	0	0	617	0	0
Grp Sat Flow(s),veh/h/ln	1538	0	0	1680	0	0	1742	0	0	1822	0	0
Q Serve(g_s), s	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	4.5	0.0	0.0	0.7	0.0	0.0	2.8	0.0	0.0	8.4	0.0	0.0
Prop In Lane	0.47		0.44	0.46		0.25	0.13		0.03	0.01		0.14
Lane Grp Cap(c), veh/h	525	0	0	558	0	0	970	0	0	995	0	0
V/C Ratio(X)	0.47	0.00	0.00	0.09	0.00	0.00	0.28	0.00	0.00	0.62	0.00	0.00
Avail Cap(c_a), veh/h	1523	0	0	1536	0	0	2840	0	0	3113	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.0	0.0	0.0	9.6	0.0	0.0	5.0	0.0	0.0	6.4	0.0	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.0	0.2	0.0	0.0	0.6	0.0	0.0	1.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.7	0.0	0.0	9.7	0.0	0.0	5.1	0.0	0.0	7.0	0.0	0.0
LnGrp LOS	B	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		245			52			269			617	
Approach Delay, s/veh		11.7			9.7			5.1			7.0	
Approach LOS		B			A			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		19.9		11.9		19.9		11.9				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		52.5		28.5		52.5		28.5				
Max Q Clear Time (g_c+I1), s		4.8		6.5		10.4		2.7				
Green Ext Time (p_c), s		1.9		1.5		5.0		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			7.7									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	1	15	5	7	19	7	239	11	31	558	40
Future Vol, veh/h	3	1	15	5	7	19	7	239	11	31	558	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	1	16	5	8	21	8	260	12	34	607	43

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	994	985	629	987	1000	266	650	0	0	272	0	0
Stage 1	697	697	-	282	282	-	-	-	-	-	-	-
Stage 2	297	288	-	705	718	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	224	248	482	226	243	773	936	-	-	1291	-	-
Stage 1	431	443	-	725	678	-	-	-	-	-	-	-
Stage 2	712	674	-	427	433	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	204	235	482	209	230	773	936	-	-	1291	-	-
Mov Cap-2 Maneuver	204	235	-	209	230	-	-	-	-	-	-	-
Stage 1	427	424	-	718	671	-	-	-	-	-	-	-
Stage 2	678	667	-	394	415	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15	15	0.2	0.4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	936	-	-	379	393	1291	-	-
HCM Lane V/C Ratio	0.008	-	-	0.054	0.086	0.026	-	-
HCM Control Delay (s)	8.9	0	-	15	15	7.9	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	3	2	7	4	0	1	1	224	3	8	567	7
Future Vol, veh/h	3	2	7	4	0	1	1	224	3	8	567	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	2	8	4	0	1	1	243	3	9	616	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	885	886	620	890	889	245	624	0	0	246	0	0
Stage 1	638	638	-	247	247	-	-	-	-	-	-	-
Stage 2	247	248	-	643	642	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	266	284	488	264	282	794	957	-	-	1320	-	-
Stage 1	465	471	-	757	702	-	-	-	-	-	-	-
Stage 2	757	701	-	462	469	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	263	281	488	256	279	794	957	-	-	1320	-	-
Mov Cap-2 Maneuver	263	281	-	256	279	-	-	-	-	-	-	-
Stage 1	465	466	-	756	701	-	-	-	-	-	-	-
Stage 2	755	700	-	448	464	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.2	17.4	0	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	957	-	-	365	296	1320	-	-
HCM Lane V/C Ratio	0.001	-	-	0.036	0.018	0.007	-	-
HCM Control Delay (s)	8.8	0	-	15.2	17.4	7.7	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	2	0	1	2	0	3	0	231	0	5	568	3
Future Vol, veh/h	2	0	1	2	0	3	0	231	0	5	568	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	1	2	0	3	0	251	0	5	617	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	882	880	619	880	881	251	620	0	0	251	0	0
Stage 1	629	629	-	251	251	-	-	-	-	-	-	-
Stage 2	253	251	-	629	630	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	267	286	489	268	285	788	960	-	-	1314	-	-
Stage 1	470	475	-	753	699	-	-	-	-	-	-	-
Stage 2	751	699	-	470	475	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	265	284	489	266	283	788	960	-	-	1314	-	-
Mov Cap-2 Maneuver	265	284	-	266	283	-	-	-	-	-	-	-
Stage 1	470	472	-	753	699	-	-	-	-	-	-	-
Stage 2	748	699	-	466	472	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.6	13.3	0	0.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	960	-	-	313	441	1314	-	-
HCM Lane V/C Ratio	-	-	-	0.01	0.012	0.004	-	-
HCM Control Delay (s)	0	-	-	16.6	13.3	7.8	0	-
HCM Lane LOS	A	-	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	5	1	210	570	3
Future Vol, veh/h	9	5	1	210	570	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	5	1	228	620	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	852	622	623	0	-	0
Stage 1	622	-	-	-	-	-
Stage 2	230	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	330	487	958	-	-	-
Stage 1	535	-	-	-	-	-
Stage 2	808	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	330	487	958	-	-	-
Mov Cap-2 Maneuver	330	-	-	-	-	-
Stage 1	534	-	-	-	-	-
Stage 2	808	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	958	-	373	-	-
HCM Lane V/C Ratio	0.001	-	0.041	-	-
HCM Control Delay (s)	8.8	0	15.1	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	9	1	203	555	7
Future Vol, veh/h	7	9	1	203	555	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	275	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	10	1	221	603	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	830	607	611	0	-	0
Stage 1	607	-	-	-	-	-
Stage 2	223	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	340	496	968	-	-	-
Stage 1	544	-	-	-	-	-
Stage 2	814	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	340	496	968	-	-	-
Mov Cap-2 Maneuver	340	-	-	-	-	-
Stage 1	543	-	-	-	-	-
Stage 2	814	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	968	-	340	496	-	-
HCM Lane V/C Ratio	0.001	-	0.022	0.02	-	-
HCM Control Delay (s)	8.7	-	15.8	12.4	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	182	13	3	84	0	9	0	6	1	0	0
Future Vol, veh/h	1	182	13	3	84	0	9	0	6	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	198	14	3	91	0	10	0	7	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	91	0	0	212	0	0	304	304	205	308	311	91
Stage 1	-	-	-	-	-	-	207	207	-	97	97	-
Stage 2	-	-	-	-	-	-	97	97	-	211	214	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1504	-	-	1358	-	-	648	609	836	644	604	967
Stage 1	-	-	-	-	-	-	795	731	-	910	815	-
Stage 2	-	-	-	-	-	-	910	815	-	791	725	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1504	-	-	1358	-	-	647	607	836	638	602	967
Mov Cap-2 Maneuver	-	-	-	-	-	-	647	607	-	638	602	-
Stage 1	-	-	-	-	-	-	794	730	-	909	813	-
Stage 2	-	-	-	-	-	-	908	813	-	784	724	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	10.2	10.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	711	1504	-	-	1358	-	-	638
HCM Lane V/C Ratio	0.023	0.001	-	-	0.002	-	-	0.002
HCM Control Delay (s)	10.2	7.4	0	-	7.7	0	-	10.7
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	50	74	13	32	27	2
Future Vol, veh/h	50	74	13	32	27	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	80	14	35	29	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	134	0	157	94
Stage 1	-	-	-	-	94	-
Stage 2	-	-	-	-	63	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1451	-	834	963
Stage 1	-	-	-	-	930	-
Stage 2	-	-	-	-	960	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1451	-	826	963
Mov Cap-2 Maneuver	-	-	-	-	826	-
Stage 1	-	-	-	-	930	-
Stage 2	-	-	-	-	950	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	834	-	-	1451	-
HCM Lane V/C Ratio	0.038	-	-	0.01	-
HCM Control Delay (s)	9.5	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	111	25	17	35	186	430
Future Vol, veh/h	111	25	17	35	186	430
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	121	27	18	38	202	467

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	510	436	669	0	-	0
Stage 1	436	-	-	-	-	-
Stage 2	74	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	523	620	921	-	-	-
Stage 1	652	-	-	-	-	-
Stage 2	949	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	513	620	921	-	-	-
Mov Cap-2 Maneuver	513	-	-	-	-	-
Stage 1	639	-	-	-	-	-
Stage 2	949	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.4	2.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	921	-	530	-	-
HCM Lane V/C Ratio	0.02	-	0.279	-	-
HCM Control Delay (s)	9	0	14.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1.1	-	-

Intersection	
Int Delay, s/veh	19.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	491	37	74	95	28	89
Future Vol, veh/h	491	37	74	95	28	89
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	534	40	80	103	30	97

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	289	132	0	0	183	0
Stage 1	132	-	-	-	-	-
Stage 2	157	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	702	917	-	-	1392	-
Stage 1	894	-	-	-	-	-
Stage 2	871	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	687	917	-	-	1392	-
Mov Cap-2 Maneuver	687	-	-	-	-	-
Stage 1	894	-	-	-	-	-
Stage 2	852	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	29.3	0	1.8
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	699	1392	-
HCM Lane V/C Ratio	-	-	0.821	0.022	-
HCM Control Delay (s)	-	-	29.3	7.6	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	8.8	0.1	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	166	123	1	1	10
Future Vol, veh/h	10	166	123	1	1	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	180	134	1	1	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	135	0	-	0	337	135
Stage 1	-	-	-	-	135	-
Stage 2	-	-	-	-	202	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1449	-	-	-	658	914
Stage 1	-	-	-	-	891	-
Stage 2	-	-	-	-	832	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1449	-	-	-	653	914
Mov Cap-2 Maneuver	-	-	-	-	653	-
Stage 1	-	-	-	-	884	-
Stage 2	-	-	-	-	832	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1449	-	-	-	882
HCM Lane V/C Ratio	0.008	-	-	-	0.014
HCM Control Delay (s)	7.5	0	-	-	9.1
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	142	5	1	99	2	5	0	1	2	0	20
Future Vol, veh/h	20	142	5	1	99	2	5	0	1	2	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	154	5	1	108	2	5	0	1	2	0	22

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	110	0	0	159	0	0	323	313	157	312	314	109
Stage 1	-	-	-	-	-	-	201	201	-	111	111	-
Stage 2	-	-	-	-	-	-	122	112	-	201	203	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1480	-	-	1420	-	-	630	602	889	641	601	945
Stage 1	-	-	-	-	-	-	801	735	-	894	804	-
Stage 2	-	-	-	-	-	-	882	803	-	801	733	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1480	-	-	1420	-	-	607	592	889	632	591	945
Mov Cap-2 Maneuver	-	-	-	-	-	-	607	592	-	632	591	-
Stage 1	-	-	-	-	-	-	788	723	-	880	803	-
Stage 2	-	-	-	-	-	-	861	802	-	787	721	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0.1	10.7	9.1
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	641	1480	-	-	1420	-	-	904
HCM Lane V/C Ratio	0.01	0.015	-	-	0.001	-	-	0.026
HCM Control Delay (s)	10.7	7.5	0	-	7.5	0	-	9.1
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

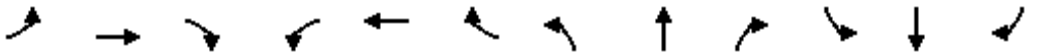
Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	63	82	39	8	8	63
Future Vol, veh/h	63	82	39	8	8	63
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	68	89	42	9	9	68

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	51	0	-	0	272	47
Stage 1	-	-	-	-	47	-
Stage 2	-	-	-	-	225	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1555	-	-	-	717	1022
Stage 1	-	-	-	-	975	-
Stage 2	-	-	-	-	812	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1555	-	-	-	684	1022
Mov Cap-2 Maneuver	-	-	-	-	684	-
Stage 1	-	-	-	-	930	-
Stage 2	-	-	-	-	812	-

Approach	EB	WB	SB
HCM Control Delay, s	3.2	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1555	-	-	-	968
HCM Lane V/C Ratio	0.044	-	-	-	0.08
HCM Control Delay (s)	7.4	0	-	-	9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	302	41	105	54	43	88	133	428	57	93	348	358
Future Volume (veh/h)	302	41	105	54	43	88	133	428	57	93	348	358
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	328	45	114	59	47	96	145	465	62	101	378	389
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	494	87	220	96	180	271	192	1140	151	133	1167	521
Arrive On Green	0.14	0.19	0.19	0.05	0.10	0.10	0.11	0.36	0.36	0.07	0.33	0.33
Sat Flow, veh/h	3456	469	1188	1781	1870	1585	1781	3153	418	1781	3554	1585
Grp Volume(v), veh/h	328	0	159	59	47	96	145	261	266	101	378	389
Grp Sat Flow(s),veh/h/ln	1728	0	1657	1781	1870	1585	1781	1777	1795	1781	1777	1585
Q Serve(g_s), s	5.0	0.0	4.8	1.8	1.3	3.0	4.4	6.1	6.2	3.1	4.4	12.1
Cycle Q Clear(g_c), s	5.0	0.0	4.8	1.8	1.3	3.0	4.4	6.1	6.2	3.1	4.4	12.1
Prop In Lane	1.00		0.72	1.00		1.00	1.00		0.23	1.00		1.00
Lane Grp Cap(c), veh/h	494	0	307	96	180	271	192	643	649	133	1167	521
V/C Ratio(X)	0.66	0.00	0.52	0.62	0.26	0.35	0.76	0.41	0.41	0.76	0.32	0.75
Avail Cap(c_a), veh/h	1339	0	881	369	657	675	690	1425	1440	530	2530	1129
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.5	0.0	20.4	25.7	23.2	20.3	24.0	13.3	13.3	25.2	14.0	16.6
Incr Delay (d2), s/veh	1.5	0.0	1.3	6.3	0.8	0.8	5.9	0.4	0.4	8.6	0.2	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	1.8	0.9	0.6	1.1	2.0	2.2	2.2	1.5	1.6	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.1	0.0	21.7	31.9	24.0	21.1	30.0	13.7	13.7	33.8	14.2	18.7
LnGrp LOS	C	A	C	C	C	C	C	B	B	C	B	B
Approach Vol, veh/h		487			202			672			868	
Approach Delay, s/veh		23.3			24.9			17.2			18.5	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.6	24.6	7.5	14.8	10.5	22.7	12.4	9.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	44.5	11.5	29.5	21.5	39.5	21.5	19.5
Max Q Clear Time (g_c+I1), s	5.1	8.2	3.8	6.8	6.4	14.1	7.0	5.0
Green Ext Time (p_c), s	0.2	3.5	0.1	0.9	0.3	4.1	1.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	19.7
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	0	10	0	47	0	597	19	77	465	2
Future Vol, veh/h	1	0	0	10	0	47	0	597	19	77	465	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	-	-	-	375	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	0	11	0	51	0	649	21	84	505	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1359	1344	506	1334	1335	660	507	0	0	670	0	0
Stage 1	674	674	-	660	660	-	-	-	-	-	-	-
Stage 2	685	670	-	674	675	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	126	152	566	131	154	463	1058	-	-	920	-	-
Stage 1	444	454	-	452	460	-	-	-	-	-	-	-
Stage 2	438	455	-	444	453	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	104	138	566	122	140	463	1058	-	-	920	-	-
Mov Cap-2 Maneuver	104	138	-	122	140	-	-	-	-	-	-	-
Stage 1	444	413	-	452	460	-	-	-	-	-	-	-
Stage 2	390	455	-	403	412	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	40	17.9	0	1.3
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1058	-	-	104	122	463	920	-	-
HCM Lane V/C Ratio	-	-	-	0.01	0.089	0.11	0.091	-	-
HCM Control Delay (s)	0	-	-	40	37.4	13.7	9.3	-	-
HCM Lane LOS	A	-	-	E	E	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.3	0.4	0.3	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	64	47	585	137	93	424
Future Vol, veh/h	64	47	585	137	93	424
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	70	51	636	149	101	461

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1374	711	0	0	785	0
Stage 1	711	-	-	-	-	-
Stage 2	663	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	160	433	-	-	834	-
Stage 1	487	-	-	-	-	-
Stage 2	512	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	141	433	-	-	834	-
Mov Cap-2 Maneuver	141	-	-	-	-	-
Stage 1	487	-	-	-	-	-
Stage 2	450	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	48.5	0	1.8
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	197	834	-
HCM Lane V/C Ratio	-	-	0.612	0.121	-
HCM Control Delay (s)	-	-	48.5	9.9	-
HCM Lane LOS	-	-	E	A	-
HCM 95th %tile Q(veh)	-	-	3.5	0.4	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1	6	16	0	25	2	731	40	30	457	1
Future Vol, veh/h	3	1	6	16	0	25	2	731	40	30	457	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	50	275	-	275	375	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	1	7	17	0	27	2	795	43	33	497	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1397	1405	497	1367	1363	795	498	0	0	838	0	0
Stage 1	563	563	-	799	799	-	-	-	-	-	-	-
Stage 2	834	842	-	568	564	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	118	139	573	124	148	388	1066	-	-	796	-	-
Stage 1	511	509	-	379	398	-	-	-	-	-	-	-
Stage 2	362	380	-	508	508	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	106	133	573	118	142	388	1066	-	-	796	-	-
Mov Cap-2 Maneuver	106	133	-	118	142	-	-	-	-	-	-	-
Stage 1	510	488	-	378	397	-	-	-	-	-	-	-
Stage 2	336	379	-	480	487	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.2	25	0	0.6
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1066	-	-	112	573	118	388	796	-	-
HCM Lane V/C Ratio	0.002	-	-	0.039	0.011	0.147	0.07	0.041	-	-
HCM Control Delay (s)	8.4	-	-	38.4	11.4	40.7	15	9.7	-	-
HCM Lane LOS	A	-	-	E	B	E	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0.5	0.2	0.1	-	-

Intersection	
Intersection Delay, s/veh	20.8
Intersection LOS	C

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	232	1106	478
Demand Flow Rate, veh/h	237	1128	487
Vehicles Circulating, veh/h	754	113	143
Vehicles Exiting, veh/h	487	517	848
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	10.9	28.7	7.2
Approach LOS	B	D	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	237	1128	487
Cap Entry Lane, veh/h	640	1230	1193
Entry HV Adj Factor	0.979	0.981	0.981
Flow Entry, veh/h	232	1106	478
Cap Entry, veh/h	626	1206	1170
V/C Ratio	0.371	0.917	0.408
Control Delay, s/veh	10.9	28.7	7.2
LOS	B	D	A
95th %tile Queue, veh	2	15	2

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	0	3	5	0	10	2	990	3	6	437	3
Future Vol, veh/h	15	0	3	5	0	10	2	990	3	6	437	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	-	125	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	0	3	5	0	11	2	1076	3	7	475	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1578	1574	477	1574	1574	1078	478	0	0	1079	0	0
Stage 1	491	491	-	1082	1082	-	-	-	-	-	-	-
Stage 2	1087	1083	-	492	492	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	89	110	588	89	110	266	1084	-	-	646	-	-
Stage 1	559	548	-	263	294	-	-	-	-	-	-	-
Stage 2	262	293	-	558	548	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	85	109	588	88	109	266	1084	-	-	646	-	-
Mov Cap-2 Maneuver	85	109	-	88	109	-	-	-	-	-	-	-
Stage 1	558	542	-	262	293	-	-	-	-	-	-	-
Stage 2	251	292	-	549	542	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	49.5	30.2	0	0.1
HCM LOS	E	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1084	-	-	85	588	159	646	-	-
HCM Lane V/C Ratio	0.002	-	-	0.192	0.006	0.103	0.01	-	-
HCM Control Delay (s)	8.3	-	-	57.1	11.2	30.2	10.6	-	-
HCM Lane LOS	A	-	-	F	B	D	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0	0.3	0	-	-

Intersection	
Int Delay, s/veh	39

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	132	222	797	152	164	265
Future Vol, veh/h	132	222	797	152	164	265
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	325	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	143	241	866	165	178	288

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1593	949	0	0	1031	0
Stage 1	949	-	-	-	-	-
Stage 2	644	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	~ 118	316	-	-	674	-
Stage 1	376	-	-	-	-	-
Stage 2	523	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 87	316	-	-	674	-
Mov Cap-2 Maneuver	~ 87	-	-	-	-	-
Stage 1	376	-	-	-	-	-
Stage 2	385	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	185.2	0	4.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	87	316	674	-
HCM Lane V/C Ratio	-	-	1.649	0.764	0.264	-
HCM Control Delay (s)	-	-	$ 420.6	45.3	12.3	-
HCM Lane LOS	-	-	F	E	B	-
HCM 95th %tile Q(veh)	-	-	11.7	5.9	1.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	319	3	2	353	4	1
Future Vol, veh/h	319	3	2	353	4	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	347	3	2	384	4	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	350	0	737	349
Stage 1	-	-	-	-	349	-
Stage 2	-	-	-	-	388	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1209	-	386	694
Stage 1	-	-	-	-	714	-
Stage 2	-	-	-	-	686	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1209	-	385	694
Mov Cap-2 Maneuver	-	-	-	-	385	-
Stage 1	-	-	-	-	714	-
Stage 2	-	-	-	-	685	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	423	-	-	1209	-
HCM Lane V/C Ratio	0.013	-	-	0.002	-
HCM Control Delay (s)	13.6	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

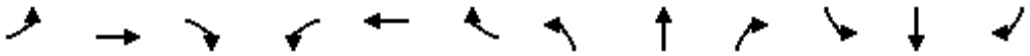
Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	310	3	1	330	2	0
Future Vol, veh/h	310	3	1	330	2	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	337	3	1	359	2	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	340	0	700	339
Stage 1	-	-	-	-	339	-
Stage 2	-	-	-	-	361	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1219	-	405	703
Stage 1	-	-	-	-	722	-
Stage 2	-	-	-	-	705	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1219	-	405	703
Mov Cap-2 Maneuver	-	-	-	-	405	-
Stage 1	-	-	-	-	722	-
Stage 2	-	-	-	-	704	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	405	-	-	1219	-
HCM Lane V/C Ratio	0.005	-	-	0.001	-
HCM Control Delay (s)	13.9	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	107	3	35	35	10	41	14	823	13	8	363	108
Future Volume (veh/h)	107	3	35	35	10	41	14	823	13	8	363	108
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	116	3	38	38	11	45	15	895	14	9	395	117
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	316	10	55	197	57	119	606	1158	18	348	874	259
Arrive On Green	0.15	0.15	0.15	0.15	0.15	0.15	0.63	0.63	0.63	0.63	0.63	0.63
Sat Flow, veh/h	1096	68	372	490	386	805	888	1836	29	614	1386	411
Grp Volume(v), veh/h	157	0	0	94	0	0	15	0	909	9	0	512
Grp Sat Flow(s),veh/h/ln	1536	0	0	1681	0	0	888	0	1865	614	0	1796
Q Serve(g_s), s	1.8	0.0	0.0	0.0	0.0	0.0	0.4	0.0	14.3	0.4	0.0	6.0
Cycle Q Clear(g_c), s	3.7	0.0	0.0	2.0	0.0	0.0	6.4	0.0	14.3	14.7	0.0	6.0
Prop In Lane	0.74		0.24	0.40		0.48	1.00		0.02	1.00		0.23
Lane Grp Cap(c), veh/h	381	0	0	373	0	0	606	0	1177	348	0	1133
V/C Ratio(X)	0.41	0.00	0.00	0.25	0.00	0.00	0.02	0.00	0.77	0.03	0.00	0.45
Avail Cap(c_a), veh/h	866	0	0	896	0	0	1373	0	2788	879	0	2685
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.3	0.0	0.0	15.6	0.0	0.0	5.5	0.0	5.4	10.7	0.0	3.9
Incr Delay (d2), s/veh	0.7	0.0	0.0	0.4	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.0	0.7	0.0	0.0	0.0	0.0	2.7	0.1	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.0	0.0	0.0	16.0	0.0	0.0	5.5	0.0	6.5	10.8	0.0	4.2
LnGrp LOS	B	A	A	B	A	A	A	A	A	B	A	A
Approach Vol, veh/h		157			94			924			521	
Approach Delay, s/veh		17.0			16.0			6.5			4.3	
Approach LOS		B			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		30.2		10.5		30.2		10.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		60.9		20.1		60.9		20.1				
Max Q Clear Time (g_c+I1), s		16.3		5.7		16.7		4.0				
Green Ext Time (p_c), s		9.4		0.7		4.0		0.4				

Intersection Summary												
HCM 6th Ctrl Delay			7.3									
HCM 6th LOS			A									

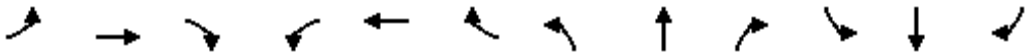
Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	6	1	5	3	0	4	5	823	13	9	457	6
Future Vol, veh/h	6	1	5	3	0	4	5	823	13	9	457	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1	5	3	0	4	5	895	14	10	497	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1435	1440	501	1436	1436	902	504	0	0	909	0	0
Stage 1	521	521	-	912	912	-	-	-	-	-	-	-
Stage 2	914	919	-	524	524	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	111	133	570	111	133	336	1061	-	-	749	-	-
Stage 1	539	532	-	328	353	-	-	-	-	-	-	-
Stage 2	327	350	-	537	530	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	107	129	570	107	129	336	1061	-	-	749	-	-
Mov Cap-2 Maneuver	107	129	-	107	129	-	-	-	-	-	-	-
Stage 1	534	522	-	325	349	-	-	-	-	-	-	-
Stage 2	320	347	-	521	520	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	28.7	26.5	0.1	0.2
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1061	-	-	165	175	749	-	-
HCM Lane V/C Ratio	0.005	-	-	0.079	0.043	0.013	-	-
HCM Control Delay (s)	8.4	0	-	28.7	26.5	9.9	0	-
HCM Lane LOS	A	A	-	D	D	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.1	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	169	12	68	22	22	12	53	653	8	2	354	119
Future Volume (veh/h)	169	12	68	22	22	12	53	653	8	2	354	119
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	184	13	74	24	24	13	58	710	9	2	385	129
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	369	32	98	234	211	89	131	927	11	84	736	245
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.55	0.55	0.55	0.55	0.55	0.55
Sat Flow, veh/h	943	134	405	484	871	367	75	1689	21	1	1340	447
Grp Volume(v), veh/h	271	0	0	61	0	0	777	0	0	516	0	0
Grp Sat Flow(s),veh/h/ln	1481	0	0	1722	0	0	1784	0	0	1788	0	0
Q Serve(g_s), s	6.1	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	7.2	0.0	0.0	1.1	0.0	0.0	14.5	0.0	0.0	7.9	0.0	0.0
Prop In Lane	0.68		0.27	0.39		0.21	0.07		0.01	0.00		0.25
Lane Grp Cap(c), veh/h	499	0	0	534	0	0	1069	0	0	1066	0	0
V/C Ratio(X)	0.54	0.00	0.00	0.11	0.00	0.00	0.73	0.00	0.00	0.48	0.00	0.00
Avail Cap(c_a), veh/h	1001	0	0	1073	0	0	2339	0	0	2376	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.0	0.0	0.0	12.8	0.0	0.0	7.6	0.0	0.0	6.2	0.0	0.0
Incr Delay (d2), s/veh	0.9	0.0	0.0	0.1	0.0	0.0	1.0	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	0.0	0.4	0.0	0.0	3.6	0.0	0.0	1.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.9	0.0	0.0	12.9	0.0	0.0	8.5	0.0	0.0	6.5	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		271			61			777			516	
Approach Delay, s/veh		15.9			12.9			8.5			6.5	
Approach LOS		B			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		28.2		15.0		28.2		15.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		55.5		25.5		55.5		25.5				
Max Q Clear Time (g_c+I1), s		16.5		9.2		9.9		3.1				
Green Ext Time (p_c), s		7.2		1.4		4.0		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			9.3									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	4	18	6	7	26	21	720	11	19	342	58
Future Vol, veh/h	6	4	18	6	7	26	21	720	11	19	342	58
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	4	20	7	8	28	23	783	12	21	372	63

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1299	1287	404	1293	1312	789	435	0	0	795	0	0
Stage 1	446	446	-	835	835	-	-	-	-	-	-	-
Stage 2	853	841	-	458	477	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	138	164	647	140	159	391	1125	-	-	826	-	-
Stage 1	591	574	-	362	383	-	-	-	-	-	-	-
Stage 2	354	380	-	583	556	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	116	153	647	126	148	391	1125	-	-	826	-	-
Mov Cap-2 Maneuver	116	153	-	126	148	-	-	-	-	-	-	-
Stage 1	569	554	-	349	369	-	-	-	-	-	-	-
Stage 2	310	366	-	542	537	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.3	23	0.2	0.4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1125	-	-	265	242	826	-	-
HCM Lane V/C Ratio	0.02	-	-	0.115	0.175	0.025	-	-
HCM Control Delay (s)	8.3	0	-	20.3	23	9.5	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.6	0.1	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	0	1	2	1	9	3	801	7	9	344	5
Future Vol, veh/h	1	0	1	2	1	9	3	801	7	9	344	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	1	2	1	10	3	871	8	10	374	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1284	1282	377	1278	1280	875	379	0	0	879	0	0
Stage 1	397	397	-	881	881	-	-	-	-	-	-	-
Stage 2	887	885	-	397	399	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	142	165	670	143	166	349	1179	-	-	769	-	-
Stage 1	629	603	-	341	365	-	-	-	-	-	-	-
Stage 2	339	363	-	629	602	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	135	162	670	140	163	349	1179	-	-	769	-	-
Mov Cap-2 Maneuver	135	162	-	140	163	-	-	-	-	-	-	-
Stage 1	626	593	-	339	363	-	-	-	-	-	-	-
Stage 2	327	361	-	618	592	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.2	19.6	0	0.2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1179	-	-	225	260	769	-	-
HCM Lane V/C Ratio	0.003	-	-	0.01	0.05	0.013	-	-
HCM Control Delay (s)	8.1	0	-	21.2	19.6	9.7	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	3	1	2	4	0	9	8	793	7	0	326	5
Future Vol, veh/h	3	1	2	4	0	9	8	793	7	0	326	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	1	2	4	0	10	9	862	8	0	354	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1246	1245	357	1242	1243	866	359	0	0	870	0	0
Stage 1	357	357	-	884	884	-	-	-	-	-	-	-
Stage 2	889	888	-	358	359	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	151	174	687	152	174	353	1200	-	-	775	-	-
Stage 1	661	628	-	340	363	-	-	-	-	-	-	-
Stage 2	338	362	-	660	627	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	145	171	687	149	171	353	1200	-	-	775	-	-
Mov Cap-2 Maneuver	145	171	-	149	171	-	-	-	-	-	-	-
Stage 1	651	628	-	335	358	-	-	-	-	-	-	-
Stage 2	324	357	-	657	627	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.2	20.4	0.1	0
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1200	-	-	204	248	775	-	-
HCM Lane V/C Ratio	0.007	-	-	0.032	0.057	-	-	-
HCM Control Delay (s)	8	0	-	23.2	20.4	0	-	-
HCM Lane LOS	A	A	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	4	3	779	328	11
Future Vol, veh/h	6	4	3	779	328	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	4	3	847	357	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1216	363	369	0	-	0
Stage 1	363	-	-	-	-	-
Stage 2	853	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	200	682	1190	-	-	-
Stage 1	704	-	-	-	-	-
Stage 2	418	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	199	682	1190	-	-	-
Mov Cap-2 Maneuver	199	-	-	-	-	-
Stage 1	700	-	-	-	-	-
Stage 2	418	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1190	-	278	-	-
HCM Lane V/C Ratio	0.003	-	0.039	-	-
HCM Control Delay (s)	8	0	18.5	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	3	34	797	299	13
Future Vol, veh/h	11	3	34	797	299	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	275	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	3	37	866	325	14

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1272	332	339	0	-	0
Stage 1	332	-	-	-	-	-
Stage 2	940	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	185	710	1220	-	-	-
Stage 1	727	-	-	-	-	-
Stage 2	380	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	179	710	1220	-	-	-
Mov Cap-2 Maneuver	179	-	-	-	-	-
Stage 1	705	-	-	-	-	-
Stage 2	380	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1220	-	179	710	-	-
HCM Lane V/C Ratio	0.03	-	0.067	0.005	-	-
HCM Control Delay (s)	8	-	26.5	10.1	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	0	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	181	8	21	202	4	17	1	16	2	0	1
Future Vol, veh/h	1	181	8	21	202	4	17	1	16	2	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	197	9	23	220	4	18	1	17	2	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	224	0	0	206	0	0	473	474	202	481	476	222
Stage 1	-	-	-	-	-	-	204	204	-	268	268	-
Stage 2	-	-	-	-	-	-	269	270	-	213	208	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1345	-	-	1365	-	-	501	489	839	495	488	818
Stage 1	-	-	-	-	-	-	798	733	-	738	687	-
Stage 2	-	-	-	-	-	-	737	686	-	789	730	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1345	-	-	1365	-	-	492	479	839	477	478	818
Mov Cap-2 Maneuver	-	-	-	-	-	-	492	479	-	477	478	-
Stage 1	-	-	-	-	-	-	797	732	-	737	674	-
Stage 2	-	-	-	-	-	-	722	673	-	771	729	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.7	11.3	11.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	610	1345	-	-	1365	-	-	554
HCM Lane V/C Ratio	0.061	0.001	-	-	0.017	-	-	0.006
HCM Control Delay (s)	11.3	7.7	0	-	7.7	0	-	11.5
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0.1	-	-	0

Intersection	
Int Delay, s/veh	3.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	40	39	11	62	79	3
Future Vol, veh/h	40	39	11	62	79	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	42	12	67	86	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	85	0	155	64
Stage 1	-	-	-	-	64	-
Stage 2	-	-	-	-	91	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1512	-	836	1000
Stage 1	-	-	-	-	959	-
Stage 2	-	-	-	-	933	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1512	-	829	1000
Mov Cap-2 Maneuver	-	-	-	-	829	-
Stage 1	-	-	-	-	959	-
Stage 2	-	-	-	-	926	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	834	-	-	1512	-
HCM Lane V/C Ratio	0.107	-	-	0.008	-
HCM Control Delay (s)	9.8	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection	
Int Delay, s/veh	132.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	565	32	80	242	66	181
Future Vol, veh/h	565	32	80	242	66	181
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	614	35	87	263	72	197

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	608	171	269	0	-	0
Stage 1	171	-	-	-	-	-
Stage 2	437	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	~ 459	873	1295	-	-	-
Stage 1	859	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 423	873	1295	-	-	-
Mov Cap-2 Maneuver	~ 423	-	-	-	-	-
Stage 1	791	-	-	-	-	-
Stage 2	651	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	257.3	2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1295	-	435	-	-
HCM Lane V/C Ratio	0.067	-	1.492	-	-
HCM Control Delay (s)	8	0	257.3	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0.2	-	33.9	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	25.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	302	47	58	437	121	115
Future Vol, veh/h	302	47	58	437	121	115
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	328	51	63	475	132	125

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	690	301	0	0	538	0
Stage 1	301	-	-	-	-	-
Stage 2	389	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	411	739	-	-	1030	-
Stage 1	751	-	-	-	-	-
Stage 2	685	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	358	739	-	-	1030	-
Mov Cap-2 Maneuver	358	-	-	-	-	-
Stage 1	751	-	-	-	-	-
Stage 2	597	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	75.5	0	4.6
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	385	1030	-
HCM Lane V/C Ratio	-	-	0.985	0.128	-
HCM Control Delay (s)	-	-	75.5	9	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	11.6	0.4	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	283	311	3	3	20
Future Vol, veh/h	27	283	311	3	3	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	308	338	3	3	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	341	0	-	0	706	340
Stage 1	-	-	-	-	340	-
Stage 2	-	-	-	-	366	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1218	-	-	-	402	702
Stage 1	-	-	-	-	721	-
Stage 2	-	-	-	-	702	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1218	-	-	-	390	702
Mov Cap-2 Maneuver	-	-	-	-	390	-
Stage 1	-	-	-	-	700	-
Stage 2	-	-	-	-	702	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1218	-	-	-	636
HCM Lane V/C Ratio	0.024	-	-	-	0.039
HCM Control Delay (s)	8	0	-	-	10.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	54	218	14	2	264	7	10	0	1	5	0	40
Future Vol, veh/h	54	218	14	2	264	7	10	0	1	5	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	59	237	15	2	287	8	11	0	1	5	0	43

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	295	0	0	252	0	0	680	662	245	658	665	291
Stage 1	-	-	-	-	-	-	363	363	-	295	295	-
Stage 2	-	-	-	-	-	-	317	299	-	363	370	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1266	-	-	1313	-	-	365	382	794	378	381	748
Stage 1	-	-	-	-	-	-	656	625	-	713	669	-
Stage 2	-	-	-	-	-	-	694	666	-	656	620	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1266	-	-	1313	-	-	329	361	794	361	360	748
Mov Cap-2 Maneuver	-	-	-	-	-	-	329	361	-	361	360	-
Stage 1	-	-	-	-	-	-	621	591	-	674	668	-
Stage 2	-	-	-	-	-	-	652	665	-	620	587	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.5	0.1	15.7	10.8
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	348	1266	-	-	1313	-	-	668
HCM Lane V/C Ratio	0.034	0.046	-	-	0.002	-	-	0.073
HCM Control Delay (s)	15.7	8	0	-	7.7	0	-	10.8
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.2

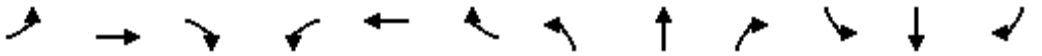
Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	177	47	143	22	16	130
Future Vol, veh/h	177	47	143	22	16	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	192	51	155	24	17	141

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	179	0	-	0	602	167
Stage 1	-	-	-	-	167	-
Stage 2	-	-	-	-	435	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1397	-	-	-	463	877
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	653	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1397	-	-	-	398	877
Mov Cap-2 Maneuver	-	-	-	-	398	-
Stage 1	-	-	-	-	741	-
Stage 2	-	-	-	-	653	-

Approach	EB	WB	SB
HCM Control Delay, s	6.3	0	10.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1397	-	-	-	775
HCM Lane V/C Ratio	0.138	-	-	-	0.205
HCM Control Delay (s)	8	0	-	-	10.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.5	-	-	-	0.8



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	317	40	91	31	38	59	148	354	51	65	273	292
Future Volume (veh/h)	317	40	91	31	38	59	148	354	51	65	273	292
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	345	43	99	34	41	64	161	385	55	71	297	317
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	530	106	245	67	179	250	214	1056	150	111	993	443
Arrive On Green	0.15	0.21	0.21	0.04	0.10	0.10	0.12	0.34	0.34	0.06	0.28	0.28
Sat Flow, veh/h	3456	503	1159	1781	1870	1585	1781	3124	443	1781	3554	1585
Grp Volume(v), veh/h	345	0	142	34	41	64	161	218	222	71	297	317
Grp Sat Flow(s),veh/h/ln	1728	0	1662	1781	1870	1585	1781	1777	1791	1781	1777	1585
Q Serve(g_s), s	4.8	0.0	3.8	1.0	1.0	1.8	4.5	4.7	4.8	2.0	3.4	9.2
Cycle Q Clear(g_c), s	4.8	0.0	3.8	1.0	1.0	1.8	4.5	4.7	4.8	2.0	3.4	9.2
Prop In Lane	1.00		0.70	1.00		1.00	1.00		0.25	1.00		1.00
Lane Grp Cap(c), veh/h	530	0	352	67	179	250	214	600	605	111	993	443
V/C Ratio(X)	0.65	0.00	0.40	0.51	0.23	0.26	0.75	0.36	0.37	0.64	0.30	0.72
Avail Cap(c_a), veh/h	1584	0	1118	295	711	701	851	1577	1589	469	2391	1067
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.4	0.0	17.4	24.2	21.4	18.9	21.8	12.8	12.8	23.5	14.5	16.6
Incr Delay (d2), s/veh	1.4	0.0	0.7	5.9	0.6	0.5	5.2	0.4	0.4	6.1	0.2	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	1.4	0.5	0.5	0.6	2.0	1.7	1.7	1.0	1.2	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.8	0.0	18.2	30.1	22.1	19.5	27.0	13.2	13.2	29.6	14.7	18.8
LnGrp LOS	C	A	B	C	C	B	C	B	B	C	B	B
Approach Vol, veh/h		487			139			601			685	
Approach Delay, s/veh		20.7			22.8			16.9			18.1	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.7	21.8	6.4	15.3	10.7	18.8	12.4	9.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.5	45.5	8.5	34.5	24.5	34.5	23.5	19.5
Max Q Clear Time (g_c+I1), s	4.0	6.8	3.0	5.8	6.5	11.2	6.8	3.8
Green Ext Time (p_c), s	0.1	2.9	0.0	0.8	0.4	3.1	1.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	18.7
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	0	17	0	45	0	472	12	44	400	2
Future Vol, veh/h	1	0	0	17	0	45	0	472	12	44	400	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	-	-	-	375	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	0	18	0	49	0	513	13	48	435	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1076	1058	436	1052	1053	520	437	0	0	526	0	0
Stage 1	532	532	-	520	520	-	-	-	-	-	-	-
Stage 2	544	526	-	532	533	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	197	225	620	204	226	556	1123	-	-	1041	-	-
Stage 1	531	526	-	539	532	-	-	-	-	-	-	-
Stage 2	523	529	-	531	525	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	173	215	620	197	216	556	1123	-	-	1041	-	-
Mov Cap-2 Maneuver	173	215	-	197	216	-	-	-	-	-	-	-
Stage 1	531	502	-	539	532	-	-	-	-	-	-	-
Stage 2	477	529	-	507	501	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	25.9	15.7	0	0.9
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1123	-	-	173	197	556	1041	-	-
HCM Lane V/C Ratio	-	-	-	0.006	0.094	0.088	0.046	-	-
HCM Control Delay (s)	0	-	-	25.9	25.2	12.1	8.6	-	-
HCM Lane LOS	A	-	-	D	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.3	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	4.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	113	64	386	55	22	398
Future Vol, veh/h	113	64	386	55	22	398
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	123	70	420	60	24	433

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	931	450	0	0	480	0
Stage 1	450	-	-	-	-	-
Stage 2	481	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	296	609	-	-	1082	-
Stage 1	642	-	-	-	-	-
Stage 2	622	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	289	609	-	-	1082	-
Mov Cap-2 Maneuver	289	-	-	-	-	-
Stage 1	642	-	-	-	-	-
Stage 2	608	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	26.3	0	0.4
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	357	1082	-
HCM Lane V/C Ratio	-	-	0.539	0.022	-
HCM Control Delay (s)	-	-	26.3	8.4	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	3.1	0.1	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	1	60	0	61	1	487	20	18	515	1
Future Vol, veh/h	3	0	1	60	0	61	1	487	20	18	515	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	50	275	-	275	375	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	1	65	0	66	1	529	22	20	560	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1175	1153	560	1132	1132	529	561	0	0	551	0	0
Stage 1	600	600	-	531	531	-	-	-	-	-	-	-
Stage 2	575	553	-	601	601	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	168	197	528	180	203	550	1010	-	-	1019	-	-
Stage 1	488	490	-	532	526	-	-	-	-	-	-	-
Stage 2	503	514	-	487	489	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	145	193	528	177	199	550	1010	-	-	1019	-	-
Mov Cap-2 Maneuver	145	193	-	177	199	-	-	-	-	-	-	-
Stage 1	488	480	-	531	525	-	-	-	-	-	-	-
Stage 2	442	513	-	476	479	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	25.8	24.4	0	0.3
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1010	-	-	145	528	177	550	1019	-	-
HCM Lane V/C Ratio	0.001	-	-	0.022	0.002	0.368	0.121	0.019	-	-
HCM Control Delay (s)	8.6	-	-	30.4	11.8	36.7	12.4	8.6	-	-
HCM Lane LOS	A	-	-	D	B	E	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	1.6	0.4	0.1	-	-

Intersection	
Intersection Delay, s/veh	12.1
Intersection LOS	B

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	471	606	658
Demand Flow Rate, veh/h	480	618	671
Vehicles Circulating, veh/h	430	97	366
Vehicles Exiting, veh/h	285	940	544
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	11.5	8.3	16.1
Approach LOS	B	A	C

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	480	618	671
Cap Entry Lane, veh/h	890	1250	950
Entry HV Adj Factor	0.981	0.980	0.980
Flow Entry, veh/h	471	606	658
Cap Entry, veh/h	873	1225	931
V/C Ratio	0.539	0.494	0.706
Control Delay, s/veh	11.5	8.3	16.1
LOS	B	A	C
95th %tile Queue, veh	3	3	6

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	1	3	1	4	5	518	3	1	815	22
Future Vol, veh/h	10	0	1	3	1	4	5	518	3	1	815	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	-	125	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	0	1	3	1	4	5	563	3	1	886	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1477	1476	898	1476	1487	565	910	0	0	566	0	0
Stage 1	900	900	-	575	575	-	-	-	-	-	-	-
Stage 2	577	576	-	901	912	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	104	126	338	104	124	524	748	-	-	1006	-	-
Stage 1	333	357	-	503	503	-	-	-	-	-	-	-
Stage 2	502	502	-	333	353	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	102	125	338	103	123	524	748	-	-	1006	-	-
Mov Cap-2 Maneuver	102	125	-	103	123	-	-	-	-	-	-	-
Stage 1	331	357	-	499	499	-	-	-	-	-	-	-
Stage 2	493	498	-	332	353	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	41.9	26.3	0.1	0
HCM LOS	E	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	748	-	-	102	338	178	1006	-	-
HCM Lane V/C Ratio	0.007	-	-	0.107	0.003	0.049	0.001	-	-
HCM Control Delay (s)	9.8	-	-	44.5	15.7	26.3	8.6	-	-
HCM Lane LOS	A	-	-	E	C	D	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0	0.2	0	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	31	343	25	79	766
Future Vol, veh/h	14	31	343	25	79	766
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	325	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	34	373	27	86	833

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1392	387	0	0	400	0
Stage 1	387	-	-	-	-	-
Stage 2	1005	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	156	661	-	-	1159	-
Stage 1	686	-	-	-	-	-
Stage 2	354	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	144	661	-	-	1159	-
Mov Cap-2 Maneuver	144	-	-	-	-	-
Stage 1	686	-	-	-	-	-
Stage 2	328	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.6	0	0.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	144	661	1159	-
HCM Lane V/C Ratio	-	-	0.106	0.051	0.074	-
HCM Control Delay (s)	-	-	32.9	10.7	8.4	-
HCM Lane LOS	-	-	D	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0.2	0.2	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	115	6	0	61	5	2
Future Vol, veh/h	115	6	0	61	5	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	125	7	0	66	5	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	132	0	195	129
Stage 1	-	-	-	-	129	-
Stage 2	-	-	-	-	66	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1453	-	794	921
Stage 1	-	-	-	-	897	-
Stage 2	-	-	-	-	957	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1453	-	794	921
Mov Cap-2 Maneuver	-	-	-	-	794	-
Stage 1	-	-	-	-	897	-
Stage 2	-	-	-	-	957	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	827	-	-	1453	-
HCM Lane V/C Ratio	0.009	-	-	-	-
HCM Control Delay (s)	9.4	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

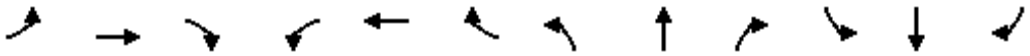
Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	98	2	2	40	5	0
Future Vol, veh/h	98	2	2	40	5	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	107	2	2	43	5	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	109	0	155	108
Stage 1	-	-	-	-	108	-
Stage 2	-	-	-	-	47	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1481	-	836	946
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	975	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1481	-	835	946
Mov Cap-2 Maneuver	-	-	-	-	835	-
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	974	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	9.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	835	-	-	1481	-
HCM Lane V/C Ratio	0.007	-	-	0.001	-
HCM Control Delay (s)	9.3	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	6	40	6	34	18	10	283	1	11	554	332
Future Volume (veh/h)	144	6	40	6	34	18	10	283	1	11	554	332
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	157	7	43	7	37	20	11	308	1	12	602	361
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	313	15	55	87	206	100	267	1217	4	758	715	429
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.65	0.65	0.65	0.65	0.65	0.65
Sat Flow, veh/h	1083	83	306	75	1137	551	583	1863	6	1070	1095	657
Grp Volume(v), veh/h	207	0	0	64	0	0	11	0	309	12	0	963
Grp Sat Flow(s),veh/h/ln	1471	0	0	1763	0	0	583	0	1869	1070	0	1752
Q Serve(g_s), s	5.5	0.0	0.0	0.0	0.0	0.0	0.8	0.0	3.7	0.3	0.0	23.0
Cycle Q Clear(g_c), s	7.1	0.0	0.0	1.7	0.0	0.0	23.8	0.0	3.7	4.0	0.0	23.0
Prop In Lane	0.76		0.21	0.11		0.31	1.00		0.00	1.00		0.37
Lane Grp Cap(c), veh/h	383	0	0	393	0	0	267	0	1221	758	0	1144
V/C Ratio(X)	0.54	0.00	0.00	0.16	0.00	0.00	0.04	0.00	0.25	0.02	0.00	0.84
Avail Cap(c_a), veh/h	659	0	0	728	0	0	536	0	2084	1253	0	1954
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.0	0.0	0.0	18.9	0.0	0.0	16.4	0.0	3.9	4.7	0.0	7.2
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.1	0.0	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	0.0	0.6	0.0	0.0	0.1	0.0	0.9	0.0	0.0	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.1	0.0	0.0	19.1	0.0	0.0	16.5	0.0	4.0	4.7	0.0	9.0
LnGrp LOS	C	A	A	B	A	A	B	A	A	A	A	A
Approach Vol, veh/h		207			64			320			975	
Approach Delay, s/veh		22.1			19.1			4.4			9.0	
Approach LOS		C			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		39.9		14.3		39.9		14.3				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		60.5		20.5		60.5		20.5				
Max Q Clear Time (g_c+I1), s		25.8		9.1		25.0		3.7				
Green Ext Time (p_c), s		2.1		0.9		10.5		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			10.2									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	22	2	14	3	3	4	12	263	9	11	672	4
Future Vol, veh/h	22	2	14	3	3	4	12	263	9	11	672	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	2	15	3	3	4	13	286	10	12	730	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1077	1078	732	1082	1075	291	734	0	0	296	0	0
Stage 1	756	756	-	317	317	-	-	-	-	-	-	-
Stage 2	321	322	-	765	758	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	197	219	421	195	220	748	871	-	-	1265	-	-
Stage 1	400	416	-	694	654	-	-	-	-	-	-	-
Stage 2	691	651	-	396	415	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	189	212	421	182	213	748	871	-	-	1265	-	-
Mov Cap-2 Maneuver	189	212	-	182	213	-	-	-	-	-	-	-
Stage 1	393	409	-	682	642	-	-	-	-	-	-	-
Stage 2	671	639	-	374	408	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.2	18.5	0.4	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	871	-	-	239	278	1265	-	-
HCM Lane V/C Ratio	0.015	-	-	0.173	0.039	0.009	-	-
HCM Control Delay (s)	9.2	0	-	23.2	18.5	7.9	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.1	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	22	101	23	14	12	32	207	6	7	518	104
Future Volume (veh/h)	106	22	101	23	14	12	32	207	6	7	518	104
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	115	24	110	25	15	13	35	225	7	8	563	113
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	285	62	157	284	160	95	166	818	23	106	776	154
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.51	0.51	0.51	0.51	0.51	0.51
Sat Flow, veh/h	591	268	680	580	693	414	99	1589	45	6	1508	299
Grp Volume(v), veh/h	249	0	0	53	0	0	267	0	0	684	0	0
Grp Sat Flow(s),veh/h/ln	1539	0	0	1687	0	0	1734	0	0	1813	0	0
Q Serve(g_s), s	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.2	0.0	0.0	0.8	0.0	0.0	2.9	0.0	0.0	10.4	0.0	0.0
Prop In Lane	0.46		0.44	0.47		0.25	0.13		0.03	0.01		0.17
Lane Grp Cap(c), veh/h	504	0	0	539	0	0	1008	0	0	1036	0	0
V/C Ratio(X)	0.49	0.00	0.00	0.10	0.00	0.00	0.26	0.00	0.00	0.66	0.00	0.00
Avail Cap(c_a), veh/h	1286	0	0	1301	0	0	2617	0	0	2890	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.4	0.0	0.0	10.8	0.0	0.0	4.9	0.0	0.0	6.7	0.0	0.0
Incr Delay (d2), s/veh	0.8	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	0.3	0.0	0.0	0.6	0.0	0.0	2.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.1	0.0	0.0	10.9	0.0	0.0	5.0	0.0	0.0	7.4	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		249			53			267			684	
Approach Delay, s/veh		13.1			10.9			5.0			7.4	
Approach LOS		B			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		22.7		12.6		22.7		12.6				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		54.5		26.5		54.5		26.5				
Max Q Clear Time (g_c+I1), s		4.9		7.2		12.4		2.8				
Green Ext Time (p_c), s		2.0		1.4		5.8		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			8.2									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	3	1	15	5	7	20	7	237	11	32	595	41
Future Vol, veh/h	3	1	15	5	7	20	7	237	11	32	595	41
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	1	16	5	8	22	8	258	12	35	647	45

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1035	1026	670	1028	1042	264	692	0	0	270	0	0
Stage 1	740	740	-	280	280	-	-	-	-	-	-	-
Stage 2	295	286	-	748	762	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	210	235	457	212	230	775	903	-	-	1293	-	-
Stage 1	409	423	-	727	679	-	-	-	-	-	-	-
Stage 2	713	675	-	404	414	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	191	222	457	195	218	775	903	-	-	1293	-	-
Mov Cap-2 Maneuver	191	222	-	195	218	-	-	-	-	-	-	-
Stage 1	405	404	-	720	672	-	-	-	-	-	-	-
Stage 2	678	668	-	371	396	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.7	15.3	0.2	0.4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	903	-	-	358	383	1293	-	-
HCM Lane V/C Ratio	0.008	-	-	0.058	0.091	0.027	-	-
HCM Control Delay (s)	9	0	-	15.7	15.3	7.9	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	3	2	7	4	0	1	1	221	3	8	604	7
Future Vol, veh/h	3	2	7	4	0	1	1	221	3	8	604	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	2	8	4	0	1	1	240	3	9	657	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	923	924	661	928	927	242	665	0	0	243	0	0
Stage 1	679	679	-	244	244	-	-	-	-	-	-	-
Stage 2	244	245	-	684	683	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	250	269	462	248	268	797	924	-	-	1323	-	-
Stage 1	441	451	-	760	704	-	-	-	-	-	-	-
Stage 2	760	703	-	439	449	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	248	266	462	240	265	797	924	-	-	1323	-	-
Mov Cap-2 Maneuver	248	266	-	240	265	-	-	-	-	-	-	-
Stage 1	441	446	-	759	703	-	-	-	-	-	-	-
Stage 2	758	702	-	425	444	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.8	18.2	0	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	924	-	-	345	279	1323	-	-
HCM Lane V/C Ratio	0.001	-	-	0.038	0.019	0.007	-	-
HCM Control Delay (s)	8.9	0	-	15.8	18.2	7.7	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	0	1	2	0	3	0	229	0	5	607	2
Future Vol, veh/h	1	0	1	2	0	3	0	229	0	5	607	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	1	2	0	3	0	249	0	5	660	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	922	920	661	921	921	249	662	0	0	249	0	0
Stage 1	671	671	-	249	249	-	-	-	-	-	-	-
Stage 2	251	249	-	672	672	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	251	271	462	251	270	790	927	-	-	1317	-	-
Stage 1	446	455	-	755	701	-	-	-	-	-	-	-
Stage 2	753	701	-	445	454	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	249	269	462	249	268	790	927	-	-	1317	-	-
Mov Cap-2 Maneuver	249	269	-	249	268	-	-	-	-	-	-	-
Stage 1	446	452	-	755	701	-	-	-	-	-	-	-
Stage 2	750	701	-	441	451	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.2	13.6	0	0.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	927	-	-	324	423	1317	-	-
HCM Lane V/C Ratio	-	-	-	0.007	0.013	0.004	-	-
HCM Control Delay (s)	0	-	-	16.2	13.6	7.7	0	-
HCM Lane LOS	A	-	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	5	1	208	609	3
Future Vol, veh/h	9	5	1	208	609	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	5	1	226	662	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	892	664	665	0	-	0
Stage 1	664	-	-	-	-	-
Stage 2	228	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	312	461	924	-	-	-
Stage 1	512	-	-	-	-	-
Stage 2	810	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	312	461	924	-	-	-
Mov Cap-2 Maneuver	312	-	-	-	-	-
Stage 1	511	-	-	-	-	-
Stage 2	810	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	924	-	353	-	-
HCM Lane V/C Ratio	0.001	-	0.043	-	-
HCM Control Delay (s)	8.9	0	15.7	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	9	1	201	594	6
Future Vol, veh/h	6	9	1	201	594	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	275	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	10	1	218	646	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	870	650	653	0	-	0
Stage 1	650	-	-	-	-	-
Stage 2	220	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	322	469	934	-	-	-
Stage 1	520	-	-	-	-	-
Stage 2	817	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	322	469	934	-	-	-
Mov Cap-2 Maneuver	322	-	-	-	-	-
Stage 1	519	-	-	-	-	-
Stage 2	817	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	934	-	322	469	-	-
HCM Lane V/C Ratio	0.001	-	0.02	0.021	-	-
HCM Control Delay (s)	8.9	-	16.4	12.8	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	185	13	2	112	0	9	0	5	1	0	0
Future Vol, veh/h	1	185	13	2	112	0	9	0	5	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	201	14	2	122	0	10	0	5	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	122	0	0	215	0	0	336	336	208	339	343	122
Stage 1	-	-	-	-	-	-	210	210	-	126	126	-
Stage 2	-	-	-	-	-	-	126	126	-	213	217	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1465	-	-	1355	-	-	618	585	832	615	579	929
Stage 1	-	-	-	-	-	-	792	728	-	878	792	-
Stage 2	-	-	-	-	-	-	878	792	-	789	723	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1465	-	-	1355	-	-	617	583	832	609	577	929
Mov Cap-2 Maneuver	-	-	-	-	-	-	617	583	-	609	577	-
Stage 1	-	-	-	-	-	-	791	727	-	877	790	-
Stage 2	-	-	-	-	-	-	876	790	-	783	722	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	10.4	10.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	680	1465	-	-	1355	-	-	609
HCM Lane V/C Ratio	0.022	0.001	-	-	0.002	-	-	0.002
HCM Control Delay (s)	10.4	7.5	0	-	7.7	0	-	10.9
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	54	79	13	29	26	2
Future Vol, veh/h	54	79	13	29	26	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	59	86	14	32	28	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	145	0	162	102
Stage 1	-	-	-	-	102	-
Stage 2	-	-	-	-	60	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1437	-	829	953
Stage 1	-	-	-	-	922	-
Stage 2	-	-	-	-	963	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1437	-	821	953
Mov Cap-2 Maneuver	-	-	-	-	821	-
Stage 1	-	-	-	-	922	-
Stage 2	-	-	-	-	953	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.3	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	829	-	-	1437	-
HCM Lane V/C Ratio	0.037	-	-	0.01	-
HCM Control Delay (s)	9.5	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	109	26	18	34	197	458
Future Vol, veh/h	109	26	18	34	197	458
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	118	28	20	37	214	498

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	540	463	712	0	-	0
Stage 1	463	-	-	-	-	-
Stage 2	77	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	503	599	888	-	-	-
Stage 1	634	-	-	-	-	-
Stage 2	946	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	491	599	888	-	-	-
Mov Cap-2 Maneuver	491	-	-	-	-	-
Stage 1	619	-	-	-	-	-
Stage 2	946	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.9	3.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	888	-	509	-	-
HCM Lane V/C Ratio	0.022	-	0.288	-	-
HCM Control Delay (s)	9.1	0	14.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1.2	-	-

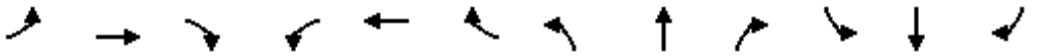
Intersection	
Int Delay, s/veh	23.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	518	40	76	93	28	92
Future Vol, veh/h	518	40	76	93	28	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	563	43	83	101	30	100

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	294	134	0	0	184	0
Stage 1	134	-	-	-	-	-
Stage 2	160	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	697	915	-	-	1391	-
Stage 1	892	-	-	-	-	-
Stage 2	869	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	682	915	-	-	1391	-
Mov Cap-2 Maneuver	682	-	-	-	-	-
Stage 1	892	-	-	-	-	-
Stage 2	850	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	35	0	1.8
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	695	1391	-
HCM Lane V/C Ratio	-	-	0.873	0.022	-
HCM Control Delay (s)	-	-	35	7.6	-
HCM Lane LOS	-	-	E	A	-
HCM 95th %tile Q(veh)	-	-	10.5	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	311	42	121	57	44	91	139	452	57	96	397	369
Future Volume (veh/h)	311	42	121	57	44	91	139	452	57	96	397	369
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	338	46	132	62	48	99	151	491	62	104	432	401
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	498	79	227	97	180	274	199	1184	149	137	1201	536
Arrive On Green	0.14	0.19	0.19	0.05	0.10	0.10	0.11	0.37	0.37	0.08	0.34	0.34
Sat Flow, veh/h	3456	426	1224	1781	1870	1585	1781	3176	399	1781	3554	1585
Grp Volume(v), veh/h	338	0	178	62	48	99	151	274	279	104	432	401
Grp Sat Flow(s),veh/h/ln	1728	0	1650	1781	1870	1585	1781	1777	1798	1781	1777	1585
Q Serve(g_s), s	5.4	0.0	5.7	2.0	1.4	3.2	4.8	6.6	6.7	3.3	5.3	13.0
Cycle Q Clear(g_c), s	5.4	0.0	5.7	2.0	1.4	3.2	4.8	6.6	6.7	3.3	5.3	13.0
Prop In Lane	1.00		0.74	1.00		1.00	1.00		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	498	0	307	97	180	274	199	662	670	137	1201	536
V/C Ratio(X)	0.68	0.00	0.58	0.64	0.27	0.36	0.76	0.41	0.42	0.76	0.36	0.75
Avail Cap(c_a), veh/h	1280	0	810	353	596	627	660	1393	1410	506	2479	1106
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.6	0.0	21.6	26.9	24.3	21.2	25.0	13.5	13.5	26.3	14.5	17.0
Incr Delay (d2), s/veh	1.6	0.0	1.7	6.8	0.8	0.8	5.9	0.4	0.4	8.3	0.2	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	2.2	1.0	0.6	1.2	2.2	2.4	2.5	1.6	1.9	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.2	0.0	23.3	33.7	25.1	22.0	30.9	13.9	13.9	34.6	14.7	19.1
LnGrp LOS	C	A	C	C	C	C	C	B	B	C	B	B
Approach Vol, veh/h		516			209			704			937	
Approach Delay, s/veh		24.5			26.2			17.6			18.8	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	26.1	7.7	15.3	11.0	24.1	12.9	10.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	45.5	11.5	28.5	21.5	40.5	21.5	18.5
Max Q Clear Time (g_c+I1), s	5.3	8.7	4.0	7.7	6.8	15.0	7.4	5.2
Green Ext Time (p_c), s	0.2	3.7	0.1	1.0	0.3	4.6	1.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	20.3
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	0	11	0	48	0	627	18	79	532	2
Future Vol, veh/h	1	0	0	11	0	48	0	627	18	79	532	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	-	-	-	375	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	0	12	0	52	0	682	20	86	578	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1469	1453	579	1443	1444	692	580	0	0	702	0	0
Stage 1	751	751	-	692	692	-	-	-	-	-	-	-
Stage 2	718	702	-	751	752	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	106	130	515	110	132	444	994	-	-	895	-	-
Stage 1	403	418	-	434	445	-	-	-	-	-	-	-
Stage 2	420	440	-	403	418	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	87	118	515	102	119	444	994	-	-	895	-	-
Mov Cap-2 Maneuver	87	118	-	102	119	-	-	-	-	-	-	-
Stage 1	403	378	-	434	445	-	-	-	-	-	-	-
Stage 2	371	440	-	364	378	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	46.9	19.9	0	1.2
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	994	-	-	87	102	444	895	-	-
HCM Lane V/C Ratio	-	-	-	0.012	0.117	0.118	0.096	-	-
HCM Control Delay (s)	0	-	-	46.9	44.9	14.2	9.4	-	-
HCM Lane LOS	A	-	-	E	E	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.4	0.4	0.3	-	-

Intersection	
Int Delay, s/veh	6.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	67	48	614	140	96	491
Future Vol, veh/h	67	48	614	140	96	491
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	73	52	667	152	104	534

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1485	743	0	0	819	0
Stage 1	743	-	-	-	-	-
Stage 2	742	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	137	415	-	-	810	-
Stage 1	470	-	-	-	-	-
Stage 2	471	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	119	415	-	-	810	-
Mov Cap-2 Maneuver	119	-	-	-	-	-
Stage 1	470	-	-	-	-	-
Stage 2	411	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	70.3	0	1.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	169	810	-
HCM Lane V/C Ratio	-	-	0.74	0.129	-
HCM Control Delay (s)	-	-	70.3	10.1	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	4.6	0.4	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1	6	24	0	37	2	752	51	52	505	1
Future Vol, veh/h	3	1	6	24	0	37	2	752	51	52	505	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	50	275	-	275	375	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	1	7	26	0	40	2	817	55	57	549	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1532	1539	549	1489	1485	817	550	0	0	872	0	0
Stage 1	663	663	-	821	821	-	-	-	-	-	-	-
Stage 2	869	876	-	668	664	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	95	116	535	102	125	376	1020	-	-	773	-	-
Stage 1	450	459	-	369	389	-	-	-	-	-	-	-
Stage 2	347	367	-	448	458	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	80	107	535	94	116	376	1020	-	-	773	-	-
Mov Cap-2 Maneuver	80	107	-	94	116	-	-	-	-	-	-	-
Stage 1	449	425	-	368	388	-	-	-	-	-	-	-
Stage 2	309	366	-	409	424	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26.9	32.1	0	0.9
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1020	-	-	85	535	94	376	773	-	-
HCM Lane V/C Ratio	0.002	-	-	0.051	0.012	0.278	0.107	0.073	-	-
HCM Control Delay (s)	8.5	-	-	49.6	11.8	57.4	15.7	10	-	-
HCM Lane LOS	A	-	-	E	B	F	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	1	0.4	0.2	-	-

Intersection	
Intersection Delay, s/veh	24.7
Intersection LOS	C

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	241	1149	538
Demand Flow Rate, veh/h	246	1172	548
Vehicles Circulating, veh/h	786	116	148
Vehicles Exiting, veh/h	502	580	884
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	11.8	35.1	8.0
Approach LOS	B	E	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	246	1172	548
Cap Entry Lane, veh/h	619	1226	1187
Entry HV Adj Factor	0.980	0.980	0.981
Flow Entry, veh/h	241	1149	538
Cap Entry, veh/h	606	1201	1164
V/C Ratio	0.397	0.956	0.462
Control Delay, s/veh	11.8	35.1	8.0
LOS	B	E	A
95th %tile Queue, veh	2	18	2

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	0	3	5	0	10	2	1029	3	6	492	3
Future Vol, veh/h	15	0	3	5	0	10	2	1029	3	6	492	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	-	125	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	0	3	5	0	11	2	1118	3	7	535	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1680	1676	537	1676	1676	1120	538	0	0	1121	0	0
Stage 1	551	551	-	1124	1124	-	-	-	-	-	-	-
Stage 2	1129	1125	-	552	552	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	75	95	544	76	95	251	1030	-	-	623	-	-
Stage 1	519	515	-	249	281	-	-	-	-	-	-	-
Stage 2	248	280	-	518	515	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	71	94	544	75	94	251	1030	-	-	623	-	-
Mov Cap-2 Maneuver	71	94	-	75	94	-	-	-	-	-	-	-
Stage 1	518	509	-	249	280	-	-	-	-	-	-	-
Stage 2	237	279	-	509	509	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	60.5	33.8	0	0.1
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1030	-	-	71	544	141	623	-	-
HCM Lane V/C Ratio	0.002	-	-	0.23	0.006	0.116	0.01	-	-
HCM Control Delay (s)	8.5	-	-	70.2	11.7	33.8	10.8	-	-
HCM Lane LOS	A	-	-	F	B	D	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.8	0	0.4	0	-	-

Intersection	
Int Delay, s/veh	4.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	40	134	930	27	29	339
Future Vol, veh/h	40	134	930	27	29	339
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	325	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	146	1011	29	32	368

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1458	1026	0	0	1040	0
Stage 1	1026	-	-	-	-	-
Stage 2	432	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	143	285	-	-	669	-
Stage 1	346	-	-	-	-	-
Stage 2	655	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	136	285	-	-	669	-
Mov Cap-2 Maneuver	136	-	-	-	-	-
Stage 1	346	-	-	-	-	-
Stage 2	624	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	33.2	0	0.8
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	136	285	669	-
HCM Lane V/C Ratio	-	-	0.32	0.511	0.047	-
HCM Control Delay (s)	-	-	43.4	30.1	10.6	-
HCM Lane LOS	-	-	E	D	B	-
HCM 95th %tile Q(veh)	-	-	1.3	2.7	0.1	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	60	3	2	178	4	1
Future Vol, veh/h	60	3	2	178	4	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	65	3	2	193	4	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	68	0	264	67
Stage 1	-	-	-	-	67	-
Stage 2	-	-	-	-	197	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1533	-	725	997
Stage 1	-	-	-	-	956	-
Stage 2	-	-	-	-	836	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1533	-	724	997
Mov Cap-2 Maneuver	-	-	-	-	724	-
Stage 1	-	-	-	-	956	-
Stage 2	-	-	-	-	835	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	766	-	-	1533	-
HCM Lane V/C Ratio	0.007	-	-	0.001	-
HCM Control Delay (s)	9.7	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	51	3	1	154	2	0
Future Vol, veh/h	51	3	1	154	2	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	55	3	1	167	2	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	58	0	226	57
Stage 1	-	-	-	-	57	-
Stage 2	-	-	-	-	169	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1546	-	762	1009
Stage 1	-	-	-	-	966	-
Stage 2	-	-	-	-	861	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1546	-	761	1009
Mov Cap-2 Maneuver	-	-	-	-	761	-
Stage 1	-	-	-	-	966	-
Stage 2	-	-	-	-	860	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	761	-	-	1546	-
HCM Lane V/C Ratio	0.003	-	-	0.001	-
HCM Control Delay (s)	9.7	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	3	36	36	10	42	14	828	13	8	346	110
Future Volume (veh/h)	111	3	36	36	10	42	14	828	13	8	346	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	121	3	39	39	11	46	15	900	14	9	376	120
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	318	11	56	196	59	123	614	1158	18	342	857	273
Arrive On Green	0.15	0.15	0.15	0.15	0.15	0.15	0.63	0.63	0.63	0.63	0.63	0.63
Sat Flow, veh/h	1097	70	367	488	388	806	901	1837	29	611	1359	434
Grp Volume(v), veh/h	163	0	0	96	0	0	15	0	914	9	0	496
Grp Sat Flow(s),veh/h/ln	1533	0	0	1681	0	0	901	0	1865	611	0	1792
Q Serve(g_s), s	1.9	0.0	0.0	0.0	0.0	0.0	0.4	0.0	14.8	0.5	0.0	5.9
Cycle Q Clear(g_c), s	4.0	0.0	0.0	2.1	0.0	0.0	6.2	0.0	14.8	15.2	0.0	5.9
Prop In Lane	0.74		0.24	0.41		0.48	1.00		0.02	1.00		0.24
Lane Grp Cap(c), veh/h	385	0	0	379	0	0	614	0	1176	342	0	1130
V/C Ratio(X)	0.42	0.00	0.00	0.25	0.00	0.00	0.02	0.00	0.78	0.03	0.00	0.44
Avail Cap(c_a), veh/h	863	0	0	893	0	0	1358	0	2714	845	0	2608
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.5	0.0	0.0	15.8	0.0	0.0	5.5	0.0	5.6	11.1	0.0	3.9
Incr Delay (d2), s/veh	0.7	0.0	0.0	0.3	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	0.0	0.7	0.0	0.0	0.0	0.0	2.9	0.1	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.2	0.0	0.0	16.1	0.0	0.0	5.5	0.0	6.7	11.1	0.0	4.2
LnGrp LOS	B	A	A	B	A	A	A	A	A	B	A	A
Approach Vol, veh/h		163			96			929			505	
Approach Delay, s/veh		17.2			16.1			6.7			4.3	
Approach LOS		B			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		30.7		10.9		30.7		10.9				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		60.5		20.5		60.5		20.5				
Max Q Clear Time (g_c+I1), s		16.8		6.0		17.2		4.1				
Green Ext Time (p_c), s		9.5		0.7		3.9		0.4				

Intersection Summary												
HCM 6th Ctrl Delay			7.5									
HCM 6th LOS			A									

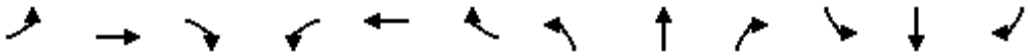
Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	6	1	5	3	0	4	5	828	13	9	443	6
Future Vol, veh/h	6	1	5	3	0	4	5	828	13	9	443	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1	5	3	0	4	5	900	14	10	482	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1425	1430	486	1426	1426	907	489	0	0	914	0	0
Stage 1	506	506	-	917	917	-	-	-	-	-	-	-
Stage 2	919	924	-	509	509	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	113	135	581	113	135	334	1074	-	-	746	-	-
Stage 1	549	540	-	326	351	-	-	-	-	-	-	-
Stage 2	325	348	-	547	538	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	109	131	581	109	131	334	1074	-	-	746	-	-
Mov Cap-2 Maneuver	109	131	-	109	131	-	-	-	-	-	-	-
Stage 1	544	530	-	323	348	-	-	-	-	-	-	-
Stage 2	318	345	-	531	528	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	28.2	26.3	0	0.2
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1074	-	-	168	177	746	-	-
HCM Lane V/C Ratio	0.005	-	-	0.078	0.043	0.013	-	-
HCM Control Delay (s)	8.4	0	-	28.2	26.3	9.9	0	-
HCM Lane LOS	A	A	-	D	D	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	174	12	70	23	23	12	55	653	8	2	344	116
Future Volume (veh/h)	174	12	70	23	23	12	55	653	8	2	344	116
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	189	13	76	25	25	13	60	710	9	2	374	126
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	371	32	100	236	214	87	131	923	11	83	734	246
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.55	0.55	0.55	0.55	0.55	0.55
Sat Flow, veh/h	947	129	405	492	867	353	78	1683	21	1	1338	449
Grp Volume(v), veh/h	278	0	0	63	0	0	779	0	0	502	0	0
Grp Sat Flow(s),veh/h/ln	1481	0	0	1712	0	0	1782	0	0	1788	0	0
Q Serve(g_s), s	6.4	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	7.6	0.0	0.0	1.2	0.0	0.0	14.9	0.0	0.0	7.7	0.0	0.0
Prop In Lane	0.68		0.27	0.40		0.21	0.08		0.01	0.00		0.25
Lane Grp Cap(c), veh/h	503	0	0	537	0	0	1066	0	0	1063	0	0
V/C Ratio(X)	0.55	0.00	0.00	0.12	0.00	0.00	0.73	0.00	0.00	0.47	0.00	0.00
Avail Cap(c_a), veh/h	982	0	0	1052	0	0	2294	0	0	2331	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.2	0.0	0.0	12.9	0.0	0.0	7.7	0.0	0.0	6.2	0.0	0.0
Incr Delay (d2), s/veh	1.0	0.0	0.0	0.1	0.0	0.0	1.0	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	0.0	0.4	0.0	0.0	3.8	0.0	0.0	1.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.2	0.0	0.0	13.0	0.0	0.0	8.7	0.0	0.0	6.6	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		278			63			779			502	
Approach Delay, s/veh		16.2			13.0			8.7			6.6	
Approach LOS		B			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		28.6		15.4		28.6		15.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		55.5		25.5		55.5		25.5				
Max Q Clear Time (g_c+I1), s		16.9		9.6		9.7		3.2				
Green Ext Time (p_c), s		7.3		1.5		3.8		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			9.5									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	6	4	19	6	7	27	22	722	11	20	332	60
Future Vol, veh/h	6	4	19	6	7	27	22	722	11	20	332	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	4	21	7	8	29	24	785	12	22	361	65

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1296	1283	394	1289	1309	791	426	0	0	797	0	0
Stage 1	438	438	-	839	839	-	-	-	-	-	-	-
Stage 2	858	845	-	450	470	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	139	165	655	141	159	390	1133	-	-	825	-	-
Stage 1	597	579	-	360	381	-	-	-	-	-	-	-
Stage 2	352	379	-	589	560	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	117	153	655	126	148	390	1133	-	-	825	-	-
Mov Cap-2 Maneuver	117	153	-	126	148	-	-	-	-	-	-	-
Stage 1	574	559	-	346	367	-	-	-	-	-	-	-
Stage 2	307	365	-	546	540	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20	22.9	0.2	0.5
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1133	-	-	272	244	825	-	-
HCM Lane V/C Ratio	0.021	-	-	0.116	0.178	0.026	-	-
HCM Control Delay (s)	8.2	0	-	20	22.9	9.5	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.6	0.1	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	0	1	2	1	9	3	805	7	9	334	5
Future Vol, veh/h	1	0	1	2	1	9	3	805	7	9	334	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	1	2	1	10	3	875	8	10	363	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1277	1275	366	1271	1273	879	368	0	0	883	0	0
Stage 1	386	386	-	885	885	-	-	-	-	-	-	-
Stage 2	891	889	-	386	388	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	143	167	679	145	167	347	1191	-	-	766	-	-
Stage 1	637	610	-	340	363	-	-	-	-	-	-	-
Stage 2	337	361	-	637	609	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	136	163	679	142	163	347	1191	-	-	766	-	-
Mov Cap-2 Maneuver	136	163	-	142	163	-	-	-	-	-	-	-
Stage 1	634	600	-	338	361	-	-	-	-	-	-	-
Stage 2	325	359	-	626	599	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21	19.6	0	0.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1191	-	-	227	260	766	-	-
HCM Lane V/C Ratio	0.003	-	-	0.01	0.05	0.013	-	-
HCM Control Delay (s)	8	0	-	21	19.6	9.8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	1	2	4	0	9	8	800	7	0	317	3
Future Vol, veh/h	0	1	2	4	0	9	8	800	7	0	317	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	2	4	0	10	9	870	8	0	345	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1244	1243	347	1240	1240	874	348	0	0	878	0	0
Stage 1	347	347	-	892	892	-	-	-	-	-	-	-
Stage 2	897	896	-	348	348	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	151	174	696	152	175	349	1211	-	-	769	-	-
Stage 1	669	635	-	337	360	-	-	-	-	-	-	-
Stage 2	334	359	-	668	634	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	145	171	696	149	172	349	1211	-	-	769	-	-
Mov Cap-2 Maneuver	145	171	-	149	172	-	-	-	-	-	-	-
Stage 1	659	635	-	332	355	-	-	-	-	-	-	-
Stage 2	320	354	-	665	634	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.6	20.5	0.1	0
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1211	-	-	344	247	769	-	-
HCM Lane V/C Ratio	0.007	-	-	0.009	0.057	-	-	-
HCM Control Delay (s)	8	0	-	15.6	20.5	0	-	-
HCM Lane LOS	A	A	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	4	3	786	320	11
Future Vol, veh/h	6	4	3	786	320	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	4	3	854	348	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1214	354	360	0	-	0
Stage 1	354	-	-	-	-	-
Stage 2	860	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	201	690	1199	-	-	-
Stage 1	710	-	-	-	-	-
Stage 2	414	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	200	690	1199	-	-	-
Mov Cap-2 Maneuver	200	-	-	-	-	-
Stage 1	706	-	-	-	-	-
Stage 2	414	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1199	-	279	-	-
HCM Lane V/C Ratio	0.003	-	0.039	-	-
HCM Control Delay (s)	8	0	18.4	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	3	35	808	292	11
Future Vol, veh/h	7	3	35	808	292	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	275	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	3	38	878	317	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1277	323	329	0	-	0
Stage 1	323	-	-	-	-	-
Stage 2	954	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	184	718	1231	-	-	-
Stage 1	734	-	-	-	-	-
Stage 2	374	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	178	718	1231	-	-	-
Mov Cap-2 Maneuver	178	-	-	-	-	-
Stage 1	711	-	-	-	-	-
Stage 2	374	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.3	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1231	-	178	718	-	-
HCM Lane V/C Ratio	0.031	-	0.043	0.005	-	-
HCM Control Delay (s)	8	-	26.1	10	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	238	8	20	203	4	18	1	14	2	0	1
Future Vol, veh/h	1	238	8	20	203	4	18	1	14	2	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	259	9	22	221	4	20	1	15	2	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	225	0	0	268	0	0	534	535	264	541	537	223
Stage 1	-	-	-	-	-	-	266	266	-	267	267	-
Stage 2	-	-	-	-	-	-	268	269	-	274	270	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1344	-	-	1296	-	-	457	452	775	452	450	817
Stage 1	-	-	-	-	-	-	739	689	-	738	688	-
Stage 2	-	-	-	-	-	-	738	687	-	732	686	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1344	-	-	1296	-	-	449	443	775	436	441	817
Mov Cap-2 Maneuver	-	-	-	-	-	-	449	443	-	436	441	-
Stage 1	-	-	-	-	-	-	738	688	-	737	675	-
Stage 2	-	-	-	-	-	-	723	674	-	716	685	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.7	12.1	12
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	546	1344	-	-	1296	-	-	516
HCM Lane V/C Ratio	0.066	0.001	-	-	0.017	-	-	0.006
HCM Control Delay (s)	12.1	7.7	0	-	7.8	0	-	12
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0.1	-	-	0

Intersection	
Int Delay, s/veh	3.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	34	34	11	56	74	3
Future Vol, veh/h	34	34	11	56	74	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	37	37	12	61	80	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	74	0	141	56
Stage 1	-	-	-	-	56	-
Stage 2	-	-	-	-	85	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1526	-	852	1011
Stage 1	-	-	-	-	967	-
Stage 2	-	-	-	-	938	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1526	-	845	1011
Mov Cap-2 Maneuver	-	-	-	-	845	-
Stage 1	-	-	-	-	967	-
Stage 2	-	-	-	-	930	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	850	-	-	1526	-
HCM Lane V/C Ratio	0.098	-	-	0.008	-
HCM Control Delay (s)	9.7	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection	
Int Delay, s/veh	140.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	574	33	82	245	64	175
Future Vol, veh/h	574	33	82	245	64	175
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	624	36	89	266	70	190

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	609	165	260	0	-	0
Stage 1	165	-	-	-	-	-
Stage 2	444	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	~ 458	879	1304	-	-	-
Stage 1	864	-	-	-	-	-
Stage 2	646	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 421	879	1304	-	-	-
Mov Cap-2 Maneuver	~ 421	-	-	-	-	-
Stage 1	795	-	-	-	-	-
Stage 2	646	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	271.1	2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1304	-	433	-	-
HCM Lane V/C Ratio	0.068	-	1.524	-	-
HCM Control Delay (s)	8	0	271.1	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0.2	-	35.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

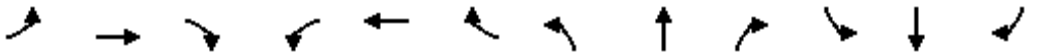
Intersection	
Int Delay, s/veh	26.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	301	46	60	443	123	118
Future Vol, veh/h	301	46	60	443	123	118
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	327	50	65	482	134	128

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	702	306	0	0	547	0
Stage 1	306	-	-	-	-	-
Stage 2	396	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	404	734	-	-	1022	-
Stage 1	747	-	-	-	-	-
Stage 2	680	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	351	734	-	-	1022	-
Mov Cap-2 Maneuver	351	-	-	-	-	-
Stage 1	747	-	-	-	-	-
Stage 2	591	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	80.2	0	4.6
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	377	1022	-
HCM Lane V/C Ratio	-	-	1	0.131	-
HCM Control Delay (s)	-	-	80.2	9.1	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	11.9	0.5	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	317	40	104	36	38	59	161	382	55	65	301	292
Future Volume (veh/h)	317	40	104	36	38	59	161	382	55	65	301	292
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	345	43	113	39	41	64	175	415	60	71	327	317
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	526	93	245	74	176	246	232	1090	157	109	998	445
Arrive On Green	0.15	0.20	0.20	0.04	0.09	0.09	0.13	0.35	0.35	0.06	0.28	0.28
Sat Flow, veh/h	3456	456	1199	1781	1870	1585	1781	3119	448	1781	3554	1585
Grp Volume(v), veh/h	345	0	156	39	41	64	175	235	240	71	327	317
Grp Sat Flow(s),veh/h/ln	1728	0	1655	1781	1870	1585	1781	1777	1790	1781	1777	1585
Q Serve(g_s), s	4.9	0.0	4.3	1.1	1.1	1.9	5.0	5.2	5.3	2.0	3.8	9.4
Cycle Q Clear(g_c), s	4.9	0.0	4.3	1.1	1.1	1.9	5.0	5.2	5.3	2.0	3.8	9.4
Prop In Lane	1.00		0.72	1.00		1.00	1.00		0.25	1.00		1.00
Lane Grp Cap(c), veh/h	526	0	339	74	176	246	232	621	626	109	998	445
V/C Ratio(X)	0.66	0.00	0.46	0.53	0.23	0.26	0.76	0.38	0.38	0.65	0.33	0.71
Avail Cap(c_a), veh/h	1547	0	1056	288	659	656	865	1608	1619	424	2335	1042
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	0.0	18.3	24.7	22.0	19.5	22.0	12.8	12.8	24.1	14.9	17.0
Incr Delay (d2), s/veh	1.4	0.0	1.0	5.8	0.7	0.6	5.0	0.4	0.4	6.3	0.2	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	1.6	0.6	0.5	0.7	2.2	1.9	1.9	1.0	1.4	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.4	0.0	19.3	30.5	22.7	20.1	27.0	13.2	13.2	30.4	15.1	19.1
LnGrp LOS	C	A	B	C	C	C	C	B	B	C	B	B
Approach Vol, veh/h		501			144			650			715	
Approach Delay, s/veh		21.4			23.6			16.9			18.4	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.7	22.9	6.7	15.3	11.3	19.2	12.5	9.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.5	47.5	8.5	33.5	25.5	34.5	23.5	18.5
Max Q Clear Time (g_c+I1), s	4.0	7.3	3.1	6.3	7.0	11.4	6.9	3.9
Green Ext Time (p_c), s	0.1	3.2	0.0	0.9	0.4	3.3	1.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	19.0
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	0	19	0	45	0	517	14	44	446	2
Future Vol, veh/h	1	0	0	19	0	45	0	517	14	44	446	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	-	-	-	375	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	0	21	0	49	0	562	15	48	485	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1176	1159	486	1152	1153	570	487	0	0	577	0	0
Stage 1	582	582	-	570	570	-	-	-	-	-	-	-
Stage 2	594	577	-	582	583	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	168	196	581	175	197	521	1076	-	-	996	-	-
Stage 1	499	499	-	506	505	-	-	-	-	-	-	-
Stage 2	491	502	-	499	499	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	147	187	581	169	188	521	1076	-	-	996	-	-
Mov Cap-2 Maneuver	147	187	-	169	188	-	-	-	-	-	-	-
Stage 1	499	475	-	506	505	-	-	-	-	-	-	-
Stage 2	445	502	-	475	475	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.7	17.5	0	0.8
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1076	-	-	147	169	521	996	-	-
HCM Lane V/C Ratio	-	-	-	0.007	0.122	0.094	0.048	-	-
HCM Control Delay (s)	0	-	-	29.7	29.2	12.6	8.8	-	-
HCM Lane LOS	A	-	-	D	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.4	0.3	0.2	-	-

Intersection	
Int Delay, s/veh	5.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	115	64	433	57	22	446
Future Vol, veh/h	115	64	433	57	22	446
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	125	70	471	62	24	485

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1035	502	0	0	533	0
Stage 1	502	-	-	-	-	-
Stage 2	533	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	257	569	-	-	1035	-
Stage 1	608	-	-	-	-	-
Stage 2	588	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	251	569	-	-	1035	-
Mov Cap-2 Maneuver	251	-	-	-	-	-
Stage 1	608	-	-	-	-	-
Stage 2	574	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	33.5	0	0.4
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	314	1035	-
HCM Lane V/C Ratio	-	-	0.62	0.023	-
HCM Control Delay (s)	-	-	33.5	8.6	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	3.9	0.1	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	1	63	0	61	1	536	23	18	565	1
Future Vol, veh/h	3	0	1	63	0	61	1	536	23	18	565	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	50	275	-	275	375	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	1	68	0	66	1	583	25	20	614	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1285	1264	614	1240	1240	583	615	0	0	608	0	0
Stage 1	654	654	-	585	585	-	-	-	-	-	-	-
Stage 2	631	610	-	655	655	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	142	169	492	152	175	512	965	-	-	970	-	-
Stage 1	456	463	-	497	498	-	-	-	-	-	-	-
Stage 2	469	485	-	455	463	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	122	165	492	149	171	512	965	-	-	970	-	-
Mov Cap-2 Maneuver	122	165	-	149	171	-	-	-	-	-	-	-
Stage 1	456	453	-	497	498	-	-	-	-	-	-	-
Stage 2	408	485	-	445	453	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.5	30.9	0	0.3
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	965	-	-	122	492	149	512	970	-	-
HCM Lane V/C Ratio	0.001	-	-	0.027	0.002	0.46	0.13	0.02	-	-
HCM Control Delay (s)	8.7	-	-	35.3	12.3	48.2	13.1	8.8	-	-
HCM Lane LOS	A	-	-	E	B	E	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	2.1	0.4	0.1	-	-

Intersection	
Intersection Delay, s/veh	14.0
Intersection LOS	B

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	471	662	716
Demand Flow Rate, veh/h	480	676	730
Vehicles Circulating, veh/h	488	97	366
Vehicles Exiting, veh/h	285	999	602
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	12.9	9.0	19.3
Approach LOS	B	A	C

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	480	676	730
Cap Entry Lane, veh/h	839	1250	950
Entry HV Adj Factor	0.981	0.980	0.980
Flow Entry, veh/h	471	662	716
Cap Entry, veh/h	823	1225	931
V/C Ratio	0.572	0.541	0.768
Control Delay, s/veh	12.9	9.0	19.3
LOS	B	A	C
95th %tile Queue, veh	4	3	8

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	1	3	1	4	5	570	3	1	868	22
Future Vol, veh/h	10	0	1	3	1	4	5	570	3	1	868	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	-	125	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	0	1	3	1	4	5	620	3	1	943	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1591	1590	955	1590	1601	622	967	0	0	623	0	0
Stage 1	957	957	-	632	632	-	-	-	-	-	-	-
Stage 2	634	633	-	958	969	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	87	108	313	87	106	487	712	-	-	958	-	-
Stage 1	310	336	-	468	474	-	-	-	-	-	-	-
Stage 2	467	473	-	309	332	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	85	107	313	86	105	487	712	-	-	958	-	-
Mov Cap-2 Maneuver	85	107	-	86	105	-	-	-	-	-	-	-
Stage 1	308	336	-	465	471	-	-	-	-	-	-	-
Stage 2	459	470	-	308	332	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	50.1	30.1	0.1	0
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	712	-	-	85	313	152	958	-	-
HCM Lane V/C Ratio	0.008	-	-	0.128	0.003	0.057	0.001	-	-
HCM Control Delay (s)	10.1	-	-	53.5	16.5	30.1	8.8	-	-
HCM Lane LOS	B	-	-	F	C	D	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0	0.2	0	-	-

Intersection	
Int Delay, s/veh	4.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	60	83	343	70	132	766
Future Vol, veh/h	60	83	343	70	132	766
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	325	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	65	90	373	76	143	833

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1530	411	0	0	449	0
Stage 1	411	-	-	-	-	-
Stage 2	1119	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	129	641	-	-	1111	-
Stage 1	669	-	-	-	-	-
Stage 2	312	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	112	641	-	-	1111	-
Mov Cap-2 Maneuver	112	-	-	-	-	-
Stage 1	669	-	-	-	-	-
Stage 2	272	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	37.9	0	1.3
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	112	641	1111	-
HCM Lane V/C Ratio	-	-	0.582	0.141	0.129	-
HCM Control Delay (s)	-	-	74.5	11.5	8.7	-
HCM Lane LOS	-	-	F	B	A	-
HCM 95th %tile Q(veh)	-	-	2.8	0.5	0.4	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	213	6	0	159	5	2
Future Vol, veh/h	213	6	0	159	5	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	232	7	0	173	5	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	239	0	409	236
Stage 1	-	-	-	-	236	-
Stage 2	-	-	-	-	173	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1328	-	599	803
Stage 1	-	-	-	-	803	-
Stage 2	-	-	-	-	857	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1328	-	599	803
Mov Cap-2 Maneuver	-	-	-	-	599	-
Stage 1	-	-	-	-	803	-
Stage 2	-	-	-	-	857	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	646	-	-	1328	-
HCM Lane V/C Ratio	0.012	-	-	-	-
HCM Control Delay (s)	10.6	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

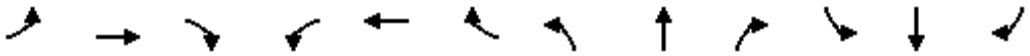
Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	196	2	2	138	5	0
Future Vol, veh/h	196	2	2	138	5	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	213	2	2	150	5	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	215	0	368	214
Stage 1	-	-	-	-	214	-
Stage 2	-	-	-	-	154	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1355	-	632	826
Stage 1	-	-	-	-	822	-
Stage 2	-	-	-	-	874	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1355	-	631	826
Mov Cap-2 Maneuver	-	-	-	-	631	-
Stage 1	-	-	-	-	822	-
Stage 2	-	-	-	-	872	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	631	-	-	1355	-
HCM Lane V/C Ratio	0.009	-	-	0.002	-
HCM Control Delay (s)	10.8	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	148	6	40	6	34	18	10	324	1	11	595	337
Future Volume (veh/h)	148	6	40	6	34	18	10	324	1	11	595	337
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	161	7	43	7	37	20	11	352	1	12	647	366
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	304	13	54	80	205	99	243	1249	4	730	752	425
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.67	0.67	0.67	0.67	0.67	0.67
Sat Flow, veh/h	1100	71	300	74	1140	552	556	1864	5	1028	1122	635
Grp Volume(v), veh/h	211	0	0	64	0	0	11	0	353	12	0	1013
Grp Sat Flow(s),veh/h/ln	1471	0	0	1766	0	0	556	0	1869	1028	0	1756
Q Serve(g_s), s	6.2	0.0	0.0	0.0	0.0	0.0	0.9	0.0	4.6	0.3	0.0	26.9
Cycle Q Clear(g_c), s	8.1	0.0	0.0	1.8	0.0	0.0	27.8	0.0	4.6	4.9	0.0	26.9
Prop In Lane	0.76		0.20	0.11		0.31	1.00		0.00	1.00		0.36
Lane Grp Cap(c), veh/h	370	0	0	384	0	0	243	0	1253	730	0	1177
V/C Ratio(X)	0.57	0.00	0.00	0.17	0.00	0.00	0.05	0.00	0.28	0.02	0.00	0.86
Avail Cap(c_a), veh/h	575	0	0	633	0	0	442	0	1921	1098	0	1805
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.3	0.0	0.0	20.9	0.0	0.0	18.6	0.0	4.0	5.0	0.0	7.7
Incr Delay (d2), s/veh	1.4	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.1	0.0	0.0	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	0.0	0.7	0.0	0.0	0.1	0.0	1.2	0.0	0.0	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.7	0.0	0.0	21.1	0.0	0.0	18.6	0.0	4.1	5.0	0.0	10.5
LnGrp LOS	C	A	A	C	A	A	B	A	A	A	A	B
Approach Vol, veh/h		211			64			364			1025	
Approach Delay, s/veh		24.7			21.1			4.6			10.5	
Approach LOS		C			C			A			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		44.6		15.2		44.6		15.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		61.5		19.5		61.5		19.5				
Max Q Clear Time (g_c+I1), s		29.8		10.1		28.9		3.8				
Green Ext Time (p_c), s		2.4		0.8		11.2		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			11.4									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	22	2	14	3	3	4	12	304	9	11	713	4
Future Vol, veh/h	22	2	14	3	3	4	12	304	9	11	713	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	2	15	3	3	4	13	330	10	12	775	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1166	1167	777	1171	1164	335	779	0	0	340	0	0
Stage 1	801	801	-	361	361	-	-	-	-	-	-	-
Stage 2	365	366	-	810	803	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	171	194	397	170	194	707	838	-	-	1219	-	-
Stage 1	378	397	-	657	626	-	-	-	-	-	-	-
Stage 2	654	623	-	374	396	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	163	187	397	158	187	707	838	-	-	1219	-	-
Mov Cap-2 Maneuver	163	187	-	158	187	-	-	-	-	-	-	-
Stage 1	371	390	-	645	614	-	-	-	-	-	-	-
Stage 2	634	611	-	352	389	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26.3	20.3	0.3	0.1
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	838	-	-	210	246	1219	-	-
HCM Lane V/C Ratio	0.016	-	-	0.197	0.044	0.01	-	-
HCM Control Delay (s)	9.4	0	-	26.3	20.3	8	0	-
HCM Lane LOS	A	A	-	D	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0.1	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	22	101	23	14	12	32	231	6	7	542	121
Future Volume (veh/h)	123	22	101	23	14	12	32	231	6	7	542	121
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	134	24	110	25	15	13	35	251	7	8	589	132
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	295	59	151	280	160	99	152	854	22	95	782	174
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.53	0.53	0.53	0.53	0.53	0.53
Sat Flow, veh/h	655	245	626	602	665	412	93	1610	42	5	1475	327
Grp Volume(v), veh/h	268	0	0	53	0	0	293	0	0	729	0	0
Grp Sat Flow(s),veh/h/ln	1526	0	0	1679	0	0	1745	0	0	1808	0	0
Q Serve(g_s), s	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	6.3	0.0	0.0	0.9	0.0	0.0	3.5	0.0	0.0	12.5	0.0	0.0
Prop In Lane	0.50		0.41	0.47		0.25	0.12		0.02	0.01		0.18
Lane Grp Cap(c), veh/h	505	0	0	540	0	0	1027	0	0	1051	0	0
V/C Ratio(X)	0.53	0.00	0.00	0.10	0.00	0.00	0.29	0.00	0.00	0.69	0.00	0.00
Avail Cap(c_a), veh/h	1151	0	0	1173	0	0	2369	0	0	2586	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.7	0.0	0.0	11.7	0.0	0.0	5.2	0.0	0.0	7.3	0.0	0.0
Incr Delay (d2), s/veh	0.9	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	0.0	0.3	0.0	0.0	0.8	0.0	0.0	3.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.5	0.0	0.0	11.8	0.0	0.0	5.3	0.0	0.0	8.1	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		268			53			293			729	
Approach Delay, s/veh		14.5			11.8			5.3			8.1	
Approach LOS		B			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		25.4		14.0		25.4		14.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		54.5		26.5		54.5		26.5				
Max Q Clear Time (g_c+I1), s		5.5		8.3		14.5		2.9				
Green Ext Time (p_c), s		2.2		1.5		6.4		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			8.9									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	3	1	15	5	7	20	7	261	11	32	619	41
Future Vol, veh/h	3	1	15	5	7	20	7	261	11	32	619	41
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	1	16	5	8	22	8	284	12	35	673	45

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1087	1078	696	1080	1094	290	718	0	0	296	0	0
Stage 1	766	766	-	306	306	-	-	-	-	-	-	-
Stage 2	321	312	-	774	788	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	194	219	442	196	214	749	883	-	-	1265	-	-
Stage 1	395	412	-	704	662	-	-	-	-	-	-	-
Stage 2	691	658	-	391	402	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	175	207	442	180	202	749	883	-	-	1265	-	-
Mov Cap-2 Maneuver	175	207	-	180	202	-	-	-	-	-	-	-
Stage 1	391	393	-	696	655	-	-	-	-	-	-	-
Stage 2	656	651	-	358	384	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.3	16.1	0.2	0.4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	883	-	-	340	359	1265	-	-
HCM Lane V/C Ratio	0.009	-	-	0.061	0.097	0.027	-	-
HCM Control Delay (s)	9.1	0	-	16.3	16.1	7.9	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	3	2	7	4	0	1	1	245	3	8	628	7
Future Vol, veh/h	3	2	7	4	0	1	1	245	3	8	628	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	2	8	4	0	1	1	266	3	9	683	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	975	976	687	980	979	268	691	0	0	269	0	0
Stage 1	705	705	-	270	270	-	-	-	-	-	-	-
Stage 2	270	271	-	710	709	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	231	251	447	229	250	771	904	-	-	1295	-	-
Stage 1	427	439	-	736	686	-	-	-	-	-	-	-
Stage 2	736	685	-	424	437	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	228	248	447	221	247	771	904	-	-	1295	-	-
Mov Cap-2 Maneuver	228	248	-	221	247	-	-	-	-	-	-	-
Stage 1	427	434	-	735	685	-	-	-	-	-	-	-
Stage 2	734	684	-	410	432	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.5	19.3	0	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	904	-	-	325	258	1295	-	-
HCM Lane V/C Ratio	0.001	-	-	0.04	0.021	0.007	-	-
HCM Control Delay (s)	9	0	-	16.5	19.3	7.8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	2	0	1	2	0	3	0	252	0	5	630	3
Future Vol, veh/h	2	0	1	2	0	3	0	252	0	5	630	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	1	2	0	3	0	274	0	5	685	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	973	971	687	971	972	274	688	0	0	274	0	0
Stage 1	697	697	-	274	274	-	-	-	-	-	-	-
Stage 2	276	274	-	697	698	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	231	253	447	232	252	765	906	-	-	1289	-	-
Stage 1	431	443	-	732	683	-	-	-	-	-	-	-
Stage 2	730	683	-	431	442	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	229	251	447	230	250	765	906	-	-	1289	-	-
Mov Cap-2 Maneuver	229	251	-	230	250	-	-	-	-	-	-	-
Stage 1	431	440	-	732	683	-	-	-	-	-	-	-
Stage 2	727	683	-	427	439	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.3	14.2	0	0.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	906	-	-	273	396	1289	-	-
HCM Lane V/C Ratio	-	-	-	0.012	0.014	0.004	-	-
HCM Control Delay (s)	0	-	-	18.3	14.2	7.8	0	-
HCM Lane LOS	A	-	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	5	1	231	632	3
Future Vol, veh/h	9	5	1	231	632	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	5	1	251	687	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	942	689	690	0	-	0
Stage 1	689	-	-	-	-	-
Stage 2	253	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	292	446	905	-	-	-
Stage 1	498	-	-	-	-	-
Stage 2	789	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	292	446	905	-	-	-
Mov Cap-2 Maneuver	292	-	-	-	-	-
Stage 1	498	-	-	-	-	-
Stage 2	789	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.3	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	905	-	333	-	-
HCM Lane V/C Ratio	0.001	-	0.046	-	-
HCM Control Delay (s)	9	0	16.3	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	9	1	223	616	7
Future Vol, veh/h	7	9	1	223	616	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	275	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	10	1	242	670	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	918	674	678	0	-	0
Stage 1	674	-	-	-	-	-
Stage 2	244	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	302	455	914	-	-	-
Stage 1	506	-	-	-	-	-
Stage 2	797	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	302	455	914	-	-	-
Mov Cap-2 Maneuver	302	-	-	-	-	-
Stage 1	505	-	-	-	-	-
Stage 2	797	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	914	-	302	455	-	-
HCM Lane V/C Ratio	0.001	-	0.025	0.022	-	-
HCM Control Delay (s)	8.9	-	17.2	13.1	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	201	13	3	128	0	9	0	6	1	0	0
Future Vol, veh/h	1	201	13	3	128	0	9	0	6	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	218	14	3	139	0	10	0	7	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	139	0	0	232	0	0	372	372	225	376	379	139
Stage 1	-	-	-	-	-	-	227	227	-	145	145	-
Stage 2	-	-	-	-	-	-	145	145	-	231	234	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1445	-	-	1336	-	-	585	558	814	581	553	909
Stage 1	-	-	-	-	-	-	776	716	-	858	777	-
Stage 2	-	-	-	-	-	-	858	777	-	772	711	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1445	-	-	1336	-	-	584	556	814	575	551	909
Mov Cap-2 Maneuver	-	-	-	-	-	-	584	556	-	575	551	-
Stage 1	-	-	-	-	-	-	775	715	-	857	775	-
Stage 2	-	-	-	-	-	-	856	775	-	765	710	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	10.6	11.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	658	1445	-	-	1336	-	-	575
HCM Lane V/C Ratio	0.025	0.001	-	-	0.002	-	-	0.002
HCM Control Delay (s)	10.6	7.5	0	-	7.7	0	-	11.3
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	60	85	13	35	32	2
Future Vol, veh/h	60	85	13	35	32	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	65	92	14	38	35	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	157	0	177	111
Stage 1	-	-	-	-	111	-
Stage 2	-	-	-	-	66	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1423	-	813	942
Stage 1	-	-	-	-	914	-
Stage 2	-	-	-	-	957	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1423	-	805	942
Mov Cap-2 Maneuver	-	-	-	-	805	-
Stage 1	-	-	-	-	914	-
Stage 2	-	-	-	-	947	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	812	-	-	1423	-
HCM Lane V/C Ratio	0.046	-	-	0.01	-
HCM Control Delay (s)	9.6	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	124	26	18	40	203	473
Future Vol, veh/h	124	26	18	40	203	473
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	135	28	20	43	221	514

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	561	478	735	0	-	0
Stage 1	478	-	-	-	-	-
Stage 2	83	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	489	587	870	-	-	-
Stage 1	624	-	-	-	-	-
Stage 2	940	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	477	587	870	-	-	-
Mov Cap-2 Maneuver	477	-	-	-	-	-
Stage 1	609	-	-	-	-	-
Stage 2	940	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.9	2.9	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	870	-	493	-	-
HCM Lane V/C Ratio	0.022	-	0.331	-	-
HCM Control Delay (s)	9.2	0	15.9	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	1.4	-	-

Intersection	
Int Delay, s/veh	27.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	531	42	76	106	30	92
Future Vol, veh/h	531	42	76	106	30	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	577	46	83	115	33	100

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	307	141	0	0	198	0
Stage 1	141	-	-	-	-	-
Stage 2	166	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	685	907	-	-	1375	-
Stage 1	886	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	669	907	-	-	1375	-
Mov Cap-2 Maneuver	669	-	-	-	-	-
Stage 1	886	-	-	-	-	-
Stage 2	842	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	41.3	0	1.9
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	682	1375	-
HCM Lane V/C Ratio	-	-	0.913	0.024	-
HCM Control Delay (s)	-	-	41.3	7.7	-
HCM Lane LOS	-	-	E	A	-
HCM 95th %tile Q(veh)	-	-	12	0.1	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	186	130	1	1	10
Future Vol, veh/h	10	186	130	1	1	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	202	141	1	1	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	142	0	-	0	366	142
Stage 1	-	-	-	-	142	-
Stage 2	-	-	-	-	224	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1441	-	-	-	634	906
Stage 1	-	-	-	-	885	-
Stage 2	-	-	-	-	813	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1441	-	-	-	628	906
Mov Cap-2 Maneuver	-	-	-	-	628	-
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	813	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1441	-	-	-	871
HCM Lane V/C Ratio	0.008	-	-	-	0.014
HCM Control Delay (s)	7.5	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	20	162	5	1	106	2	5	0	1	2	0	20
Future Vol, veh/h	20	162	5	1	106	2	5	0	1	2	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	176	5	1	115	2	5	0	1	2	0	22

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	117	0	0	181	0	0	352	342	179	341	343	116
Stage 1	-	-	-	-	-	-	223	223	-	118	118	-
Stage 2	-	-	-	-	-	-	129	119	-	223	225	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1471	-	-	1394	-	-	603	580	864	613	579	936
Stage 1	-	-	-	-	-	-	780	719	-	887	798	-
Stage 2	-	-	-	-	-	-	875	797	-	780	718	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1471	-	-	1394	-	-	581	570	864	604	569	936
Mov Cap-2 Maneuver	-	-	-	-	-	-	581	570	-	604	569	-
Stage 1	-	-	-	-	-	-	767	707	-	872	797	-
Stage 2	-	-	-	-	-	-	854	796	-	766	706	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.1	10.9	9.2
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	615	1471	-	-	1394	-	-	891
HCM Lane V/C Ratio	0.011	0.015	-	-	0.001	-	-	0.027
HCM Control Delay (s)	10.9	7.5	0	-	7.6	0	-	9.2
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

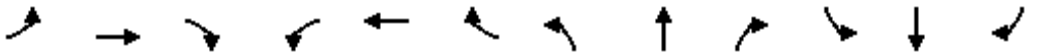
Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	63	102	46	8	8	63
Future Vol, veh/h	63	102	46	8	8	63
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	68	111	50	9	9	68

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	59	0	-	0	302	55
Stage 1	-	-	-	-	55	-
Stage 2	-	-	-	-	247	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1545	-	-	-	690	1012
Stage 1	-	-	-	-	968	-
Stage 2	-	-	-	-	794	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1545	-	-	-	658	1012
Mov Cap-2 Maneuver	-	-	-	-	658	-
Stage 1	-	-	-	-	923	-
Stage 2	-	-	-	-	794	-

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1545	-	-	-	954
HCM Lane V/C Ratio	0.044	-	-	-	0.081
HCM Control Delay (s)	7.4	0	-	-	9.1
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	311	42	158	69	44	91	166	508	66	96	474	369
Future Volume (veh/h)	311	42	158	69	44	91	166	508	66	96	474	369
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	338	46	172	75	48	99	180	552	72	104	515	401
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	487	61	230	105	178	273	233	1248	162	137	1210	540
Arrive On Green	0.14	0.18	0.18	0.06	0.10	0.10	0.13	0.39	0.39	0.08	0.34	0.34
Sat Flow, veh/h	3456	346	1292	1781	1870	1585	1781	3162	411	1781	3554	1585
Grp Volume(v), veh/h	338	0	218	75	48	99	180	310	314	104	515	401
Grp Sat Flow(s),veh/h/ln	1728	0	1638	1781	1870	1585	1781	1777	1796	1781	1777	1585
Q Serve(g_s), s	5.7	0.0	7.8	2.5	1.5	3.4	6.0	7.9	7.9	3.5	6.9	13.7
Cycle Q Clear(g_c), s	5.7	0.0	7.8	2.5	1.5	3.4	6.0	7.9	7.9	3.5	6.9	13.7
Prop In Lane	1.00		0.79	1.00		1.00	1.00		0.23	1.00		1.00
Lane Grp Cap(c), veh/h	487	0	291	105	178	273	233	701	709	137	1210	540
V/C Ratio(X)	0.69	0.00	0.75	0.72	0.27	0.36	0.77	0.44	0.44	0.76	0.43	0.74
Avail Cap(c_a), veh/h	1151	0	705	362	562	598	680	1371	1386	449	2281	1017
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.2	0.0	24.0	28.5	25.8	22.5	25.9	13.7	13.7	27.9	15.7	17.9
Incr Delay (d2), s/veh	1.8	0.0	3.9	8.8	0.8	0.8	5.4	0.4	0.4	8.4	0.2	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	3.1	1.3	0.7	1.3	2.8	2.9	2.9	1.7	2.6	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.0	0.0	27.9	37.3	26.6	23.3	31.3	14.1	14.1	36.3	15.9	20.0
LnGrp LOS	C	A	C	D	C	C	C	B	B	D	B	B
Approach Vol, veh/h		556			222			804			1020	
Approach Delay, s/veh		27.3			28.8			18.0			19.6	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.2	28.8	8.1	15.4	12.5	25.5	13.2	10.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	47.5	12.5	26.5	23.5	39.5	20.5	18.5
Max Q Clear Time (g_c+I1), s	5.5	9.9	4.5	9.8	8.0	15.7	7.7	5.4
Green Ext Time (p_c), s	0.2	4.3	0.1	1.2	0.4	5.2	1.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	21.5
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	0	17	0	48	0	719	22	79	658	2
Future Vol, veh/h	1	0	0	17	0	48	0	719	22	79	658	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	-	-	-	375	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	0	18	0	52	0	782	24	86	715	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1708	1694	716	1682	1683	794	717	0	0	806	0	0
Stage 1	888	888	-	794	794	-	-	-	-	-	-	-
Stage 2	820	806	-	888	889	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	72	93	430	75	94	388	884	-	-	819	-	-
Stage 1	338	362	-	381	400	-	-	-	-	-	-	-
Stage 2	369	395	-	338	361	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	57	83	430	69	84	388	884	-	-	819	-	-
Mov Cap-2 Maneuver	57	83	-	69	84	-	-	-	-	-	-	-
Stage 1	338	324	-	381	400	-	-	-	-	-	-	-
Stage 2	319	395	-	303	323	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	69.4	31.3	0	1.1
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	884	-	-	57	69	388	819	-	-
HCM Lane V/C Ratio	-	-	-	0.019	0.268	0.134	0.105	-	-
HCM Control Delay (s)	0	-	-	69.4	75.3	15.7	9.9	-	-
HCM Lane LOS	A	-	-	F	F	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1	0.5	0.3	-	-

Intersection	
Int Delay, s/veh	14

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	73	48	710	145	96	623
Future Vol, veh/h	73	48	710	145	96	623
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	79	52	772	158	104	677

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1736	851	0	0	930	0
Stage 1	851	-	-	-	-	-
Stage 2	885	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	96	360	-	-	736	-
Stage 1	419	-	-	-	-	-
Stage 2	403	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	82	360	-	-	736	-
Mov Cap-2 Maneuver	82	-	-	-	-	-
Stage 1	419	-	-	-	-	-
Stage 2	346	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	187.7	0	1.4
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	118	736	-
HCM Lane V/C Ratio	-	-	1.115	0.142	-
HCM Control Delay (s)	-	-	187.7	10.7	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	7.9	0.5	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1	6	33	0	37	2	853	58	52	643	1
Future Vol, veh/h	3	1	6	33	0	37	2	853	58	52	643	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	50	275	-	275	375	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	1	7	36	0	40	2	927	63	57	699	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1796	1807	699	1749	1745	927	700	0	0	990	0	0
Stage 1	813	813	-	931	931	-	-	-	-	-	-	-
Stage 2	983	994	-	818	814	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	62	79	440	67	86	325	897	-	-	698	-	-
Stage 1	372	392	-	320	346	-	-	-	-	-	-	-
Stage 2	299	323	-	370	391	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	51	72	440	61	79	325	897	-	-	698	-	-
Mov Cap-2 Maneuver	51	72	-	61	79	-	-	-	-	-	-	-
Stage 1	371	360	-	319	345	-	-	-	-	-	-	-
Stage 2	261	322	-	334	359	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	38.4	69.1	0	0.8
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	897	-	-	55	440	61	325	698	-	-
HCM Lane V/C Ratio	0.002	-	-	0.079	0.015	0.588	0.124	0.081	-	-
HCM Control Delay (s)	9	-	-	76	13.3	126.9	17.6	10.6	-	-
HCM Lane LOS	A	-	-	F	B	F	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	2.4	0.4	0.3	-	-

Intersection	
Intersection Delay, s/veh	39.2
Intersection LOS	E

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	241	1266	698
Demand Flow Rate, veh/h	246	1292	712
Vehicles Circulating, veh/h	906	116	148
Vehicles Exiting, veh/h	502	744	1004
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	14.3	59.7	10.6
Approach LOS	B	F	B

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	246	1292	712
Cap Entry Lane, veh/h	548	1226	1187
Entry HV Adj Factor	0.980	0.980	0.981
Flow Entry, veh/h	241	1266	698
Cap Entry, veh/h	537	1201	1164
V/C Ratio	0.449	1.054	0.600
Control Delay, s/veh	14.3	59.7	10.6
LOS	B	F	B
95th %tile Queue, veh	2	26	4

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	0	3	5	0	10	2	1137	3	6	639	3
Future Vol, veh/h	15	0	3	5	0	10	2	1137	3	6	639	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	-	125	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	0	3	5	0	11	2	1236	3	7	695	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1958	1954	697	1954	1954	1238	698	0	0	1239	0	0
Stage 1	711	711	-	1242	1242	-	-	-	-	-	-	-
Stage 2	1247	1243	-	712	712	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	48	64	441	48	64	214	898	-	-	562	-	-
Stage 1	424	436	-	214	247	-	-	-	-	-	-	-
Stage 2	213	246	-	423	436	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	45	63	441	47	63	214	898	-	-	562	-	-
Mov Cap-2 Maneuver	45	63	-	47	63	-	-	-	-	-	-	-
Stage 1	423	431	-	214	247	-	-	-	-	-	-	-
Stage 2	202	246	-	415	431	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	106.3	48.9	0	0.1
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	898	-	-	45	441	98	562	-	-
HCM Lane V/C Ratio	0.002	-	-	0.362	0.007	0.166	0.012	-	-
HCM Control Delay (s)	9	-	-	124.9	13.2	48.9	11.5	-	-
HCM Lane LOS	A	-	-	F	B	E	B	-	-
HCM 95th %tile Q(veh)	0	-	-	1.3	0	0.6	0	-	-

Intersection	
Int Delay, s/veh	71.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	132	242	930	152	176	339
Future Vol, veh/h	132	242	930	152	176	339
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	325	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	143	263	1011	165	191	368

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1844	1094	0	0	1176	0
Stage 1	1094	-	-	-	-	-
Stage 2	750	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	~ 82	~ 260	-	-	594	-
Stage 1	321	-	-	-	-	-
Stage 2	467	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 56	~ 260	-	-	594	-
Mov Cap-2 Maneuver	~ 56	-	-	-	-	-
Stage 1	321	-	-	-	-	-
Stage 2	317	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 370.7	0	4.8
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	56	260	594	-
HCM Lane V/C Ratio	-	-	2.562	1.012	0.322	-
HCM Control Delay (s)	-	-	$ 865.3	100.9	13.9	-
HCM Lane LOS	-	-	F	F	B	-
HCM 95th %tile Q(veh)	-	-	14.6	10.1	1.4	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	332	3	2	378	4	1
Future Vol, veh/h	332	3	2	378	4	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	361	3	2	411	4	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	364	0	778	363
Stage 1	-	-	-	-	363	-
Stage 2	-	-	-	-	415	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1195	-	365	682
Stage 1	-	-	-	-	704	-
Stage 2	-	-	-	-	666	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1195	-	364	682
Mov Cap-2 Maneuver	-	-	-	-	364	-
Stage 1	-	-	-	-	704	-
Stage 2	-	-	-	-	665	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	14.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	401	-	-	1195	-
HCM Lane V/C Ratio	0.014	-	-	0.002	-
HCM Control Delay (s)	14.1	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

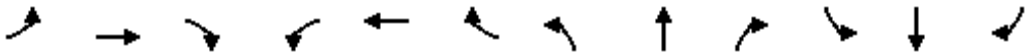
Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	323	3	1	354	2	0
Future Vol, veh/h	323	3	1	354	2	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	351	3	1	385	2	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	354	0	740	353
Stage 1	-	-	-	-	353	-
Stage 2	-	-	-	-	387	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1205	-	384	691
Stage 1	-	-	-	-	711	-
Stage 2	-	-	-	-	686	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1205	-	384	691
Mov Cap-2 Maneuver	-	-	-	-	384	-
Stage 1	-	-	-	-	711	-
Stage 2	-	-	-	-	685	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	14.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	384	-	-	1205	-
HCM Lane V/C Ratio	0.006	-	-	0.001	-
HCM Control Delay (s)	14.4	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	3	36	36	10	42	14	941	13	8	429	119
Future Volume (veh/h)	123	3	36	36	10	42	14	941	13	8	429	119
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	134	3	39	39	11	46	15	1023	14	9	466	129
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	296	9	52	171	62	125	560	1240	17	283	950	263
Arrive On Green	0.15	0.15	0.15	0.15	0.15	0.15	0.67	0.67	0.67	0.67	0.67	0.67
Sat Flow, veh/h	1135	56	339	481	404	814	823	1841	25	544	1410	390
Grp Volume(v), veh/h	176	0	0	96	0	0	15	0	1037	9	0	595
Grp Sat Flow(s),veh/h/ln	1530	0	0	1699	0	0	823	0	1866	544	0	1800
Q Serve(g_s), s	2.9	0.0	0.0	0.0	0.0	0.0	0.5	0.0	21.3	0.6	0.0	8.4
Cycle Q Clear(g_c), s	5.5	0.0	0.0	2.6	0.0	0.0	8.9	0.0	21.3	21.9	0.0	8.4
Prop In Lane	0.76		0.22	0.41		0.48	1.00		0.01	1.00		0.22
Lane Grp Cap(c), veh/h	357	0	0	358	0	0	560	0	1257	283	0	1213
V/C Ratio(X)	0.49	0.00	0.00	0.27	0.00	0.00	0.03	0.00	0.82	0.03	0.00	0.49
Avail Cap(c_a), veh/h	638	0	0	662	0	0	991	0	2234	568	0	2156
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.9	0.0	0.0	19.8	0.0	0.0	6.3	0.0	6.2	14.3	0.0	4.1
Incr Delay (d2), s/veh	1.1	0.0	0.0	0.4	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	0.0	1.0	0.0	0.0	0.1	0.0	4.8	0.1	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.9	0.0	0.0	20.2	0.0	0.0	6.3	0.0	7.7	14.3	0.0	4.5
LnGrp LOS	C	A	A	C	A	A	A	A	A	B	A	A
Approach Vol, veh/h		176			96			1052			604	
Approach Delay, s/veh		21.9			20.2			7.7			4.6	
Approach LOS		C			C			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		39.7		12.5		39.7		12.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		62.5		18.5		62.5		18.5				
Max Q Clear Time (g_c+I1), s		23.3		7.5		23.9		4.6				
Green Ext Time (p_c), s		11.9		0.7		4.9		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			8.6									
HCM 6th LOS			A									

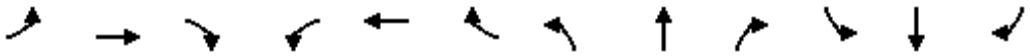
Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	6	1	5	3	0	4	5	941	13	9	526	6
Future Vol, veh/h	6	1	5	3	0	4	5	941	13	9	526	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1	5	3	0	4	5	1023	14	10	572	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1638	1643	576	1639	1639	1030	579	0	0	1037	0	0
Stage 1	596	596	-	1040	1040	-	-	-	-	-	-	-
Stage 2	1042	1047	-	599	599	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	80	100	517	80	100	283	995	-	-	670	-	-
Stage 1	490	492	-	278	307	-	-	-	-	-	-	-
Stage 2	277	305	-	488	490	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	77	97	517	76	97	283	995	-	-	670	-	-
Mov Cap-2 Maneuver	77	97	-	76	97	-	-	-	-	-	-	-
Stage 1	484	481	-	275	303	-	-	-	-	-	-	-
Stage 2	269	301	-	471	479	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	37.7	34.2	0	0.2
HCM LOS	E	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	995	-	-	123	131	670	-	-
HCM Lane V/C Ratio	0.005	-	-	0.106	0.058	0.015	-	-
HCM Control Delay (s)	8.6	0	-	37.7	34.2	10.5	0	-
HCM Lane LOS	A	A	-	E	D	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.2	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	219	12	70	23	23	12	55	721	8	2	393	150
Future Volume (veh/h)	219	12	70	23	23	12	55	721	8	2	393	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	238	13	76	25	25	13	60	784	9	2	427	163
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	397	19	92	231	217	93	111	954	11	65	733	279
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.57	0.57	0.57	0.57	0.57	0.57
Sat Flow, veh/h	1055	70	341	520	800	343	75	1678	19	1	1289	490
Grp Volume(v), veh/h	327	0	0	63	0	0	853	0	0	592	0	0
Grp Sat Flow(s),veh/h/ln	1466	0	0	1664	0	0	1772	0	0	1781	0	0
Q Serve(g_s), s	10.1	0.0	0.0	0.0	0.0	0.0	9.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	11.6	0.0	0.0	1.5	0.0	0.0	21.8	0.0	0.0	12.0	0.0	0.0
Prop In Lane	0.73		0.23	0.40		0.21	0.07		0.01	0.00		0.28
Lane Grp Cap(c), veh/h	508	0	0	541	0	0	1076	0	0	1077	0	0
V/C Ratio(X)	0.64	0.00	0.00	0.12	0.00	0.00	0.79	0.00	0.00	0.55	0.00	0.00
Avail Cap(c_a), veh/h	796	0	0	852	0	0	1767	0	0	1790	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.0	0.0	0.0	15.4	0.0	0.0	9.7	0.0	0.0	7.8	0.0	0.0
Incr Delay (d2), s/veh	1.4	0.0	0.0	0.1	0.0	0.0	1.4	0.0	0.0	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	0.0	0.0	0.6	0.0	0.0	6.4	0.0	0.0	3.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.4	0.0	0.0	15.5	0.0	0.0	11.1	0.0	0.0	8.3	0.0	0.0
LnGrp LOS	C	A	A	B	A	A	B	A	A	A	A	A
Approach Vol, veh/h		327			63			853			592	
Approach Delay, s/veh		20.4			15.5			11.1			8.3	
Approach LOS		C			B			B			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		36.4		19.7		36.4		19.7				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		54.5		26.5		54.5		26.5				
Max Q Clear Time (g_c+I1), s		23.8		13.6		14.0		3.5				
Green Ext Time (p_c), s		8.1		1.6		4.8		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			12.0									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	4	19	6	7	27	22	790	11	20	381	60
Future Vol, veh/h	6	4	19	6	7	27	22	790	11	20	381	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	4	21	7	8	29	24	859	12	22	414	65

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1423	1410	447	1416	1436	865	479	0	0	871	0	0
Stage 1	491	491	-	913	913	-	-	-	-	-	-	-
Stage 2	932	919	-	503	523	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	114	138	612	115	133	353	1083	-	-	774	-	-
Stage 1	559	548	-	328	352	-	-	-	-	-	-	-
Stage 2	320	350	-	551	530	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	93	127	612	102	122	353	1083	-	-	774	-	-
Mov Cap-2 Maneuver	93	127	-	102	122	-	-	-	-	-	-	-
Stage 1	535	527	-	314	337	-	-	-	-	-	-	-
Stage 2	274	335	-	507	509	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.3	26.8	0.2	0.4
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1083	-	-	228	208	774	-	-
HCM Lane V/C Ratio	0.022	-	-	0.138	0.209	0.028	-	-
HCM Control Delay (s)	8.4	0	-	23.3	26.8	9.8	0	-
HCM Lane LOS	A	A	-	C	D	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	0.8	0.1	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	0	1	2	1	9	3	873	7	9	383	5
Future Vol, veh/h	1	0	1	2	1	9	3	873	7	9	383	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	1	2	1	10	3	949	8	10	416	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1404	1402	419	1398	1400	953	421	0	0	957	0	0
Stage 1	439	439	-	959	959	-	-	-	-	-	-	-
Stage 2	965	963	-	439	441	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	117	140	634	118	140	314	1138	-	-	719	-	-
Stage 1	597	578	-	309	335	-	-	-	-	-	-	-
Stage 2	306	334	-	597	577	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	111	137	634	116	137	314	1138	-	-	719	-	-
Mov Cap-2 Maneuver	111	137	-	116	137	-	-	-	-	-	-	-
Stage 1	593	568	-	307	333	-	-	-	-	-	-	-
Stage 2	294	332	-	585	567	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	24.3	21.9	0	0.2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1138	-	-	189	226	719	-	-
HCM Lane V/C Ratio	0.003	-	-	0.012	0.058	0.014	-	-
HCM Control Delay (s)	8.2	0	-	24.3	21.9	10.1	0	-
HCM Lane LOS	A	A	-	C	C	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	3	1	2	4	0	9	8	865	7	0	364	5
Future Vol, veh/h	3	1	2	4	0	9	8	865	7	0	364	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	1	2	4	0	10	9	940	8	0	396	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1366	1365	399	1362	1363	944	401	0	0	948	0	0
Stage 1	399	399	-	962	962	-	-	-	-	-	-	-
Stage 2	967	966	-	400	401	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	124	147	651	125	148	318	1158	-	-	724	-	-
Stage 1	627	602	-	308	334	-	-	-	-	-	-	-
Stage 2	306	333	-	626	601	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	119	145	651	122	146	318	1158	-	-	724	-	-
Mov Cap-2 Maneuver	119	145	-	122	146	-	-	-	-	-	-	-
Stage 1	617	602	-	303	329	-	-	-	-	-	-	-
Stage 2	292	328	-	623	601	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26.9	23.1	0.1	0
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1158	-	-	171	213	724	-	-
HCM Lane V/C Ratio	0.008	-	-	0.038	0.066	-	-	-
HCM Control Delay (s)	8.1	0	-	26.9	23.1	0	-	-
HCM Lane LOS	A	A	-	D	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	4	3	851	367	11
Future Vol, veh/h	6	4	3	851	367	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	4	3	925	399	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1336	405	411	0	-	0
Stage 1	405	-	-	-	-	-
Stage 2	931	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	169	646	1148	-	-	-
Stage 1	673	-	-	-	-	-
Stage 2	384	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	168	646	1148	-	-	-
Mov Cap-2 Maneuver	168	-	-	-	-	-
Stage 1	670	-	-	-	-	-
Stage 2	384	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1148	-	239	-	-
HCM Lane V/C Ratio	0.003	-	0.045	-	-
HCM Control Delay (s)	8.1	0	20.8	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	3	35	869	337	13
Future Vol, veh/h	11	3	35	869	337	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	275	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	3	38	945	366	14

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1394	373	380	0	-	0
Stage 1	373	-	-	-	-	-
Stage 2	1021	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	156	673	1178	-	-	-
Stage 1	696	-	-	-	-	-
Stage 2	348	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	151	673	1178	-	-	-
Mov Cap-2 Maneuver	151	-	-	-	-	-
Stage 1	674	-	-	-	-	-
Stage 2	348	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	26.5	0.3	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1178	-	151	673	-	-
HCM Lane V/C Ratio	0.032	-	0.079	0.005	-	-
HCM Control Delay (s)	8.2	-	30.9	10.4	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	0	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	281	8	22	235	4	18	1	16	2	0	1
Future Vol, veh/h	1	281	8	22	235	4	18	1	16	2	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	305	9	24	255	4	20	1	17	2	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	259	0	0	314	0	0	618	619	310	626	621	257
Stage 1	-	-	-	-	-	-	312	312	-	305	305	-
Stage 2	-	-	-	-	-	-	306	307	-	321	316	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1306	-	-	1246	-	-	402	404	730	397	403	782
Stage 1	-	-	-	-	-	-	699	658	-	705	662	-
Stage 2	-	-	-	-	-	-	704	661	-	691	655	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1306	-	-	1246	-	-	394	394	730	380	393	782
Mov Cap-2 Maneuver	-	-	-	-	-	-	394	394	-	380	393	-
Stage 1	-	-	-	-	-	-	698	657	-	704	647	-
Stage 2	-	-	-	-	-	-	687	646	-	673	654	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.7	12.8	12.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	499	1306	-	-	1246	-	-	459
HCM Lane V/C Ratio	0.076	0.001	-	-	0.019	-	-	0.007
HCM Control Delay (s)	12.8	7.8	0	-	7.9	0	-	12.9
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0.1	-	-	0

Intersection	
Int Delay, s/veh	3.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	46	47	11	72	92	3
Future Vol, veh/h	46	47	11	72	92	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	51	12	78	100	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	101	0	178	76
Stage 1	-	-	-	-	76	-
Stage 2	-	-	-	-	102	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1491	-	812	985
Stage 1	-	-	-	-	947	-
Stage 2	-	-	-	-	922	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1491	-	806	985
Mov Cap-2 Maneuver	-	-	-	-	806	-
Stage 1	-	-	-	-	947	-
Stage 2	-	-	-	-	915	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	811	-	-	1491	-
HCM Lane V/C Ratio	0.127	-	-	0.008	-
HCM Control Delay (s)	10.1	-	-	7.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection	
Int Delay, s/veh	187.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	615	33	82	262	76	206
Future Vol, veh/h	615	33	82	262	76	206
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	668	36	89	285	83	224

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	658	195	307	0	-	0
Stage 1	195	-	-	-	-	-
Stage 2	463	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	~ 429	846	1254	-	-	-
Stage 1	838	-	-	-	-	-
Stage 2	~ 634	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 393	846	1254	-	-	-
Mov Cap-2 Maneuver	~ 393	-	-	-	-	-
Stage 1	768	-	-	-	-	-
Stage 2	~ 634	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 368.2	1.9	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1254	-	404	-	-
HCM Lane V/C Ratio	0.071	-	1.743	-	-
HCM Control Delay (s)	8.1	0	$ 368.2	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0.2	-	43.6	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	42.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	327	51	60	477	130	118
Future Vol, veh/h	327	51	60	477	130	118
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	355	55	65	518	141	128

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	734	324	0	0	583	0
Stage 1	324	-	-	-	-	-
Stage 2	410	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	387	717	-	-	991	-
Stage 1	733	-	-	-	-	-
Stage 2	670	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 332	717	-	-	991	-
Mov Cap-2 Maneuver	~ 332	-	-	-	-	-
Stage 1	733	-	-	-	-	-
Stage 2	575	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	127.6	0	4.8
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	358	991	-
HCM Lane V/C Ratio	-	-	1.148	0.143	-
HCM Control Delay (s)	-	-	127.6	9.2	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	16.1	0.5	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	296	335	3	3	20
Future Vol, veh/h	27	296	335	3	3	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	322	364	3	3	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	367	0	-	0	746	366
Stage 1	-	-	-	-	366	-
Stage 2	-	-	-	-	380	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1192	-	-	-	381	679
Stage 1	-	-	-	-	702	-
Stage 2	-	-	-	-	691	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1192	-	-	-	370	679
Mov Cap-2 Maneuver	-	-	-	-	370	-
Stage 1	-	-	-	-	681	-
Stage 2	-	-	-	-	691	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1192	-	-	-	612
HCM Lane V/C Ratio	0.025	-	-	-	0.041
HCM Control Delay (s)	8.1	0	-	-	11.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	54	231	14	2	288	7	10	0	1	5	0	40
Future Vol, veh/h	54	231	14	2	288	7	10	0	1	5	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	59	251	15	2	313	8	11	0	1	5	0	43

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	321	0	0	266	0	0	720	702	259	698	705	317
Stage 1	-	-	-	-	-	-	377	377	-	321	321	-
Stage 2	-	-	-	-	-	-	343	325	-	377	384	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1239	-	-	1298	-	-	343	362	780	355	361	724
Stage 1	-	-	-	-	-	-	644	616	-	691	652	-
Stage 2	-	-	-	-	-	-	672	649	-	644	611	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1239	-	-	1298	-	-	308	341	780	339	340	724
Mov Cap-2 Maneuver	-	-	-	-	-	-	308	341	-	339	340	-
Stage 1	-	-	-	-	-	-	608	582	-	652	651	-
Stage 2	-	-	-	-	-	-	630	648	-	607	577	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.5	0.1	16.5	11.1
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	326	1239	-	-	1298	-	-	643
HCM Lane V/C Ratio	0.037	0.047	-	-	0.002	-	-	0.076
HCM Control Delay (s)	16.5	8.1	0	-	7.8	0	-	11.1
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.2

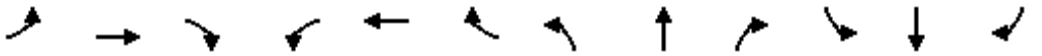
Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	177	60	167	22	16	130
Future Vol, veh/h	177	60	167	22	16	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	192	65	182	24	17	141

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	206	0	-	0	643	194
Stage 1	-	-	-	-	194	-
Stage 2	-	-	-	-	449	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1365	-	-	-	438	847
Stage 1	-	-	-	-	839	-
Stage 2	-	-	-	-	643	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1365	-	-	-	374	847
Mov Cap-2 Maneuver	-	-	-	-	374	-
Stage 1	-	-	-	-	717	-
Stage 2	-	-	-	-	643	-

Approach	EB	WB	SB
HCM Control Delay, s	6	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1365	-	-	-	744
HCM Lane V/C Ratio	0.141	-	-	-	0.213
HCM Control Delay (s)	8.1	0	-	-	11.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.5	-	-	-	0.8



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	355	45	109	37	42	66	187	444	64	73	321	327
Future Volume (veh/h)	355	45	109	37	42	66	187	444	64	73	321	327
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	386	49	118	40	46	72	203	483	70	79	349	355
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	555	100	241	73	160	234	262	1192	172	110	1057	471
Arrive On Green	0.16	0.21	0.21	0.04	0.09	0.09	0.15	0.38	0.38	0.06	0.30	0.30
Sat Flow, veh/h	3456	487	1172	1781	1870	1585	1781	3117	450	1781	3554	1585
Grp Volume(v), veh/h	386	0	167	40	46	72	203	274	279	79	349	355
Grp Sat Flow(s),veh/h/ln	1728	0	1659	1781	1870	1585	1781	1777	1789	1781	1777	1585
Q Serve(g_s), s	6.1	0.0	5.2	1.3	1.3	2.4	6.4	6.6	6.6	2.5	4.5	11.8
Cycle Q Clear(g_c), s	6.1	0.0	5.2	1.3	1.3	2.4	6.4	6.6	6.6	2.5	4.5	11.8
Prop In Lane	1.00		0.71	1.00		1.00	1.00		0.25	1.00		1.00
Lane Grp Cap(c), veh/h	555	0	340	73	160	234	262	680	685	110	1057	471
V/C Ratio(X)	0.70	0.00	0.49	0.55	0.29	0.31	0.77	0.40	0.41	0.72	0.33	0.75
Avail Cap(c_a), veh/h	1396	0	984	230	595	602	811	1420	1430	413	2046	913
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.1	0.0	20.4	27.4	24.9	22.1	23.9	13.1	13.1	26.8	15.9	18.5
Incr Delay (d2), s/veh	1.6	0.0	1.1	6.3	1.0	0.7	4.9	0.4	0.4	8.3	0.2	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	2.0	0.6	0.6	0.9	2.9	2.4	2.4	1.3	1.7	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.7	0.0	21.5	33.7	25.9	22.9	28.7	13.5	13.5	35.1	16.1	21.0
LnGrp LOS	C	A	C	C	C	C	C	B	B	D	B	C
Approach Vol, veh/h		553			158			756			783	
Approach Delay, s/veh		23.7			26.5			17.6			20.2	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	26.8	6.9	16.4	13.1	21.8	13.8	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.5	46.5	7.5	34.5	26.5	33.5	23.5	18.5
Max Q Clear Time (g_c+I1), s	4.5	8.6	3.3	7.2	8.4	13.8	8.1	4.4
Green Ext Time (p_c), s	0.1	3.8	0.0	1.0	0.5	3.5	1.2	0.3

Intersection Summary	
HCM 6th Ctrl Delay	20.6
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	0	20	0	50	0	604	16	49	472	2
Future Vol, veh/h	1	0	0	20	0	50	0	604	16	49	472	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	-	-	-	375	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	0	22	0	54	0	657	17	53	513	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1313	1294	514	1286	1287	666	515	0	0	674	0	0
Stage 1	620	620	-	666	666	-	-	-	-	-	-	-
Stage 2	693	674	-	620	621	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	135	163	560	141	164	459	1051	-	-	917	-	-
Stage 1	476	480	-	449	457	-	-	-	-	-	-	-
Stage 2	434	454	-	476	479	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	114	154	560	135	154	459	1051	-	-	917	-	-
Mov Cap-2 Maneuver	114	154	-	135	154	-	-	-	-	-	-	-
Stage 1	476	452	-	449	457	-	-	-	-	-	-	-
Stage 2	383	454	-	448	451	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	36.9	20.4	0	0.9
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1051	-	-	114	135	459	917	-	-
HCM Lane V/C Ratio	-	-	-	0.01	0.161	0.118	0.058	-	-
HCM Control Delay (s)	0	-	-	36.9	36.7	13.9	9.2	-	-
HCM Lane LOS	A	-	-	E	E	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.6	0.4	0.2	-	-

Intersection	
Int Delay, s/veh	9.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	127	72	511	65	25	471
Future Vol, veh/h	127	72	511	65	25	471
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	138	78	555	71	27	512

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1157	591	0	0	626	0
Stage 1	591	-	-	-	-	-
Stage 2	566	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	217	507	-	-	956	-
Stage 1	553	-	-	-	-	-
Stage 2	568	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	211	507	-	-	956	-
Mov Cap-2 Maneuver	211	-	-	-	-	-
Stage 1	553	-	-	-	-	-
Stage 2	552	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	57.3	0	0.4
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	268	956	-
HCM Lane V/C Ratio	-	-	0.807	0.028	-
HCM Control Delay (s)	-	-	57.3	8.9	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	6.3	0.1	-

Intersection	
Int Delay, s/veh	14.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	1	119	0	150	1	545	40	47	576	1
Future Vol, veh/h	3	0	1	119	0	150	1	545	40	47	576	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	50	275	-	275	375	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	1	129	0	163	1	592	43	51	626	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1425	1365	626	1323	1323	592	627	0	0	635	0	0
Stage 1	728	728	-	594	594	-	-	-	-	-	-	-
Stage 2	697	637	-	729	729	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	113	147	484	133	156	506	955	-	-	948	-	-
Stage 1	415	429	-	491	493	-	-	-	-	-	-	-
Stage 2	431	471	-	414	428	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	73	139	484	~ 127	147	506	955	-	-	948	-	-
Mov Cap-2 Maneuver	73	139	-	~ 127	147	-	-	-	-	-	-	-
Stage 1	415	406	-	491	493	-	-	-	-	-	-	-
Stage 2	292	471	-	391	405	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	45.6	75.7	0	0.7
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	955	-	-	73	484	127	506	948	-	-
HCM Lane V/C Ratio	0.001	-	-	0.045	0.002	1.018	0.322	0.054	-	-
HCM Control Delay (s)	8.8	-	-	56.6	12.5	151.6	15.5	9	-	-
HCM Lane LOS	A	-	-	F	B	F	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	7.1	1.4	0.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	19.5
Intersection LOS	C

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	526	696	791
Demand Flow Rate, veh/h	537	710	807
Vehicles Circulating, veh/h	501	107	409
Vehicles Exiting, veh/h	316	1109	628
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	15.5	9.8	30.6
Approach LOS	C	A	D

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	537	710	807
Cap Entry Lane, veh/h	828	1237	909
Entry HV Adj Factor	0.980	0.981	0.981
Flow Entry, veh/h	526	696	791
Cap Entry, veh/h	811	1213	892
V/C Ratio	0.649	0.574	0.888
Control Delay, s/veh	15.5	9.8	30.6
LOS	C	A	D
95th %tile Queue, veh	5	4	12

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	0	1	3	1	4	6	597	3	1	963	25
Future Vol, veh/h	11	0	1	3	1	4	6	597	3	1	963	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	-	125	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	0	1	3	1	4	7	649	3	1	1047	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1730	1729	1061	1728	1741	651	1074	0	0	652	0	0
Stage 1	1063	1063	-	665	665	-	-	-	-	-	-	-
Stage 2	667	666	-	1063	1076	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	69	88	272	70	87	469	649	-	-	935	-	-
Stage 1	270	300	-	449	458	-	-	-	-	-	-	-
Stage 2	448	457	-	270	296	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	67	87	272	69	86	469	649	-	-	935	-	-
Mov Cap-2 Maneuver	67	87	-	69	86	-	-	-	-	-	-	-
Stage 1	267	300	-	444	453	-	-	-	-	-	-	-
Stage 2	438	452	-	269	296	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	65.8	35.7	0.1	0
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	649	-	-	67	272	126	935	-	-
HCM Lane V/C Ratio	0.01	-	-	0.178	0.004	0.069	0.001	-	-
HCM Control Delay (s)	10.6	-	-	70.1	18.3	35.7	8.9	-	-
HCM Lane LOS	B	-	-	F	C	E	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0	0.2	0	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	34	399	25	87	901
Future Vol, veh/h	14	34	399	25	87	901
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	325	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	37	434	27	95	979

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1617	448	0	0	461	0
Stage 1	448	-	-	-	-	-
Stage 2	1169	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	114	611	-	-	1100	-
Stage 1	644	-	-	-	-	-
Stage 2	295	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	104	611	-	-	1100	-
Mov Cap-2 Maneuver	104	-	-	-	-	-
Stage 1	644	-	-	-	-	-
Stage 2	270	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.3	0	0.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	104	611	1100	-
HCM Lane V/C Ratio	-	-	0.146	0.06	0.086	-
HCM Control Delay (s)	-	-	45.5	11.3	8.6	-
HCM Lane LOS	-	-	E	B	A	-
HCM 95th %tile Q(veh)	-	-	0.5	0.2	0.3	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	137	7	0	71	6	2
Future Vol, veh/h	137	7	0	71	6	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	149	8	0	77	7	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	157	0	230	153
Stage 1	-	-	-	-	153	-
Stage 2	-	-	-	-	77	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1423	-	758	893
Stage 1	-	-	-	-	875	-
Stage 2	-	-	-	-	946	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1423	-	758	893
Mov Cap-2 Maneuver	-	-	-	-	758	-
Stage 1	-	-	-	-	875	-
Stage 2	-	-	-	-	946	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	788	-	-	1423	-
HCM Lane V/C Ratio	0.011	-	-	-	-
HCM Control Delay (s)	9.6	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	118	2	2	48	6	0
Future Vol, veh/h	118	2	2	48	6	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	128	2	2	52	7	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	130	0	185	129
Stage 1	-	-	-	-	129	-
Stage 2	-	-	-	-	56	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1455	-	804	921
Stage 1	-	-	-	-	897	-
Stage 2	-	-	-	-	967	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1455	-	803	921
Mov Cap-2 Maneuver	-	-	-	-	803	-
Stage 1	-	-	-	-	897	-
Stage 2	-	-	-	-	966	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	803	-	-	1455	-
HCM Lane V/C Ratio	0.008	-	-	0.001	-
HCM Control Delay (s)	9.5	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	163	7	45	7	38	20	11	329	1	12	659	376
Future Volume (veh/h)	163	7	45	7	38	20	11	329	1	12	659	376
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	177	8	49	8	41	22	12	358	1	13	716	409
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	288	9	57	66	212	102	174	1302	4	734	780	446
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.70	0.70	0.70	0.70	0.70	0.70
Sat Flow, veh/h	1114	50	308	78	1149	551	501	1864	5	1022	1117	638
Grp Volume(v), veh/h	234	0	0	71	0	0	12	0	359	13	0	1125
Grp Sat Flow(s),veh/h/ln	1472	0	0	1778	0	0	501	0	1869	1022	0	1755
Q Serve(g_s), s	9.1	0.0	0.0	0.0	0.0	0.0	1.6	0.0	5.5	0.4	0.0	41.4
Cycle Q Clear(g_c), s	11.7	0.0	0.0	2.6	0.0	0.0	43.0	0.0	5.5	5.9	0.0	41.4
Prop In Lane	0.76		0.21	0.11		0.31	1.00		0.00	1.00		0.36
Lane Grp Cap(c), veh/h	354	0	0	381	0	0	174	0	1305	734	0	1226
V/C Ratio(X)	0.66	0.00	0.00	0.19	0.00	0.00	0.07	0.00	0.28	0.02	0.00	0.92
Avail Cap(c_a), veh/h	432	0	0	475	0	0	231	0	1519	851	0	1426
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.1	0.0	0.0	26.6	0.0	0.0	27.8	0.0	4.3	5.4	0.0	9.8
Incr Delay (d2), s/veh	2.7	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.1	0.0	0.0	8.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.0	0.0	1.1	0.0	0.0	0.2	0.0	1.6	0.1	0.0	14.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.8	0.0	0.0	26.9	0.0	0.0	28.0	0.0	4.4	5.4	0.0	18.6
LnGrp LOS	C	A	A	C	A	A	C	A	A	A	A	B
Approach Vol, veh/h		234			71			371			1138	
Approach Delay, s/veh		32.8			26.9			5.2			18.5	
Approach LOS		C			C			A			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		58.2		18.7		58.2		18.7				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		62.5		18.5		62.5		18.5				
Max Q Clear Time (g_c+I1), s		45.0		13.7		43.4		4.6				
Green Ext Time (p_c), s		2.1		0.5		10.3		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			17.9									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	2	16	3	3	4	13	307	10	12	791	4
Future Vol, veh/h	25	2	16	3	3	4	13	307	10	12	791	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	2	17	3	3	4	14	334	11	13	860	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1259	1261	862	1266	1258	340	864	0	0	345	0	0
Stage 1	888	888	-	368	368	-	-	-	-	-	-	-
Stage 2	371	373	-	898	890	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	147	170	355	146	171	702	779	-	-	1214	-	-
Stage 1	338	362	-	652	621	-	-	-	-	-	-	-
Stage 2	649	618	-	334	361	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	139	163	355	133	164	702	779	-	-	1214	-	-
Mov Cap-2 Maneuver	139	163	-	133	164	-	-	-	-	-	-	-
Stage 1	331	354	-	638	607	-	-	-	-	-	-	-
Stage 2	627	604	-	309	353	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	31.7	22.6	0.4	0.1
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	779	-	-	181	215	1214	-	-
HCM Lane V/C Ratio	0.018	-	-	0.258	0.051	0.011	-	-
HCM Control Delay (s)	9.7	0	-	31.7	22.6	8	0	-
HCM Lane LOS	A	A	-	D	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1	0.2	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	25	113	26	16	13	36	238	7	8	599	135
Future Volume (veh/h)	125	25	113	26	16	13	36	238	7	8	599	135
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	136	27	123	28	17	14	39	259	8	9	651	147
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	269	59	161	261	152	93	152	874	25	82	824	184
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.56	0.56	0.56	0.56	0.56	0.56
Sat Flow, veh/h	628	242	657	594	621	378	115	1562	45	6	1473	329
Grp Volume(v), veh/h	286	0	0	59	0	0	306	0	0	807	0	0
Grp Sat Flow(s),veh/h/ln	1528	0	0	1593	0	0	1722	0	0	1807	0	0
Q Serve(g_s), s	6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	7.9	0.0	0.0	1.2	0.0	0.0	4.0	0.0	0.0	16.3	0.0	0.0
Prop In Lane	0.48		0.43	0.47		0.24	0.13		0.03	0.01		0.18
Lane Grp Cap(c), veh/h	490	0	0	506	0	0	1052	0	0	1090	0	0
V/C Ratio(X)	0.58	0.00	0.00	0.12	0.00	0.00	0.29	0.00	0.00	0.74	0.00	0.00
Avail Cap(c_a), veh/h	950	0	0	952	0	0	2031	0	0	2245	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.1	0.0	0.0	13.6	0.0	0.0	5.4	0.0	0.0	8.1	0.0	0.0
Incr Delay (d2), s/veh	1.1	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	0.0	0.4	0.0	0.0	1.1	0.0	0.0	4.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.2	0.0	0.0	13.7	0.0	0.0	5.5	0.0	0.0	9.1	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		286			59			306			807	
Approach Delay, s/veh		17.2			13.7			5.5			9.1	
Approach LOS		B			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		30.3		15.8		30.3		15.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		55.5		25.5		55.5		25.5				
Max Q Clear Time (g_c+I1), s		6.0		9.9		18.3		3.2				
Green Ext Time (p_c), s		2.3		1.5		7.5		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			10.1									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	3	1	17	6	8	22	8	272	12	36	685	46
Future Vol, veh/h	3	1	17	6	8	22	8	272	12	36	685	46
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	1	18	7	9	24	9	296	13	39	745	50

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1185	1175	770	1179	1194	303	795	0	0	309	0	0
Stage 1	848	848	-	321	321	-	-	-	-	-	-	-
Stage 2	337	327	-	858	873	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	166	192	401	167	187	737	826	-	-	1252	-	-
Stage 1	356	378	-	691	652	-	-	-	-	-	-	-
Stage 2	677	648	-	352	368	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	146	179	401	150	174	737	826	-	-	1252	-	-
Mov Cap-2 Maneuver	146	179	-	150	174	-	-	-	-	-	-	-
Stage 1	351	357	-	682	644	-	-	-	-	-	-	-
Stage 2	638	640	-	316	347	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.7	18.2	0.3	0.4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	826	-	-	306	311	1252	-	-
HCM Lane V/C Ratio	0.011	-	-	0.075	0.126	0.031	-	-
HCM Control Delay (s)	9.4	0	-	17.7	18.2	8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.4	0.1	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	3	2	8	4	0	1	1	254	3	9	695	8
Future Vol, veh/h	3	2	8	4	0	1	1	254	3	9	695	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	2	9	4	0	1	1	276	3	10	755	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1060	1061	760	1065	1064	278	764	0	0	279	0	0
Stage 1	780	780	-	280	280	-	-	-	-	-	-	-
Stage 2	280	281	-	785	784	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	202	224	406	200	223	761	849	-	-	1284	-	-
Stage 1	388	406	-	727	679	-	-	-	-	-	-	-
Stage 2	727	678	-	386	404	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	199	221	406	192	220	761	849	-	-	1284	-	-
Mov Cap-2 Maneuver	199	221	-	192	220	-	-	-	-	-	-	-
Stage 1	388	400	-	726	678	-	-	-	-	-	-	-
Stage 2	725	677	-	370	398	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.7	21.3	0	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	849	-	-	297	226	1284	-	-
HCM Lane V/C Ratio	0.001	-	-	0.048	0.024	0.008	-	-
HCM Control Delay (s)	9.2	0	-	17.7	21.3	7.8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	0	1	2	0	3	0	263	0	6	699	2
Future Vol, veh/h	1	0	1	2	0	3	0	263	0	6	699	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	1	2	0	3	0	286	0	7	760	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1063	1061	761	1062	1062	286	762	0	0	286	0	0
Stage 1	775	775	-	286	286	-	-	-	-	-	-	-
Stage 2	288	286	-	776	776	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	201	224	405	201	223	753	850	-	-	1276	-	-
Stage 1	391	408	-	721	675	-	-	-	-	-	-	-
Stage 2	720	675	-	390	407	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	199	222	405	199	221	753	850	-	-	1276	-	-
Mov Cap-2 Maneuver	199	222	-	199	221	-	-	-	-	-	-	-
Stage 1	391	404	-	721	675	-	-	-	-	-	-	-
Stage 2	717	675	-	385	403	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.6	15.3	0	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	850	-	-	267	356	1276	-	-
HCM Lane V/C Ratio	-	-	-	0.008	0.015	0.005	-	-
HCM Control Delay (s)	0	-	-	18.6	15.3	7.8	0	-
HCM Lane LOS	A	-	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	6	1	240	701	3
Future Vol, veh/h	10	6	1	240	701	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	7	1	261	762	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1027	764	765	0	-	0
Stage 1	764	-	-	-	-	-
Stage 2	263	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	260	404	848	-	-	-
Stage 1	460	-	-	-	-	-
Stage 2	781	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	260	404	848	-	-	-
Mov Cap-2 Maneuver	260	-	-	-	-	-
Stage 1	460	-	-	-	-	-
Stage 2	781	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	848	-	300	-	-
HCM Lane V/C Ratio	0.001	-	0.058	-	-
HCM Control Delay (s)	9.3	0	17.7	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	10	1	232	684	7
Future Vol, veh/h	7	10	1	232	684	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	275	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	11	1	252	743	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1001	747	751	0	-	0
Stage 1	747	-	-	-	-	-
Stage 2	254	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	269	413	858	-	-	-
Stage 1	468	-	-	-	-	-
Stage 2	788	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	269	413	858	-	-	-
Mov Cap-2 Maneuver	269	-	-	-	-	-
Stage 1	468	-	-	-	-	-
Stage 2	788	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	858	-	269	413	-	-
HCM Lane V/C Ratio	0.001	-	0.028	0.026	-	-
HCM Control Delay (s)	9.2	-	18.8	14	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	213	15	2	144	0	10	0	6	1	0	0
Future Vol, veh/h	1	213	15	2	144	0	10	0	6	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	232	16	2	157	0	11	0	7	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	157	0	0	248	0	0	403	403	240	407	411	157
Stage 1	-	-	-	-	-	-	242	242	-	161	161	-
Stage 2	-	-	-	-	-	-	161	161	-	246	250	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1423	-	-	1318	-	-	558	536	799	555	531	889
Stage 1	-	-	-	-	-	-	762	705	-	841	765	-
Stage 2	-	-	-	-	-	-	841	765	-	758	700	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1423	-	-	1318	-	-	557	534	799	549	529	889
Mov Cap-2 Maneuver	-	-	-	-	-	-	557	534	-	549	529	-
Stage 1	-	-	-	-	-	-	761	704	-	840	763	-
Stage 2	-	-	-	-	-	-	839	763	-	751	699	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	10.9	11.6
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	628	1423	-	-	1318	-	-	549
HCM Lane V/C Ratio	0.028	0.001	-	-	0.002	-	-	0.002
HCM Control Delay (s)	10.9	7.5	0	-	7.7	0	-	11.6
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	64	92	15	33	31	2
Future Vol, veh/h	64	92	15	33	31	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	70	100	16	36	34	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	170	0	188	120
Stage 1	-	-	-	-	120	-
Stage 2	-	-	-	-	68	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1407	-	801	931
Stage 1	-	-	-	-	905	-
Stage 2	-	-	-	-	955	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1407	-	791	931
Mov Cap-2 Maneuver	-	-	-	-	791	-
Stage 1	-	-	-	-	905	-
Stage 2	-	-	-	-	944	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.4	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	798	-	-	1407	-
HCM Lane V/C Ratio	0.045	-	-	0.012	-
HCM Control Delay (s)	9.7	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	126	29	20	40	226	525
Future Vol, veh/h	126	29	20	40	226	525
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	137	32	22	43	246	571

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	619	532	817	0	-	0
Stage 1	532	-	-	-	-	-
Stage 2	87	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	452	547	811	-	-	-
Stage 1	589	-	-	-	-	-
Stage 2	936	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	439	547	811	-	-	-
Mov Cap-2 Maneuver	439	-	-	-	-	-
Stage 1	573	-	-	-	-	-
Stage 2	936	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.4	3.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	811	-	456	-	-
HCM Lane V/C Ratio	0.027	-	0.369	-	-
HCM Control Delay (s)	9.6	0	17.4	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	1.7	-	-

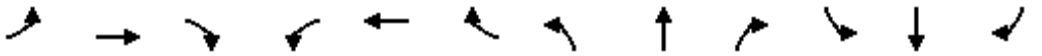
Intersection	
Int Delay, s/veh	48.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	590	47	85	107	32	103
Future Vol, veh/h	590	47	85	107	32	103
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	641	51	92	116	35	112

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	332	150	0	0	208	0
Stage 1	150	-	-	-	-	-
Stage 2	182	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	663	896	-	-	1363	-
Stage 1	878	-	-	-	-	-
Stage 2	849	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	646	896	-	-	1363	-
Mov Cap-2 Maneuver	646	-	-	-	-	-
Stage 1	878	-	-	-	-	-
Stage 2	827	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	73.4	0	1.8
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	660	1363	-
HCM Lane V/C Ratio	-	-	1.049	0.026	-
HCM Control Delay (s)	-	-	73.4	7.7	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	18.3	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	348	47	159	71	49	102	169	537	68	107	497	413
Future Volume (veh/h)	348	47	159	71	49	102	169	537	68	107	497	413
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	378	51	173	77	53	111	184	584	74	116	540	449
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	518	71	242	100	182	289	234	1285	162	152	1274	568
Arrive On Green	0.15	0.19	0.19	0.06	0.10	0.10	0.13	0.40	0.40	0.09	0.36	0.36
Sat Flow, veh/h	3456	374	1268	1781	1870	1585	1781	3174	401	1781	3554	1585
Grp Volume(v), veh/h	378	0	224	77	53	111	184	326	332	116	540	449
Grp Sat Flow(s),veh/h/ln	1728	0	1642	1781	1870	1585	1781	1777	1798	1781	1777	1585
Q Serve(g_s), s	7.1	0.0	8.7	2.9	1.8	4.2	6.9	9.2	9.2	4.4	7.9	17.4
Cycle Q Clear(g_c), s	7.1	0.0	8.7	2.9	1.8	4.2	6.9	9.2	9.2	4.4	7.9	17.4
Prop In Lane	1.00		0.77	1.00		1.00	1.00		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	518	0	314	100	182	289	234	719	728	152	1274	568
V/C Ratio(X)	0.73	0.00	0.71	0.77	0.29	0.38	0.79	0.45	0.46	0.77	0.42	0.79
Avail Cap(c_a), veh/h	1136	0	683	325	505	563	611	1155	1169	429	1946	868
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.8	0.0	25.9	31.9	28.7	24.6	28.8	14.9	14.9	30.7	16.6	19.7
Incr Delay (d2), s/veh	2.0	0.0	3.0	11.7	0.9	0.8	5.8	0.4	0.4	7.8	0.2	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.0	3.5	1.5	0.8	1.6	3.2	3.5	3.5	2.1	3.0	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.8	0.0	29.0	43.6	29.6	25.5	34.6	15.3	15.3	38.5	16.8	22.5
LnGrp LOS	C	A	C	D	C	C	C	B	B	D	B	C
Approach Vol, veh/h		602			241			842			1105	
Approach Delay, s/veh		29.5			32.2			19.5			21.4	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	32.2	8.3	17.6	13.5	29.1	14.8	11.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	44.5	12.5	28.5	23.5	37.5	22.5	18.5
Max Q Clear Time (g_c+I1), s	6.4	11.2	4.9	10.7	8.9	19.4	9.1	6.2
Green Ext Time (p_c), s	0.2	4.6	0.1	1.2	0.4	5.2	1.1	0.4

Intersection Summary	
HCM 6th Ctrl Delay	23.5
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	0	15	0	54	0	751	22	88	679	2
Future Vol, veh/h	1	0	0	15	0	54	0	751	22	88	679	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	-	-	-	375	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	0	16	0	59	0	816	24	96	738	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1789	1771	739	1759	1760	828	740	0	0	840	0	0
Stage 1	931	931	-	828	828	-	-	-	-	-	-	-
Stage 2	858	840	-	931	932	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	63	83	417	66	84	371	867	-	-	795	-	-
Stage 1	320	346	-	365	386	-	-	-	-	-	-	-
Stage 2	352	381	-	320	345	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	48	73	417	60	74	371	867	-	-	795	-	-
Mov Cap-2 Maneuver	48	73	-	60	74	-	-	-	-	-	-	-
Stage 1	320	304	-	365	386	-	-	-	-	-	-	-
Stage 2	296	381	-	281	303	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	81.7	31.6	0	1.2
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	867	-	-	48	60	371	795	-	-
HCM Lane V/C Ratio	-	-	-	0.023	0.272	0.158	0.12	-	-
HCM Control Delay (s)	0	-	-	81.7	86	16.5	10.1	-	-
HCM Lane LOS	A	-	-	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1	0.6	0.4	-	-

Intersection	
Int Delay, s/veh	21.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	78	54	739	159	107	636
Future Vol, veh/h	78	54	739	159	107	636
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	85	59	803	173	116	691

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1813	890	0	0	976	0
Stage 1	890	-	-	-	-	-
Stage 2	923	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	86	342	-	-	707	-
Stage 1	401	-	-	-	-	-
Stage 2	387	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 72	342	-	-	707	-
Mov Cap-2 Maneuver	~ 72	-	-	-	-	-
Stage 1	401	-	-	-	-	-
Stage 2	324	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	282.9	0	1.6
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	106	707	-
HCM Lane V/C Ratio	-	-	1.354	0.165	-
HCM Control Delay (s)	-	-	282.9	11.1	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	10	0.6	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	17.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1	7	61	0	95	2	841	115	148	565	1
Future Vol, veh/h	3	1	7	61	0	95	2	841	115	148	565	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	50	275	-	275	375	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	1	8	66	0	103	2	914	125	161	614	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1968	1979	614	1859	1855	914	615	0	0	1039	0	0
Stage 1	936	936	-	918	918	-	-	-	-	-	-	-
Stage 2	1032	1043	-	941	937	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	47	62	492	~ 56	74	331	965	-	-	669	-	-
Stage 1	318	344	-	326	350	-	-	-	-	-	-	-
Stage 2	281	306	-	316	343	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	26	47	492	~ 44	56	331	965	-	-	669	-	-
Mov Cap-2 Maneuver	26	47	-	~ 44	56	-	-	-	-	-	-	-
Stage 1	317	261	-	325	349	-	-	-	-	-	-	-
Stage 2	193	305	-	235	260	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	62.4	193.5	0	2.5
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	965	-	-	29	492	44	331	669	-	-
HCM Lane V/C Ratio	0.002	-	-	0.15	0.015	1.507	0.312	0.24	-	-
HCM Control Delay (s)	8.7	-	-	149.9	12.4	$ 462.6	20.7	12.1	-	-
HCM Lane LOS	A	-	-	F	B	F	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0	6.6	1.3	0.9	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	58.1
Intersection LOS	F

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	269	1348	638
Demand Flow Rate, veh/h	274	1375	651
Vehicles Circulating, veh/h	943	130	165
Vehicles Exiting, veh/h	561	686	1052
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	16.8	89.2	9.8
Approach LOS	C	F	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	274	1375	651
Cap Entry Lane, veh/h	527	1209	1166
Entry HV Adj Factor	0.982	0.981	0.980
Flow Entry, veh/h	269	1348	638
Cap Entry, veh/h	518	1185	1142
V/C Ratio	0.520	1.138	0.558
Control Delay, s/veh	16.8	89.2	9.8
LOS	C	F	A
95th %tile Queue, veh	3	35	4

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	0	3	6	0	11	2	1209	3	7	584	3
Future Vol, veh/h	17	0	3	6	0	11	2	1209	3	7	584	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	-	125	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	0	3	7	0	12	2	1314	3	8	635	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1979	1974	637	1974	1974	1316	638	0	0	1317	0	0
Stage 1	653	653	-	1320	1320	-	-	-	-	-	-	-
Stage 2	1326	1321	-	654	654	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	46	62	477	47	62	193	946	-	-	525	-	-
Stage 1	456	464	-	193	226	-	-	-	-	-	-	-
Stage 2	192	226	-	456	463	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	43	61	477	46	61	193	946	-	-	525	-	-
Mov Cap-2 Maneuver	43	61	-	46	61	-	-	-	-	-	-	-
Stage 1	455	457	-	193	226	-	-	-	-	-	-	-
Stage 2	180	226	-	446	456	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	121.8	54.4	0	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	946	-	-	43	477	91	525	-	-
HCM Lane V/C Ratio	0.002	-	-	0.43	0.007	0.203	0.014	-	-
HCM Control Delay (s)	8.8	-	-	141.1	12.6	54.4	12	-	-
HCM Lane LOS	A	-	-	F	B	F	B	-	-
HCM 95th %tile Q(veh)	0	-	-	1.5	0	0.7	0	-	-

Intersection	
Int Delay, s/veh	5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	40	143	999	27	34	408
Future Vol, veh/h	40	143	999	27	34	408
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	325	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	155	1086	29	37	443

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1618	1101	0	0	1115	0
Stage 1	1101	-	-	-	-	-
Stage 2	517	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	114	258	-	-	626	-
Stage 1	318	-	-	-	-	-
Stage 2	598	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	107	258	-	-	626	-
Mov Cap-2 Maneuver	107	-	-	-	-	-
Stage 1	318	-	-	-	-	-
Stage 2	563	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	42.9	0	0.9
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	107	258	626	-
HCM Lane V/C Ratio	-	-	0.406	0.602	0.059	-
HCM Control Delay (s)	-	-	60	38.1	11.1	-
HCM Lane LOS	-	-	F	E	B	-
HCM 95th %tile Q(veh)	-	-	1.7	3.6	0.2	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	72	3	2	208	4	1
Future Vol, veh/h	72	3	2	208	4	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	78	3	2	226	4	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	81	0	310	80
Stage 1	-	-	-	-	80	-
Stage 2	-	-	-	-	230	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1517	-	682	980
Stage 1	-	-	-	-	943	-
Stage 2	-	-	-	-	808	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1517	-	681	980
Mov Cap-2 Maneuver	-	-	-	-	681	-
Stage 1	-	-	-	-	943	-
Stage 2	-	-	-	-	806	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	725	-	-	1517	-
HCM Lane V/C Ratio	0.007	-	-	0.001	-
HCM Control Delay (s)	10	-	-	7.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	62	3	1	181	2	0
Future Vol, veh/h	62	3	1	181	2	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	67	3	1	197	2	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	70	0	268	69
Stage 1	-	-	-	-	69	-
Stage 2	-	-	-	-	199	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1531	-	721	994
Stage 1	-	-	-	-	954	-
Stage 2	-	-	-	-	835	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1531	-	720	994
Mov Cap-2 Maneuver	-	-	-	-	720	-
Stage 1	-	-	-	-	954	-
Stage 2	-	-	-	-	834	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	720	-	-	1531	-
HCM Lane V/C Ratio	0.003	-	-	0.001	-
HCM Control Delay (s)	10	-	-	7.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	3	40	40	11	47	16	969	15	9	412	127
Future Volume (veh/h)	130	3	40	40	11	47	16	969	15	9	412	127
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	141	3	43	43	12	51	17	1053	16	10	448	138
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	291	8	56	168	62	130	566	1253	19	263	936	288
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.68	0.68	0.68	0.68	0.68	0.68
Sat Flow, veh/h	1133	50	353	492	394	821	829	1837	28	528	1372	423
Grp Volume(v), veh/h	187	0	0	106	0	0	17	0	1069	10	0	586
Grp Sat Flow(s),veh/h/ln	1536	0	0	1706	0	0	829	0	1865	528	0	1794
Q Serve(g_s), s	3.2	0.0	0.0	0.0	0.0	0.0	0.6	0.0	24.0	0.8	0.0	8.7
Cycle Q Clear(g_c), s	6.3	0.0	0.0	3.1	0.0	0.0	9.2	0.0	24.0	24.9	0.0	8.7
Prop In Lane	0.75		0.23	0.41		0.48	1.00		0.01	1.00		0.24
Lane Grp Cap(c), veh/h	355	0	0	360	0	0	566	0	1272	263	0	1224
V/C Ratio(X)	0.53	0.00	0.00	0.29	0.00	0.00	0.03	0.00	0.84	0.04	0.00	0.48
Avail Cap(c_a), veh/h	592	0	0	617	0	0	920	0	2069	488	0	1990
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.4	0.0	0.0	21.3	0.0	0.0	6.4	0.0	6.7	15.9	0.0	4.2
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.5	0.0	0.0	0.0	0.0	1.8	0.1	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	0.0	1.2	0.0	0.0	0.1	0.0	5.9	0.1	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.6	0.0	0.0	21.7	0.0	0.0	6.4	0.0	8.4	16.0	0.0	4.5
LnGrp LOS	C	A	A	C	A	A	A	A	A	B	A	A
Approach Vol, veh/h		187			106			1086			596	
Approach Delay, s/veh		23.6			21.7			8.4			4.7	
Approach LOS		C			C			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		42.9		13.4		42.9		13.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		62.5		18.5		62.5		18.5				
Max Q Clear Time (g_c+I1), s		26.0		8.3		26.9		5.1				
Green Ext Time (p_c), s		12.4		0.7		4.8		0.4				

Intersection Summary												
HCM 6th Ctrl Delay			9.4									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	7	1	6	3	0	4	6	969	15	10	520	7
Future Vol, veh/h	7	1	6	3	0	4	6	969	15	10	520	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	1	7	3	0	4	7	1053	16	11	565	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1668	1674	569	1670	1670	1061	573	0	0	1069	0	0
Stage 1	591	591	-	1075	1075	-	-	-	-	-	-	-
Stage 2	1077	1083	-	595	595	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	77	95	522	76	96	272	1000	-	-	652	-	-
Stage 1	493	494	-	266	296	-	-	-	-	-	-	-
Stage 2	265	293	-	491	492	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	73	91	522	72	92	272	1000	-	-	652	-	-
Mov Cap-2 Maneuver	73	91	-	72	92	-	-	-	-	-	-	-
Stage 1	485	482	-	261	291	-	-	-	-	-	-	-
Stage 2	256	288	-	472	480	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	40	35.9	0.1	0.2
HCM LOS	E	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1000	-	-	118	124	652	-	-
HCM Lane V/C Ratio	0.007	-	-	0.129	0.061	0.017	-	-
HCM Control Delay (s)	8.6	0	-	40	35.9	10.6	0	-
HCM Lane LOS	A	A	-	E	E	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.2	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	216	13	78	26	26	13	62	752	9	2	398	142
Future Volume (veh/h)	216	13	78	26	26	13	62	752	9	2	398	142
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	235	14	85	28	28	14	67	817	10	2	433	154
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	376	19	101	223	211	88	112	970	12	59	771	273
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.59	0.59	0.59	0.59	0.59	0.59
Sat Flow, veh/h	1029	69	375	527	785	328	85	1657	20	1	1317	467
Grp Volume(v), veh/h	334	0	0	70	0	0	894	0	0	589	0	0
Grp Sat Flow(s),veh/h/ln	1473	0	0	1640	0	0	1762	0	0	1785	0	0
Q Serve(g_s), s	11.3	0.0	0.0	0.0	0.0	0.0	13.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	13.1	0.0	0.0	1.8	0.0	0.0	25.7	0.0	0.0	12.6	0.0	0.0
Prop In Lane	0.70		0.25	0.40		0.20	0.07		0.01	0.00		0.26
Lane Grp Cap(c), veh/h	495	0	0	522	0	0	1095	0	0	1104	0	0
V/C Ratio(X)	0.67	0.00	0.00	0.13	0.00	0.00	0.82	0.00	0.00	0.53	0.00	0.00
Avail Cap(c_a), veh/h	702	0	0	745	0	0	1629	0	0	1660	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	21.1	0.0	0.0	17.2	0.0	0.0	10.4	0.0	0.0	7.9	0.0	0.0
Incr Delay (d2), s/veh	1.6	0.0	0.0	0.1	0.0	0.0	2.1	0.0	0.0	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	0.0	0.0	0.7	0.0	0.0	7.9	0.0	0.0	3.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.7	0.0	0.0	17.3	0.0	0.0	12.5	0.0	0.0	8.3	0.0	0.0
LnGrp LOS	C	A	A	B	A	A	B	A	A	A	A	A
Approach Vol, veh/h		334			70			894			589	
Approach Delay, s/veh		22.7			17.3			12.5			8.3	
Approach LOS		C			B			B			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		40.7		21.1		40.7		21.1				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		55.5		25.5		55.5		25.5				
Max Q Clear Time (g_c+I1), s		27.7		15.1		14.6		3.8				
Green Ext Time (p_c), s		8.5		1.5		4.7		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			13.2									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	7	4	21	7	8	30	25	829	12	22	384	67
Future Vol, veh/h	7	4	21	7	8	30	25	829	12	22	384	67
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	4	23	8	9	33	27	901	13	24	417	73

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1485	1470	454	1477	1500	908	490	0	0	914	0	0
Stage 1	502	502	-	962	962	-	-	-	-	-	-	-
Stage 2	983	968	-	515	538	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	103	127	606	104	122	334	1073	-	-	746	-	-
Stage 1	552	542	-	308	334	-	-	-	-	-	-	-
Stage 2	299	332	-	543	522	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	81	115	606	90	111	334	1073	-	-	746	-	-
Mov Cap-2 Maneuver	81	115	-	90	111	-	-	-	-	-	-	-
Stage 1	524	518	-	292	317	-	-	-	-	-	-	-
Stage 2	249	315	-	495	499	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26.1	30.8	0.2	0.5
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1073	-	-	205	188	746	-	-
HCM Lane V/C Ratio	0.025	-	-	0.17	0.26	0.032	-	-
HCM Control Delay (s)	8.4	0	-	26.1	30.8	10	0	-
HCM Lane LOS	A	A	-	D	D	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	1	0.1	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	0	1	2	1	10	3	922	8	10	387	6
Future Vol, veh/h	1	0	1	2	1	10	3	922	8	10	387	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	1	2	1	11	3	1002	9	11	421	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1466	1464	425	1460	1463	1007	428	0	0	1011	0	0
Stage 1	447	447	-	1013	1013	-	-	-	-	-	-	-
Stage 2	1019	1017	-	447	450	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	106	128	629	107	129	292	1131	-	-	686	-	-
Stage 1	591	573	-	288	316	-	-	-	-	-	-	-
Stage 2	286	315	-	591	572	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	99	125	629	105	126	292	1131	-	-	686	-	-
Mov Cap-2 Maneuver	99	125	-	105	126	-	-	-	-	-	-	-
Stage 1	587	561	-	286	314	-	-	-	-	-	-	-
Stage 2	273	313	-	578	560	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26.3	23.2	0	0.3
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1131	-	-	171	212	686	-	-
HCM Lane V/C Ratio	0.003	-	-	0.013	0.067	0.016	-	-
HCM Control Delay (s)	8.2	0	-	26.3	23.2	10.3	0	-
HCM Lane LOS	A	A	-	D	C	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	1	2	4	0	10	9	917	8	0	368	3
Future Vol, veh/h	0	1	2	4	0	10	9	917	8	0	368	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	2	4	0	11	10	997	9	0	400	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1429	1428	402	1425	1425	1002	403	0	0	1006	0	0
Stage 1	402	402	-	1022	1022	-	-	-	-	-	-	-
Stage 2	1027	1026	-	403	403	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	112	135	648	113	136	294	1156	-	-	689	-	-
Stage 1	625	600	-	285	313	-	-	-	-	-	-	-
Stage 2	283	312	-	624	600	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	106	132	648	110	133	294	1156	-	-	689	-	-
Mov Cap-2 Maneuver	106	132	-	110	133	-	-	-	-	-	-	-
Stage 1	613	600	-	279	307	-	-	-	-	-	-	-
Stage 2	267	306	-	621	600	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18	24.6	0.1	0
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1156	-	-	281	199	689	-	-
HCM Lane V/C Ratio	0.008	-	-	0.012	0.076	-	-	-
HCM Control Delay (s)	8.1	0	-	18	24.6	0	-	-
HCM Lane LOS	A	A	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	4	3	901	371	12
Future Vol, veh/h	7	4	3	901	371	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	4	3	979	403	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1395	410	416	0	-	0
Stage 1	410	-	-	-	-	-
Stage 2	985	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	156	642	1143	-	-	-
Stage 1	670	-	-	-	-	-
Stage 2	362	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	155	642	1143	-	-	-
Mov Cap-2 Maneuver	155	-	-	-	-	-
Stage 1	666	-	-	-	-	-
Stage 2	362	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1143	-	214	-	-
HCM Lane V/C Ratio	0.003	-	0.056	-	-
HCM Control Delay (s)	8.2	0	22.8	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	3	39	926	340	12
Future Vol, veh/h	8	3	39	926	340	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	275	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	3	42	1007	370	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1468	377	383	0	-	0
Stage 1	377	-	-	-	-	-
Stage 2	1091	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	141	670	1175	-	-	-
Stage 1	694	-	-	-	-	-
Stage 2	322	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	136	670	1175	-	-	-
Mov Cap-2 Maneuver	136	-	-	-	-	-
Stage 1	669	-	-	-	-	-
Stage 2	322	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	27.1	0.3	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1175	-	136	670	-	-
HCM Lane V/C Ratio	0.036	-	0.064	0.005	-	-
HCM Control Delay (s)	8.2	-	33.3	10.4	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	0	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	287	9	22	239	4	20	1	16	2	0	1
Future Vol, veh/h	1	287	9	22	239	4	20	1	16	2	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	312	10	24	260	4	22	1	17	2	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	264	0	0	322	0	0	630	631	317	638	634	262
Stage 1	-	-	-	-	-	-	319	319	-	310	310	-
Stage 2	-	-	-	-	-	-	311	312	-	328	324	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1300	-	-	1238	-	-	394	398	724	389	397	777
Stage 1	-	-	-	-	-	-	693	653	-	700	659	-
Stage 2	-	-	-	-	-	-	699	658	-	685	650	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1300	-	-	1238	-	-	386	388	724	372	387	777
Mov Cap-2 Maneuver	-	-	-	-	-	-	386	388	-	372	387	-
Stage 1	-	-	-	-	-	-	692	652	-	699	644	-
Stage 2	-	-	-	-	-	-	682	643	-	667	649	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.7	13.1	13.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	484	1300	-	-	1238	-	-	450
HCM Lane V/C Ratio	0.083	0.001	-	-	0.019	-	-	0.007
HCM Control Delay (s)	13.1	7.8	0	-	8	0	-	13.1
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0.1	-	-	0

Intersection	
Int Delay, s/veh	4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	40	41	12	67	88	3
Future Vol, veh/h	40	41	12	67	88	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	45	13	73	96	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	88	0	165	66
Stage 1	-	-	-	-	66	-
Stage 2	-	-	-	-	99	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1508	-	826	998
Stage 1	-	-	-	-	957	-
Stage 2	-	-	-	-	925	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1508	-	819	998
Mov Cap-2 Maneuver	-	-	-	-	819	-
Stage 1	-	-	-	-	957	-
Stage 2	-	-	-	-	917	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	10
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	824	-	-	1508	-
HCM Lane V/C Ratio	0.12	-	-	0.009	-
HCM Control Delay (s)	10	-	-	7.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection	
Int Delay, s/veh	247.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	657	37	92	280	75	205
Future Vol, veh/h	657	37	92	280	75	205
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	714	40	100	304	82	223

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	698	194	305	0	-	0
Stage 1	194	-	-	-	-	-
Stage 2	504	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	~ 407	847	1256	-	-	-
Stage 1	839	-	-	-	-	-
Stage 2	~ 607	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 368	847	1256	-	-	-
Mov Cap-2 Maneuver	~ 368	-	-	-	-	-
Stage 1	758	-	-	-	-	-
Stage 2	~ 607	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 478.5	2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1256	-	379	-	-
HCM Lane V/C Ratio	0.08	-	1.99	-	-
HCM Control Delay (s)	8.1	0	$ 478.5	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0.3	-	52.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	65.9

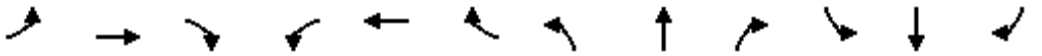
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	345	52	67	508	140	132
Future Vol, veh/h	345	52	67	508	140	132
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	375	57	73	552	152	143

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	796	349	0	0	625	0
Stage 1	349	-	-	-	-	-
Stage 2	447	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	~ 356	694	-	-	956	-
Stage 1	714	-	-	-	-	-
Stage 2	644	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 299	694	-	-	956	-
Mov Cap-2 Maneuver	~ 299	-	-	-	-	-
Stage 1	714	-	-	-	-	-
Stage 2	542	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	203.2	0	4.9
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	323	956	-
HCM Lane V/C Ratio	-	-	1.336	0.159	-
HCM Control Delay (s)	-	-	203.2	9.5	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	21.2	0.6	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	355	45	122	42	42	66	200	472	68	73	349	327
Future Volume (veh/h)	355	45	122	42	42	66	200	472	68	73	349	327
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	386	49	133	46	46	72	217	513	74	79	379	355
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	552	88	240	80	157	230	278	1223	176	109	1058	472
Arrive On Green	0.16	0.20	0.20	0.04	0.08	0.08	0.16	0.39	0.39	0.06	0.30	0.30
Sat Flow, veh/h	3456	445	1208	1781	1870	1585	1781	3118	448	1781	3554	1585
Grp Volume(v), veh/h	386	0	182	46	46	72	217	291	296	79	379	355
Grp Sat Flow(s),veh/h/ln	1728	0	1653	1781	1870	1585	1781	1777	1790	1781	1777	1585
Q Serve(g_s), s	6.3	0.0	5.9	1.5	1.4	2.4	7.0	7.1	7.1	2.6	5.0	12.0
Cycle Q Clear(g_c), s	6.3	0.0	5.9	1.5	1.4	2.4	7.0	7.1	7.1	2.6	5.0	12.0
Prop In Lane	1.00		0.73	1.00		1.00	1.00		0.25	1.00		1.00
Lane Grp Cap(c), veh/h	552	0	328	80	157	230	278	697	702	109	1058	472
V/C Ratio(X)	0.70	0.00	0.55	0.58	0.29	0.31	0.78	0.42	0.42	0.72	0.36	0.75
Avail Cap(c_a), veh/h	1367	0	904	285	583	591	825	1391	1401	405	1944	867
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.6	0.0	21.4	27.8	25.6	22.7	24.1	13.1	13.1	27.4	16.4	18.9
Incr Delay (d2), s/veh	1.6	0.0	1.5	6.4	1.0	0.8	4.8	0.4	0.4	8.7	0.2	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	2.2	0.8	0.6	0.9	3.1	2.6	2.6	1.3	1.9	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.2	0.0	22.9	34.2	26.6	23.5	28.9	13.5	13.5	36.1	16.6	21.3
LnGrp LOS	C	A	C	C	C	C	C	B	B	D	B	C
Approach Vol, veh/h		568			164			804			813	
Approach Delay, s/veh		24.5			27.4			17.7			20.6	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	27.8	7.2	16.3	13.8	22.2	14.0	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.5	46.5	9.5	32.5	27.5	32.5	23.5	18.5
Max Q Clear Time (g_c+I1), s	4.6	9.1	3.5	7.9	9.0	14.0	8.3	4.4
Green Ext Time (p_c), s	0.1	4.0	0.0	1.1	0.6	3.6	1.2	0.3

Intersection Summary	
HCM 6th Ctrl Delay	21.0
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	0	22	0	50	0	649	18	49	518	2
Future Vol, veh/h	1	0	0	22	0	50	0	649	18	49	518	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	-	-	-	375	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	0	24	0	54	0	705	20	53	563	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1412	1395	564	1385	1386	715	565	0	0	725	0	0
Stage 1	670	670	-	715	715	-	-	-	-	-	-	-
Stage 2	742	725	-	670	671	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	116	141	525	121	143	431	1007	-	-	878	-	-
Stage 1	446	455	-	422	434	-	-	-	-	-	-	-
Stage 2	408	430	-	446	455	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	97	133	525	115	134	431	1007	-	-	878	-	-
Mov Cap-2 Maneuver	97	133	-	115	134	-	-	-	-	-	-	-
Stage 1	446	428	-	422	434	-	-	-	-	-	-	-
Stage 2	357	430	-	419	428	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	42.5	23.7	0	0.8
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1007	-	-	97	115	431	878	-	-
HCM Lane V/C Ratio	-	-	-	0.011	0.208	0.126	0.061	-	-
HCM Control Delay (s)	0	-	-	42.5	44.3	14.6	9.4	-	-
HCM Lane LOS	A	-	-	E	E	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.7	0.4	0.2	-	-

Intersection	
Int Delay, s/veh	13.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	129	72	558	67	25	519
Future Vol, veh/h	129	72	558	67	25	519
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	140	78	607	73	27	564

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1262	644	0	0	680	0
Stage 1	644	-	-	-	-	-
Stage 2	618	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	188	473	-	-	912	-
Stage 1	523	-	-	-	-	-
Stage 2	538	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	182	473	-	-	912	-
Mov Cap-2 Maneuver	182	-	-	-	-	-
Stage 1	523	-	-	-	-	-
Stage 2	522	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	88.4	0	0.4
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	233	912	-
HCM Lane V/C Ratio	-	-	0.938	0.03	-
HCM Control Delay (s)	-	-	88.4	9.1	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	8.2	0.1	-

Intersection	
Int Delay, s/veh	20.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	1	122	0	150	1	594	43	47	626	1
Future Vol, veh/h	3	0	1	122	0	150	1	594	43	47	626	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	50	275	-	275	375	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	1	133	0	163	1	646	47	51	680	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1535	1477	680	1431	1431	646	681	0	0	693	0	0
Stage 1	782	782	-	648	648	-	-	-	-	-	-	-
Stage 2	753	695	-	783	783	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	95	126	451	~ 112	134	472	912	-	-	902	-	-
Stage 1	387	405	-	459	466	-	-	-	-	-	-	-
Stage 2	402	444	-	387	404	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	59	119	451	~ 107	126	472	912	-	-	902	-	-
Mov Cap-2 Maneuver	59	119	-	~ 107	126	-	-	-	-	-	-	-
Stage 1	387	382	-	459	466	-	-	-	-	-	-	-
Stage 2	263	444	-	364	381	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	55.5	116.7	0	0.6
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	912	-	-	59	451	107	472	902	-	-
HCM Lane V/C Ratio	0.001	-	-	0.055	0.002	1.239	0.345	0.057	-	-
HCM Control Delay (s)	9	-	-	69.6	13	239.7	16.6	9.2	-	-
HCM Lane LOS	A	-	-	F	B	F	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	8.8	1.5	0.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	24.5
Intersection LOS	C

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	526	753	848
Demand Flow Rate, veh/h	537	768	865
Vehicles Circulating, veh/h	559	107	409
Vehicles Exiting, veh/h	316	1167	686
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	17.9	10.8	40.8
Approach LOS	C	B	E

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	537	768	865
Cap Entry Lane, veh/h	780	1237	909
Entry HV Adj Factor	0.980	0.981	0.981
Flow Entry, veh/h	526	753	848
Cap Entry, veh/h	764	1213	892
V/C Ratio	0.688	0.621	0.951
Control Delay, s/veh	17.9	10.8	40.8
LOS	C	B	E
95th %tile Queue, veh	6	5	15

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	0	1	3	1	4	6	649	3	1	1016	25
Future Vol, veh/h	11	0	1	3	1	4	6	649	3	1	1016	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	-	125	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	0	1	3	1	4	7	705	3	1	1104	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1843	1842	1118	1841	1854	707	1131	0	0	708	0	0
Stage 1	1120	1120	-	721	721	-	-	-	-	-	-	-
Stage 2	723	722	-	1120	1133	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	58	75	252	58	74	435	618	-	-	891	-	-
Stage 1	251	282	-	419	432	-	-	-	-	-	-	-
Stage 2	417	431	-	251	278	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	56	74	252	57	73	435	618	-	-	891	-	-
Mov Cap-2 Maneuver	56	74	-	57	73	-	-	-	-	-	-	-
Stage 1	248	282	-	414	427	-	-	-	-	-	-	-
Stage 2	407	426	-	250	278	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	80.4	42	0.1	0
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	618	-	-	56	252	106	891	-	-
HCM Lane V/C Ratio	0.011	-	-	0.214	0.004	0.082	0.001	-	-
HCM Control Delay (s)	10.9	-	-	86	19.3	42	9	-	-
HCM Lane LOS	B	-	-	F	C	E	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0	0.3	0	-	-

Intersection	
Int Delay, s/veh	6.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	60	86	399	70	140	901
Future Vol, veh/h	60	86	399	70	140	901
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	325	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	65	93	434	76	152	979

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1755	472	0	0	510	0
Stage 1	472	-	-	-	-	-
Stage 2	1283	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	94	592	-	-	1055	-
Stage 1	628	-	-	-	-	-
Stage 2	260	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	80	592	-	-	1055	-
Mov Cap-2 Maneuver	80	-	-	-	-	-
Stage 1	628	-	-	-	-	-
Stage 2	223	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	66.2	0	1.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	80	592	1055	-
HCM Lane V/C Ratio	-	-	0.815	0.158	0.144	-
HCM Control Delay (s)	-	-	143.5	12.2	9	-
HCM Lane LOS	-	-	F	B	A	-
HCM 95th %tile Q(veh)	-	-	4.1	0.6	0.5	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	235	7	0	169	6	2
Future Vol, veh/h	235	7	0	169	6	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	255	8	0	184	7	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	263	0	443	259
Stage 1	-	-	-	-	259	-
Stage 2	-	-	-	-	184	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1301	-	572	780
Stage 1	-	-	-	-	784	-
Stage 2	-	-	-	-	848	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1301	-	572	780
Mov Cap-2 Maneuver	-	-	-	-	572	-
Stage 1	-	-	-	-	784	-
Stage 2	-	-	-	-	848	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	613	-	-	1301	-
HCM Lane V/C Ratio	0.014	-	-	-	-
HCM Control Delay (s)	11	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

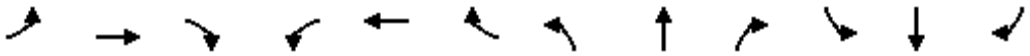
Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	216	2	2	146	6	0
Future Vol, veh/h	216	2	2	146	6	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	235	2	2	159	7	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	237	0	399	236
Stage 1	-	-	-	-	236	-
Stage 2	-	-	-	-	163	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1330	-	607	803
Stage 1	-	-	-	-	803	-
Stage 2	-	-	-	-	866	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1330	-	606	803
Mov Cap-2 Maneuver	-	-	-	-	606	-
Stage 1	-	-	-	-	803	-
Stage 2	-	-	-	-	864	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	11
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	606	-	-	1330	-
HCM Lane V/C Ratio	0.011	-	-	0.002	-
HCM Control Delay (s)	11	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	167	7	45	7	38	20	11	370	1	12	700	381
Future Volume (veh/h)	167	7	45	7	38	20	11	370	1	12	700	381
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	182	8	49	8	41	22	12	402	1	13	761	414
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	284	9	56	63	213	102	142	1317	3	701	805	438
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.71	0.71	0.71	0.71	0.71	0.71
Sat Flow, veh/h	1120	49	302	78	1151	552	477	1865	5	982	1139	620
Grp Volume(v), veh/h	239	0	0	71	0	0	12	0	403	13	0	1175
Grp Sat Flow(s),veh/h/ln	1471	0	0	1781	0	0	477	0	1870	982	0	1759
Q Serve(g_s), s	10.2	0.0	0.0	0.0	0.0	0.0	1.9	0.0	6.7	0.4	0.0	49.1
Cycle Q Clear(g_c), s	13.0	0.0	0.0	2.8	0.0	0.0	51.0	0.0	6.7	7.1	0.0	49.1
Prop In Lane	0.76		0.21	0.11		0.31	1.00		0.00	1.00		0.35
Lane Grp Cap(c), veh/h	349	0	0	378	0	0	142	0	1320	701	0	1242
V/C Ratio(X)	0.68	0.00	0.00	0.19	0.00	0.00	0.08	0.00	0.31	0.02	0.00	0.95
Avail Cap(c_a), veh/h	401	0	0	442	0	0	164	0	1407	746	0	1323
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.6	0.0	0.0	28.7	0.0	0.0	33.4	0.0	4.6	5.9	0.0	10.8
Incr Delay (d2), s/veh	4.0	0.0	0.0	0.2	0.0	0.0	0.3	0.0	0.1	0.0	0.0	13.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	0.0	0.0	1.2	0.0	0.0	0.2	0.0	2.0	0.1	0.0	18.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.5	0.0	0.0	28.9	0.0	0.0	33.6	0.0	4.7	5.9	0.0	24.2
LnGrp LOS	D	A	A	C	A	A	C	A	A	A	A	C
Approach Vol, veh/h		239			71			415			1188	
Approach Delay, s/veh		36.5			28.9			5.5			24.0	
Approach LOS		D			C			A			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		63.2		19.9		63.2		19.9				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		62.5		18.5		62.5		18.5				
Max Q Clear Time (g_c+I1), s		53.0		15.0		51.1		4.8				
Green Ext Time (p_c), s		1.8		0.4		7.6		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			21.8									
HCM 6th LOS			C									

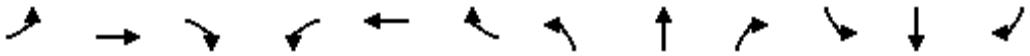
Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	2	16	3	3	4	13	348	10	12	832	4
Future Vol, veh/h	25	2	16	3	3	4	13	348	10	12	832	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	2	17	3	3	4	14	378	11	13	904	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1347	1349	906	1354	1346	384	908	0	0	389	0	0
Stage 1	932	932	-	412	412	-	-	-	-	-	-	-
Stage 2	415	417	-	942	934	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	128	151	334	127	151	664	750	-	-	1170	-	-
Stage 1	320	345	-	617	594	-	-	-	-	-	-	-
Stage 2	615	591	-	316	345	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	121	144	334	115	144	664	750	-	-	1170	-	-
Mov Cap-2 Maneuver	121	144	-	115	144	-	-	-	-	-	-	-
Stage 1	312	337	-	602	580	-	-	-	-	-	-	-
Stage 2	593	577	-	291	337	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	36.5	25.2	0.3	0.1
HCM LOS	E	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	750	-	-	160	189	1170	-	-
HCM Lane V/C Ratio	0.019	-	-	0.292	0.058	0.011	-	-
HCM Control Delay (s)	9.9	0	-	36.5	25.2	8.1	0	-
HCM Lane LOS	A	A	-	E	D	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.1	0.2	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	25	113	26	16	13	36	262	7	8	623	152
Future Volume (veh/h)	142	25	113	26	16	13	36	262	7	8	623	152
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	154	27	123	28	17	14	39	285	8	9	677	165
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	279	54	155	251	148	92	139	894	24	73	831	201
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.57	0.57	0.57	0.57	0.57	0.57
Sat Flow, veh/h	690	214	614	588	585	365	107	1560	41	5	1449	350
Grp Volume(v), veh/h	304	0	0	59	0	0	332	0	0	851	0	0
Grp Sat Flow(s),veh/h/ln	1518	0	0	1539	0	0	1708	0	0	1804	0	0
Q Serve(g_s), s	8.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	9.6	0.0	0.0	1.3	0.0	0.0	4.8	0.0	0.0	19.7	0.0	0.0
Prop In Lane	0.51		0.40	0.47		0.24	0.12		0.02	0.01		0.19
Lane Grp Cap(c), veh/h	489	0	0	491	0	0	1057	0	0	1105	0	0
V/C Ratio(X)	0.62	0.00	0.00	0.12	0.00	0.00	0.31	0.00	0.00	0.77	0.00	0.00
Avail Cap(c_a), veh/h	845	0	0	839	0	0	1818	0	0	1997	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.0	0.0	0.0	15.0	0.0	0.0	5.7	0.0	0.0	8.9	0.0	0.0
Incr Delay (d2), s/veh	1.3	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	1.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	0.0	0.5	0.0	0.0	1.4	0.0	0.0	5.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.3	0.0	0.0	15.1	0.0	0.0	5.9	0.0	0.0	10.1	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	A	A	A	B	A	A
Approach Vol, veh/h		304			59			332			851	
Approach Delay, s/veh		19.3			15.1			5.9			10.1	
Approach LOS		B			B			A			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		34.2		17.6		34.2		17.6				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		55.5		25.5		55.5		25.5				
Max Q Clear Time (g_c+I1), s		6.8		11.6		21.7		3.3				
Green Ext Time (p_c), s		2.6		1.6		8.1		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			11.2									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	3	1	17	6	8	22	8	296	12	36	709	46
Future Vol, veh/h	3	1	17	6	8	22	8	296	12	36	709	46
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	1	18	7	9	24	9	322	13	39	771	50

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1237	1227	796	1231	1246	329	821	0	0	335	0	0
Stage 1	874	874	-	347	347	-	-	-	-	-	-	-
Stage 2	363	353	-	884	899	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	153	178	387	154	174	712	808	-	-	1224	-	-
Stage 1	344	367	-	669	635	-	-	-	-	-	-	-
Stage 2	656	631	-	340	358	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	134	165	387	138	161	712	808	-	-	1224	-	-
Mov Cap-2 Maneuver	134	165	-	138	161	-	-	-	-	-	-	-
Stage 1	339	345	-	660	626	-	-	-	-	-	-	-
Stage 2	616	622	-	304	337	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.5	19.3	0.2	0.4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	808	-	-	290	290	1224	-	-
HCM Lane V/C Ratio	0.011	-	-	0.079	0.135	0.032	-	-
HCM Control Delay (s)	9.5	0	-	18.5	19.3	8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.5	0.1	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	3	2	8	4	0	1	1	278	3	9	719	8
Future Vol, veh/h	3	2	8	4	0	1	1	278	3	9	719	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	2	9	4	0	1	1	302	3	10	782	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1113	1114	787	1118	1117	304	791	0	0	305	0	0
Stage 1	807	807	-	306	306	-	-	-	-	-	-	-
Stage 2	306	307	-	812	811	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	186	208	392	184	207	736	829	-	-	1256	-	-
Stage 1	375	394	-	704	662	-	-	-	-	-	-	-
Stage 2	704	661	-	373	393	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	184	205	392	176	204	736	829	-	-	1256	-	-
Mov Cap-2 Maneuver	184	205	-	176	204	-	-	-	-	-	-	-
Stage 1	375	388	-	703	661	-	-	-	-	-	-	-
Stage 2	702	660	-	358	387	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.5	22.8	0	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	829	-	-	280	208	1256	-	-
HCM Lane V/C Ratio	0.001	-	-	0.05	0.026	0.008	-	-
HCM Control Delay (s)	9.3	0	-	18.5	22.8	7.9	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	2	0	1	2	0	3	0	286	0	6	722	3
Future Vol, veh/h	2	0	1	2	0	3	0	286	0	6	722	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	1	2	0	3	0	311	0	7	785	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1114	1112	787	1112	1113	311	788	0	0	311	0	0
Stage 1	801	801	-	311	311	-	-	-	-	-	-	-
Stage 2	313	311	-	801	802	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	185	209	392	186	208	729	831	-	-	1249	-	-
Stage 1	378	397	-	699	658	-	-	-	-	-	-	-
Stage 2	698	658	-	378	396	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	183	207	392	184	206	729	831	-	-	1249	-	-
Mov Cap-2 Maneuver	183	207	-	184	206	-	-	-	-	-	-	-
Stage 1	378	393	-	699	658	-	-	-	-	-	-	-
Stage 2	695	658	-	373	392	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.4	16	0	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	831	-	-	223	334	1249	-	-
HCM Lane V/C Ratio	-	-	-	0.015	0.016	0.005	-	-
HCM Control Delay (s)	0	-	-	21.4	16	7.9	0	-
HCM Lane LOS	A	-	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	6	1	263	724	3
Future Vol, veh/h	10	6	1	263	724	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	7	1	286	787	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1077	789	790	0	-	0
Stage 1	789	-	-	-	-	-
Stage 2	288	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	242	391	830	-	-	-
Stage 1	448	-	-	-	-	-
Stage 2	761	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	242	391	830	-	-	-
Mov Cap-2 Maneuver	242	-	-	-	-	-
Stage 1	448	-	-	-	-	-
Stage 2	761	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	830	-	282	-	-
HCM Lane V/C Ratio	0.001	-	0.062	-	-
HCM Control Delay (s)	9.3	0	18.6	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	10	1	254	706	8
Future Vol, veh/h	8	10	1	254	706	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	275	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	11	1	276	767	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1050	772	776	0	-	0
Stage 1	772	-	-	-	-	-
Stage 2	278	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	252	400	840	-	-	-
Stage 1	456	-	-	-	-	-
Stage 2	769	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	252	400	840	-	-	-
Mov Cap-2 Maneuver	252	-	-	-	-	-
Stage 1	456	-	-	-	-	-
Stage 2	769	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	840	-	252	400	-	-
HCM Lane V/C Ratio	0.001	-	0.035	0.027	-	-
HCM Control Delay (s)	9.3	-	19.8	14.3	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	229	15	3	160	0	10	0	7	1	0	0
Future Vol, veh/h	1	229	15	3	160	0	10	0	7	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	249	16	3	174	0	11	0	8	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	174	0	0	265	0	0	439	439	257	443	447	174
Stage 1	-	-	-	-	-	-	259	259	-	180	180	-
Stage 2	-	-	-	-	-	-	180	180	-	263	267	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1403	-	-	1299	-	-	528	512	782	525	506	869
Stage 1	-	-	-	-	-	-	746	694	-	822	750	-
Stage 2	-	-	-	-	-	-	822	750	-	742	688	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1403	-	-	1299	-	-	526	510	782	518	504	869
Mov Cap-2 Maneuver	-	-	-	-	-	-	526	510	-	518	504	-
Stage 1	-	-	-	-	-	-	745	693	-	821	748	-
Stage 2	-	-	-	-	-	-	820	748	-	734	687	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	11.1	12
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	608	1403	-	-	1299	-	-	518
HCM Lane V/C Ratio	0.03	0.001	-	-	0.003	-	-	0.002
HCM Control Delay (s)	11.1	7.6	0	-	7.8	0	-	12
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	70	98	15	39	37	2
Future Vol, veh/h	70	98	15	39	37	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	76	107	16	42	40	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	183	0	204	130
Stage 1	-	-	-	-	130	-
Stage 2	-	-	-	-	74	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1392	-	784	920
Stage 1	-	-	-	-	896	-
Stage 2	-	-	-	-	949	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1392	-	775	920
Mov Cap-2 Maneuver	-	-	-	-	775	-
Stage 1	-	-	-	-	896	-
Stage 2	-	-	-	-	938	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	781	-	-	1392	-
HCM Lane V/C Ratio	0.054	-	-	0.012	-
HCM Control Delay (s)	9.9	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	141	29	20	46	232	540
Future Vol, veh/h	141	29	20	46	232	540
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	153	32	22	50	252	587

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	640	546	839	0	-	0
Stage 1	546	-	-	-	-	-
Stage 2	94	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	440	538	796	-	-	-
Stage 1	580	-	-	-	-	-
Stage 2	930	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	428	538	796	-	-	-
Mov Cap-2 Maneuver	428	-	-	-	-	-
Stage 1	564	-	-	-	-	-
Stage 2	930	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.8	2.9	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	796	-	443	-	-
HCM Lane V/C Ratio	0.027	-	0.417	-	-
HCM Control Delay (s)	9.7	0	18.8	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	2	-	-

Intersection	
Int Delay, s/veh	57.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	603	49	85	120	34	103
Future Vol, veh/h	603	49	85	120	34	103
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	655	53	92	130	37	112

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	343	157	0	0	222	0
Stage 1	157	-	-	-	-	-
Stage 2	186	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	~ 653	889	-	-	1347	-
Stage 1	871	-	-	-	-	-
Stage 2	846	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 635	889	-	-	1347	-
Mov Cap-2 Maneuver	~ 635	-	-	-	-	-
Stage 1	871	-	-	-	-	-
Stage 2	823	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	87.4	0	1.9
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	649	1347	-
HCM Lane V/C Ratio	-	-	1.092	0.027	-
HCM Control Delay (s)	-	-	87.4	7.7	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	20.5	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	198	135	1	1	10
Future Vol, veh/h	10	198	135	1	1	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	215	147	1	1	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	148	0	-	0	385	148
Stage 1	-	-	-	-	148	-
Stage 2	-	-	-	-	237	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1434	-	-	-	618	899
Stage 1	-	-	-	-	880	-
Stage 2	-	-	-	-	802	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1434	-	-	-	612	899
Mov Cap-2 Maneuver	-	-	-	-	612	-
Stage 1	-	-	-	-	872	-
Stage 2	-	-	-	-	802	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1434	-	-	-	862
HCM Lane V/C Ratio	0.008	-	-	-	0.014
HCM Control Delay (s)	7.5	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	20	174	5	1	111	2	5	0	1	2	0	20
Future Vol, veh/h	20	174	5	1	111	2	5	0	1	2	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	189	5	1	121	2	5	0	1	2	0	22

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	123	0	0	194	0	0	371	361	192	360	362	122
Stage 1	-	-	-	-	-	-	236	236	-	124	124	-
Stage 2	-	-	-	-	-	-	135	125	-	236	238	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1464	-	-	1379	-	-	586	566	850	596	565	929
Stage 1	-	-	-	-	-	-	767	710	-	880	793	-
Stage 2	-	-	-	-	-	-	868	792	-	767	708	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1464	-	-	1379	-	-	564	556	850	587	555	929
Mov Cap-2 Maneuver	-	-	-	-	-	-	564	556	-	587	555	-
Stage 1	-	-	-	-	-	-	754	698	-	865	792	-
Stage 2	-	-	-	-	-	-	847	791	-	753	696	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.1	11.1	9.2
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	598	1464	-	-	1379	-	-	882
HCM Lane V/C Ratio	0.011	0.015	-	-	0.001	-	-	0.027
HCM Control Delay (s)	11.1	7.5	0	-	7.6	0	-	9.2
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

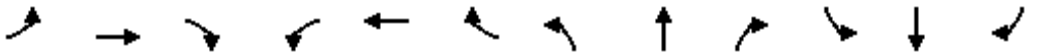
Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	63	114	51	8	8	63
Future Vol, veh/h	63	114	51	8	8	63
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	68	124	55	9	9	68

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	64	0	-	0	320	60
Stage 1	-	-	-	-	60	-
Stage 2	-	-	-	-	260	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1538	-	-	-	673	1005
Stage 1	-	-	-	-	963	-
Stage 2	-	-	-	-	783	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1538	-	-	-	641	1005
Mov Cap-2 Maneuver	-	-	-	-	641	-
Stage 1	-	-	-	-	918	-
Stage 2	-	-	-	-	783	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1538	-	-	-	945
HCM Lane V/C Ratio	0.045	-	-	-	0.082
HCM Control Delay (s)	7.5	0	-	-	9.1
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	348	47	196	83	49	102	196	593	77	107	574	413
Future Volume (veh/h)	348	47	196	83	49	102	196	593	77	107	574	413
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	378	51	213	90	53	111	213	645	84	116	624	449
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	502	62	261	117	222	322	262	1313	171	150	1253	559
Arrive On Green	0.15	0.20	0.20	0.07	0.12	0.12	0.15	0.42	0.42	0.08	0.35	0.35
Sat Flow, veh/h	3456	316	1318	1781	1870	1585	1781	3162	411	1781	3554	1585
Grp Volume(v), veh/h	378	0	264	90	53	111	213	362	367	116	624	449
Grp Sat Flow(s),veh/h/ln	1728	0	1633	1781	1870	1585	1781	1777	1796	1781	1777	1585
Q Serve(g_s), s	8.0	0.0	11.8	3.8	2.0	4.6	8.8	11.4	11.4	4.9	10.5	19.5
Cycle Q Clear(g_c), s	8.0	0.0	11.8	3.8	2.0	4.6	8.8	11.4	11.4	4.9	10.5	19.5
Prop In Lane	1.00		0.81	1.00		1.00	1.00		0.23	1.00		1.00
Lane Grp Cap(c), veh/h	502	0	323	117	222	322	262	738	746	150	1253	559
V/C Ratio(X)	0.75	0.00	0.82	0.77	0.24	0.35	0.81	0.49	0.49	0.77	0.50	0.80
Avail Cap(c_a), veh/h	977	0	569	316	455	519	597	1063	1074	386	1705	761
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.2	0.0	29.2	35.0	30.4	26.0	31.4	16.3	16.3	34.1	19.3	22.2
Incr Delay (d2), s/veh	2.3	0.0	5.1	10.0	0.6	0.6	6.0	0.5	0.5	8.1	0.3	4.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.0	4.9	1.9	0.9	1.7	4.1	4.4	4.5	2.4	4.1	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.5	0.0	34.2	45.0	31.0	26.6	37.4	16.8	16.8	42.2	19.6	26.7
LnGrp LOS	C	A	C	D	C	C	D	B	B	D	B	C
Approach Vol, veh/h		642			254			942			1189	
Approach Delay, s/veh		33.8			34.0			21.5			24.5	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	36.1	9.5	19.6	15.7	31.3	15.5	13.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	45.5	13.5	26.5	25.5	36.5	21.5	18.5
Max Q Clear Time (g_c+I1), s	6.9	13.4	5.8	13.8	10.8	21.5	10.0	6.6
Green Ext Time (p_c), s	0.2	5.2	0.1	1.3	0.5	5.4	1.1	0.4

Intersection Summary	
HCM 6th Ctrl Delay	26.4
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	0	21	0	54	0	843	26	88	805	2
Future Vol, veh/h	1	0	0	21	0	54	0	843	26	88	805	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	-	-	-	375	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	0	23	0	59	0	916	28	96	875	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2028	2012	876	1998	1999	930	877	0	0	944	0	0
Stage 1	1068	1068	-	930	930	-	-	-	-	-	-	-
Stage 2	960	944	-	1068	1069	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	43	59	348	45	60	324	770	-	-	727	-	-
Stage 1	268	298	-	321	346	-	-	-	-	-	-	-
Stage 2	308	341	-	268	298	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	32	51	348	40	52	324	770	-	-	727	-	-
Mov Cap-2 Maneuver	32	51	-	40	52	-	-	-	-	-	-	-
Stage 1	268	259	-	321	346	-	-	-	-	-	-	-
Stage 2	252	341	-	233	259	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	121.4	63.4	0	1.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	770	-	-	32	40	324	727	-	-
HCM Lane V/C Ratio	-	-	-	0.034	0.571	0.181	0.132	-	-
HCM Control Delay (s)	0	-	-	121.4	178.5	18.6	10.7	-	-
HCM Lane LOS	A	-	-	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	2	0.7	0.5	-	-

Intersection	
Int Delay, s/veh	42.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	84	54	835	164	107	768
Future Vol, veh/h	84	54	835	164	107	768
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	91	59	908	178	116	835

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2064	997	0	0	1086	0
Stage 1	997	-	-	-	-	-
Stage 2	1067	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	~ 60	296	-	-	642	-
Stage 1	357	-	-	-	-	-
Stage 2	331	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 49	296	-	-	642	-
Mov Cap-2 Maneuver	~ 49	-	-	-	-	-
Stage 1	357	-	-	-	-	-
Stage 2	271	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 610.9	0	1.4
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	73	642	-
HCM Lane V/C Ratio	-	-	2.055	0.181	-
HCM Control Delay (s)	-	-	$ 610.9	11.8	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	13.7	0.7	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	38.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1	7	70	0	95	2	942	122	148	703	1
Future Vol, veh/h	3	1	7	70	0	95	2	942	122	148	703	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	50	275	-	275	375	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	1	8	76	0	103	2	1024	133	161	764	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2232	2247	764	2119	2115	1024	765	0	0	1157	0	0
Stage 1	1086	1086	-	1028	1028	-	-	-	-	-	-	-
Stage 2	1146	1161	-	1091	1087	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	30	42	404	~ 37	51	286	848	-	-	604	-	-
Stage 1	262	292	-	283	311	-	-	-	-	-	-	-
Stage 2	242	270	-	260	292	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	15	31	404	~ 28	37	286	848	-	-	604	-	-
Mov Cap-2 Maneuver	15	31	-	~ 28	37	-	-	-	-	-	-	-
Stage 1	261	214	-	282	310	-	-	-	-	-	-	-
Stage 2	154	269	-	186	214	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	110.1	$ 469.6	0	2.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	848	-	-	17	404	28	286	604	-	-
HCM Lane V/C Ratio	0.003	-	-	0.256	0.019	2.717	0.361	0.266	-	-
HCM Control Delay (s)	9.3	-	-	278.2	14.1	$ 1073.6	24.5	13.1	-	-
HCM Lane LOS	A	-	-	F	B	F	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0.1	9.1	1.6	1.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	80.8
Intersection LOS	F

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	269	1465	798
Demand Flow Rate, veh/h	274	1494	814
Vehicles Circulating, veh/h	1063	130	165
Vehicles Exiting, veh/h	561	849	1172
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	21.4	128.4	13.6
Approach LOS	C	F	B

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	274	1494	814
Cap Entry Lane, veh/h	467	1209	1166
Entry HV Adj Factor	0.982	0.981	0.980
Flow Entry, veh/h	269	1465	798
Cap Entry, veh/h	458	1185	1143
V/C Ratio	0.587	1.236	0.698
Control Delay, s/veh	21.4	128.4	13.6
LOS	C	F	B
95th %tile Queue, veh	4	47	6

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	0	3	6	0	11	2	1317	3	7	731	3
Future Vol, veh/h	17	0	3	6	0	11	2	1317	3	7	731	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	-	125	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	0	3	7	0	12	2	1432	3	8	795	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2257	2252	797	2252	2252	1434	798	0	0	1435	0	0
Stage 1	813	813	-	1438	1438	-	-	-	-	-	-	-
Stage 2	1444	1439	-	814	814	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	29	41	387	29	41	164	824	-	-	473	-	-
Stage 1	372	392	-	165	198	-	-	-	-	-	-	-
Stage 2	164	198	-	372	391	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	26	40	387	28	40	164	824	-	-	473	-	-
Mov Cap-2 Maneuver	26	40	-	28	40	-	-	-	-	-	-	-
Stage 1	371	385	-	165	198	-	-	-	-	-	-	-
Stage 2	152	198	-	363	384	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	256	89.7	0	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	824	-	-	26	387	60	473	-	-
HCM Lane V/C Ratio	0.003	-	-	0.711	0.008	0.308	0.016	-	-
HCM Control Delay (s)	9.4	-	-	298.6	14.4	89.7	12.7	-	-
HCM Lane LOS	A	-	-	F	B	F	B	-	-
HCM 95th %tile Q(veh)	0	-	-	2.2	0	1.1	0	-	-

Intersection	
Int Delay, s/veh	99.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	132	251	999	152	181	408
Future Vol, veh/h	132	251	999	152	181	408
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	325	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	143	273	1086	165	197	443

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2006	1169	0	0	1251	0
Stage 1	1169	-	-	-	-	-
Stage 2	837	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	~ 65	~ 235	-	-	556	-
Stage 1	295	-	-	-	-	-
Stage 2	425	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 42	~ 235	-	-	556	-
Mov Cap-2 Maneuver	~ 42	-	-	-	-	-
Stage 1	295	-	-	-	-	-
Stage 2	275	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 544.2	0	4.6
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	42	235	556	-
HCM Lane V/C Ratio	-	-	3.416	1.161	0.354	-
HCM Control Delay (s)	-	-	$ 1288	153	15	-
HCM Lane LOS	-	-	F	F	B	-
HCM 95th %tile Q(veh)	-	-	16	12.8	1.6	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	344	3	2	408	4	1
Future Vol, veh/h	344	3	2	408	4	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	374	3	2	443	4	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	377	0	823	376
Stage 1	-	-	-	-	376	-
Stage 2	-	-	-	-	447	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1181	-	343	670
Stage 1	-	-	-	-	694	-
Stage 2	-	-	-	-	644	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1181	-	342	670
Mov Cap-2 Maneuver	-	-	-	-	342	-
Stage 1	-	-	-	-	694	-
Stage 2	-	-	-	-	643	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	14.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	379	-	-	1181	-
HCM Lane V/C Ratio	0.014	-	-	0.002	-
HCM Control Delay (s)	14.6	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

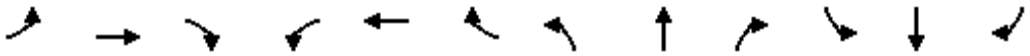
Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	334	3	1	381	2	0
Future Vol, veh/h	334	3	1	381	2	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	363	3	1	414	2	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	366	0	781	365
Stage 1	-	-	-	-	365	-
Stage 2	-	-	-	-	416	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1193	-	363	680
Stage 1	-	-	-	-	702	-
Stage 2	-	-	-	-	666	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1193	-	363	680
Mov Cap-2 Maneuver	-	-	-	-	363	-
Stage 1	-	-	-	-	702	-
Stage 2	-	-	-	-	665	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	15
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	363	-	-	1193	-
HCM Lane V/C Ratio	0.006	-	-	0.001	-
HCM Control Delay (s)	15	-	-	8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	3	40	40	11	47	16	1082	15	9	495	136
Future Volume (veh/h)	142	3	40	40	11	47	16	1082	15	9	495	136
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	154	3	43	43	12	51	17	1176	16	10	538	148
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	277	4	52	153	58	129	508	1315	18	199	1008	277
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.71	0.71	0.71	0.71	0.71	0.71
Sat Flow, veh/h	1175	24	328	512	361	809	756	1841	25	470	1412	388
Grp Volume(v), veh/h	200	0	0	106	0	0	17	0	1192	10	0	686
Grp Sat Flow(s),veh/h/ln	1527	0	0	1682	0	0	756	0	1866	470	0	1800
Q Serve(g_s), s	4.8	0.0	0.0	0.0	0.0	0.0	0.8	0.0	36.0	1.2	0.0	12.5
Cycle Q Clear(g_c), s	8.8	0.0	0.0	3.9	0.0	0.0	13.3	0.0	36.0	37.2	0.0	12.5
Prop In Lane	0.77		0.21	0.41		0.48	1.00		0.01	1.00		0.22
Lane Grp Cap(c), veh/h	333	0	0	339	0	0	508	0	1332	199	0	1286
V/C Ratio(X)	0.60	0.00	0.00	0.31	0.00	0.00	0.03	0.00	0.89	0.05	0.00	0.53
Avail Cap(c_a), veh/h	469	0	0	487	0	0	634	0	1644	277	0	1586
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.6	0.0	0.0	26.8	0.0	0.0	7.8	0.0	8.1	22.8	0.0	4.7
Incr Delay (d2), s/veh	1.7	0.0	0.0	0.5	0.0	0.0	0.0	0.0	5.8	0.1	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	0.0	1.6	0.0	0.0	0.1	0.0	11.3	0.1	0.0	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.3	0.0	0.0	27.3	0.0	0.0	7.8	0.0	13.9	22.9	0.0	5.0
LnGrp LOS	C	A	A	C	A	A	A	A	B	C	A	A
Approach Vol, veh/h		200			106			1209			696	
Approach Delay, s/veh		30.3			27.3			13.8			5.3	
Approach LOS		C			C			B			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		55.3		15.8		55.3		15.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		62.7		18.3		62.7		18.3				
Max Q Clear Time (g_c+I1), s		38.0		10.8		39.2		5.9				
Green Ext Time (p_c), s		12.8		0.6		5.4		0.4				

Intersection Summary												
HCM 6th Ctrl Delay			13.3									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	7	1	6	3	0	4	6	1082	15	10	603	7
Future Vol, veh/h	7	1	6	3	0	4	6	1082	15	10	603	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	1	7	3	0	4	7	1176	16	11	655	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1881	1887	659	1883	1883	1184	663	0	0	1192	0	0
Stage 1	681	681	-	1198	1198	-	-	-	-	-	-	-
Stage 2	1200	1206	-	685	685	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	54	70	464	54	71	230	926	-	-	586	-	-
Stage 1	440	450	-	227	259	-	-	-	-	-	-	-
Stage 2	226	257	-	438	448	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	51	66	464	50	67	230	926	-	-	586	-	-
Mov Cap-2 Maneuver	51	66	-	50	67	-	-	-	-	-	-	-
Stage 1	430	437	-	222	253	-	-	-	-	-	-	-
Stage 2	217	251	-	418	435	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	56.4	48.7	0	0.2
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	926	-	-	85	90	586	-	-
HCM Lane V/C Ratio	0.007	-	-	0.179	0.085	0.019	-	-
HCM Control Delay (s)	8.9	0	-	56.4	48.7	11.3	0	-
HCM Lane LOS	A	A	-	F	E	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.3	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	261	13	78	26	26	13	62	820	9	2	447	176
Future Volume (veh/h)	261	13	78	26	26	13	62	820	9	2	447	176
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	284	14	85	28	28	14	67	891	10	2	486	191
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	391	15	93	226	217	95	99	992	11	46	765	300
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.29	0.60	0.60	0.60	0.60	0.60	0.60
Sat Flow, veh/h	1083	53	324	566	756	330	84	1656	18	1	1278	500
Grp Volume(v), veh/h	383	0	0	70	0	0	968	0	0	679	0	0
Grp Sat Flow(s),veh/h/ln	1461	0	0	1652	0	0	1758	0	0	1779	0	0
Q Serve(g_s), s	17.7	0.0	0.0	0.0	0.0	0.0	18.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	19.9	0.0	0.0	2.3	0.0	0.0	38.1	0.0	0.0	19.6	0.0	0.0
Prop In Lane	0.74		0.22	0.40		0.20	0.07		0.01	0.00		0.28
Lane Grp Cap(c), veh/h	499	0	0	538	0	0	1102	0	0	1111	0	0
V/C Ratio(X)	0.77	0.00	0.00	0.13	0.00	0.00	0.88	0.00	0.00	0.61	0.00	0.00
Avail Cap(c_a), veh/h	549	0	0	592	0	0	1276	0	0	1293	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	26.9	0.0	0.0	20.9	0.0	0.0	13.6	0.0	0.0	10.3	0.0	0.0
Incr Delay (d2), s/veh	5.9	0.0	0.0	0.1	0.0	0.0	6.6	0.0	0.0	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	0.0	0.0	0.9	0.0	0.0	14.3	0.0	0.0	6.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.9	0.0	0.0	21.0	0.0	0.0	20.2	0.0	0.0	10.9	0.0	0.0
LnGrp LOS	C	A	A	C	A	A	C	A	A	B	A	A
Approach Vol, veh/h		383			70			968			679	
Approach Delay, s/veh		32.9			21.0			20.2			10.9	
Approach LOS		C			C			C			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		51.9		27.2		51.9		27.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		55.5		25.5		55.5		25.5				
Max Q Clear Time (g_c+I1), s		40.1		21.9		21.6		4.3				
Green Ext Time (p_c), s		7.2		0.8		5.7		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			19.5									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	7	4	21	7	8	30	25	897	12	22	433	67
Future Vol, veh/h	7	4	21	7	8	30	25	897	12	22	433	67
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	4	23	8	9	33	27	975	13	24	471	73

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1613	1598	508	1605	1628	982	544	0	0	988	0	0
Stage 1	556	556	-	1036	1036	-	-	-	-	-	-	-
Stage 2	1057	1042	-	569	592	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	84	106	565	85	102	302	1025	-	-	699	-	-
Stage 1	515	513	-	280	309	-	-	-	-	-	-	-
Stage 2	272	307	-	507	494	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	64	95	565	72	91	302	1025	-	-	699	-	-
Mov Cap-2 Maneuver	64	95	-	72	91	-	-	-	-	-	-	-
Stage 1	485	487	-	263	291	-	-	-	-	-	-	-
Stage 2	221	289	-	458	469	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	31.5	37.7	0.2	0.4
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1025	-	-	170	158	699	-	-
HCM Lane V/C Ratio	0.027	-	-	0.205	0.31	0.034	-	-
HCM Control Delay (s)	8.6	0	-	31.5	37.7	10.3	0	-
HCM Lane LOS	A	A	-	D	E	B	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.7	1.2	0.1	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	0	1	2	1	10	3	990	8	10	436	6
Future Vol, veh/h	1	0	1	2	1	10	3	990	8	10	436	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	1	2	1	11	3	1076	9	11	474	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1593	1591	478	1587	1590	1081	481	0	0	1085	0	0
Stage 1	500	500	-	1087	1087	-	-	-	-	-	-	-
Stage 2	1093	1091	-	500	503	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	86	107	587	87	108	265	1082	-	-	643	-	-
Stage 1	553	543	-	262	292	-	-	-	-	-	-	-
Stage 2	260	291	-	553	541	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	80	104	587	85	105	265	1082	-	-	643	-	-
Mov Cap-2 Maneuver	80	104	-	85	105	-	-	-	-	-	-	-
Stage 1	549	531	-	260	290	-	-	-	-	-	-	-
Stage 2	247	289	-	539	529	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30.9	26.2	0	0.2
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1082	-	-	141	184	643	-	-
HCM Lane V/C Ratio	0.003	-	-	0.015	0.077	0.017	-	-
HCM Control Delay (s)	8.3	0	-	30.9	26.2	10.7	0	-
HCM Lane LOS	A	A	-	D	D	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	3	1	2	4	0	10	9	982	8	0	415	5
Future Vol, veh/h	3	1	2	4	0	10	9	982	8	0	415	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	1	2	4	0	11	10	1067	9	0	451	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1551	1550	454	1547	1548	1072	456	0	0	1076	0	0
Stage 1	454	454	-	1092	1092	-	-	-	-	-	-	-
Stage 2	1097	1096	-	455	456	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	92	114	606	93	114	268	1105	-	-	648	-	-
Stage 1	586	569	-	260	291	-	-	-	-	-	-	-
Stage 2	258	289	-	585	568	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	87	111	606	90	111	268	1105	-	-	648	-	-
Mov Cap-2 Maneuver	87	111	-	90	111	-	-	-	-	-	-	-
Stage 1	573	569	-	254	284	-	-	-	-	-	-	-
Stage 2	242	282	-	582	568	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	34.6	28.1	0.1	0
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1105	-	-	128	171	648	-	-
HCM Lane V/C Ratio	0.009	-	-	0.051	0.089	-	-	-
HCM Control Delay (s)	8.3	0	-	34.6	28.1	0	-	-
HCM Lane LOS	A	A	-	D	D	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.3	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	4	3	966	418	12
Future Vol, veh/h	7	4	3	966	418	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	4	3	1050	454	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1517	461	467	0	-	0
Stage 1	461	-	-	-	-	-
Stage 2	1056	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	131	600	1094	-	-	-
Stage 1	635	-	-	-	-	-
Stage 2	335	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	130	600	1094	-	-	-
Mov Cap-2 Maneuver	130	-	-	-	-	-
Stage 1	631	-	-	-	-	-
Stage 2	335	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	26.2	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1094	-	182	-	-
HCM Lane V/C Ratio	0.003	-	0.066	-	-
HCM Control Delay (s)	8.3	0	26.2	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	3	39	987	385	14
Future Vol, veh/h	12	3	39	987	385	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	275	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	3	42	1073	418	15

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1583	426	433	0	-	0
Stage 1	426	-	-	-	-	-
Stage 2	1157	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	120	628	1127	-	-	-
Stage 1	659	-	-	-	-	-
Stage 2	299	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	116	628	1127	-	-	-
Mov Cap-2 Maneuver	116	-	-	-	-	-
Stage 1	635	-	-	-	-	-
Stage 2	299	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	34.1	0.3	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1127	-	116	628	-	-
HCM Lane V/C Ratio	0.038	-	0.112	0.005	-	-
HCM Control Delay (s)	8.3	-	39.9	10.8	-	-
HCM Lane LOS	A	-	E	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	0	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	330	9	24	271	4	20	1	18	2	0	1
Future Vol, veh/h	1	330	9	24	271	4	20	1	18	2	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	359	10	26	295	4	22	1	20	2	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	299	0	0	369	0	0	716	717	364	726	720	297
Stage 1	-	-	-	-	-	-	366	366	-	349	349	-
Stage 2	-	-	-	-	-	-	350	351	-	377	371	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1262	-	-	1190	-	-	345	355	681	340	354	742
Stage 1	-	-	-	-	-	-	653	623	-	667	633	-
Stage 2	-	-	-	-	-	-	666	632	-	644	620	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1262	-	-	1190	-	-	337	345	681	323	344	742
Mov Cap-2 Maneuver	-	-	-	-	-	-	337	345	-	323	344	-
Stage 1	-	-	-	-	-	-	652	622	-	666	617	-
Stage 2	-	-	-	-	-	-	648	616	-	624	619	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.6	14.1	14.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	440	1262	-	-	1190	-	-	398
HCM Lane V/C Ratio	0.096	0.001	-	-	0.022	-	-	0.008
HCM Control Delay (s)	14.1	7.9	0	-	8.1	0	-	14.1
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0.1	-	-	0

Intersection	
Int Delay, s/veh	3.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	52	54	12	83	106	3
Future Vol, veh/h	52	54	12	83	106	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	57	59	13	90	115	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	116	0	203	87
Stage 1	-	-	-	-	87	-
Stage 2	-	-	-	-	116	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1473	-	786	971
Stage 1	-	-	-	-	936	-
Stage 2	-	-	-	-	909	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1473	-	779	971
Mov Cap-2 Maneuver	-	-	-	-	779	-
Stage 1	-	-	-	-	936	-
Stage 2	-	-	-	-	901	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	10.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	783	-	-	1473	-
HCM Lane V/C Ratio	0.151	-	-	0.009	-
HCM Control Delay (s)	10.4	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0	-

Intersection	
Int Delay, s/veh	306

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	698	37	92	297	87	236
Future Vol, veh/h	698	37	92	297	87	236
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	759	40	100	323	95	257

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	747	224	352	0	-	0
Stage 1	224	-	-	-	-	-
Stage 2	523	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	~ 381	815	1207	-	-	-
Stage 1	813	-	-	-	-	-
Stage 2	~ 595	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 343	815	1207	-	-	-
Mov Cap-2 Maneuver	~ 343	-	-	-	-	-
Stage 1	~ 731	-	-	-	-	-
Stage 2	~ 595	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 601.4	2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1207	-	353	-	-
HCM Lane V/C Ratio	0.083	-	2.263	-	-
HCM Control Delay (s)	8.3	0	$ 601.4	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0.3	-	60.7	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	93.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	371	57	67	542	147	132
Future Vol, veh/h	371	57	67	542	147	132
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	403	62	73	589	160	143

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	831	368	0	0	662	0
Stage 1	368	-	-	-	-	-
Stage 2	463	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	~ 340	677	-	-	927	-
Stage 1	700	-	-	-	-	-
Stage 2	634	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 281	677	-	-	927	-
Mov Cap-2 Maneuver	~ 281	-	-	-	-	-
Stage 1	700	-	-	-	-	-
Stage 2	524	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	283.6	0	5.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	305	927	-
HCM Lane V/C Ratio	-	-	1.525	0.172	-
HCM Control Delay (s)	-	-	283.6	9.7	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	26.6	0.6	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	302	353	3	3	20
Future Vol, veh/h	27	302	353	3	3	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	328	384	3	3	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	387	0	-	0	772	386
Stage 1	-	-	-	-	386	-
Stage 2	-	-	-	-	386	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1171	-	-	-	368	662
Stage 1	-	-	-	-	687	-
Stage 2	-	-	-	-	687	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1171	-	-	-	357	662
Mov Cap-2 Maneuver	-	-	-	-	357	-
Stage 1	-	-	-	-	666	-
Stage 2	-	-	-	-	687	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1171	-	-	-	596
HCM Lane V/C Ratio	0.025	-	-	-	0.042
HCM Control Delay (s)	8.2	0	-	-	11.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	54	237	14	2	306	7	10	0	1	5	0	40
Future Vol, veh/h	54	237	14	2	306	7	10	0	1	5	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	59	258	15	2	333	8	11	0	1	5	0	43

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	341	0	0	273	0	0	747	729	266	725	732	337
Stage 1	-	-	-	-	-	-	384	384	-	341	341	-
Stage 2	-	-	-	-	-	-	363	345	-	384	391	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1218	-	-	1290	-	-	329	350	773	340	348	705
Stage 1	-	-	-	-	-	-	639	611	-	674	639	-
Stage 2	-	-	-	-	-	-	656	636	-	639	607	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1218	-	-	1290	-	-	295	329	773	324	327	705
Mov Cap-2 Maneuver	-	-	-	-	-	-	295	329	-	324	327	-
Stage 1	-	-	-	-	-	-	603	576	-	636	638	-
Stage 2	-	-	-	-	-	-	614	635	-	602	572	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	0	17	11.3
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	313	1218	-	-	1290	-	-	624
HCM Lane V/C Ratio	0.038	0.048	-	-	0.002	-	-	0.078
HCM Control Delay (s)	17	8.1	0	-	7.8	0	-	11.3
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	0.3

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	177	66	185	22	16	130
Future Vol, veh/h	177	66	185	22	16	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	192	72	201	24	17	141

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	225	0	-	0	669	213
Stage 1	-	-	-	-	213	-
Stage 2	-	-	-	-	456	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1344	-	-	-	423	827
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	638	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1344	-	-	-	360	827
Mov Cap-2 Maneuver	-	-	-	-	360	-
Stage 1	-	-	-	-	700	-
Stage 2	-	-	-	-	638	-

Approach	EB	WB	SB
HCM Control Delay, s	5.9	0	11.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1344	-	-	-	724
HCM Lane V/C Ratio	0.143	-	-	-	0.219
HCM Control Delay (s)	8.1	0	-	-	11.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.5	-	-	-	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	129	72	558	67	25	519
Future Volume (veh/h)	129	72	558	67	25	519
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	140	78	607	73	27	564
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	190	106	869	105	430	993
Arrive On Green	0.17	0.17	0.53	0.53	0.53	0.53
Sat Flow, veh/h	1091	608	1638	197	760	1870
Grp Volume(v), veh/h	219	0	0	680	27	564
Grp Sat Flow(s),veh/h/ln	1706	0	0	1835	760	1870
Q Serve(g_s), s	3.7	0.0	0.0	8.4	0.8	6.2
Cycle Q Clear(g_c), s	3.7	0.0	0.0	8.4	9.3	6.2
Prop In Lane	0.64	0.36		0.11	1.00	
Lane Grp Cap(c), veh/h	297	0	0	974	430	993
V/C Ratio(X)	0.74	0.00	0.00	0.70	0.06	0.57
Avail Cap(c_a), veh/h	1314	0	0	3458	1458	3525
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.9	0.0	0.0	5.3	8.8	4.8
Incr Delay (d2), s/veh	3.6	0.0	0.0	0.9	0.1	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	0.0	1.4	0.1	1.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.5	0.0	0.0	6.3	8.8	5.3
LnGrp LOS	B	A	A	A	A	A
Approach Vol, veh/h	219		680			591
Approach Delay, s/veh	15.5		6.3			5.5
Approach LOS	B		A			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		20.7			20.7	9.8
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		57.5			57.5	23.5
Max Q Clear Time (g_c+I1), s		10.4			11.3	5.7
Green Ext Time (p_c), s		5.8			4.6	0.6

Intersection Summary	
HCM 6th Ctrl Delay	7.3
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	1	122	0	150	1	594	43	47	626	1
Future Volume (veh/h)	3	0	1	122	0	150	1	594	43	47	626	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	3	0	1	133	0	163	1	646	47	51	680	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	10	0	9	272	0	242	3	822	697	90	914	774
Arrive On Green	0.01	0.00	0.01	0.15	0.00	0.15	0.00	0.44	0.44	0.05	0.49	0.49
Sat Flow, veh/h	1781	0	1585	1781	0	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	3	0	1	133	0	163	1	646	47	51	680	1
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1781	0	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	0.1	0.0	0.0	3.5	0.0	5.0	0.0	15.1	0.9	1.4	14.9	0.0
Cycle Q Clear(g_c), s	0.1	0.0	0.0	3.5	0.0	5.0	0.0	15.1	0.9	1.4	14.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	10	0	9	272	0	242	3	822	697	90	914	774
V/C Ratio(X)	0.31	0.00	0.12	0.49	0.00	0.67	0.29	0.79	0.07	0.57	0.74	0.00
Avail Cap(c_a), veh/h	627	0	558	627	0	558	174	2104	1783	296	2232	1891
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.3	0.0	25.3	19.8	0.0	20.5	25.5	12.3	8.3	23.7	10.5	6.7
Incr Delay (d2), s/veh	17.3	0.0	5.9	1.4	0.0	3.3	40.0	1.7	0.0	5.5	1.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	1.4	0.0	1.9	0.0	5.4	0.3	0.7	5.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.7	0.0	31.2	21.2	0.0	23.7	65.4	14.0	8.3	29.3	11.7	6.7
LnGrp LOS	D	A	C	C	A	C	E	B	A	C	B	A
Approach Vol, veh/h		4			296			694			732	
Approach Delay, s/veh		39.8			22.6			13.7			12.9	
Approach LOS		D			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.1	27.0		4.8	4.6	29.5		12.3
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	8.5	57.5		18.0	5.0	61.0		18.0
Max Q Clear Time (g_c+I1), s	3.4	17.1		2.1	2.0	16.9		7.0
Green Ext Time (p_c), s	0.0	5.4		0.0	0.0	5.6		1.0

Intersection Summary	
HCM 6th Ctrl Delay	14.9
HCM 6th LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	369	115	504	189	97	684
Future Volume (veh/h)	369	115	504	189	97	684
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	401	125	548	205	105	743
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	499	444	721	611	138	1026
Arrive On Green	0.28	0.28	0.39	0.39	0.08	0.55
Sat Flow, veh/h	1781	1585	1870	1585	1781	1870
Grp Volume(v), veh/h	401	125	548	205	105	743
Grp Sat Flow(s),veh/h/ln	1781	1585	1870	1585	1781	1870
Q Serve(g_s), s	11.0	3.2	13.4	4.8	3.0	15.6
Cycle Q Clear(g_c), s	11.0	3.2	13.4	4.8	3.0	15.6
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	499	444	721	611	138	1026
V/C Ratio(X)	0.80	0.28	0.76	0.34	0.76	0.72
Avail Cap(c_a), veh/h	1375	1224	1832	1553	496	2513
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.6	14.8	14.0	11.4	23.7	8.9
Incr Delay (d2), s/veh	3.1	0.3	1.7	0.3	8.4	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	1.1	5.0	1.5	1.5	4.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.7	15.1	15.7	11.7	32.1	9.9
LnGrp LOS	C	B	B	B	C	A
Approach Vol, veh/h	526		753			848
Approach Delay, s/veh	19.3		14.6			12.6
Approach LOS	B		B			B

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	8.6	24.7			33.3	19.2
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	14.6	51.4			70.5	40.5
Max Q Clear Time (g_c+I1), s	15.0	15.4			17.6	13.0
Green Ext Time (p_c), s	0.2	4.9			6.6	1.7

Intersection Summary	
HCM 6th Ctrl Delay	15.0
HCM 6th LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Traffic Volume (veh/h)	60	86	399	70	140	901		
Future Volume (veh/h)	60	86	399	70	140	901		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach	No		No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870		
Adj Flow Rate, veh/h	65	93	434	76	152	979		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	181	343	849	719	204	1269		
Arrive On Green	0.10	0.10	0.45	0.45	0.11	0.68		
Sat Flow, veh/h	1781	1585	1870	1585	1781	1870		
Grp Volume(v), veh/h	65	93	434	76	152	979		
Grp Sat Flow(s),veh/h/ln	1781	1585	1870	1585	1781	1870		
Q Serve(g_s), s	1.4	2.0	6.8	1.1	3.4	14.5		
Cycle Q Clear(g_c), s	1.4	2.0	6.8	1.1	3.4	14.5		
Prop In Lane	1.00	1.00		1.00	1.00			
Lane Grp Cap(c), veh/h	181	343	849	719	204	1269		
V/C Ratio(X)	0.36	0.27	0.51	0.11	0.74	0.77		
Avail Cap(c_a), veh/h	805	898	3082	2612	892	4224		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	17.1	13.4	8.0	6.4	17.5	4.4		
Incr Delay (d2), s/veh	1.2	0.4	0.5	0.1	5.3	1.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.6	0.6	2.0	0.3	1.5	1.9		
Unsig. Movement Delay, s/veh								
LnGrp Delay(d),s/veh	18.3	13.8	8.4	6.5	22.8	5.5		
LnGrp LOS	B	B	A	A	C	A		
Approach Vol, veh/h	158		510			1131		
Approach Delay, s/veh	15.7		8.1			7.8		
Approach LOS	B		A			A		
Timer - Assigned Phs	1	2				6	8	
Phs Duration (G+Y+Rc), s	9.2	23.1				32.3	8.7	
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5	
Max Green Setting (Gmax), s	20.5	67.5				92.5	18.5	
Max Q Clear Time (g_c+I1), s	15.4	8.8				16.5	4.0	
Green Ext Time (p_c), s	0.3	3.3				11.3	0.4	

Intersection Summary	
HCM 6th Ctrl Delay	8.6
HCM 6th LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	141	29	20	46	232	540
Future Volume (veh/h)	141	29	20	46	232	540
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	153	32	22	50	252	587
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	203	43	213	429	318	741
Arrive On Green	0.14	0.14	0.64	0.64	0.64	0.64
Sat Flow, veh/h	1435	300	153	672	499	1162
Grp Volume(v), veh/h	186	0	72	0	0	839
Grp Sat Flow(s),veh/h/ln	1745	0	825	0	0	1661
Q Serve(g_s), s	4.2	0.0	0.7	0.0	0.0	15.1
Cycle Q Clear(g_c), s	4.2	0.0	15.8	0.0	0.0	15.1
Prop In Lane	0.82	0.17	0.31			0.70
Lane Grp Cap(c), veh/h	247	0	642	0	0	1059
V/C Ratio(X)	0.75	0.00	0.11	0.00	0.00	0.79
Avail Cap(c_a), veh/h	800	0	1705	0	0	2539
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	16.8	0.0	4.2	0.0	0.0	5.4
Incr Delay (d2), s/veh	4.6	0.0	0.1	0.0	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	0.1	0.0	0.0	2.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.4	0.0	4.3	0.0	0.0	6.8
LnGrp LOS	C	A	A	A	A	A
Approach Vol, veh/h	186			72	839	
Approach Delay, s/veh	21.4			4.3	6.8	
Approach LOS	C			A	A	

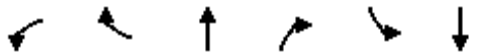
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		30.5		10.3		30.5
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		62.3		18.7		62.3
Max Q Clear Time (g_c+I1), s		17.8		6.2		17.1
Green Ext Time (p_c), s		0.5		0.4		8.9

Intersection Summary		
HCM 6th Ctrl Delay	9.1	
HCM 6th LOS	A	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	603	49	85	120	34	103
Future Volume (veh/h)	603	49	85	120	34	103
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	655	53	92	130	37	112
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	802	65	155	219	349	413
Arrive On Green	0.49	0.49	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1631	132	701	991	1159	1870
Grp Volume(v), veh/h	709	0	0	222	37	112
Grp Sat Flow(s),veh/h/ln	1765	0	0	1692	1159	1870
Q Serve(g_s), s	10.7	0.0	0.0	3.7	0.9	1.6
Cycle Q Clear(g_c), s	10.7	0.0	0.0	3.7	4.6	1.6
Prop In Lane	0.92	0.07		0.59	1.00	
Lane Grp Cap(c), veh/h	868	0	0	374	349	413
V/C Ratio(X)	0.82	0.00	0.00	0.59	0.11	0.27
Avail Cap(c_a), veh/h	3240	0	0	1269	963	1403
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.8	0.0	0.0	10.9	13.0	10.1
Incr Delay (d2), s/veh	1.9	0.0	0.0	1.5	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	0.0	1.2	0.2	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.7	0.0	0.0	12.5	13.1	10.5
LnGrp LOS	A	A	A	B	B	B
Approach Vol, veh/h	709		222			149
Approach Delay, s/veh	8.7		12.5			11.1
Approach LOS	A		B			B

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	11.4			11.4	19.9
Change Period (Y+Rc), s	4.5			4.5	4.5
Max Green Setting (Gmax), s	23.5			23.5	57.5
Max Q Clear Time (g_c+I1), s	5.7			6.6	12.7
Green Ext Time (p_c), s	1.2			0.6	2.8

Intersection Summary	
HCM 6th Ctrl Delay	9.8
HCM 6th LOS	A



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	84	54	835	164	107	768
Future Volume (veh/h)	84	54	835	164	107	768
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	91	59	908	178	116	835
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	117	76	1126	221	301	1387
Arrive On Green	0.11	0.11	0.74	0.74	0.74	0.74
Sat Flow, veh/h	1024	664	1519	298	519	1870
Grp Volume(v), veh/h	151	0	0	1086	116	835
Grp Sat Flow(s),veh/h/ln	1700	0	0	1817	519	1870
Q Serve(g_s), s	5.4	0.0	0.0	23.9	11.5	13.0
Cycle Q Clear(g_c), s	5.4	0.0	0.0	23.9	35.4	13.0
Prop In Lane	0.60	0.39		0.16	1.00	
Lane Grp Cap(c), veh/h	194	0	0	1347	301	1387
V/C Ratio(X)	0.78	0.00	0.00	0.81	0.39	0.60
Avail Cap(c_a), veh/h	491	0	0	1838	442	1893
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.8	0.0	0.0	5.2	16.6	3.8
Incr Delay (d2), s/veh	6.6	0.0	0.0	1.9	0.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	0.0	5.0	1.3	2.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	33.5	0.0	0.0	7.1	17.4	4.2
LnGrp LOS	C	A	A	A	B	A
Approach Vol, veh/h	151		1086			951
Approach Delay, s/veh	33.5		7.1			5.8
Approach LOS	C		A			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		50.7			50.7	11.6
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		63.0			63.0	18.0
Max Q Clear Time (g_c+I1), s		25.9			37.4	7.4
Green Ext Time (p_c), s		13.0			8.7	0.3

Intersection Summary	
HCM 6th Ctrl Delay	8.4
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	1	7	70	0	95	2	942	122	148	703	1
Future Volume (veh/h)	3	1	7	70	0	95	2	942	122	148	703	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	3	1	8	76	0	103	2	1024	133	161	764	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	19	6	23	160	0	143	5	1098	931	190	1293	1095
Arrive On Green	0.01	0.01	0.01	0.09	0.00	0.09	0.00	0.59	0.59	0.11	0.69	0.69
Sat Flow, veh/h	1352	451	1585	1781	0	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	4	0	8	76	0	103	2	1024	133	161	764	1
Grp Sat Flow(s),veh/h/ln	1803	0	1585	1781	0	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	0.2	0.0	0.4	3.6	0.0	5.6	0.1	44.5	3.4	7.9	19.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.4	3.6	0.0	5.6	0.1	44.5	3.4	7.9	19.0	0.0
Prop In Lane	0.75		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	26	0	23	160	0	143	5	1098	931	190	1293	1095
V/C Ratio(X)	0.15	0.00	0.35	0.47	0.00	0.72	0.41	0.93	0.14	0.85	0.59	0.00
Avail Cap(c_a), veh/h	364	0	320	360	0	320	100	1185	1004	190	1293	1095
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.4	0.0	43.5	38.6	0.0	39.5	44.4	16.8	8.3	39.1	7.2	4.3
Incr Delay (d2), s/veh	2.7	0.0	8.9	2.2	0.0	6.7	48.2	12.6	0.1	28.5	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.2	1.7	0.0	2.4	0.1	20.5	1.1	4.9	6.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.1	0.0	52.4	40.7	0.0	46.2	92.6	29.4	8.4	67.7	7.9	4.3
LnGrp LOS	D	A	D	D	A	D	F	C	A	E	A	A
Approach Vol, veh/h		12			179			1159			926	
Approach Delay, s/veh		50.3			43.9			27.1			18.3	
Approach LOS		D			D			C			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	14.0	56.9		5.8	4.7	66.1		12.5
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	9.5	56.5		18.0	5.0	61.0		18.0
Max Q Clear Time (g_c+I1), s	19.9	46.5		2.4	2.1	21.0		7.6
Green Ext Time (p_c), s	0.0	5.8		0.0	0.0	6.7		0.5

Intersection Summary		
HCM 6th Ctrl Delay		24.9
HCM 6th LOS		C

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	149	98	959	389	117	617
Future Volume (veh/h)	149	98	959	389	117	617
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	162	107	1042	423	127	671
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	209	186	1193	1011	160	1458
Arrive On Green	0.12	0.12	0.64	0.64	0.09	0.78
Sat Flow, veh/h	1781	1585	1870	1585	1781	1870
Grp Volume(v), veh/h	162	107	1042	423	127	671
Grp Sat Flow(s),veh/h/ln	1781	1585	1870	1585	1781	1870
Q Serve(g_s), s	7.7	5.6	39.6	11.5	6.1	10.7
Cycle Q Clear(g_c), s	7.7	5.6	39.6	11.5	6.1	10.7
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	209	186	1193	1011	160	1458
V/C Ratio(X)	0.78	0.58	0.87	0.42	0.79	0.46
Avail Cap(c_a), veh/h	369	328	1644	1394	248	2002
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.3	36.3	12.9	7.8	38.8	3.3
Incr Delay (d2), s/veh	6.1	2.8	4.1	0.3	9.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	2.3	15.1	3.4	3.0	2.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	43.4	39.1	17.0	8.0	48.1	3.5
LnGrp LOS	D	D	B	A	D	A
Approach Vol, veh/h	269		1465			798
Approach Delay, s/veh	41.7		14.4			10.6
Approach LOS	D		B			B

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	12.3	59.9				72.2	14.7
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5
Max Green Setting (Gmax), s	12.1	76.4				93.0	18.0
Max Q Clear Time (g_c+I1), s	9.1	41.6				12.7	9.7
Green Ext Time (p_c), s	0.1	13.8				5.6	0.5

Intersection Summary	
HCM 6th Ctrl Delay	16.1
HCM 6th LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Traffic Volume (veh/h)	132	251	999	152	181	408		
Future Volume (veh/h)	132	251	999	152	181	408		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach	No		No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870		
Adj Flow Rate, veh/h	143	273	1086	165	197	443		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	274	440	1136	963	220	1439		
Arrive On Green	0.15	0.15	0.61	0.61	0.12	0.77		
Sat Flow, veh/h	1781	1585	1870	1585	1781	1870		
Grp Volume(v), veh/h	143	273	1086	165	197	443		
Grp Sat Flow(s),veh/h/ln	1781	1585	1870	1585	1781	1870		
Q Serve(g_s), s	8.7	17.6	63.7	5.3	12.8	8.4		
Cycle Q Clear(g_c), s	8.7	17.6	63.7	5.3	12.8	8.4		
Prop In Lane	1.00	1.00		1.00	1.00			
Lane Grp Cap(c), veh/h	274	440	1136	963	220	1439		
V/C Ratio(X)	0.52	0.62	0.96	0.17	0.89	0.31		
Avail Cap(c_a), veh/h	274	440	1181	1001	220	1485		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	45.6	36.9	21.5	10.1	50.6	4.1		
Incr Delay (d2), s/veh	1.8	2.7	16.4	0.1	33.6	0.1		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	4.0	7.1	30.8	1.8	7.7	2.7		
Unsig. Movement Delay, s/veh								
LnGrp Delay(d),s/veh	47.4	39.6	38.0	10.2	84.1	4.2		
LnGrp LOS	D	D	D	B	F	A		
Approach Vol, veh/h	416		1251			640		
Approach Delay, s/veh	42.3		34.3			28.8		
Approach LOS	D		C			C		

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	19.0	75.7				94.7	22.5
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5
Max Green Setting (Gmax), s	14.5	74.0				93.0	18.0
Max Q Clear Time (g_c+I1), s	14.8	65.7				10.4	19.6
Green Ext Time (p_c), s	0.0	5.5				3.2	0.0

Intersection Summary		
HCM 6th Ctrl Delay	34.2	
HCM 6th LOS	C	

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	698	37	92	297	87	236
Future Volume (veh/h)	698	37	92	297	87	236
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	759	40	100	323	95	257
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	819	43	144	404	173	467
Arrive On Green	0.49	0.49	0.39	0.39	0.39	0.39
Sat Flow, veh/h	1680	89	212	1045	446	1207
Grp Volume(v), veh/h	800	0	423	0	0	352
Grp Sat Flow(s),veh/h/ln	1770	0	1257	0	0	1653
Q Serve(g_s), s	30.3	0.0	11.9	0.0	0.0	11.9
Cycle Q Clear(g_c), s	30.3	0.0	23.8	0.0	0.0	11.9
Prop In Lane	0.95	0.05	0.24			0.73
Lane Grp Cap(c), veh/h	863	0	548	0	0	639
V/C Ratio(X)	0.93	0.00	0.77	0.00	0.00	0.55
Avail Cap(c_a), veh/h	1123	0	718	0	0	818
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	17.2	0.0	21.4	0.0	0.0	17.1
Incr Delay (d2), s/veh	10.9	0.0	3.8	0.0	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.3	0.0	6.9	0.0	0.0	4.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	28.0	0.0	25.2	0.0	0.0	17.9
LnGrp LOS	C	A	C	A	A	B
Approach Vol, veh/h	800			423	352	
Approach Delay, s/veh	28.0			25.2	17.9	
Approach LOS	C			C	B	

Timer - Assigned Phs	2		4		6
Phs Duration (G+Y+Rc), s	32.2		39.5		32.2
Change Period (Y+Rc), s	4.5		4.5		4.5
Max Green Setting (Gmax), s	35.5		45.5		35.5
Max Q Clear Time (g_c+I1), s	25.8		32.3		13.9
Green Ext Time (p_c), s	2.0		2.7		2.3

Intersection Summary		
HCM 6th Ctrl Delay		25.0
HCM 6th LOS		C

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	371	57	67	542	147	132
Future Volume (veh/h)	371	57	67	542	147	132
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	403	62	73	589	160	143
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	460	71	99	801	305	1045
Arrive On Green	0.30	0.30	0.56	0.56	0.56	0.56
Sat Flow, veh/h	1516	233	178	1434	773	1870
Grp Volume(v), veh/h	466	0	0	662	160	143
Grp Sat Flow(s),veh/h/ln	1753	0	0	1612	773	1870
Q Serve(g_s), s	16.4	0.0	0.0	20.0	12.7	2.4
Cycle Q Clear(g_c), s	16.4	0.0	0.0	20.0	32.8	2.4
Prop In Lane	0.86	0.13		0.89	1.00	
Lane Grp Cap(c), veh/h	531	0	0	901	305	1045
V/C Ratio(X)	0.88	0.00	0.00	0.74	0.53	0.14
Avail Cap(c_a), veh/h	848	0	0	1226	461	1422
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.5	0.0	0.0	10.8	23.0	6.9
Incr Delay (d2), s/veh	6.4	0.0	0.0	1.5	1.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	0.0	0.0	6.1	2.3	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	27.9	0.0	0.0	12.3	24.4	6.9
LnGrp LOS	C	A	A	B	C	A
Approach Vol, veh/h	466		662			303
Approach Delay, s/veh	27.9		12.3			16.2
Approach LOS	C		B			B

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	40.9			40.9	24.2
Change Period (Y+Rc), s	4.5			4.5	4.5
Max Green Setting (Gmax), s	49.5			49.5	31.5
Max Q Clear Time (g_c+I1), s	22.0			34.8	18.4
Green Ext Time (p_c), s	5.7			1.6	1.3

Intersection Summary	
HCM 6th Ctrl Delay	18.2
HCM 6th LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations							
Traffic Volume (veh/h)	133	72	736	76	25	610	
Future Volume (veh/h)	133	72	736	76	25	610	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach	No		No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870	
Adj Flow Rate, veh/h	145	78	800	83	27	663	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	0	0	2	2	2	2	
Cap, veh/h	191	103	1022	106	333	1147	
Arrive On Green	0.17	0.17	0.61	0.61	0.61	0.61	
Sat Flow, veh/h	1106	595	1666	173	629	1870	
Grp Volume(v), veh/h	224	0	0	883	27	663	
Grp Sat Flow(s),veh/h/ln	1708	0	0	1839	629	1870	
Q Serve(g_s), s	5.3	0.0	0.0	15.0	1.4	8.9	
Cycle Q Clear(g_c), s	5.3	0.0	0.0	15.0	16.4	8.9	
Prop In Lane	0.65	0.35		0.09	1.00		
Lane Grp Cap(c), veh/h	295	0	0	1128	333	1147	
V/C Ratio(X)	0.76	0.00	0.00	0.78	0.08	0.58	
Avail Cap(c_a), veh/h	914	0	0	2559	822	2602	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	16.6	0.0	0.0	6.0	12.1	4.9	
Incr Delay (d2), s/veh	4.0	0.0	0.0	1.2	0.1	0.5	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	2.1	0.0	0.0	3.2	0.2	1.8	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	20.6	0.0	0.0	7.3	12.2	5.3	
LnGrp LOS	C	A	A	A	B	A	
Approach Vol, veh/h	224		883			690	
Approach Delay, s/veh	20.6		7.3			5.6	
Approach LOS	C		A			A	

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		30.3			30.3	11.8
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		58.5			58.5	22.5
Max Q Clear Time (g_c+I1), s		17.0			18.4	7.3
Green Ext Time (p_c), s		8.8			5.7	0.6

Intersection Summary	
HCM 6th Ctrl Delay	8.3
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	1	129	0	150	1	781	56	47	721	1
Future Volume (veh/h)	3	0	1	129	0	150	1	781	56	47	721	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	3	0	1	140	0	163	1	849	61	51	784	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	10	0	8	253	0	225	3	1000	847	82	1083	918
Arrive On Green	0.01	0.00	0.01	0.14	0.00	0.14	0.00	0.53	0.53	0.05	0.58	0.58
Sat Flow, veh/h	1781	0	1585	1781	0	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	3	0	1	140	0	163	1	849	61	51	784	1
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1781	0	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	0.1	0.0	0.0	4.8	0.0	6.5	0.0	25.6	1.2	1.9	20.1	0.0
Cycle Q Clear(g_c), s	0.1	0.0	0.0	4.8	0.0	6.5	0.0	25.6	1.2	1.9	20.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	10	0	8	253	0	225	3	1000	847	82	1083	918
V/C Ratio(X)	0.31	0.00	0.12	0.55	0.00	0.73	0.37	0.85	0.07	0.62	0.72	0.00
Avail Cap(c_a), veh/h	485	0	432	485	0	432	135	1624	1376	232	1726	1463
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.8	0.0	32.7	26.4	0.0	27.1	33.0	13.1	7.4	31.0	10.1	5.9
Incr Delay (d2), s/veh	17.7	0.0	6.0	1.9	0.0	4.4	68.6	2.5	0.0	7.5	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	2.1	0.0	2.6	0.1	9.5	0.4	0.9	6.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.4	0.0	38.7	28.3	0.0	31.5	101.5	15.6	7.5	38.5	11.0	5.9
LnGrp LOS	D	A	D	C	A	C	F	B	A	D	B	A
Approach Vol, veh/h		4			303			911			836	
Approach Delay, s/veh		47.5			30.1			15.1			12.7	
Approach LOS		D			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.5	39.8		4.9	4.6	42.8		13.9
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	3.0	57.4		18.0	5.0	61.0		18.0
Max Q Clear Time (g_c+I1), s	3.9	27.6		2.1	2.0	22.1		8.5
Green Ext Time (p_c), s	0.0	7.8		0.0	0.0	7.0		0.9

Intersection Summary		
HCM 6th Ctrl Delay		16.4
HCM 6th LOS		B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	369	115	704	189	97	786
Future Volume (veh/h)	369	115	704	189	97	786
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	401	125	765	205	105	854
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	468	416	898	761	137	1154
Arrive On Green	0.26	0.26	0.48	0.48	0.08	0.62
Sat Flow, veh/h	1781	1585	1870	1585	1781	1870
Grp Volume(v), veh/h	401	125	765	205	105	854
Grp Sat Flow(s),veh/h/ln	1781	1585	1870	1585	1781	1870
Q Serve(g_s), s	16.0	4.7	26.9	5.8	4.3	24.1
Cycle Q Clear(g_c), s	16.0	4.7	26.9	5.8	4.3	24.1
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	468	416	898	761	137	1154
V/C Ratio(X)	0.86	0.30	0.85	0.27	0.77	0.74
Avail Cap(c_a), veh/h	870	774	1386	1175	348	1864
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.2	22.1	17.1	11.6	33.9	10.1
Incr Delay (d2), s/veh	4.7	0.4	3.3	0.2	8.7	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	1.7	11.1	1.9	2.1	8.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	30.9	22.5	20.4	11.8	42.6	11.0
LnGrp LOS	C	C	C	B	D	B
Approach Vol, veh/h	526		970			959
Approach Delay, s/veh	28.9		18.5			14.5
Approach LOS	C		B			B

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	10.2	40.4				50.6	24.1
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5
Max Green Setting (Gmax), s	14.6	55.4				74.5	36.5
Max Q Clear Time (g_c+I1), s	6.3	28.9				26.1	18.0
Green Ext Time (p_c), s	0.1	7.0				8.3	1.6

Intersection Summary	
HCM 6th Ctrl Delay	19.2
HCM 6th LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	228	286	399	156	242	901
Future Volume (veh/h)	228	286	399	156	242	901
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	248	311	434	170	263	979
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	367	623	689	584	333	1188
Arrive On Green	0.21	0.21	0.37	0.37	0.19	0.63
Sat Flow, veh/h	1781	1585	1870	1585	1781	1870
Grp Volume(v), veh/h	248	311	434	170	263	979
Grp Sat Flow(s),veh/h/ln	1781	1585	1870	1585	1781	1870
Q Serve(g_s), s	7.3	8.4	10.8	4.3	8.0	22.7
Cycle Q Clear(g_c), s	7.3	8.4	10.8	4.3	8.0	22.7
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	367	623	689	584	333	1188
V/C Ratio(X)	0.68	0.50	0.63	0.29	0.79	0.82
Avail Cap(c_a), veh/h	582	814	1635	1385	1211	3054
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.7	13.0	14.7	12.6	22.0	7.9
Incr Delay (d2), s/veh	2.2	0.6	1.0	0.3	4.2	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	2.7	4.2	1.4	3.4	6.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.9	13.6	15.7	12.9	26.2	9.4
LnGrp LOS	C	B	B	B	C	A
Approach Vol, veh/h	559		604			1242
Approach Delay, s/veh	17.7		14.9			13.0
Approach LOS	B		B			B

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	15.1	25.4				40.5	16.2
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5
Max Green Setting (Gmax), s	38.5	49.5				92.5	18.5
Max Q Clear Time (g_c+I1), s	10.0	12.8				24.7	10.4
Green Ext Time (p_c), s	0.8	3.6				11.3	1.3

Intersection Summary	
HCM 6th Ctrl Delay	14.6
HCM 6th LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	169	29	20	58	255	596
Future Volume (veh/h)	169	29	20	58	255	596
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	184	32	22	63	277	648
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	238	41	164	424	330	771
Arrive On Green	0.16	0.16	0.66	0.66	0.66	0.66
Sat Flow, veh/h	1484	258	113	640	497	1164
Grp Volume(v), veh/h	217	0	85	0	0	925
Grp Sat Flow(s),veh/h/ln	1750	0	753	0	0	1661
Q Serve(g_s), s	6.0	0.0	1.2	0.0	0.0	21.6
Cycle Q Clear(g_c), s	6.0	0.0	22.8	0.0	0.0	21.6
Prop In Lane	0.85	0.15	0.26			0.70
Lane Grp Cap(c), veh/h	280	0	588	0	0	1101
V/C Ratio(X)	0.77	0.00	0.14	0.00	0.00	0.84
Avail Cap(c_a), veh/h	726	0	1213	0	0	1956
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	20.5	0.0	5.7	0.0	0.0	6.5
Incr Delay (d2), s/veh	4.6	0.0	0.1	0.0	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	0.2	0.0	0.0	4.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	25.0	0.0	5.8	0.0	0.0	8.3
LnGrp LOS	C	A	A	A	A	A
Approach Vol, veh/h	217			85	925	
Approach Delay, s/veh	25.0			5.8	8.3	
Approach LOS	C			A	A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		38.2		12.6		38.2
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		59.9		21.1		59.9
Max Q Clear Time (g_c+I1), s		24.8		8.0		23.6
Green Ext Time (p_c), s		0.6		0.5		10.2

Intersection Summary		
HCM 6th Ctrl Delay	11.1	
HCM 6th LOS	B	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	650	58	85	143	39	103
Future Volume (veh/h)	650	58	85	143	39	103
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	707	63	92	155	42	112
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	836	74	147	247	315	438
Arrive On Green	0.52	0.52	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1617	144	626	1055	1133	1870
Grp Volume(v), veh/h	771	0	0	247	42	112
Grp Sat Flow(s),veh/h/ln	1764	0	0	1681	1133	1870
Q Serve(g_s), s	13.6	0.0	0.0	4.8	1.2	1.8
Cycle Q Clear(g_c), s	13.6	0.0	0.0	4.8	6.0	1.8
Prop In Lane	0.92	0.08		0.63	1.00	
Lane Grp Cap(c), veh/h	911	0	0	394	315	438
V/C Ratio(X)	0.85	0.00	0.00	0.63	0.13	0.26
Avail Cap(c_a), veh/h	2755	0	0	1139	817	1267
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.5	0.0	0.0	12.4	15.1	11.3
Incr Delay (d2), s/veh	2.3	0.0	0.0	1.6	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	0.0	0.0	1.6	0.3	0.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.8	0.0	0.0	14.1	15.3	11.6
LnGrp LOS	A	A	A	B	B	B
Approach Vol, veh/h	771		247			154
Approach Delay, s/veh	9.8		14.1			12.6
Approach LOS	A		B			B

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	13.0			13.0	23.2
Change Period (Y+Rc), s	4.5			4.5	4.5
Max Green Setting (Gmax), s	24.5			24.5	56.5
Max Q Clear Time (g_c+I1), s	6.8			8.0	15.6
Green Ext Time (p_c), s	1.4			0.6	3.1

Intersection Summary	
HCM 6th Ctrl Delay	11.0
HCM 6th LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	95	54	989	171	107	990
Future Volume (veh/h)	95	54	989	171	107	990
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	103	59	1075	186	116	1076
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	127	73	1199	207	202	1443
Arrive On Green	0.12	0.12	0.77	0.77	0.77	0.77
Sat Flow, veh/h	1078	617	1553	269	440	1870
Grp Volume(v), veh/h	163	0	0	1261	116	1076
Grp Sat Flow(s),veh/h/ln	1705	0	0	1822	440	1870
Q Serve(g_s), s	7.6	0.0	0.0	41.9	21.1	25.2
Cycle Q Clear(g_c), s	7.6	0.0	0.0	41.9	63.0	25.2
Prop In Lane	0.63	0.36		0.15	1.00	
Lane Grp Cap(c), veh/h	201	0	0	1406	202	1443
V/C Ratio(X)	0.81	0.00	0.00	0.90	0.57	0.75
Avail Cap(c_a), veh/h	376	0	0	1406	202	1443
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.1	0.0	0.0	6.9	30.5	5.0
Incr Delay (d2), s/veh	7.6	0.0	0.0	8.0	3.9	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	0.0	12.5	2.4	6.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	42.7	0.0	0.0	14.9	34.4	7.2
LnGrp LOS	D	A	A	B	C	A
Approach Vol, veh/h	163		1261			1192
Approach Delay, s/veh	42.7		14.9			9.8
Approach LOS	D		B			A

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	67.5			67.5	14.1
Change Period (Y+Rc), s	4.5			4.5	4.5
Max Green Setting (Gmax), s	63.0			63.0	18.0
Max Q Clear Time (g_c+I1), s	43.9			65.0	9.6
Green Ext Time (p_c), s	12.0			0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	14.3
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	1	7	86	0	95	2	1103	133	148	936	1
Future Volume (veh/h)	3	1	7	86	0	95	2	1103	133	148	936	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	3	1	8	93	0	103	2	1199	145	161	1017	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	19	6	23	160	0	142	5	1147	972	161	1311	1111
Arrive On Green	0.01	0.01	0.01	0.09	0.00	0.09	0.00	0.61	0.61	0.09	0.70	0.70
Sat Flow, veh/h	1352	451	1585	1781	0	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	4	0	8	93	0	103	2	1199	145	161	1017	1
Grp Sat Flow(s),veh/h/ln	1803	0	1585	1781	0	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	0.2	0.0	0.5	4.7	0.0	5.9	0.1	57.5	3.7	8.5	33.4	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.5	4.7	0.0	5.9	0.1	57.5	3.7	8.5	33.4	0.0
Prop In Lane	0.75		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	26	0	23	160	0	142	5	1147	972	161	1311	1111
V/C Ratio(X)	0.16	0.00	0.35	0.58	0.00	0.72	0.41	1.05	0.15	1.00	0.78	0.00
Avail Cap(c_a), veh/h	346	0	304	342	0	304	95	1147	972	161	1311	1111
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.7	0.0	45.8	41.0	0.0	41.5	46.7	18.1	7.7	42.6	9.2	4.2
Incr Delay (d2), s/veh	2.7	0.0	9.1	3.3	0.0	6.8	48.3	39.2	0.1	69.9	3.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.2	2.2	0.0	0.3	0.1	33.8	1.2	6.8	12.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.4	0.0	54.8	44.3	0.0	48.3	95.0	57.4	7.8	112.5	12.2	4.2
LnGrp LOS	D	A	D	D	A	D	F	F	A	F	B	A
Approach Vol, veh/h		12			196			1346			1179	
Approach Delay, s/veh		52.7			46.4			52.1			25.9	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.0	62.0		5.8	4.8	70.2		12.9
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	8.5	57.5		18.0	5.0	61.0		18.0
Max Q Clear Time (g_c+I1), s	10.5	59.5		2.5	2.1	35.4		7.9
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	9.7		0.5

Intersection Summary		
HCM 6th Ctrl Delay		40.4
HCM 6th LOS		D

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	149	98	1131	389	117	866
Future Volume (veh/h)	149	98	1131	389	117	866
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	162	107	1229	423	127	941
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	197	175	1284	1089	146	1513
Arrive On Green	0.11	0.11	0.69	0.69	0.08	0.81
Sat Flow, veh/h	1781	1585	1870	1585	1781	1870
Grp Volume(v), veh/h	162	107	1229	423	127	941
Grp Sat Flow(s),veh/h/ln	1781	1585	1870	1585	1781	1870
Q Serve(g_s), s	10.0	7.2	67.2	12.8	7.9	21.6
Cycle Q Clear(g_c), s	10.0	7.2	67.2	12.8	7.9	21.6
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	197	175	1284	1089	146	1513
V/C Ratio(X)	0.82	0.61	0.96	0.39	0.87	0.62
Avail Cap(c_a), veh/h	286	255	1324	1122	146	1553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.7	47.5	16.0	7.5	50.8	4.1
Incr Delay (d2), s/veh	11.8	3.4	15.4	0.2	38.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	3.0	30.1	4.0	5.1	6.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	60.5	50.9	31.4	7.7	89.6	4.9
LnGrp LOS	E	D	C	A	F	A
Approach Vol, veh/h	269		1652			1068
Approach Delay, s/veh	56.7		25.3			14.9
Approach LOS	E		C			B

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	13.7	81.4				95.1	16.9
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5
Max Green Setting (Gmax), s	9.2	79.3				93.0	18.0
Max Q Clear Time (g_c+I1), s	12.0	69.2				23.6	12.0
Green Ext Time (p_c), s	0.0	7.7				10.3	0.4

Intersection Summary		
HCM 6th Ctrl Delay	24.4	
HCM 6th LOS	C	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	280	423	999	363	430	408
Future Volume (veh/h)	280	423	999	363	430	408
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	304	460	1086	395	467	443
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	275	594	959	1057	393	1442
Arrive On Green	0.15	0.15	0.51	0.51	0.22	0.77
Sat Flow, veh/h	1781	1585	1870	1585	1781	1870
Grp Volume(v), veh/h	304	460	1086	395	467	443
Grp Sat Flow(s),veh/h/ln	1781	1585	1870	1585	1781	1870
Q Serve(g_s), s	18.5	18.5	61.5	13.3	26.5	8.5
Cycle Q Clear(g_c), s	18.5	18.5	61.5	13.3	26.5	8.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	275	594	959	1057	393	1442
V/C Ratio(X)	1.11	0.77	1.13	0.37	1.19	0.31
Avail Cap(c_a), veh/h	275	594	959	1057	393	1442
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.8	33.0	29.3	8.9	46.8	4.1
Incr Delay (d2), s/veh	86.1	6.3	73.0	0.2	107.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.8	12.7	45.7	7.1	23.3	2.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	136.8	39.3	102.2	9.1	153.8	4.2
LnGrp LOS	F	D	F	A	F	A
Approach Vol, veh/h	764		1481			910
Approach Delay, s/veh	78.1		77.4			81.0
Approach LOS	E		E			F

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	31.0	66.0				97.0	23.0
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5
Max Green Setting (Gmax), s	26.5	61.5				92.5	18.5
Max Q Clear Time (g_c+I1), s	28.5	63.5				10.5	20.5
Green Ext Time (p_c), s	0.0	0.0				3.2	0.0

Intersection Summary	
HCM 6th Ctrl Delay	78.6
HCM 6th LOS	E

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	768	37	92	325	107	284
Future Volume (veh/h)	768	37	92	325	107	284
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	835	40	100	353	116	309
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	842	40	115	355	181	482
Arrive On Green	0.50	0.50	0.40	0.40	0.40	0.40
Sat Flow, veh/h	1688	81	165	885	451	1202
Grp Volume(v), veh/h	876	0	453	0	0	425
Grp Sat Flow(s),veh/h/ln	1771	0	1050	0	0	1654
Q Serve(g_s), s	44.1	0.0	17.5	0.0	0.0	18.6
Cycle Q Clear(g_c), s	44.1	0.0	36.1	0.0	0.0	18.6
Prop In Lane	0.95	0.05	0.22			0.73
Lane Grp Cap(c), veh/h	884	0	470	0	0	663
V/C Ratio(X)	0.99	0.00	0.96	0.00	0.00	0.64
Avail Cap(c_a), veh/h	884	0	470	0	0	663
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	22.4	0.0	30.4	0.0	0.0	21.7
Incr Delay (d2), s/veh	28.0	0.0	32.3	0.0	0.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	23.6	0.0	14.0	0.0	0.0	7.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	50.4	0.0	62.7	0.0	0.0	23.8
LnGrp LOS	D	A	E	A	A	C
Approach Vol, veh/h	876			453	425	
Approach Delay, s/veh	50.4			62.7	23.8	
Approach LOS	D			E	C	

Timer - Assigned Phs	2		4		6
Phs Duration (G+Y+Rc), s	40.6		49.4		40.6
Change Period (Y+Rc), s	4.5		4.5		4.5
Max Green Setting (Gmax), s	36.1		44.9		36.1
Max Q Clear Time (g_c+I1), s	38.1		46.1		20.6
Green Ext Time (p_c), s	0.0		0.0		2.5

Intersection Summary		
HCM 6th Ctrl Delay	47.1	
HCM 6th LOS	D	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	411	65	67	601	158	132
Future Volume (veh/h)	411	65	67	601	158	132
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	447	71	73	653	172	143
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	480	76	94	838	252	1083
Arrive On Green	0.32	0.32	0.58	0.58	0.58	0.58
Sat Flow, veh/h	1509	240	162	1448	728	1870
Grp Volume(v), veh/h	519	0	0	726	172	143
Grp Sat Flow(s),veh/h/ln	1752	0	0	1610	728	1870
Q Serve(g_s), s	25.0	0.0	0.0	30.2	20.3	3.0
Cycle Q Clear(g_c), s	25.0	0.0	0.0	30.2	50.5	3.0
Prop In Lane	0.86	0.14		0.90	1.00	
Lane Grp Cap(c), veh/h	557	0	0	932	252	1083
V/C Ratio(X)	0.93	0.00	0.00	0.78	0.68	0.13
Avail Cap(c_a), veh/h	613	0	0	932	252	1083
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.8	0.0	0.0	14.1	33.6	8.4
Incr Delay (d2), s/veh	20.3	0.0	0.0	4.3	7.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.2	0.0	0.0	10.8	4.0	1.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	49.1	0.0	0.0	18.3	40.9	8.4
LnGrp LOS	D	A	A	B	D	A
Approach Vol, veh/h	519		726			315
Approach Delay, s/veh	49.1		18.3			26.1
Approach LOS	D		B			C

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	55.0			55.0	32.2
Change Period (Y+Rc), s	4.5			4.5	4.5
Max Green Setting (Gmax), s	50.5			50.5	30.5
Max Q Clear Time (g_c+I1), s	32.2			52.5	27.0
Green Ext Time (p_c), s	5.6			0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	30.2
HCM 6th LOS	C

APPENDIX WATER

WATER DEMAND TECH MEMO AND WATER INFRASTRUCTURE PLAN

REVISED WATER DEMAND TECHNICAL MEMO

SHERWOOD
DESIGN ENGINEERS

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Technical Memorandum

To: Kirsty Shelton
Chris Meredith

From: Peter Haase, MS, PE

Date: Revised October 4, 2019

Subject: **Water Demand Analysis for Maha Resort at Guenoc**

Dear Kirsty and Chris:

Sherwood Design Engineers, Inc. (SDE) has prepared a revised water demand analysis for the First Phase (Phase I) and Future Phase of development planned for the Maha Resort at Guenoc, in Lake County, California (The Project). The water demand analysis presents The Project water demands for the Phase I and future phased projects as described in the Specific Plan of Development (SPOD) submitted to the County of Lake July 1, 2019. The technical memorandum describes the methodology and the results of the water demand analysis.

1. Project Description

The Project has applied to the County of Lake for a development application. Pursuant to the California Environmental Quality Act (CEQA) the application will include an Environmental Impact Report (EIR). The EIR will include a programmatic analysis of the impacts to rezone the 16,000-acre Guenoc Ranch to "Guenoc Valley District (GVD)". In addition to the programmatic level EIR to allow the rezone, the EIR will include a detailed, project level analysis of the impacts at a Project level review of the first phase (Phase I) of development, submitted as the SPOD.

The Programmatic review of the overall project will occur in the EIR to assess the environmental impacts of the rezone. Project level review will analyze the specific objectives and environmental impacts of the proposed first phase of development, as outlined in the SPOD. The Project Level review EIR will analyze the environmental changes caused by a development including the construction and operation, whereas the programmatic EIR will look at the impacts of the rezone classification rather than a project specific analysis. Future phases of the project will require additional CEQA review.

As referenced in SPOD, Phase I includes the construction of the roads and the utility infrastructure, approximately 225 hotel rooms, 144 resort residential units, and 411 Residential villas, workforce and staff housing, and the accessory to resort commercial structures. This report looks at the feasibility of these operations relating to the phase one development. (The actual number of hotel rooms has been reduced for the Phase I project; however, for this analysis the original room numbers presented in the SPOD have been used, which results in a more conservative estimate of water demand).

Future phase development will include additional hotel rooms, resort residential units, residential villas, expanded sport facilities and recreation opportunities.

2. Water Demand Analysis

The Project will rely on both potable and non-potable water demands to supply the various water uses at the site. The Project will be designed with two separate water systems: a potable water system primarily used to supply all the drinking, interior, and recreation water demands features (i.e. swimming pools) for The Project and a separate non-potable water system will be installed to meet all the non-drinking water and primarily exterior water demands for irrigation, non-recreational water features (i.e. fountains and other non-recreational features), fire protection water and construction related water demands.

Potable water demand will be met by onsite water supply wells that have been or will be constructed to meet the State's standards for drinking water supply. Non-potable water demand will be met by a combination of existing surface water entitlements stored in the existing onsite reservoirs for areas that are located on Place of Use (POU) land, on-site recycled wastewater, and from groundwater supply wells. All POU land has an existing appropriative permit water right so that surface water can been used for a beneficial purpose, such as irrigation on that delineated land.

The following sections include a description of the methodology used to calculate the water demands for the project and results of the water demand calculations.

2.1. Potable Water Demand

Onsite deep groundwater supply wells will be used to supply potable water to the project.

SDE calculated the potable or domestic water demands for the project. The potable water demands include the following:

- Domestic and commercial water needs for drinking, cooking, bathing, toilet flushing, and laundry.
- Clean-in-place (wash) water for wineries and other food related production facilities.

SDE employed water use values published in technical references for similar types of uses and the expected occupancy rates.[1,2] SDE used two different occupancy rates for the hospitality and residential uses: the first occupancy rate represents the average occupancy rate for similar resorts managed by the development team, which run at 60% for the hotel rooms and resort villas, and 40% for the estate villas, and the second occupancy rate assumes the resort and villas are at full occupancy (100%). Similarly, many of the support facilities are not expected to run at full occupancy, which is also accounted for the in the water demand calculations.

Commercial Retail Space. Water demand values for commercial uses are calculated based on values published based on the area or square footage of retail and commercial space, a method relied on by many jurisdictions in California.[3]

Makeup Water for Pools and Recreational Water Features. Water demand calculations for pools and man-made recreational water features have been estimated using pan evaporative data reported for Markley Cove in Lake Berryessa by the CA Department of Water Resources. The annual average pan evaporation rate at Lake Berryessa was calculated to be 53 inches

[1] USEPA. 1980. *Design Manual: Onsite Wastewater Treatment and Disposal Systems*
[2] R. Crites and G. Tchobanoglous. 1998. *Small & Decentralized Wastewater Management Systems*. WCB/McGraw-Hill
[3] San Francisco Public Utility Commission, *Water Use Calculator*

per year for the period from 1991 to 2018.

Winery Process Water Demands. Water demand calculations for the winery production is based on the amount of water used per case of wine produced at the winery. SDE used 16 gallons of water required to produce a case or 2.4 gallons of wine.[4]

Table 1 presents the values relied upon to calculate the potable water demands for both Phase I and Future Phase potable water demands. Tables 2 and 3 presents the estimated daily water demands under average and maximum occupancy rates for both the Phase I and Future Phase projects, respectively. Tables 4 and 5 presents the estimated annual average potable water demand for Phase I and Future Phase projects, respectively. Table 5 presents the potable water demand for the Future Phase development. Table 6 presents a summary the total daily and annual potable water demands for both the Phase I and Future Phase projects.

Table 1. Unit Water Demands Values

Description	Unit	Unit Demand	Reference Number
Restaurant			
Staff	gpd	15	1,2
Guest	gpd	10	1,2
Pool			
Staff	gpd	15	1,2
Guest	gpd	15	
Hotel			
Staff	gpd	15	1,2
Guest	god	75	1,2
Resort Villa Resident	gpd	75	1,2
Villa Resident	gpd	75	1,2
Pool Evaporative Loss	gpsf	0.1175	
Winery Production	gpc	16	4
Notes:			
gpd - gallons per day			
gpsf - gallons per square foot of water area			
gpc - gallons per case			

[4] Storm, D.R., 200. *Winery Utilities: Planning, Design & Operation.* Chapman & Hall Enology Library

Use	Unit	Quantity	Water Demand (gallons)	Average Occupancy Rate (percent)	Average Daily Water Demand (gallons/day)	Average Daily Water Demand (ac-ft/day)	Full Occupance (percent)	Maximum DayWater Demand (gallons/day)	Maximum Annual Water Demand (ac-ft/day)
1. Resort Facilities									
1.1. Hotel Rooms	EA	225	277.5	60%	37,463	0.11	100%	62,438	0.19
1.2. Resort Residential units	EA	144	427.5	60%	36,936	0.11	100%	61,560	0.19
2. Residential Development									
2.1. Residential Estate Villas*	EA	411	674.4	40%	110,871	0.34	100%	277,178	0.85
2.2. Workforce Co-Housing	EA	300	75	70%	15,750	0.05	100%	22,500	0.07
3. Resort Amenities									
3.1. Outdoor Entertainment	Seats	500	5.5	60%	1,650	0.005	100%	2,750	0.01
3.2. Spa and Wellness Area	Visitors	70	25	60%	1,050	0.00	100%	1,750	0.01
3.3. Sports and Recreation	Visitors	0							
3.4. Equestrian Area	Visitors	105	18	60%	1,134	0.00	100%	1,890	0.01
3.5. Golf	Visitors	85	21	60%	1,071	0.00	100%	1,785	0.01
3.6. Camping Area	EA	42	64	60%	1,613	0.00	100%	2,688	0.01
3.7. Commercial & Retail	Visitors	120	23	60%	1,656	0.01	100%	2,760	0.01
4. Agricultural Production Facilities									
4.1. Wineries	Cases	62,500	16	60%	1860	0.006	100%	2,956	0.01
4.2. Diversified Agricultural Production	Visitors	8	35	60%	168	0.001	100%	280	0.00
4.3. Livestock and Farm Management	Visitors	8	35	60%	168	0.001	100%	280	0.00
5. Essential Accessory Uses									
5.1. Back of House Facilities	EA	1	17100	60%	10,260	0.031	100%	17,100	0.05
5.2. Emergency Response Center	EA	1	4140	60%	2,484	0.008	100%	4,140	0.01
5.3. Alternative Energy Production	EA	1	280	100%	280	0.001	100%	280	0.00
5.4. Float Plane Dock	EA	1	60	25%	15	0.000	100%	60	0.00
5.5. Hellipads	EA	1	30	25%	8	0.000	100%	30	0.00
Total Estimated Water Demand					**224,436**	**0.69**		**462,425**	**1.42**

*Occupancy rate represent similar resorts managed by the development team, which run at 60% for the hotel rooms and resort villas, and 40% for the estate villas.

Table 2. Phase I Average and Maximum Daily Potable Water Demand

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Use	Unit	Quantity	Water Demand (gallons)	Average Occupancy Rate (percent)	Average Daily Water Demand (gallons/day)	Average Daily Water Demand (ac-ft/day)	Full Occupance (percent)	Maximum DayWater Demand (gallons/day)	Maximum Annual Water Demand (ac-ft/day)
1. Resort Facilities									
1.1. Hotel Rooms	EA	225	277.5	60%	37,463	0.11	100%	62,438	0.19
1.2. Resort Residential units	EA	144	427.5	60%	36,936	0.11	100%	61,560	0.19
2. Residential Development									
2.1. Residential Estate Villas*	EA	411	674.4	40%	110,871	0.34	100%	277,178	0.85
2.2. Workforce Co-Housing	EA	300	75	70%	15,750	0.05	100%	22,500	0.07
3. Resort Amenities									
3.1. Outdoor Entertainment	Seats	500	5.5	60%	1,650	0.005	100%	2,750	0.01
3.2. Spa and Wellness Area	Visitors	70	25	60%	1,050	0.00	100%	1,750	0.01
3.3. Sports and Recreation	Visitors	0							
3.4. Equestrian Area	Visitors	105	18	60%	1,134	0.00	100%	1,890	0.01
3.5. Golf	Visitors	85	21	60%	1,071	0.00	100%	1,785	0.01
3.6. Camping Area	EA	42	64	60%	1,613	0.00	100%	2,688	0.01
3.7. Commercial & Retail	Visitors	120	23	60%	1,656	0.01	100%	2,760	0.01
4. Agricultural Production Facilities									
4.1. Wineries	Cases	62,500	16	60%	1860	0.006	100%	2,956	0.01
4.2. Diversified Agricultural Production	Visitors	8	35	60%	168	0.001	100%	280	0.00
4.3. Livestock and Farm Management	Visitors	8	35	60%	168	0.001	100%	280	0.00
5. Essential Accessory Uses									
5.1. Back of House Facilities	EA	1	17100	60%	10,260	0.031	100%	17,100	0.05
5.2. Emergency Response Center	EA	1	4140	60%	2,484	0.008	100%	4,140	0.01
5.3. Alternative Energy Production	EA	1	280	100%	280	0.001	100%	280	0.00
5.4. Float Plane Dock	EA	1	60	25%	15	0.000	100%	60	0.00
5.5. Hellipads	EA	1	30	25%	8	0.000	100%	30	0.00
Total Estimated Water Demand					**224,436**	**0.69**		**462,425**	**1.42**

*Occupancy rate represent similar resorts managed by the development team, which run at 60% for the hotel rooms and resort villas, and 40% for the estate villas.

Table 3. Future Phase Average and Maximum Daily Potable Water Demand

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Table 4. Phase I Average Annual Potable Water Demand

Use	Unit	Quantity	Water Demand (gallons)	Average Occupancy Rate (percent)	Average Annual Water Demand (gallons/yr)	Average Annual Water Demand (ac-ft/yr)
1. Resort Facilities						
1.1. Hotel Rooms	EA	225	277.5	60%	13,673,813	41.96
1.2. Resort Residential units	EA	144	427.5	60%	13,481,640	41.37
2. Residential Development						
2.1. Residential Estate Villas	EA	411	674.4	40%	40,468,046	124.17
2.2. Workforce Co-Housing	EA	300	75	70%	5,748,750	17.64
3. Resort Amenities						
3.1. Outdoor Entertainment	Seats	500	5.5	60%	39600	0.122
3.2. Spa and Wellness Area	Visitors	70	25	60%	383,250	1.18
3.3. Sports and Recreation	Visitors	0				
3.4. Equestrian Area	Visitors	105	18	60%	413,910	1.27
3.5. Golf	Visitors	85	21	60%	390,915	1.20
3.6. Camping Area	EA	42	64	60%	588,672	1.81
3.7. Commercial & Retail	Visitors	120	23	60%	604,440	1.85
4. Agricultural Production Facilities						
4.1. Wineries	Cases	62,500	16	60%	678840	2.083
4.2. Diversified Agricultural Production	Visitos	8	35	60%	102200	0.314
4.3. Livestock and Farm Management	Visitors	8	35	60%	168	0.001
5. Essential Accessory Uses						
5.1. Back of House Facilities	EA	1	17100	60%	3744900	11.491
5.2. Emergency Response Center	EA	1	4140	60%	906660	2.782
5.3. Alternative Energy Production	EA	1	280	100%	102200	0.314
5.4. Float Plane Dock	EA	1	60	25%	5475	0.017
5.5. Hellipads	EA	1	30	25%	2737.5	0.008
Total Estimated Water Demand					**81,336,216**	**249.57**

Table 5. Future Phase Average Annual Water Demand

Use	Unit	Quantity	Water Demand (gallons)	Average Occupancy Rate (percent)	Average Annual Water Demand (gallons/yr)	Average Annual Water Demand (ac-ft/yr)
1. Resort Facilities						
1.1. Hotel Rooms	EA	155	277.5	60%	13,673,813	41.96
1.2. Resort Residential units	EA	260	427.5	60%	13,481,640	41.37
2. Residential Development						
2.1. Residential Estate Villas*	EA	986	674.4	40%	40,468,046	124.17
2.2. Workforce Co-Housing	EA	200	75.0	70%	5,748,750	17.64
3. Resort Amenities						
3.1. Outdoor Entertainment	Seats	200	5.5	60%	15840	0.05
3.2. Spa and Wellness Area	Visitors	70	25.0	60%	383250	1.18
3.3. Sports and Recreation	Visitors	100	30.0	60%	657000	2.02
3.4. Equestrian Area	Visitors	105	18.0	60%	413910	1.27
3.5. Golf	Visitors	44	21.0	60%	202356	0.62
3.6. Wilderness Area						
3.7. Commercial & Retail	Visitors	60	23.0	60%	302220	0.93
4. Agricultural Production Facilities						
4.1. Wineries	Cases	292,000	16.0	60%	2882040	8.84
4.2. Diversified Agricultural Production	Visitors	8	35.0	60%	61320	0.19
4.3. Livestock and Farm Management	Visitors	8	35.0	60%	61320	0.19
5. Essential Accessory Uses						
5.1. Back of House Facilities	EA	1	8550.0	60%	1872450	5.75
5.2. Emergency Response Center	EA	1	2070.0	60%	453330	1.39
5.3. Alternative Energy Production	EA	1	168.0	100%	61320	0.19
5.4. Float Plane Dock	EA	1	20.0	25%	1825	0.01
5.5. Hellipads	EA	1	20.0	25%	1825	0.01
Total Estimated Water Demand					**80,742,255**	**248**

*Occupancy rate represent similar resorts managed by the development team, which run at 60% for the hotel rooms and resort villas, and 40% for the estate villas.

Table 6. Summary of Daily and Annual Potable Water Demands

Use	Average Daily Water Demand (gallons/day)	Average Daily Water Demand (ac-ft/day)	Maximum DayWater Demand (gallons/day)	Maximum Annual Water Demand (ac-ft/day)	Average Annual Water Demand (gallons/yr)	Average Annual Water Demand (ac-ft/yr)
Phase 1	224,436	0.7	462,425	1.4	81,336,216	250
Future Phase	211,894	0.7	406,669	1.2	80,742,255	248
Total Estimated Water Demand	**436,330**	**1.3**	**869,093**	**2.7**	**162,078,471**	**497**

2.2. Non-Potable Water Demand

The non-potable water demands include the landscape irrigation demands for the commercial and residential properties, new vineyard and farm areas, recreational areas including the Renaissance Golf Course and the Equestrian Center, roadway landscaping and greenroofs. Additional non-potable water demands include make up water for non-recreational water features (fountains and reflection pools). Non-potable water will also be used as the primary source for fire protection; however, the fire water demand will occur sporadically is not considered to be continuous, and as such, is not factored into the average demand analysis. There are three sources of non-potable water: recycled water, existing entitled surface water rights (appropriative and riparian) and groundwater. Although recycled and entitled water will be conveyed together to the end use, they will be stored separate. Recycled water will be stored in tanks whereas entitled water will continued to be stored in the existing reservoirs.

Irrigation Demand. The irrigation water demand estimates for the project have been calculated based on the water budget procedures established by the CA Department of Water Resources' Model Water Efficient Landscape Ordinance (MWELO) (CCR, Title 23 Waters, Division 2. Department of Water Resources, Chapter 2.7). The Estimated Total Water Use (ETWU) for each irrigation month was calculated using the ETWU formula in the MWELO. This formula was employed to calculate the water demand for all irrigated areas associated with the project including ornamental, recreational (golf course and equestrian fields/arenas) and new vineyard and farm areas. Actual water meter readings were not employed in this analysis.

Non-Recreational Water Features. There are water features (small ornamental ponds and engineered waterfalls incorporated at the Equestrian Center and Maha Farms as part of the Phase I development. At the Equestrian Center an 8-acre storage pond and constructed wetlands for habitat restoration is planned for this area. Non- potable will be used as the primary source of makeup water to replenish water losses from the pond and wetland system primarily as a result of evaporation. Monthly pan evaporation rates have been used to estimate the amount of makeup water that will be required to maintain these water features.

The Phase I project will include 452 acres of irrigated acres and 230 acres of this land is located in the Place of Use areas that can use surface water to meet the irrigation demands. The remaining 222 acres will be supplied by both recycled water and groundwater resources.

A variety of landscaping type are included in the The Project, including the golf course, the equestrian area, and other landscaped areas that will consist predominantly California native drought tolerant plantings, ornamental plantings, additional vineyards, farms and gardens and other landscape types. Based on the irrigation water demands prepared by SWA Landscape Architects the overall water demand for landscape irrigation is estimated to be 319.68 acre-feet per year or 1.44 acre-feet per acre for lands outside of the POU.

Tables 7 and 8 present estimated non-potable water demands for Phase I and Future Phase project areas to satisfy irrigation and evaporative make up water. The results present the average annual demand for both lands that will receive Place-Of-Use (POU) surface water demands, and land that is not in Place-Of-Use areas (Non-POU) and will rely on both recycled and groundwater to meet the non-potable demands. The results are presented in acre-feet per year.

The estimates indicate that the Phase I net water demand will be 482 ac-ft/yr. [5] and the total non-potable water demand is estimated to be 1,027 ac-ft/yr. The estimates indicate that the Future Phase net water demand for Non-POU irrigation water will be 759 ac-ft/yr, and the total water demand is estimated to be 1,947 ac-ft/yr. The POU water demands will be met under the established appropriative rights.

The total annual net water demands supplied by recycled water and groundwater, for both phases of projects, are presented in Table 9. It is assumed that approximately 65% of the potable water will be available as recycled water for both Phase I and Future Phase Projects and the remaining Non-POU irrigation water demands lands will be supplied by groundwater. Based on these calculations for the Phase I project approximate 47% of the non-POU land can be irrigated by reclaimed water and the balance will be supplied by groundwater. For the Future Phase project approximately 27% of the non-POU land irrigation demand is estimated to be supplied by recycled water and the balance will be supplied by groundwater.

[5] Note, the Project will rely on the existing water rights to continue to irrigate lands within the POU areas, approximately 545 ac-ft/yr for Phase 1 and approximately 1,187 ac-ft/yr for the Future Phase.

Table 7. Phase I Annual Non-Potable Water Demand Estimates (in Acre-Feet Per Year)

Use	Unit	Total Acres	POU Acres	Non-POU Acres	Water Demand (ac-ft/ac)	POU Water Demand (ac-ft/yr)	Non-POU Water Demand (ac-ft/yr)
1. Resort Facilities							
1.1. Hotel Rooms	Acres	88.5	36.9	51.6	2	73.8	103.2
1.2. Resort Residential units	Acres	16.5	1.8	14.7	2	3.6	29.4
2. Residential Development							
2.1. Residential Estate Villas	Acres	87.7	40.3	47.4	2	80.6	94.8
2.2. Workforce Co-Housing	Acres	3.8	3.8	0	2	7.6	0
3. Resort Amenities							
3.1. Outdoor Entertainment	Acres	2	0	2	2	0.0	4
3.2. Spa and Wellness Area	Acres	6.2	0	6.2	2	0.0	12.4
3.3. Sports and Recreation	Acres	0					
3.4. Equestrian Area	Acres	46	46	0	2	92.0	0
3.5. Golf	Acres	86.2	48.2	35.6	4	192.8	142.4
3.6. Camping Area	Acres	2	0	2	1	0.0	2
3.7. Commercial & Retail	Acres	2	0	2	2	0.0	4
4. Agricultural Production Facilities							
4.1. Wineries (landscape)	Acres	5.7	5.7	0	2	11.4	0
4.2. Diversified Agricultural Production	Acres	6	0	6	3	0.0	18
5. Essential Accessory Uses							
5.1. Back of House Facilities	Acres	6.2	6.2	0	1	6.2	0
5.2. Emergency Response Center	Acres	1.3	1.3	0	2	2.6	0
5.3. Float Plane Dock	Acres	0.3	0	0.3	1	0.0	0.3
5.4. Hellipads	Acres	0.3	0	0.3	1	0.0	0.3
6. Other Non-Potable Demands							
6.1. Greenroofs	Acres	22.4	5.2	17.2	2	10.4	34.4
6.2. Entry Roads	Acres	61	23.8	37.2	1	23.8	37.2
6.3. Equestrian Lake	Acres	8	8	0	5	40.0	0
Total Estimated Existing and Proposed Water Demand (ac-ft/yr)						**544.8**	**482.4**
Total Net New Water Demand							**482.4**

Table 8. Anticipated Future Phase Non-Potable Water Demand Estimates (in Acre-Feet Per Year)[6]

Use	Unit	Quantity	POU Acres	Non-POU Acres	Water Demand (ac-ft/ac)	POU Water Demand (ac-ft/yr)	Non-POU Water Demand (ac-ft/yr)
1. Resort Facilities							
1.1. Hotel Rooms	Acres	36	7.2	28.8	2	14.4	57.6
1.2. Resort Residential units	Acres	30	6	24	2	12.0	48.0
2. Residential Development							
2.1. Residential Estate Villas	Acres	227	113.5	113.5	2	227.0	227.0
2.2. Workforce Co-Housing	Acres	1.5	1.5	0	2	3.0	0.0
3. Resort Amenities							
3.1. Outdoor Entertainment	Acres	2	0	2	2	0.0	4.0
3.2. Spa and Wellness Area	Acres	6.2	0	6.2	2	0.0	12.4
3.3. Sports and Recreation	Acres	300	300	0	1.5	450.0	0.0
3.4. Equestrian Area	Acres	46	46	0	2	92.0	0.0
3.5. Golf	Acres	175	87.5	87.5	4	350.0	350.0
3.6. Camping Area	Acres	0		0	1	0.0	0.0
3.7. Commercial & Retail	Acres	1.5	0	1.5	2	0.0	3.0
4. Agricultural Production Facilities							
4.1. Wineries (landscaping)	Acres	11	0	11	2	0.0	22.0
4.2. Diversified Agricultural Production	Acres	3	1.5	1.5	3	4.5	4.5
4.3. Livestock and Farm Management	Acres	3	1.5	1.5	3	4.5	4.5
5. Essential Accessory Uses							
5.1. Back of House Facilities	Acres	3.2	3.2	0	1	3.2	0.0
5.2. Emergency Response Center	Acres	0.25	0.25	0	2	0.5	0.0
6. Other Non-Potable Demands							
6.1. Greenroofs	Acres	11.2	5.6	5.6	2	11.2	11.2
6.2. Entry Roads	Acres	30	15	15	1	15.0	15.0
Total Estimated Water Demand (ac-ft/yr)						**1187.3**	**759.2**
Total Net New Water Demand							**759.2**

[6] Note: Future phases will be evaluated under a separate CEQA project level review process and document.

Table 9. Summary of Non-Potable Net Water Demands by Sources for Phase I and Future Phase Projects

Phase	Recycled Water (ac-ft/yr)	Groundwater (ac-ft/yr)	Total Water Demand (ac-ft/yr)
Phase 1	154	328	**482**
Future Phase	162	597	**759**
Total Demand by Source (ac-ft/yr)	**316**	**926**	**1,242**

Fire Water Storage Requirements and Sources

Fire water demand for the site will be supplied by non-potable water sources including surface water from the surface water storage reservoirs, recycled wastewater and from non-potable irrigation groundwater wells. All of these sources of water will be connected to a common non-potable water distribution system, designated with the state mandated purple piping. The non-potable water distribution system will be sized to supply the fire water flows to water hydrants, to both internal and external fire sprinkler systems, to landscape and recreational area landscape areas and, non-recreational water features.

Fire water storage requirements have been calculated for each development cluster in order to determine the amount of water that will be maintained in each area; however, fire water demands have not been calculated as a water demand that must be met on a continuous basis. It is important to note that the existing surface water reservoirs maintained on the property will serve as a primary source of fire water for project. In some parts of the property the availability of surface water is limited, and in these areas standalone water storage facilities will be required.

The water storage requirements have been developed comparing both Lake County Fire Protection Standards (LCFPS) that apply to residential properties and the California Fire Code (CFC) that applies to the commercial uses on the site.

LCFPS requires that each residential lot has a minimum volume of water that must be available daily, equivalent to 350 gallons per residence.

The CFC minimum fire flow requirement for sprinklered buildings is 180,000 gallons of water to provide a fire flow of 1,500 gallons per minute for two (2) hours.

Using the Lake County requirements, SDE calculated the maximum fire water storage for the largest residential development cluster, Maha Farms, which will have 211 residential units at full build out. Based on this number of units the minimum fire water storage volume would be 73,850 gallons. Given the mixed use and commercial development planned in this area, 180,000 gallons of fire water will be required for this area. Based on this comparison it is safe to assume that for all of the mixed used clusters (commercial and residential developments 180,000 gallons of stored fire water will be required.

Table 10. presents the minimum volume of water required for the different areas on the property and the proposed source of fire water supply for the Phase I project. The Future Phase will be evaluated at the project level EIR for the specific project.

Table 10. Fire Water Volume and Source

	Description	Residential Units	Residential Fire Storage	Commercial Storage	Proposed Water Source
PHASE ONE	Onsite Workforce Housing	24	8,400	-	McCreay Reservoir
	Equestrian Center	180	63,000	180,000	McCreary Reservoir
	Red Hill Estates	131	45,850	180,000	Upper Bohn Reservoir
	Bohn Ridge Resort	68	23,800	180,000	McCreary Reservoir
	Resort at Trout Flat	68	23,800	180,000	Upper Bohn Reservoir
	Spa	11	3,850	180,000	Upper Bohn Reservoir
	Golf Course			180,000	Upper Bohn Reservoir
	Camping Area			180,000	New 180,000 Tank
	Central Back-of-House Facilities			180,000	Detert Reservoir
	Emergency Center & Short Term Staff Accomodations			180,000	Upper Bohn Reservoir
	Maha Farm	211	73,850	180,000	Upper Bohn Reservoir

REVISED WATER INFRASTRUCTURE TECHNICAL MEMO

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Technical Memorandum

To: Kirsty Shelton
Chris Meredith
Kevin Case

From: Peter Haase, MS, PE and Carina Chen, MS, PE

Date: October 14, 2019

Subject: **Water and Wastewater Supply Facilities for Maha Resort at Guenoc**

Dear Kirsty, Chris, and Kevin:

Sherwood Design Engineers, Inc. (SDE) has prepared a water supply facilities memorandum to provide a description of the proposed water supply facilities for the First Phase (Phase I) of the Maha Resort at Guenoc, in Lake County, California (The Project).

1. Project Description

The Project has applied to the County of Lake for a development application. Pursuant to the California Environmental Quality Act (CEQA) the application will include an Environmental Impact Report (EIR). The EIR will include a programmatic analysis of the impacts to rezone the 16,000-acre Guenoc Ranch to "Guenoc Valley District (GVD)". In addition to the programmatic level EIR to allow the rezone, the EIR will include a detailed, project level analysis of the impacts at a Project level review of the first phase (Phase I) of development, submitted as the Specific Plan of Development (SPOD).

The Programmatic review of the overall project will occur in the EIR to assess the environmental impacts of the entire project proposal. Project level review will analyze the specific objectives and environmental impacts of the proposed first phase of development, as outlined in the SPOD. The Project Level review EIR will analyze the environmental changes caused by a development including the construction and operation, whereas the programmatic EIR will look at the impacts of the rezone classification rather than a project specific analysis. Future phases of the project will require additional CEQA review.

Phase I includes the construction of the roads and the utility infrastructure, approximately 255 hotel rooms, 144 resort residential units, and 411 Residential villas, workforce and staff housing, and the accessory to resort commercial structures[1]. This report looks at the feasibility of these operations relating to the phase one development.

Future phase development will include additional hotel rooms, resort residential units, residential villas, and expanded sport and recreation opportunities.

The Project will include both potable and non-potable water demands to supply the various water uses at the site. The Project will be designed with two separate water

[1] Since the publication of this study, the total units have been updated to be less than the number indicated here based on the tentative map lot analysis; therefore, the total analysis is conservative.

systems: a potable water system primarily used to supply all the drinking, interior, and recreation water demands features (i.e. swimming pools) for The Project and a separate non-potable water system will be installed to meet all the non-drinking water and primarily exterior water demands for irrigation, non-recreational water features (i.e. fountains and other features), fire protection water and construction related water demands.

Potable water demand will be met by onsite water supply wells that have been or will be constructed to meet the State's standards for drinking water supply. Non-potable water demand will be met by a combination of surface water from the onsite reservoirs for areas that are located on Place of Use (POU) land. On-site recycled wastewater, and groundwater supply wells will supply water to lands located outside of the designated POU land. POU land is has an appropriative permit water right so that surface water can been used for a beneficial purpose, such as irrigation of agricultural on that delineated land.

Planned Water Supply Facilities

New water supply infrastructure is being planned for the Maha Resort that will include both a potable and non-potable water systems. The following sections provide a general description of these different water systems.

7.1. Potable Water System Improvements

The potable water system will include two main water systems that will serve the Guenoc Valley area and the Upper Bohn Lake area. The Guenoc Valley system will be designed to serve the Central Back of House area, the Equestrian Center, and the Bohn Ridge Resort. The Upper Bohn Lake system will serve the Maha Farm/Sales Center area, the Spa, Emergency Center and Support Services, the Red Hill Estates and Renaissance Golf Course, and the Resort at Trout Flat. A small water system will serve the remotely located Camping Area.

Each water system will include a series of deep, water supply wells that will pump water into the potable water distribution system. The distribution system will include a pressure piped network of main and submain lines to convey potable water to the commercial and residential parcels. The water distribution system that will consist of a series of branched and looped water lines and will be constructed with either PVC or HDPE pipe rated for drinking water. The potable water system will include strategically placed water storage tanks and booster pump station stations to maintain pressure in the system to meet maximum water demands.

Water Supply Wells. Based on the results of the ongoing hydrogeologic investigation it is apparent that each main water system will consist of water supply wells that are placed in areas of abundant groundwater yields. Each water system is being planned to have between two to four wells, and each well will likely be drilled to 300 to 500 feet deep and completed with at least a 50-foot sanitary seal. Each well will be designed to produce between 75 to 300 gallons per minute depending on the results of the pump test results.

The Back of House area will also be served by the existing spring. The spring reportedly provided approximately 10 gallons per minute and will be used for domestic water supply only.

At the Cross Roads area on the Upper Bohn Ridge zone there is a non-potable well (Cross Roads Well) that yields close to 300 gallons per minute. This well will be used for irrigation and other non-potable uses at the site.

Figure 1 shows the proposed and approximate locations of the water supply wells and spring for the Phase I project.

Each water system will have multiple wells (at least two) so that at any given time only one or two wells will be in operation, and one or two additional wells can be placed in standby and "rested" for several months. This will allow the system operator to manage wells in a manner so that they are not over pumping and over drafting the groundwater basin.

The placement of the wells will be done in a manner to avoid direct impacts to sensitive cultural, historic and biotic resources at the site.

Water Storage Tanks. A series of potable water storage tanks will be installed at each water system. The potable water storage tanks will be steel bolted above ground tanks placed in locations that are not visible to the commercial and residential parcels. The domestic water storage tanks will be sized to satisfy the maximum day demand requirements for each area.

For the Guenoc Valley water system the total amount of water storage is estimated to be approximately 181,000 gallons. A preliminary analysis indicates that three tanks would service this area. A 130,000 gallon tank would serve the Equestrian Center and the Central Back of House area. A 40,000 gallon tank would serve Bohn Ridge and a 11,000 gallon tank would serve the Spa.

For the Upper Bohn Lake water system, a total of approximately 270,000 gallons of potable water will be needed. For this system approximately 130,000 gallons will be needed at Maha Farms area, a 105,000 gallons to serve the Red Hill Estate, the golf course, the Emergency Center and short-term staff accommodations, and 35,000 to serve the Resort at Trout Flat.

Additional smaller tanks will be needed to serve remote areas. A 14,000 gallon tank will be needed at the onsite workforce housing area, a 9,000 gallon tank will be needed at the Wilderness Camp area, and a 5,000 gallon tank will be needed at the Aerial Access area.

The water storage tanks will likely be placed in elevated locations to provide gravity flow to the parcels served in the event of a power outage. The tanks will likely be placed on graded pads that will also be bermed with the cut material so that the grading cut and fill volumes are closely balanced to avoid the transport of soils from these sites. The location of the tank sites can be selected and planned so that their installation and operation does not impact sensitive cultural, historic, and biotic resources at the site.

Domestic Booster Pump Systems. A system of booster pump systems located at the water storage tanks and possibly within the distribution system will be used to maintain a uniform operating pressure in each water system. It is anticipated that each booster pump system will include at least three (3) booster pumps plumbed in parallel that will be operated by a variable frequency drive (VFD) controller to control how many pumps are operate at a time and to maintain the pressure requirements for the system. Under low or normal flow conditions it is likely

that a single booster pump is operating and as the water demand increases the standby pumps will turn on to maintain a constant flow and pressure throughout the distribution system.

The booster pump systems will typically be installed in close proximity to the water storage tanks and will be placed in areas that are graded as a result of the storage tanks. The booster pump systems will be installed in small enclosures and in small areas that should not impact sensitive cultural, historical or biotic resources at the site.

Water Distribution Network. The water systems will consist of both branched in in some locations looped water distribution systems. The water systems will consist primarily of 4-inch diameter water mains and 3-inch submains and 3- and 2-inch water laterals to supply the commercial buildings and residential parcels. The majority of the water mains and laterals will be installed in the planned roadways and driveways and will not be installed in undisturbed areas on the site. The installation of the water distribution should not result in any additional impacts to cultural, historic or biotic resources related to the installation of the new roads.

7.2. Non-Potable Water System Improvements

As discussed above, two non-potable water system will be installed to serve development in the Guenoc Valley and a second system to serve the projects in the Upper Bohn Lake area.

In general, both non-potable systems will include a new non-potable water distribution, new surface water pumping systems, and wastewater recycling systems. One or more new groundwater supply wells will be installed to meet the non-potable demand.

Non-Potable Water Distribution Systems. The non-potable water distribution will be constructed to supply fire, irrigation and make up water demands for the site. The non-potable water distribution system will be a "purple pipe" system so that it can convey recycled water, as well as other sources of non-potable through the distribution system. The non-potable water distribution system will serve fire hydrants and external and internal fire sprinkler systems for commercial and residential buildings. The non-potable water distribution system will consist primarily of 10-inch, 8-inch, and 6-inch water mains and submains, and 4-inch, 3-inch, and 2-inch diameter laterals to serve fire sprinkler systems and residential properties. The majority of the non-potable water distribution system will be installed in planned roadways and driveways and should not result in additional land disturbance and impacts to cultural, historic and biotic resources beyond impacts resulting from the construction of the new roads.

Surface Water Pumping Plants. Both non-potable water systems will include new pumping systems located in the vicinity of the existing pumping systems at Detert, McCreary, Lower Bohn Lake, and Upper Bohn Lake. A new pump station will be installed in the vicinity of the flashboard dam installed across Bucksnort Creek downstream of McCreary Reservoir and this pump station will house one pumping system to serve the Equestrian Center. Figure 2 shows the approximate location of the new surface water pumping plants.

The new surface water pump stations on Detert and McCreay Reservoirs will be connected to the Guenoc Valley non-potable water system and will be used to supply irrigation, fire protection and make up water for water features and ponds in this area. The surface water pump stations placed on Lower Bohn Lake and Upper Bohn Lake will be used to pump water to the non-potable

water system in the Upper Bohn Lake Region for irrigation, fire protection and make up water for evaporative losses in water features and ponds.

The new surface water pump stations at the reservoirs will be installed adjacent to the existing pumping plants and will be placed in areas that have been graded and should not result in substantial ground disturbance during their construction and installation. The new pumping plant at Bucksnort Creek will be placed in a small area above the normal highwater mark and outside of the immediate riparian zone of the creek. It will likely be within 50 feet of the creek and with the riparian zone; however, it will be constructed in a location that will minimize impacts to sensitive cultural, historic and biotic resources in this area.

The surface water pumps will likely be a turbine style pump that can deliver a high volume of water at a relatively high pressure to supply fire hydrants and large irrigation demands at certain parts of the property.

Water Reclamation (Recycled) Plants. Based on the decentralized and clustered development plan several small package type water recycling plants will be installed to treat wastewater from the development areas. Nine small package plants are current planned to serve the Phase I project and will include small treatment works at the Maha Farm, Redhill/Renassiance Golf Course, Resort at Trout Flat, Central Back of the House, Equestrian Center, Bohn Ridge Resort, the Spa, Onsite Workforce Housing, and a small system at the Camping Area. Figure 3 shows the approximate location of the nine (9) systems.

The treatment systems will be designed to meet State Title 22 recycled water regulations for tertiary level disinfected recycled water that can be used for unrestricted irrigation and recreational use of the water.

At each water reclamation facility there will be a recycled water storage tank and booster pump system that will pump recycled water into the non-potable water distribution system for landscape irrigation, fire protection and make up water to ornamental water features and ponds.

Each water reclamation plant will cover a relatively small area ranging from less than 1,000 square feet at the Camping Area to the largest area of 12,500 square feet for the largest system that will serve the Maha Farms area. The installation of all the water reclamation plants will require approximately one (1) acre of land. Figure 4 shows the typical layout of a water reclamation plant facility including the treatment plant, storage tank and related parking area.

The water reclamation plants will be placed in areas that are set back from the cluster developments to avoid potential odor and noise issues. The plants will be located close to planned roads to provide easy access to them and to avoid the need to construct long driveways or access roads to serve them. The plants will also be placed in area that will minimize grading and ground disturbance to the extent practical and to avoid impacts to sensitive flora and fauna.

Guenoc Ranch Irrigation Well and Conveyance Line. As previously discussed, the Property Owner (Lotusland Investment Holdings LLC) has purchased an off-site irrigation well in the vicinity of 20740 S. State highway 29 and 20830 S. State Highway 29. This high production well will be used as a primary source of non-potable water to supply irrigation, fire protection and make up water for water features and ponds, if required.

The condition of this well is marginal and appears to be partially filled with sand. Based on this condition the well will either be reconstructed or replaced in-kind. Based on a preliminary review of groundwater conditions at the site, it is likely that the well is constructed in old alluvium deposits derived from old channels of Putah and St. Helena Creek and possibly old lake or wetland deposits. The alluvium is estimated to be approximately 260 to 300 feet deep, and overlays low yielding hard bedrock. Pump test results indicate that the well has a high production capacity measured at 1,100 gallons per minute. A new well would be designed with a relatively large diameter (12-inch) casing and fitted with either a high capacity turbine or submersible style pump to yield high flows over 1,000 gallons per minute.

The well pump system will be connected to a long water conveyance line (8- to 10-inch diameter line) that will run parallel to Butts Canyon Road to convey groundwater to the property site. It is likely that the conveyance line will pump the water to Detert Reservoir.

The existing well is on land currently used for pasture and this use is assumed to continue and the reconstruction or replacement of the well will result in temporary and short-term constructed related localized impacts.

The new water conveyance line will be approximately 6 miles long and will be installed within the public right-of-way along Butts Canyon Road. The pipeline trench will likely be 24-inch wide by 40-inch deep. The construction of the pipeline and trench will require an encroachment permit from the County or State. The conveyance line will be installed in planned roadways where possible and should not result in additional land disturbance and impacts to cultural, historic and biotic resources beyond impacts resulting from the construction of the new roads.

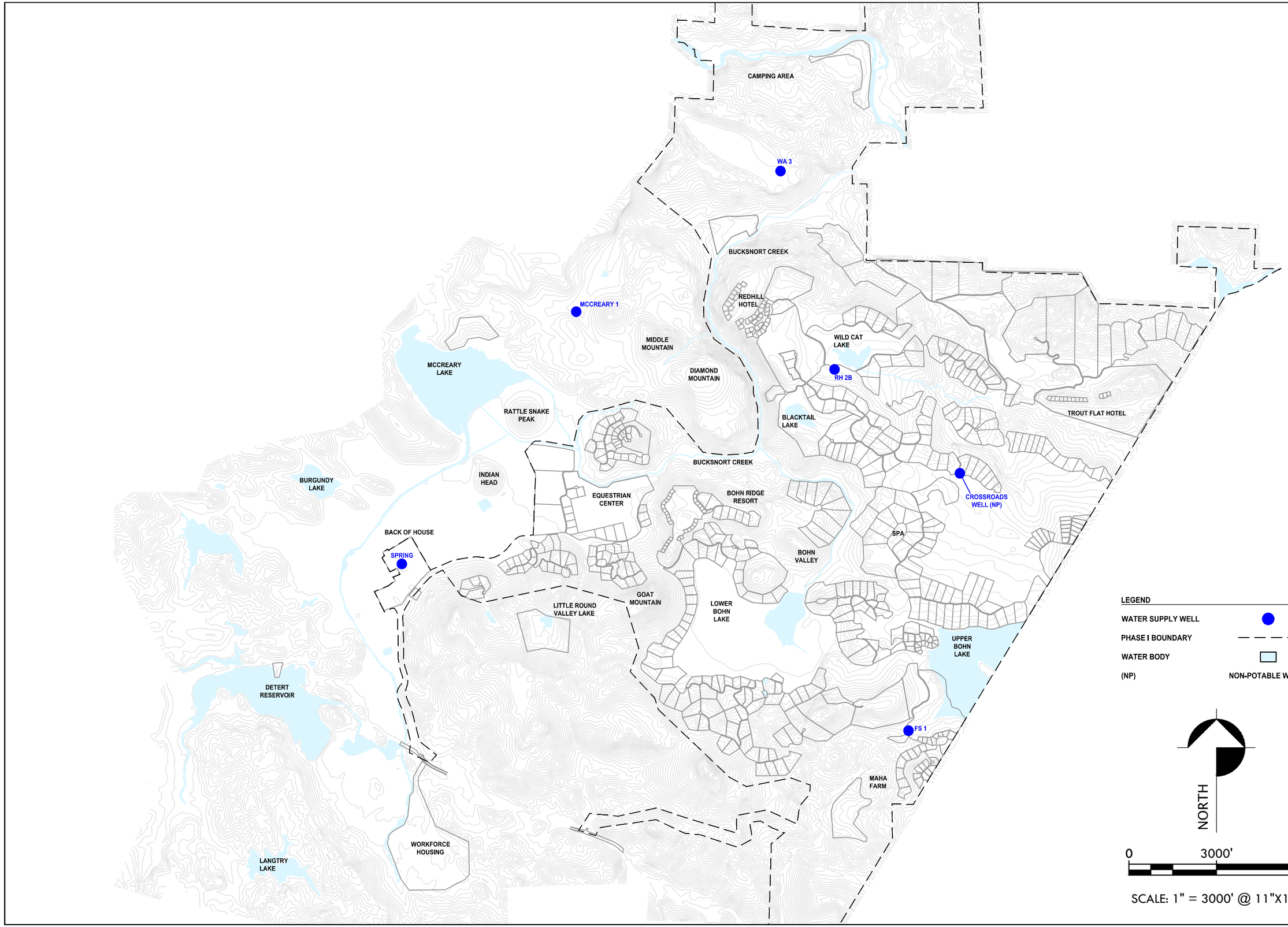

FIGURE 1. PROPOSED LOCATION OF WATER SUPPLY WELLS FOR THE PHASE I PROJECT

SHERWOOD DESIGN ENGINEERS

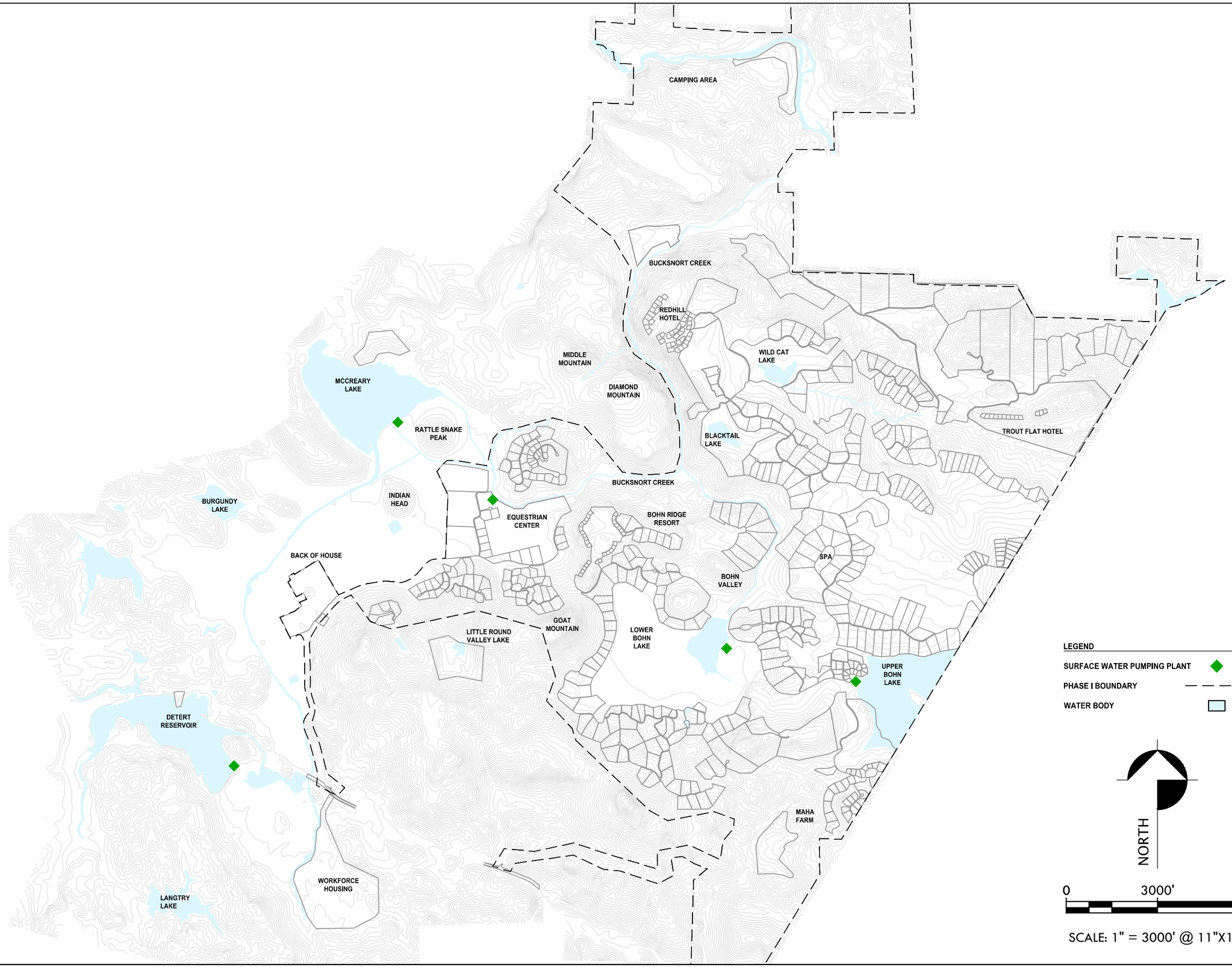

FIGURE 2. PROPOSED LOCATION OF SURFACE WATER PUMPING PLANTS

SHERWOOD DESIGN ENGINEERS

CAMPING AREA
BUCKSNORT CREEK
REDHILL HOTEL
MIDDLE MOUNTAIN
WILD CAT LAKE
MCCREARY LAKE
DIAMOND MOUNTAIN
TROUT FLAT HOTEL
RATTLE SNAKE PEAK
BLACKTAIL LAKE
BUCKSNORT CREEK
BURGUNDY LAKE
INDIAN HEAD
EQUESTRIAN CENTER
BOHN RIDGE RESORT
SPA
BACK OF HOUSE
BOHN VALLEY
GOAT MOUNTAIN
LITTLE ROUND VALLEY LAKE
LOWER BOHN LAKE
UPPER BOHN LAKE
DETERT RESERVOIR
MAHA FARM
WORKFORCE HOUSING
LANGTRY LAKE

LEGEND

WATER RECLAMATION PLANT

PHASE I BOUNDARY

WATER BODY

NORTH

0 3000' 6000'

SCALE: 1" = 3000' @ 11"X17"

FIGURE 3. PROPOSED LOCATION OF WATER RECLAMATION FACILITIES

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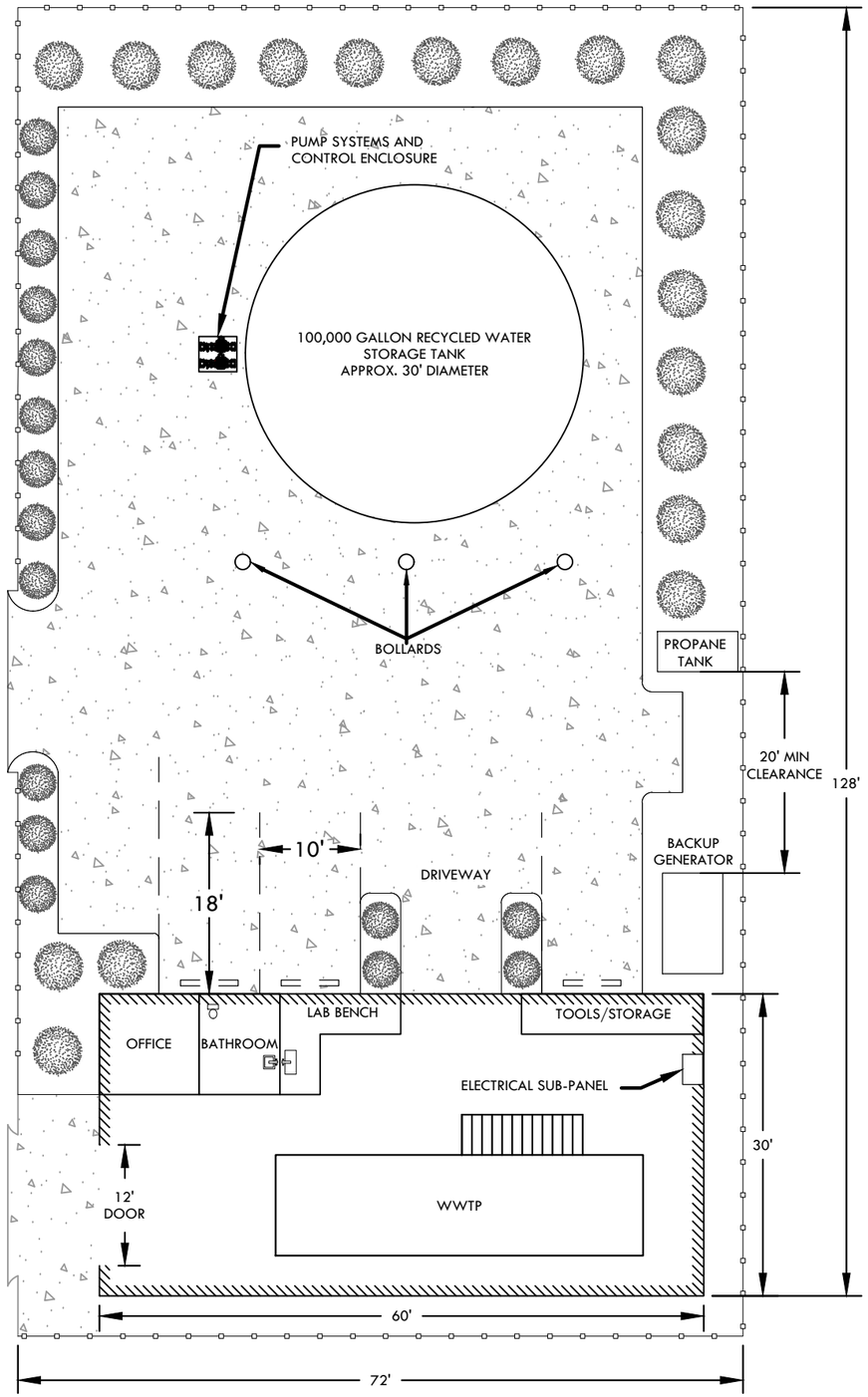
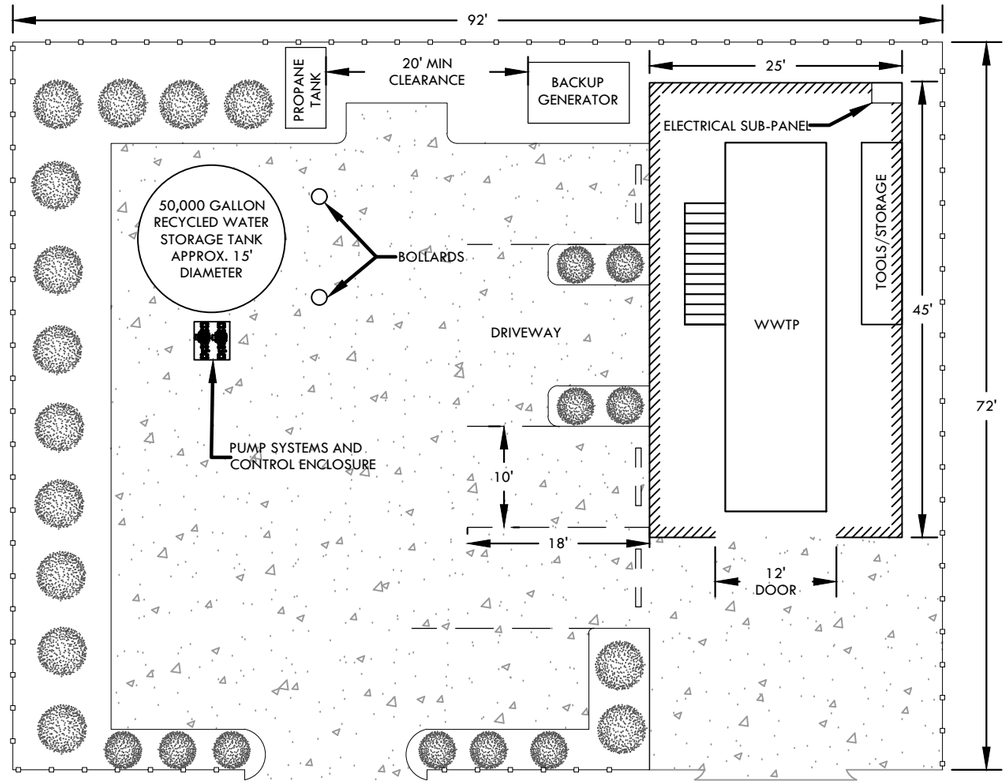


TYPE 1. CAPACITY UP TO 85,000 GALLONS PER DAY



TYPE 2. CAPACITY UP TO 30,000 GALLONS PER DAY

FIGURE 4. TYPICAL WATER RECLAMATION FACILITY LAYOUTS

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APPENDIX WD

AQUATIC RESOURCE DELINEATION REPORT – GUENOC VALLEY SITE

Aquatic Resources Delineation Report

MAHA RESORT AND GUENOC VALLEY DEVELOPMENT, PHASE 1
LAKE COUNTY, CALIFORNIA

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LIST OF ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
Corps	U.S. Army Corps of Engineers
CSRL	California Soil Resource Lab
CWA	Clean Water Act
DEM	Digital Elevation Model
EPA	Federal Environmental Protection Agency
FAC	Facultative Plant
FACU	Facultative Upland Plant
FACW	Facultative Wetland Plant
HTL	High Tide Line
MHW	Mean High Water
NAVD88	North American Vertical Datum of 1988
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
NWPL	National Wetland Plant List
OBL	Obligate Wetland Plant
OHWM	Ordinary High Water Mark
RHA	Rivers and Harbors Act
UPL	Upland Plant
USGS	U.S. Geological Survey
WRA	WRA, Inc.

1.0 INTRODUCTION

This report describes the methods and results of a delineation of aquatic resources within the approximately 5,350-acre Study Area for Phase 1 of the proposed Maha Resort and Guenoc Valley Development located on the approximately 22,695-acre Guenoc Ranch. The Ranch is located in unincorporated Lake and Napa counties, California, with the Phase 1 Study Area occurring entirely within Lake County (Figure 1, Figure 2). The Ranch contains a mix of undeveloped lands, agricultural lands including cattle pastures and vineyards, and minor areas of infrastructure to support vineyard, winery, and cattle operations.

On multiple dates in 2018 and 2019, WRA conducted a routine delineation within the Study Area to identify wetlands and non-wetland waters (also referred to as "other waters") potentially subject to jurisdiction by the U.S. Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act (CWA) and/or Section 10 of the Rivers and Harbors Act (RHA). The following sections describe the regulatory background and methods used to guide the delineation and provide a summary of potentially jurisdictional wetlands and non-wetland waters within the Study Area.

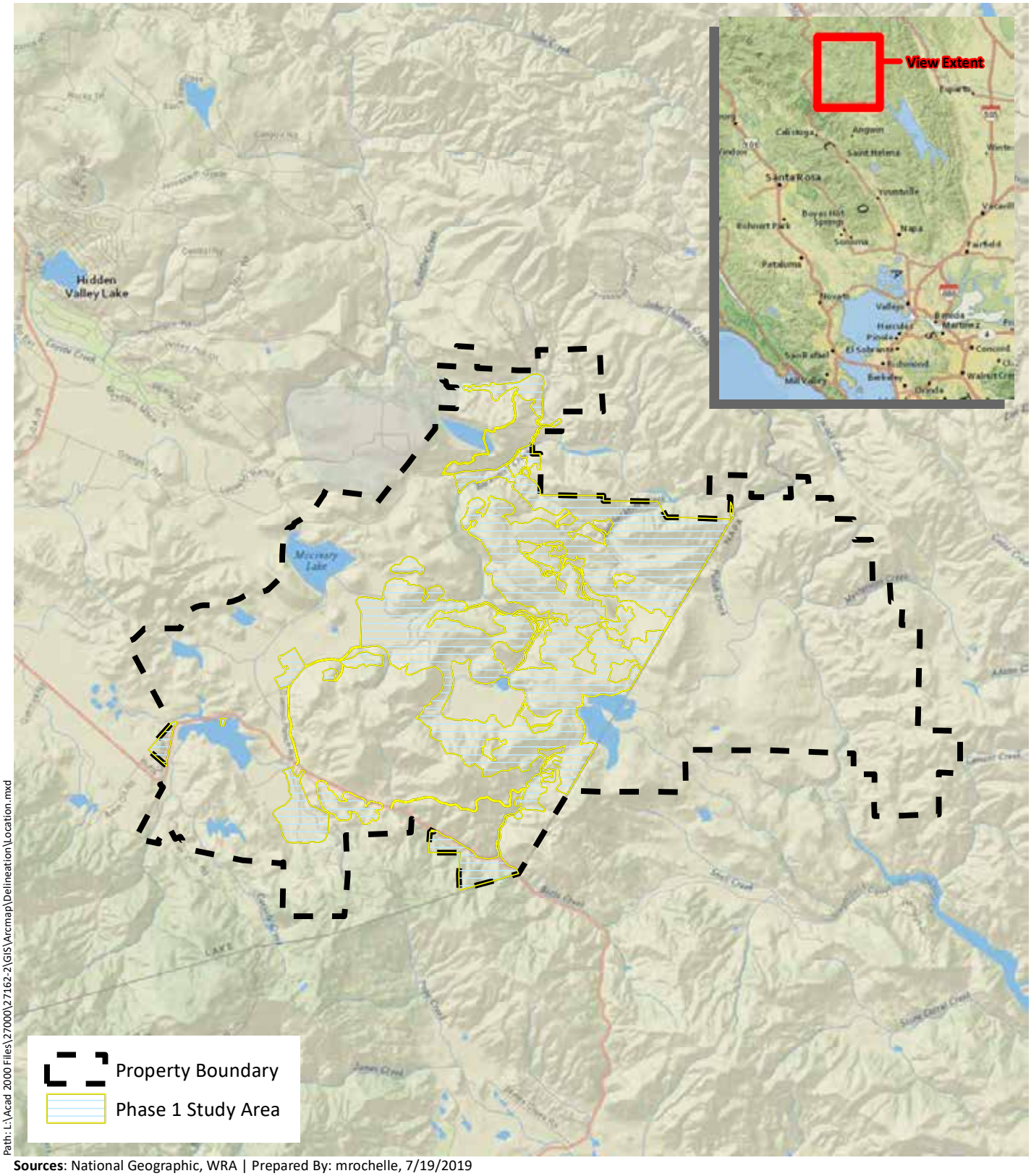
2.0 REGULATORY BACKGROUND

2.1 Section 404 of the Clean Water Act

Section 404 of the Clean Water Act gives the Environmental Protection Agency (EPA) and the Corps regulatory and permitting authority regarding discharge of dredged or fill material into "navigable waters of the United States." Section 502(7) of the CWA defines "navigable waters" as "waters of the United States, including territorial seas." Section 328 of Chapter 33 in the Code of Federal Regulations (CFR) defines the term "waters of the United States" as it applies to the jurisdictional limits of the authority of the Corps under the CWA. A summary of the definition of "waters of the United States" in 33 CFR 328.3 (a) includes (1) waters used for commerce; (2) interstate waters and wetlands; (3) territorial seas; (4) impoundments of waters listed here; (5) tributaries to the above waters; (6) waters and wetlands adjacent to the above waters; and (7) prairie potholes, Carolina and Delmarva bays, pocosins, western vernal pools, and Texas coastal prairie wetlands, provided these features have a significant nexus to the above listed waters[1]; (8) all waters located within the 100-year floodplain of waters listed above in items 1-3 or within 4,000 feet of the high tide line (HTL) or ordinary high water mark (OHWM) of a water listed above in items 1-5, provided those waters are determined to have a significant nexus to waters identified in items 1-3 above. For purposes of the determining Corps jurisdiction under the CWA, "navigable waters" as defined in the CWA are the same as "waters of the U.S." defined in 33 CFR 328.3.

Areas not considered to be "waters of the United States" as defined in 33 CFR 328.3 (b), are summarized as follows: (1) waste treatment systems; (2) prior converted cropland; (3) specific classes of ditches, including (i) ditches with ephemeral flow that are not a relocated tributary or excavated in a tributary, (ii) ditches with intermittent flow that are not a relocated tributary, excavated in a tributary, or drain wetlands, and (iii) ditches that do not flow, either directly or through another water, into a water identified in 33 CFR 328.3 paragraphs (a) (1) through (3);

[1] Wetlands and non-wetland waters in this category are similarly situated and are combined, for purposes of a significant nexus analysis, in the watershed that drains to the nearest water identified in paragraphs (a)(1) through (3) of 33 CFR 328.3.



Sources: National Geographic, WRA | Prepared By: mrochelle, 7/19/2019

Figure 1. Phase 1 Study Area Location

Maha Resort and Guenoc Valley
Development, Phase 1
Lake County, California

0 1 2 Miles

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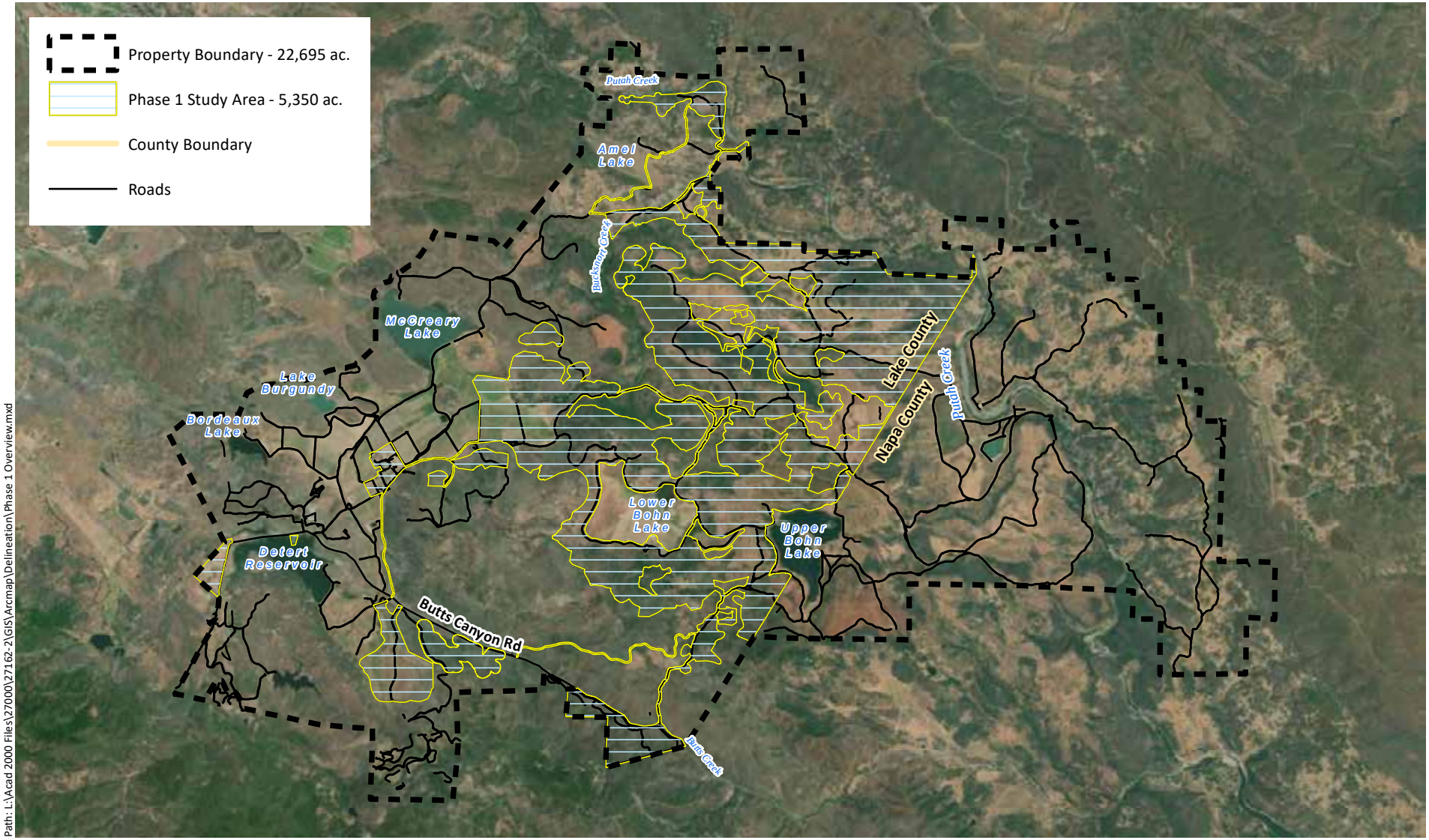

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Sources: Esri Streaming - NAIP 2016, WRA | Prepared By: mrochelle, 7/19/2019

Figure 2. Phase 1 Study Area Overview

Maha Resort and Guenoc Valley
Development, Phase 1
Lake County, California

0 1 2 Miles

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(4) artificially irrigated areas that would otherwise revert to dry land and manmade aquatic features in otherwise dry land such as stock watering ponds, irrigation ponds, settling basins, fields flooded for rice growing, log cleaning ponds, cooling ponds, reflecting pools, swimming pools, small ornamental waters, depressions incidental to mining and construction activity, erosional features, and puddles; (5) groundwater; (6) stormwater control features; (7) wastewater recycling structures, groundwater recharge basins, percolation ponds for wastewater recycling, and distribution networks for wastewater recycling.

2.1.1 Wetlands

Wetlands are defined in 33 CFR 328.3 (c) as:

> *…those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.*

The basis for determining whether a given area is a wetland for the purposes of Section 404 of the CWA is outlined in the Corps *Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers* Delineation Manual for the respective region. As defined in 33 CFR 328.4 (c), the extent of federal jurisdiction within wetlands is defined as extending to the limit of the wetland as determined using the methods outlined in the manuals.

2.1.2 Non-Wetland Waters

The limit of federal jurisdiction in tidal non-wetland waters extends to the HTL which is defined in 33 CFR 328.4 (a) as:

> *...the line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.*

The limit of federal jurisdiction in non-tidal non-wetland waters extends to the OHWM which is defined in 33 CFR 328.3 (e) as:

> *...that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impresses on the bank, shelving, changes in the characteristics of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.*

2.2 Section 10 of the Rivers and Harbors Act

The Corps also has jurisdiction over "navigable waters" under Section 10 of the Rivers and Harbors Act of 1899. Section 10 of this Act applies to tidal areas below mean high water (MHW) and includes tidal areas currently subject to tidal influence, as well as historic tidal areas behind levees that both historically and presently reside at or below MHW. "Navigable waters of the U.S.", as defined in 33 CFR 329.4, are "those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce."

The act prohibits any unauthorized action that obstructs navigable capacity. These actions can include building of structures; excavation, fill; and alterations and modifications to navigable waters (33 USC 403). A determination of navigability, once made, applies laterally over the entire surface of the waterbody, and is not extinguished by later actions or events which impede or destroy navigable capacity. The upper limit of navigable water is at the point along its length where the character of the river changes from navigable to non-navigable, such as at a major fall or rapids. Since the upper limit of navigability of waterways under Section 10 is sometimes difficult to discern, determinations of navigability under Section 10 are often made by the Corps and kept on file, independent of submitted permit applications or delineations.

3.0 STUDY AREA DESCRIPTION

3.1 Land Use

Guenoc Ranch is an approximately 22,695-acre property located in unincorporated Lake and Napa counties, approximately 6 miles southeast of the town of Middletown (Figure 1). The property contains a mix of undeveloped lands, agricultural lands including cattle pastures and vineyards, and minor areas of infrastructure to support vineyard, winery, and cattle operations. The property is bounded to the north by the U.S. Coast Guard LORAN Reservation, Putah Creek, and the Cedars mountain range; to the east by Putah Creek and Mysterious Valley; to the south by Table Mountain and the Pope Valley; and to the west by Long Valley and Coyote Valley.

The approximately 5,350-acre Phase 1 Study Area that was examined for this report contains a subset of Guenoc Ranch that occurs entirely within Lake County. The location and extent of the Phase 1 Study Area is shown on Figure 2.

3.2 Vegetation

The Study Area is located within the Inner North Coast Ranges geographic subdivision described by the Jepson Flora Project (2019). This area is characterized by widespread serpentine and volcanic soils experiencing relatively low rainfall and hot, dry summers; the resulting vegetation is dominated by a mix of chaparral, foothill pine woodland, and blue oak woodland, with grasslands in valley bottoms and alluvial positions. As is the case with Guenoc Ranch, many of the valley bottoms and alluvial positions throughout the region have been converted for grazing lands, vineyards, or other agricultural uses.

The Study Area is dominated by a mix of blue oak woodland, foothill pine woodland, chamise chaparral, scrub and leather oak chaparral, and non-native annual grasslands, with other communities and specific plant communities present over smaller areas. The large number of ponds, reservoirs, and major streams on the property have also resulted in a large amount of

wetlands and wet meadow features. Many of these features have been historically altered to support ranching and agricultural activities.

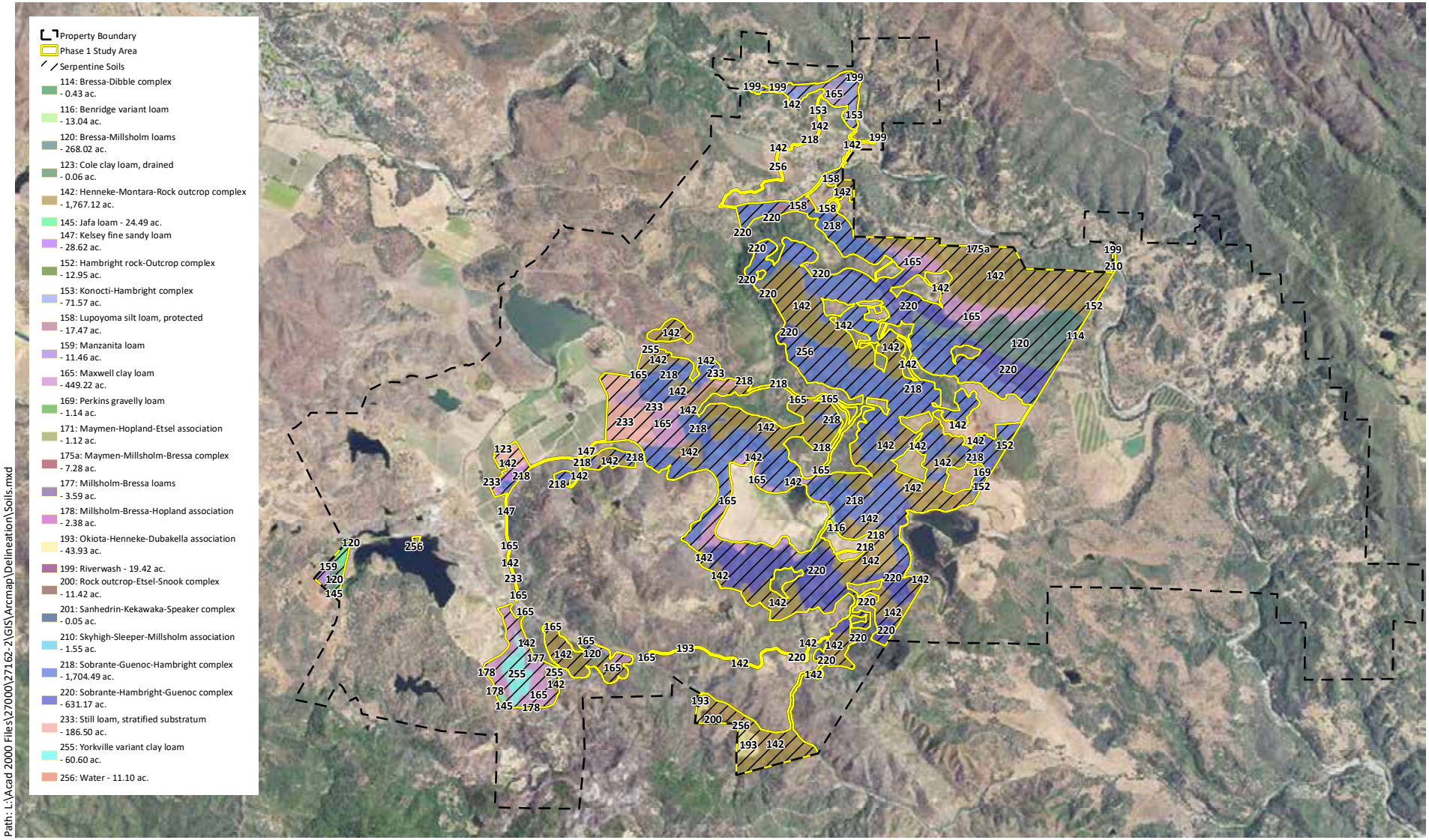
The Study Area contains a large area of serpentine soils dominated by a mix of foothill pine woodland and chaparral communities. These serpentine habitats have a high concentration of native plant species compared to adjacent habitats on non-serpentine soils which are dominated by blue oak woodlands with a high concentration of non-native and invasive species in the understory. Serpentine habitats within the Study Area also contain a high concentration of special-status plant species.

Portions of the Study Area burned during the Valley Fire of 2015. In some areas, the burn was light and the pre-fire vegetation was not completely destroyed. In other areas, the burn was severe and the pre-fire vegetation was killed. In these areas, vegetation that was once dominated by foothill pine woodland or other woodland types has transitioned to shrub-dominated habitats such as scrub or leather oak chaparral. It is anticipated that vegetation in burn-affected areas will transition through a number of stages over the coming years to decades.

3.3 Soils

Guenoc Ranch contains a variety of geologic substrates including ultramafic rocks (primarily serpentinite, with minor inclusions of peridotite, gabbro, and diabase), rocks of the Franciscan complex (primarily sandstone with smaller amounts of shale, chert, limestone, and conglomerate), and volcanic flow rocks of the Clear Lake Volcanic Field (volcanic flow rocks with minor pyroclastic deposits, primarily andesite with minor amounts of dacite and basalt) (USGS 2017).

Soils mapped within Guenoc Ranch are shown on Figure 3. A list of soils and their acreages within the Study Area, as well as their parent material, is provided as Table 1. (CSRL 2018; USDA 1989). The ultramafic, or serpentine, origin of many of the soils found within the Study Area results in a unique physical and chemical composition that hinders the growth of most species that have not evolved on these soil types. As a result, serpentine soils harbor unique native plant assemblages that are resistant to invasion by non-native species and often support numerous special-status plants that are restricted to serpentine soils (Kruckeberg 1984; Alexander et al. 2007).



Sources: Esri Streaming - NAIP 2016, SURGGO Soils, WRA | Prepared By: mrochelle, 7/19/2019

Figure 3. Soils within the Phase 1 Study Area

Maha Resort and Guenoc Valley
Development, Phase 1
Lake County, California

0 1 2 Miles

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Table 1. Soil Units Mapped within the Phase 1 Study Area

Soil Map Unit	Parent Material	Acres
Benridge variant loam, 2 to 15 percent slopes	Basalt	13.04
Bressa-Dibble complex, 30 to 50 percent slopes	Sandstone and shale	0.43
Bressa-Millsholm loams, 8 to 30 percent slopes	Sandstone	268.02
Cole clay loam, dained	Mixed alluvium	0.06
Hambright rock-Outcrop complex, 30 to 75 percent slopes	Basic volcanic rock	12.95
Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes	Serpentine	1,767.12
Jafa loam, 2 to 15 percent slopes	Mixed alluvium	24.49
Kelsey fine sandy loam	Mixed alluvium	28.62
Konocti-Hambright complex, 15 to 30 percent slopes	Basalt	71.57
Lupoyoma silt loam, protected	Mixed alluvium	17.47
Manzanita loam, 2 to 5 percent slopes	Mixed alluvium	11.46
Maxwell clay loam, 0 to 8 percent slopes	Serpentine	449.22
Maymen-Hopland-Etsel association, 15 to 50 percent slopes	Sandstone and shale	1.12
Maymen-Millsholm-Bressa complex, 30 to 50 percent slopes	Sedimentary rock	7.28
Millsholm-Bressa loams, 30 to 50 percent slopes	Sandstone and shale	3.59
Millsholm-Bressa-Hopland association, 30 to 50 percent slopes	Sandstone and shale	2.38
Okiota-Henneke-Dubakella association, 15 to 50 percent slopes	Serpentine	43.93
Perkins gravelly loam, 5 to 9 percent slopes	Igneous rock	1.14
Riverwash	Mixed alluvium	19.42
Rock outcrop-Etsel-Snook complex, 50 to 80 percent slopes	Igneous, metamorphic, and sedimentary rocks	11.42
Sanhedrin-Kekawaka-Speaker complex, 15 to 30 percent slopes	Sandstone	0.05
Skyhigh-Sleeper-Millsholm association, 8 to 15 percent slopes	Sandstone and shale	1.55

Soil Map Unit	Parent Material	Acres
Sobrante-Guenoc-Hambright complex, 2 to 30 percent slopes	Basalt	1,704.49
Sobrante-Hambright-Guenoc complex, 30 to 50 percent slopes	Basalt	631.17
Still loam, stratified substratum	Sandstone and shale	186.50
Yorkville variant clay loam, 2 to 8 percent slopes	Serpentine	60.60
Water	n/a	11.10
	Total:	5,350.20

3.4 Hydrology

Guenoc Ranch experiences a Mediterranean climate, with cool, wet winters and hot, dry summers. Average annual rainfall is approximately 43 inches, as measured at the Natural Resources Conservation Service (NRCS) weather station in Middletown, approximately 3.5 miles to the west of the site. The majority of rain falls between November and March. Average annual temperature is 51 degrees Fahrenheit, as measured at the NRCS weather station in Clear Lake, approximately 10 miles to the northwest of the property. The average summer temperature (June through August) is 71 degrees Fahrenheit; the average winter temperature (December through February) is 44 degrees. Nearly all precipitation falls as rain.

Guenoc Ranch is located entirely within the Putah Creek watershed which drains into Lake Berryessa, located approximately 8 miles to the southeast of the property. The property contains significant hydrologic resources, with a large network of ponds and reservoirs connected by perennial to intermittent streams and agricultural ditches and channels. Putah Creek, a perennial stream, runs along the northern and eastern portions of the property, and many of the drainages within the property drain into Putah Creek. Other major creeks within the property include Bucksnort Creek, Butcherknife Creek, Hunting Creek, Butts Creek, and Cassidy Creek. Major ponds and reservoirs within the Property include Detert Reservoir, McCreary Lake, Lake Burgundy, Lake Bordeaux, Upper Bohn Lake, Lower Bohn Lake, and Amel Lake.

4.0 METHODS

WRA biologists performed a delineation of aquatic resources within the Phase 1 Study Area on multiple dates between 2018 and 2019. Prior to conducting the evaluation, WRA reviewed a range of background materials including the *Soil Survey of Lake County* (USDA 1989), the California Soil Resource Lab's (CSRL) online soil viewer (CSRL 2019), the National Wetland Inventory (NWI; USFWS 2019), and the U.S. Geological Survey (USGS) Jericho Valley, Detert Reservoir, and Aetna Springs 7.5-minute quadrangle maps. WRA also reviewed historic aerial imagery from Google Earth (2019).

During the on-site evaluation, WRA followed the methods outlined in *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Corps Manual; Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Arid West Supplement; Corps 2008), and *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* ("OHWM Guide"; Lichvar and McColley 2008). The jurisdictional wetlands were identified and their boundaries mapped using the Routine Method described in the Corps Manual. The jurisdictional limits of non-wetland waters under Section 404 of the CWA were mapped based on a combination of field indicators described in the OHWM Guide and Regulatory Guidance Letter 05-05 (Corps 2005).

4.1 Section 404 of the Clean Water Act

4.1.1 Wetlands

Routine Method

WRA followed the Routine Method to evaluate the Study Area for the presence or absence of indicators of the three wetland parameters described in the Corps Manual (Environmental Laboratory 1987) and Arid West Supplement (Corps 2008). Data on vegetation, hydrology, and soils were collected at sample points within potential wetland communities and adjacent upland areas. Sample points that contained positive indicators for hydrophytic vegetation, hydric soils, and wetland hydrology were considered to be wetland. Except in cases of atypical or problematic wetland situations (i.e., difficult wetland situations, as described below), sample points that lacked one or more indicators were considered to be upland. Sample point data were reported on Arid West Supplement data forms. Sample point locations were recorded using a handheld GPS unit with sub-meter accuracy.

Wetland boundaries were identified using a combination of indicators observed on the ground, most often minor shifts in topography and changes in dominant vegetation, in addition to other indicators. Where wetland boundaries were broad and difficult to determine in the field, wetland signatures visible in recent and historical aerial imagery from Google Earth and high resolution aerial imagery from April to August 2016 acquired from Hexagon were used to determine boundaries. Based on a WETS hydrological analysis (see summary below and full analysis in Appendix A), WRA determined that the photos represent periods with normal precipitation levels. Using imagery from normal periods allowed WRA to identify the normal extent of wetland conditions across the site.

WRA also utilized high resolution topographic data derived from the USGS Lake County Lidar date set (USGS 2017). The Lidar data was processed into a Digital Elevation Model (DEM) raster with a horizontal resolution of 1 ft. x 1 ft. using ArcGIS software. The high resolution aerial imagery and elevation data were utilized during heads-up digitizing to refine wetland and stream boundaries.

Difficult Wetland Situations

The Arid West Supplement (Corps 2008) includes recommended procedures for completing wetland delineations in areas of “difficult wetland situations” in which wetlands may lack one or more indicators due to natural or anthropogenic factors. Although the Corps Manual and Arid West Supplement were utilized in the wetland determination, they do not provide exhaustive lists of the difficult situations and problem areas that can arise during delineations in the Arid West. In these situations, the Corps Manual and Regional Supplements stress the importance of using best professional judgment and knowledge of the ecology of the wetlands in the region during the collection and interpretation of data in difficult sites.

Difficult wetland situations within the Phase 1 Study Area included (1) the presence of reed fescue (*Festuca arundinacea*, FACU) displaying morphological adaptations to wetlands (i.e., hummocky growth to elevate the plants above the saturated zone) and (2) the presence of dark (N 2.5/0) serpentine soils that may mask redox features. When reed fescue was observed displaying morphological adaptations to saturated soils, it was reclassified from FACU to FAC and the dominance test was recalculated following the morphological adaptations guidance from the Arid West Manual. When dark soils were encountered with no apparent redoximorphic features, they were assumed to be upland soils when hydrophytic vegetation and wetland hydrology were absent and were assumed to be hydric soils when hydrophytic vegetation and wetland hydrology were present.

WETS Analysis

A hydrologic analysis (i.e., WETS analysis; USDA 1997; Sprecher and Warne 2000) was conducted to determine whether precipitation levels during the three months prior to each aerial image used by WRA and prior to each site visit were above, below, or within the 30-year average for the region. Long-term precipitation data (i.e., the WETS table) were obtained from weather stations in nearby Middletown, located approximately 6 miles west of the Study Area, and Clear Lake, located approximately 10 miles northwest of the Study Area, part of the National Weather Service Cooperative Network. Daily precipitation data for the three months preceding the date of each aerial image used by WRA, as well as for the date of each site visit by WRA, were obtained from the Middletown 0.1P weather station located approximately 6 miles west of the Study Area. A summary of the results of the WETS analysis is provided below in Table 2; the full analyses are provided as Appendix A.

Table 2. Summary of WETS Precipitation Analysis

Date	Description	Relative Precipitation Levels
May 2016	Date of commercial aerial imagery	Normal rainfall
June 2016	Date of commercial aerial imagery	Normal rainfall
July 2016	Date of commercial aerial imagery	Normal rainfall
August 2016	Date of commercial aerial imagery	Normal rainfall
May 1-4, 2018	Delineation site visit	Normal rainfall
May 30-June 1, 2018	Delineation site visit	Above normal rainfall
August 21-22, 2018	Delineation site visit	Normal rainfall
September 6-7, 2018	Delineation site visit	Normal rainfall
April 24-26, 2019	Delineation site visit	Above normal rainfall
May 2-3, 2019	Delineation site visit	Above normal rainfall
May 7-9, 2019	Delineation site visit	Above normal rainfall
June 17, 2019	Delineation site visit	Above normal rainfall
June 20, 2019	Delineation site visit	Above normal rainfall

4.1.2 Non-Wetland Waters

This study also evaluated the presence of non-wetland waters potentially subject to Corps jurisdiction under Section 404 of the CWA. Non-wetland waters subject to Corps jurisdiction include lakes, rivers, and streams (including intermittent and ephemeral streams).

The OHWM was used to identify the extent of Corps jurisdiction over non-wetland waters under Section 404 of the CWA. The location of the OHWM was determined based on a combination of indicators observed on the ground (e.g., water stains or scour marks). The width between the OHWM on either side of each feature was visually estimated in the field and, when possible, the segments of the centerline or edges were mapped using handheld GPS units with sub-meter accuracy.

4.2 Section 10 of the Rivers and Harbors Act

To determine the presence of non-wetland waters potentially subject to Corps jurisdiction under Section 10 of the RHA, WRA reviewed the online mapping tool hosted on the Corps Sacramento District's website[2]. Based on the mapper, no non-wetland waters within the Study Area are subject to Corps jurisdiction under Section 10 of the Rivers and Harbors Act.

5.0 RESULTS

As described in Section 3.0, the property contains significant hydrologic resources, with a large network of ponds and reservoirs connected by perennial to intermittent streams and agricultural ditches and channels. The entirety of the Study Area is located within the watershed of Putah Creek, which ultimately drains into the Sacramento River, a traditional navigable water of the United States.

Descriptions of the aquatic resources identified within the Study Area that are potentially subject to federal jurisdiction under Section 404 of the CWA are provided in the following sections. A summary of aquatic resource acreages is provided in Table 3. WETS analyses for aerial imagery and fieldwork dates are included as Appendix A. Maps showing the location and extent of aquatic resources mapped within the Study Area are provided as Appendix B. Wetland Determination Data Forms are provided as Appendix C. Photographs of the Study Area are provided as Appendix D. A list of all plant species observed during the delineation site visits is included as Appendix E.

[2] http://www.spk.usace.army.mil/Missions/Regulatory/Jurisdiction/Navigable-Waters-of-the-US/

Table 3. Summary of Potentially Jurisdictional Features Mapped within the Study Area

Habitat Type	Classification*	Acres	Linear Feet
Wetlands			
Forested Wetlands	PFO1E	0.61	-
Scrub-Shrub Wetlands	PSS1C	1.15	-
Seasonal Wetland Depressions	PEM2C	2.53	-
Seasonal Wetland Ditches	PEM2Cx	0.50	-
Seasonal Wetland Pond Fringes	PEM1/2C	3.52	-
Seasonal Wetland Seeps/Swales	PEM2C	42.40	-
Seasonal Wetland Wet Meadows	PEM2C	45.46	-
Stream Fringe/In-Stream Wetlands	R4SB7	26.15	-
	Total Wetlands:	**122.74**	**-**
Non-Wetland Waters			
Ephemeral Ditch	R4SBA/Cx	0.25	6,419
Ephemeral Stream	R4SBA	20.73	301,130
Intermittent Stream	R4SBC	13.68	61,795
Perennial Stream	R5UBF/H	23.63	26,039
Open Waters	PUBK	10.70	-
	Total Non-Wetland Waters:	**68.99**	**395,383**
	Grand Total Wetlands and Non-Wetland Waters:	**191.31**	**395,383**

*See Federal Geographic Data Committee 2013

5.1 Section 404 of the Clean Water Act

5.1.1 Wetlands

Forested Wetlands

Within the Study Area, forested wetlands occur along a low-gradient portion of Butcherknife Creek, where a stand of trees was present. In the overstory, vegetation was dominated by white alder (*Alnus rhombifolia*; FACW). In the understory, vegetation was dominated by torrent sedge (*Carex nudata*; FACW), tule (*Schoenoplectus acutus* ssp. *occidentalis*; OBL), reed fescue (*Festuca arundinacea*; FACU), and dallis grass (*Paspalum dilatatum*; FAC). Hydric soils were assumed based on the presence of perennial surface water and the fact that hydrophytic vegetation and several indicators of wetland hydrology were met. Primary indicators of wetland

hydrology included Surface Water (A1), High Water Table (A2) (assumed based on perennial surface water), and Saturation (A3); secondary indicators included Water Marks (Riverine) (B1), Drift Deposits (Riverine) (B2), and FAC-Neutral Test (D5). Wetland boundaries were determined based primarily on the edge of tree canopy.

Forested wetlands were classified as PFO1E: Palustrine (P), forested (FO), broad-leaved deciduous (1), and seasonally flooded/saturated (E).

Scrub-Shrub Wetlands

Within the Study Area, scrub-shrub wetlands occurred along low-gradient portions of Butts Creek, where shrub stands were present. In the shrub layer, the vegetation was dominated by Brewer's willow (*Salix breweri*; FAC), with other species such as coffeeberry (*Frangula californica*; NL), spice bush (*Calycanthus occidentalis*; FAC), and western azalea (*Rhododendron occidentale*; FAC) as co-dominants. In the herbaceous layer, the vegetation was typically sparse and included species such as cobwebby hedge nettle (*Stachys albens*; OBL) and seep monkeyflower (*Mimulus guttatus*; OBL). Hydric soils were assumed based on the extended presence of surface water and the fact that hydrophytic vegetation and several indicators of wetland hydrology were met. Primary indicators of wetland hydrology included Surface Water (A1), High Water Table (A2) (assumed based on perennial surface water), and Saturation (A3); secondary indicators included Water Marks (Riverine) (B1), Drift Deposits (Riverine) (B2), and FAC-Neutral Test (D5). Wetland boundaries were determined primarily based on the edge of the shrub canopy.

Scrub-shrub wetlands were classified as PSS1CE: Palustrine (P), scrub-shrub (SS), broad-leaved deciduous (1), and seasonally flooded (C) or seasonally flooded/saturated (E).

Seasonal Wetland Depressions

Features in the seasonal wetland depressions category are closed depressions that are seasonally inundated by surface runoff and groundwater and are situated outside of other aquatic features. Seasonal wetland depressions are numerous within the former golf course within the western portion of the Study Area but are otherwise infrequent and scattered within the Study Area. Vegetation was dominated by spike rush (*Eleocharis macrostachya*; OBL), hairy cats ear (*Hypochaeris radicata*; FACU), annual beard grass (*Polypogon monspeliensis*; FACW), meadow barley (*Hordeum brachyantherum*; FACW), valley sedge (*Carex barbarae*; FAC), and broadleaf cattail (*Typha latifolia*; OBL). Soils were generally loam with matrix colors of dark brown (7.5YR 3/3) or dark reddish brown (5YR 3/3), or clay with colors of very dark gray (2.5Y 3/1), very dark greenish gray (10Y 3/1), and black (10YR 2/1, 2.5Y 2.5/1), and redoximorphic features consisting of black (7.5YR 2/1) manganese concentrations and yellowish red (5YR 4/6) and olive (5Y 4/4) iron concentrations at 2 to 5 percent cover as masses in the matrix. Soils met the Redox Dark Surface (F6) hydric soil indicator, and in several situations, the problematic hydric soil indicator. At SP-116, the dark reddish brown matrix may have been masking redoximorphic concentrations, hydrophytic vegetation and wetland hydrology indicators were met, and the feature was a shallow, seasonally ponded depression. At SP-124 and SP-126, the dark serpentine soils may have masked redoximorphic features, hydrophytic vegetation and wetland hydrology indicators were met, and the feature was a shallow, seasonally ponded depression. Indicators of wetland hydrology consisted of primary indicators including High Water Table (A2), Saturation (A3), Inundation Visible on Aerial Imagery (B7), and Biotic Crust (B12), Redox Dark Surface (F7); secondary indicators of wetland hydrology included Saturation Visible on Aerial Imagery (C9) and FAC-Neutral Test (D5). Wetland boundaries were determined based on a shift in vegetation and topography.

Seasonal wetland depressions were classified as PEM2C: Palustrine (P), emergent (EM), non-persistent (2), and seasonally flooded (C).

Seasonal Wetland Ditches

Features in the seasonal wetland ditch category are man-made, linear ditch features that are adjacent and parallel to roads and are designed to convey surface water. These features are seasonally inundated and/or saturated for a duration sufficient to support wetland conditions. Seasonal wetland ditches are infrequent and scattered within the Study Area. Vegetation was dominated by Italian rye grass, reed fescue, and annual beard grass. Hydric soils were assumed based on the summer presence of surface water and saturated soils and the fact that hydrophytic vegetation indicators were met. Indicators of wetland hydrology included Surface Water (A1), Saturation (A3), and High Water Table (A2). Wetland boundaries were determined based on a shift in vegetation and topography.

Seasonal wetland ditches were classified as PEM2Cx: Palustrine (P), emergent (EM), non-persistent (2), seasonally flooded (C), and excavated (x).

Seasonal Wetland Pond Fringes

Features in the seasonal wetland pond fringes category are located adjacent to and directly connected to bodies of open water such as ponds and reservoirs. These features are typically inundated when the bodies of open water at are their seasonal maximum extent and dry down as the open water feature dries down. Seasonal wetland pond fringes are infrequent and scattered throughout the Study Area. Vegetation was dominated by spikerush, annual beard grass, variegated clover (*Trifolium variegatum*; FAC), Mediterranean barley (*Hordeum marinum*; FAC), Jepson's button celery (*Eryngium aristulatum* var. *aristulatum*; OBL), soft chess (*Bromus hordeaceus*; FACU), and broadleaf cattail. Soils were generally loamy clay or cobbly loam with matrix colors of olive gray (5Y 4/2) or dark brown (7.5YR 3/2) and redoximorphic features consisting of olive (5Y 5/6) dark reddish brown (5YR 3/4) iron concentrations and black (N2.5/-) manganese concentrations occurring as masses within the matrix or along pore linings at 2 to 4 percent. Soils most often met the Depleted Matrix (F3) and Redox Dark Surface (F6) hydric soil indicators. Primary indicators of wetland hydrology included Inundation Visible on Aerial Imagery (B7), Water-Stained Leaves (B9) Biotic Crust (B12), and Oxidized Rhizospheres Along Living Roots (C3); secondary indicators included Saturation Visible on Aerial Imagery (C9) and FAC-Neutral Test (D5). Wetland boundaries were determined based on a shift in vegetation and topography.

Seasonal wetland pond fringes were classified as PEM1/2C: Palustrine (P), emergent (EM), persistent (1) to non-persistent (2), and seasonally flooded (C).

Seasonal Wetland Seeps/Swales

Features in the seasonal wetland seeps/swales category are typically shallow, linear, open depressions that convey flows but lack OHWM indicators and remain inundated and/or saturated for a duration sufficient to support wetland conditions. This category also includes seeps situated on slopes that support wetland conditions but are not linear depressions. Seasonal wetland seeps/swales may occur singularly or as part of a network of aquatic features such as ephemeral drainages or other swales and can occur as part of a network. These features are abundant throughout the Study Area, regardless of slope, aspect, or vegetation type. Vegetation was

dominated by species such as Mexican rush, iris-leaved rush (*Juncus xiphioides*; OBL), reed fescue, Mediterranean barley, bird's-foot trefoil (*Lotus corniculatus*; FAC), Bermuda grass (*Cynodon dactylon*; FACU), bifid sedge (*Carex serratodens*; FACW), marsh zigadenus (*Toxicoscordion fontanum*; OBL), and Italian ryegrass. Soils were generally loams, loamy clays, or clays with matrix colors of very dark gray (2.5Y 3/1), dark olive gray (5Y 3/2), black (5Y 2.5/1, 10YR 2/1, 2.5Y 2.5/1), and very dark grayish brown (10YR 3/2) and redoximorphic features consisting of brown (7.5YR 4/4), strong brown (7.5YR 4/6), dark yellowish brown (10YR 3/4, 10YR 3/6) iron concentrations occurring in the matrix and along pore linings as soft masses at 5 to 30 percent. Soils most often met the Redox Dark Surface (F6) hydric soil indicator. In some cases, the problematic hydric soil indicator was met because the dark serpentine soils may have masked redoximorphic features, hydrophytic vegetation and wetland hydrology indicators were met, and the feature was in an area that seasonally ponded. Primary indicators of wetland hydrology included Surface Water (A1), Saturation (A3), Biotic Crust (B12), and Oxidized Rhizospheres Along Living Roots (C3); secondary indicators included Saturation Visible on Aerial Imagery (C9) and FAC-Neutral Test (D5). Wetland boundaries were most commonly determined based on a shift in vegetation and topography.

Seasonal wetland seeps/swales were classified as PEM2C: Palustrine (P), emergent (EM), non-persistent (2), and seasonally flooded (C).

Seasonal Wetland Wet Meadows

Features mapped as seasonal wetland wet meadows are broad, flat to gently sloping, non-depressional areas characterized by herbaceous vegetation that support wetland conditions. These features often occur in valley bottoms or in flats at the bases of slopes and may intergrade with or have direct connection with other aquatic features. They vary in size from less than 0.5 acre to as much as approximately 11 acres. Within the Study Area, seasonal wetland wet meadows are infrequent and scattered. Vegetation was dominated by spikerush, wild licorice (*Glycyrrhiza lepidota*; FAC), Italian ryegrass (*Festuca perennis*; FAC), Mediterranean barley, curly dock (*Rumex crispus*; FAC, cobwebby hedge nettle, Mexican rush (*Juncus mexicanus*; FACW), and reed fescue. Soils were clay or clay loam with matrix colors of black (5Y 2.5/1, 10YR 2/1), dark grayish brown (10YR 4/2), very dark gray (7.5YR 3/1) with redoximorphic features consisting of dark reddish brown (5YR 3/4), strong brown (7.5YR 4/6), and dark brown (7.5YR 3/3) iron concentrations occurring as soft masses in the matrix and along pore linings at 5 to 20 percent. Soils most often met the Redox Dark Surface (F6) and Depleted Matrix (F3) hydric soil indicator. In some cases, the problematic hydric soil indicator was met because the dark serpentine soils may have masked redoximorphic features, hydrophytic vegetation and wetland hydrology indicators were met, and the feature was in an area that seasonally ponded. Primary indicators of wetland hydrology include Surface Water (A1), Oxidized Rhizospheres Along Living Roots (C3); secondary indicators include Drainage Patterns (B10), FAC-Neutral Test (D5), Saturation Visible on Aerial Imagery (C9). Wetland boundaries were most often determined based on topography and a shift in vegetation.

Seasonal wetland wet meadows were classified as PEM2C: Palustrine (P), emergent (EM), non-persistent (2), and seasonally flooded (C).

Stream Fringe/In-Stream Wetlands

Features mapped in the stream fringe/in-stream wetlands category are typically flat to gently sloping areas situated adjacent to intermittent and perennial streams and characterized by perennial herbaceous vegetation. This category also includes low-gradient channels that have

the appearance of streams but lack indicators of OHWM and are fully vegetated with perennial graminoids. Stream fringe/in-stream wetlands are fairly abundant throughout the Study Area. Vegetation was dominated by spike rush, Mexican rush, iris-leaved rush, annual beard grass, Italian rye grass, bird's-foot trefoil, Bermuda grass. Soils were most often loam, clay loams, or clay with matrix colors of very dark grayish brown (10YR 3/2), dark brown (7.5YR 3/2), black (10YR 2/1), dark gray (5Y 4/1, 10YR 4/1), and very dark gray (10YR 3/1) with redoximorphic features consisting of dark gray (10YR 4/1) depletions and dark olive brown (2.5Y 3/3) and dark brown (7.5YR 3/4) and strong brown (7.5YR 4/6) iron concentrations and occurring as soft masses in the matrix and pore linings at 2 to 40 percent. Soils most often met the Depleted Matrix (F3), Depleted Dark Surface (F7), and Redox Dark Surface (F6) hydric soil indicators. Primary indicators of wetland hydrology included Surface Water (A1), Biotic Crust (B12) and Oxidized Rhizospheres Along Living Roots (C3); secondary indicators included Saturation Visible on Aerial Imagery (C9), Sediment Deposits (Riverine) (B2), and FAC-Netral Test (D5). Wetland boundaries were determined based on topography and a shift in vegetation.

Stream fringe/in-stream wetlands were classified as R4SB7: Riverine (R), intermittent (4), streambed (SB), and vegetated (7).

5.1.2 Non-Wetland Waters

For the purposes of this report, stream features were classified as ephemeral, intermittent, or perennial based on the County Code, which defines streams based on their symbology on USGS maps, with solid blue line streams considered perennial, dashed blue line streams considered intermittent, and all other streams considered ephemeral.

Ephemeral Ditch

Features in the ephemeral ditch category are man-made, linear ditch features that are adjacent and parallel to roads and are designed to convey surface water and have indicators of OHWM. These features may convey flows during and immediately after precipitation events but remain dry otherwise. Ephemeral ditches are infrequent and scattered within the Study Area.

Ephemeral ditches were classified as R4SBA/Cx: Riverine (R), intermittent (4), streambed (SB), temporarily flooded (A) to seasonally flooded (C), and excavated (x).

Ephemeral Stream

Features in the ephemeral stream category are naturally formed, linear features that have indicators of OHWM and may convey flows only during or immediately after a precipitation event but remain dry otherwise. Ephemeral streams are the most abundant feature within the Study Area, numbering in the hundreds. They occur on all slopes and aspects and within forested, shrub-dominated, and herbaceous plant communities. Though they most commonly occur on medium- to high-gradient slopes, they also sometimes occur in low-gradient topography.

Ephemeral streams were classified as R4SBA: Riverine (R), intermittent (4), streambed (SB), and temporarily flooded (A).

Intermittent Stream

Features in the intermittent stream category are linear features that have indicators of OHWM and within which water flows for a portion of the year, generally drying out during the driest time of the year. These features are fairly abundant within the Study Area.

Intermittent streams were classified as R4SBC: Riverine (R), intermittent (4), streambed (SB), and seasonally ponded (C).

Perennial Stream

Features in the perennial stream category are linear features that have indicators of OHWM and within which water flows the entire year, even during the dry season. Perennial streams are relatively uncommon within the Study Area but include larger, named streams such as Putah Creek.

Perennial streams were classified as R5UBF & R5UBF/H: Riverine (R), unknown perennial (5), unconsolidated bottom (UB), and semipermanently flooded (F) or semipermanently flooded to permanently flooded (H).

Open Waters

Features in the open waters category correspond to ponds and reservoirs that are typically man-made and range from smaller depressions that pond water only during a portion of the growing to larger features that hold water year round. Open waters features are relatively infrequent and scattered within the Study Area.

Open waters were classified as PUBK: Palustrine (P), unconsolidated bottom (UB), and artificially flooded (K).

5.2 Section 10 of the Rivers and Harbors Act

Based on a review of the Sacramento Corps District's Section 10 online mapping tool, WRA determined that none of the non-wetland waters within the Study Area are subject to Section 10 of the Rivers and Harbors Act.

6.0 CONCLUSION

The results of this delineation of aquatic resources was based on conditions observed during the time of the assessment and information provided to WRA by the property owner and project proponent. It should be noted that the Corps makes all final decisions regarding regulatory jurisdiction, and WRA recommends securing a Jurisdictional Determination from the Corps before embarking on any project activities that could result in the loss of Waters of the United States.

7.0 REFERENCES

Alexander, E.B., R.G. Coleman, T. Keeler-Wolf, S.P. Harrison. 2007. Serpentine Geoecology of Western North America. Oxford University Press, New York, NY.

California Soil Resource Lab. 2019. SoilWeb: An online soil resource browser. Online at: http://casoilresource.lawr.ucdavis.edu/gmap. Accessed on multiple dates in 2017-2019.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Department of the Army, Waterways Experiment Station, Vicksburg, Mississippi 39180-0631.

Federal Geographic Data Committee. 2013. *Classification of Wetlands and Deepwater Habitats of the United States*. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, DC.

Google Earth. 2019. Aerial Imagery 1993-2019. Accessed on multiple dates in 2017-2019.

Kruckeberg, A.R. 1984. California Serpentines: Flora, Vegetation, Geology, Soils, and Management Problems. University of California Press, Berkeley, CA.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. *Phytoneuron* 30: 1-17.

Lichvar, R.W. and S.M. McColley. 2008. *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States*. U.S. Army Corps of Engineers.

Sprecher, S.W. and A.G. Warne. 2000. Accessing and using meteorological data to evaluate wetland hydrology. Technical Report ERDC/EL TR-WRAP-00-1. U.S. Army Corps of Engineers, Vicksburg, MS.

U.S. Army Corps of Engineers. 2005. Regulatory Guidance Letter No. 05-05. Ordinary High Water Mark Identification.

U.S. Army Corps of Engineers. 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*.

[USDA] U.S. Department of Agriculture. 1989. Soil Survey of Lake County, California. In cooperation with the University of California Agricultural Experiment Station.

U.S. Department of Agriculture. 1997. Chapter 19. Hydrology tools for wetland determination. *Engineering Field Handbook*.

U.S. Fish and Wildlife Service. 2019. National Wetlands Inventory. Online at: http://www.fws.gov/nwi. Accessed on multiple dates in 2017-2019.

[USGS] U.S. Geological Survey. 2017. California Geologic Map Data. Online at: https://mrdata.usgs.gov/geology/state/state.php?state=CA; accessed June 2017.

APPENDIX A

WETS ANALYSES

WETS historic data from climate station: Middletown 4SE
2016 observed rainfall data from climate station: Middletown-01.P
Date of site visit: Google Earth May 2016

		Rainfall Data from WETS							
	Month	3 yrs in 10 less than	Average	3 yrs in 10 more than	Observed rainfall (inches)	Condition (dry, wet, normal)	Condition Value	Weighting factor	product of previous two columns
1st month prior	April	0.63	2.03	2.42	2.19	Normal	2	3	6
2nd month prior	March	1.77	5.21	6.25	18.47	Wet	3	2	6
3rd month prior	Februrary	3.25	6.34	7.6	3.02	Dry	1	1	1
								SUM=	**13**

Note: If sum is:

6-9	prior period has been drier than normal
10-14	prior period has been normal
15-18	prior period has been wetter than normal

Condition Values: Dry=1
Normal=2
Wet=3

WETS historic data from climate station: Middletown 4SE
2016 observed rainfall data from climate station: Middletown-01.P
Date of site visit: Google Earth June 2016

		Rainfall Data from WETS							
	Month	3 yrs in 10 less than	Average	3 yrs in 10 more than	Observed rainfall (inches)	Condition (dry, wet, normal)	Condition Value	Weighting factor	product of previous two columns
1st month prior	May	0.33	1.48	1.46	0.12	Dry	1	3	3
2nd month prior	April	0.63	2.03	2.42	2.19	Normal	2	2	4
3rd month prior	March	1.77	5.21	6.25	18.47	Wet	3	1	3
								SUM=	**10**

Note: If sum is:

6-9	prior period has been drier than normal
10-14	prior period has been normal
15-18	prior period has been wetter than normal

Condition Values: Dry=1
Normal=2
Wet=3

WETS historic data from climate station: Middletown 4SE
2016 observed rainfall data from climate station: Middletown-01.P
Date of site visit: Google Earth July 2016

		Rainfall Data from WETS							
	Month	3 yrs in 10 less than	Average	3 yrs in 10 more than	Observed rainfall (inches)	Condition (dry, wet, normal)	Condition Value	Weighting factor	product of previous two columns
1st month prior	June	0	0.2	0.17	0.12	Normal	2	3	6
2nd month prior	May	0.33	1.48	1.46	0.12	Dry	1	2	2
3rd month prior	April	0.63	2.03	2.42	2.19	Normal	2	1	2
								SUM=	**10**

Note: If sum is:

6-9	prior period has been drier than normal
10-14	prior period has been normal
15-18	prior period has been wetter than normal

Condition Values: Dry=1
Normal=2
Wet=3

WETS historic data from climate station: Middletown 4SE
2016 observed rainfall data from climate station: Middletown-01.P
Date of site visit: Google Earth August 2016

		Rainfall Data from WETS							
	Month	3 yrs in 10 less than	Average	3 yrs in 10 more than	Observed rainfall (inches)	Condition (dry, wet, normal)	Condition Value	Weighting factor	product of previous two columns
1st month prior	July	0	0	0	0	Normal	2	3	6
2nd month prior	June	0	0.2	0.17	0.12	Normal	2	2	4
3rd month prior	May	0.33	1.48	1.46	0.12	Dry	1	1	1
								SUM=	**11**

Note: If sum is:

6-9	prior period has been drier than normal
10-14	prior period has been normal
15-18	prior period has been wetter than normal

Condition Values: Dry=1
Normal=2
Wet=3

WETS historic data from climate station: Middletown 4SE
2017 observed rainfall data from climate station: Middletown-01.P
Date of site visit: Google Earth April 2017

		Rainfall Data from WETS							
	Month	3 yrs in 10 less than	Average	3 yrs in 10 more than	Observed rainfall (inches)	Condition (dry, wet, normal)	Condition Value	Weighting factor	product of previous two columns
1st month prior	March	1.8	5.47	6.53	4.33	dry	2	3	6
2nd month prior	Februrary	3.02	6.12	7.32	21.65	wet	3	2	6
3rd month prior	January	2.79	8.42	10.07	6.09	dry	2	1	2
								SUM=	**14**

Note: If sum is:

6-9	prior period has been drier than normal
10-14	prior period has been normal
15-18	prior period has been wetter than normal

Condition Values: Dry=1
Normal=2
Wet=3

WETS historic data from climate station: Middletown 4SE
2017 observed rainfall data from climate station: Middletown-01.P
Date of site visit: Google Earth May 2017

		Rainfall Data from WETS							
	Month	3 yrs in 10 less than	Average	3 yrs in 10 more than	Observed rainfall (inches)	Condition (dry, wet, normal)	Condition Value	Weighting factor	product of previous two columns
1st month prior	April	0.7	2.07	2.49	6.58	Wet	3	3	9
2nd month prior	March	1.8	5.47	6.53	4.33	Normal	2	2	4
3rd month prior	Februrary	3.02	6.12	7.32	21.65	Wet	3	1	3
								SUM=	**16**

Note: If sum is:

6-9	prior period has been drier than normal
10-14	prior period has been normal
15-18	prior period has been wetter than normal

Condition Values: Dry=1
Normal=2
Wet=3

WETS historic data from climate station: Middletown 4SE
2017 observed rainfall data from climate station: Middletown-01.P
Date of site visit: Google Earth June 2017

		Rainfall Data from WETS							
	Month	3 yrs in 10 less than	Average	3 yrs in 10 more than	Observed rainfall (inches)	Condition (dry, wet, normal)	Condition Value	Weighting factor	product of previous two columns
1st month prior	May	0.33	1.45	1.45	0.3	Dry	1	3	3
2nd month prior	April	0.7	2.07	2.49	6.58	Wet	3	2	6
3rd month prior	March	1.8	5.47	6.53	4.33	Normal	2	1	2
								SUM=	**11**

Note: If sum is:

6-9	prior period has been drier than normal
10-14	prior period has been normal
15-18	prior period has been wetter than normal

Condition Values: Dry=1
Normal=2
Wet=3

WETS historic data from climate station: Middletown 4SE
2017 observed rainfall data from climate station: Middletown-01.P
Date of site visit: Google Earth July 2017

		Rainfall Data from WETS							
	Month	3 yrs in 10 less than	Average	3 yrs in 10 more than	Observed rainfall (inches)	Condition (dry, wet, normal)	Condition Value	Weighting factor	product of previous two columns
1st month prior	June	0	0.2	0.17	0.33	Wet	3	3	9
2nd month prior	May	0.33	1.45	1.45	0.3	Dry	1	2	2
3rd month prior	April	0.7	2.07	2.49	6.58	Wet	3	1	3
								SUM=	**14**

Note: If sum is:

6-9	prior period has been drier than normal
10-14	prior period has been normal
15-18	prior period has been wetter than normal

Condition Values: Dry=1
Normal=2
Wet=3

WETS historic data from climate station: Middletown 4SE
2017 observed rainfall data from climate station: Middletown-01.P
Date of site visit: Google Earth August 2017

		Rainfall Data from WETS							
	Month	3 yrs in 10 less than	Average	3 yrs in 10 more than	Observed rainfall (inches)	Condition (dry, wet, normal)	Condition Value	Weighting factor	product of previous two columns
1st month prior	July	0	0	0	0	Normal	2	3	6
2nd month prior	June	0	0.2	0.17	0.33	Wet	3	2	6
3rd month prior	May	0.33	1.45	1.45	0.3	Wet	3	1	3
								SUM=	**15**

Note: If sum is:

6-9	prior period has been drier than normal
10-14	prior period has been normal
15-18	prior period has been wetter than normal

Condition Values: Dry=1
Normal=2
Wet=3

WETS historic data from climate station: Middletown 4SE
2018 observed rainfall data from climate station: Middletown-01.P
Date of site visit: May 1-4, 2018

		Rainfall Data from WETS							
	Month	3 yrs in 10 less than	Average	3 yrs in 10 more than	Observed rainfall (inches)	Condition (dry, wet, normal)	Condition Value	Weighting factor	product of previous two columns
1st month prior	March	1.75	5.25	6.29	10.91	Wet	3	3	9
2nd month prior	Februrary	3.2	6.72	8.02	1.64	Dry	1	2	2
3rd month prior	January	2.87	9.15	10.89	10.26	Normal	2	1	2
								SUM=	**13**

Note: If sum is:

6-9	prior period has been drier than normal
10-14	prior period has been normal
15-18	prior period has been wetter than normal

Condition Values: Dry=1
Normal=2
Wet=3

WETS historic data from climate station: Middletown 4SE
2018 observed rainfall data from climate station: Middletown-01.P
Date of site visit: May 17-18, 2018

		Rainfall Data from WETS							
	Month	3 yrs in 10 less than	Average	3 yrs in 10 more than	Observed rainfall (inches)	Condition (dry, wet, normal)	Condition Value	Weighting factor	product of previous two columns
1st month prior	April	0.77	2.37	2.83	4.16	Wet	3	3	9
2nd month prior	March	1.75	5.25	6.29	10.91	Wet	3	2	6
3rd month prior	Februrary	3.2	6.72	8.02	1.64	Dry	1	1	1
								SUM=	**16**

Note: If sum is:

6-9	prior period has been drier than normal
10-14	prior period has been normal
15-18	prior period has been wetter than normal

Condition Values: Dry=1
Normal=2
Wet=3

WETS historic data from climate station: Mid Middletown 4SE, CA
2018 observed rainfall data from climate station: Middletow 1987-2017
Date of site visit: May 30-June 1, 2018

		Rainfall Data from WETS							
	Month	3 yrs in 10 less than	Average	3 yrs in 10 more than	Observed rainfall (inches)	Condition (dry, wet, normal)	Condition Value	Weighting factor	product of previous two columns
1st month prior	April	0.77	2.37	2.83	4.16	Wet	3	3	9
2nd month prior	March	1.75	5.25	6.29	11.01	Wet	3	2	6
3rd month prior	Feburary	3.2	6.72	8.02	1.13	Dry	1	1	1
								SUM=	**16**

Note: If sum is:

6-9	prior period has been drier than normal
10-14	prior period has been normal
15-18	prior period has been wetter than normal

Condition Values: Dry=1
Normal=2
Wet=3

WETS historic data from climate station: Clearlake 4 SE, CA
2018 observed rainfall data from climate station: Middletown-01.P
Date of site visit: August 21, 22, and 28, 2018

		Rainfall Data from WETS							
	Month	3 yrs in 10 less than	Average	3 yrs in 10 more than	Observed rainfall (inches)	Condition (dry, wet, normal)	Condition Value	Weighting factor	product of previous two columns
1st month prior	July	0	0.04	0	0	Normal	2	3	6
2nd month prior	June	0	0.18	0.16	0.01	Normal	2	2	4
3rd month prior	May	0.24	0.87	0.87	0.11	Dry	1	1	1
								SUM=	**11**

Note: If sum is:

6-9	prior period has been drier than normal
10-14	prior period has been normal
15-18	prior period has been wetter than normal

Condition Values: Dry=1
Normal=2
Wet=3

WETS historic data from climate station: Clearlake 4 SE, CA
2018 observed rainfall data from climate station: Middletown-01.P
Date of site visit: September 6-7, 2018

		Rainfall Data from WETS							
	Month	3 yrs in 10 less than	Average	3 yrs in 10 more than	Observed rainfall (inches)	Condition (dry, wet, normal)	Condition Value	Weighting factor	product of previous two columns
1st month prior	August	0	0.08	0	0	Normal	2	3	6
2nd month prior	July	0	0.04	0	0	Normal	2	2	4
3rd month prior	June	0	0.18	0.16	0.01	Normal	2	1	2
								SUM=	**12**

Note: If sum is:

6-9	prior period has been drier than normal
10-14	prior period has been normal
15-18	prior period has been wetter than normal

Condition Values: Dry=1
Normal=2
Wet=3

WETS historic data from climate station: **Middletown, CA 1988-2018 (NCDC COOP #045598)**
2019 observed rainfall data from climate station: **Middletown 4SE, CA**
Date of site visit: **4/24/2019**

		Rainfall Data from WETS							
	Month	3 yrs in 10 less than	Average	3 yrs in 10 more than	Observed rainfall (inches)	Condition (dry, wet, normal)	Condition Value	Weighting factor	product of previous two columns
1st month prior	March	1.66	5.11	6.1	10.41	Wet	3	3	9
2nd month prior	February	2.88	6.47	7.69	24.4	Wet	3	2	6
3rd month prior	January	2.96	9.34	11.12	13.74	Wet	3	1	3
								SUM=	**18**

Note: If sum is:

6-9	prior period has been drier than normal
10-14	prior period has been normal
15-18	prior period has been wetter than normal

Condition Values: Dry=1
Normal=2
Wet=3

WETS historic data from climate station: **Middletown, CA 1988-2018 (NCDC COOP #045598)**
2019 observed rainfall data from climate station: **Middletown 4SE, CA**
Date of site visit: **5/2/2019**

		Rainfall Data from WETS							
	Month	3 yrs in 10 less than	Average	3 yrs in 10 more than	Observed rainfall (inches)	Condition (dry, wet, normal)	Condition Value	Weighting factor	product of previous two columns
1st month prior	April	0.87	2.47	2.97	1.32	Normal	2	3	6
2nd month prior	March	1.66	5.11	6.1	10.41	Wet	3	2	6
3rd month prior	February	2.88	6.47	7.69	24.4	Wet	3	1	3
								SUM=	**15**

Note: If sum is:

6-9	prior period has been drier than normal
10-14	prior period has been normal
15-18	prior period has been wetter than normal

Condition Values: Dry=1
Normal=2
Wet=3

WETS historic data from climate station: **Middletown, CA 1988-2018 (NCDC COOP #045598)**
2019 observed rainfall data from climate station: **Middletown 4SE, CA**
Date of site visit: **5/7-8/2019**

		Rainfall Data from WETS							
	Month	3 yrs in 10 less than	Average	3 yrs in 10 more than	Observed rainfall (inches)	Condition (dry, wet, normal)	Condition Value	Weighting factor	product of previous two columns
1st month prior	April	0.87	2.47	2.97	1.32	Normal	2	3	6
2nd month prior	March	1.66	5.11	6.1	10.41	Wet	3	2	6
3rd month prior	February	2.88	6.47	7.69	24.4	Wet	3	1	3
								SUM=	**15**

Note: If sum is:

6-9	prior period has been drier than normal
10-14	prior period has been normal
15-18	prior period has been wetter than normal

Condition Values: Dry=1
Normal=2
Wet=3

WETS historic data from climate station: **Middletown, CA 1988-2018 (NCDC COOP #045598)**
2019 observed rainfall data from climate station: **Middletown 4SE, CA**
Date of site visit: **6/17-20/2019**

		Rainfall Data from WETS							
	Month	3 yrs in 10 less than	Average	3 yrs in 10 more than	Observed rainfall (inches)	Condition (dry, wet, normal)	Condition Value	Weighting factor	product of previous two columns
1st month prior	May	0.29	1.45	1.34	5.38	Wet	3	3	9
2nd month prior	April	0.87	2.47	2.97	1.32	Normal	2	2	4
3rd month prior	March	1.66	5.11	6.1	10.41	Wet	3	1	3
								SUM=	**16**

Note: If sum is:

6-9	prior period has been drier than normal
10-14	prior period has been normal
15-18	prior period has been wetter than normal

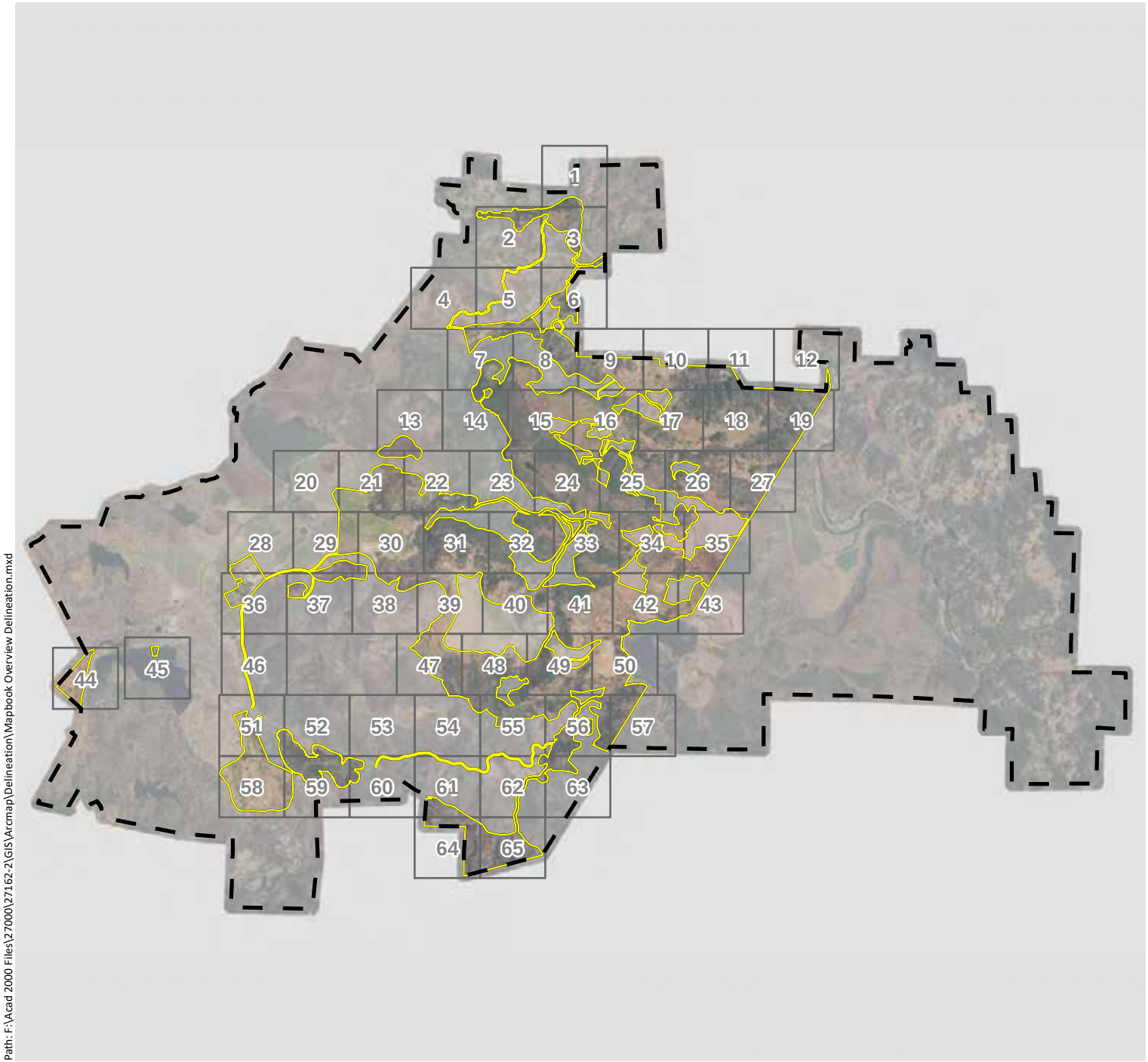
Condition Values: Dry=1
Normal=2
Wet=3

APPENDIX B

POTENTIAL WATERS OF THE UNITED STATES

Appendix B.
Potential Waters of the United States (Overview Sheet 1)

Maha Resort and Guenoc Valley Development, Phase 1



Property Boundary

Phase 1 Study Area

Mapbook Grid

N

0 1 2

Miles

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\Delineation\Mapbook Overview Delineation.mxd

Sources: Hexagon 2016 Aerial, WRA | Prepared By: mrochelle, 6/27/2019

Appendix B. Potential Waters of the United States (Overview Sheet 2)

Maha Resort and Guenoc Valley Development, Phase 1

ID	Acre(s)	Linear Ft	Cowardin Code
Forested Wetlands:			
FW-1	0.0413	n/a	PFO1E
FW-2	0.1074	n/a	PFO1E
FW-3	0.0792	n/a	PFO1E
FW-4	0.0122	n/a	PFO1E
FW-5	0.0028	n/a	PFO1E
FW-6	0.0175	n/a	PFO1E
FW-7	0.0057	n/a	PFO1E
FW-8	0.0624	n/a	PFO1E
FW-9	0.0271	n/a	PFO1E
FW-10	0.0080	n/a	PFO1E
FW-11	0.0227	n/a	PFO1E
FW-12	0.0189	n/a	PFO1E
FW-13	0.2036	n/a	PFO1E
Scrub-Shrub Wetlands:			
SS-1	0.0408	n/a	PSS1C
SS-2	0.9070	n/a	PSS1C
SS-3	0.0329	n/a	PSS1C
SS-4	0.0146	n/a	PSS1C
SS-5	0.0971	n/a	PSS1C
SS-6	0.0565	n/a	PSS1C
Seasonal Wetland Depressions:			
SW-5	0.0290	n/a	PEM2C
SW-29	0.0079	n/a	PEM2C
SW-61	0.0024	n/a	PEM2C
SW-116	0.0063	n/a	PEM2C
SW-120	0.0866	n/a	PEM2C
SW-133	0.0442	n/a	PEM2C
SW-147	0.0070	n/a	PEM2C
SW-166	0.0666	n/a	PEM2C
SW-201	0.0067	n/a	PEM2C
SW-202	0.0178	n/a	PEM2C
SW-204	0.4718	n/a	PEM2C
SW-205	0.0170	n/a	PEM2C
SW-206	0.0090	n/a	PEM2C
SW-207	0.0380	n/a	PEM2C
SW-208	0.1473	n/a	PEM2C
SW-210	0.0577	n/a	PEM2C
SW-213	0.2607	n/a	PEM2C
SW-214	0.4265	n/a	PEM2C
SW-216	0.0724	n/a	PEM2C
SW-219	0.2041	n/a	PEM2C
SW-224	0.1440	n/a	PEM2C
SW-227	0.0311	n/a	PEM2C
SW-232	0.0056	n/a	PEM2C
SW-237	0.1696	n/a	PEM2C
SW-239	0.0166	n/a	PEM2C
SW-240	0.0177	n/a	PEM2C
SW-241	0.0961	n/a	PEM2C
SW-242	0.0268	n/a	PEM2C
SW-243	0.0126	n/a	PEM2C
SW-244	0.0302	n/a	PEM2C
SW-282	0.0052	n/a	PEM2C
Seasonal Wetland Ditches:			
SW-2	0.0016	n/a	PEM2Cx
SW-3	0.0008	n/a	PEM2Cx
SW-6	0.0049	n/a	PEM2Cx
SW-7	0.0184	n/a	PEM2Cx
SW-86	0.0324	n/a	PEM2Cx
SW-148	0.1009	n/a	PEM2Cx
SW-149	0.1049	n/a	PEM2Cx
SW-150	0.0098	n/a	PEM2Cx
SW-199	0.0476	n/a	PEM2Cx
SW-203	0.0190	n/a	PEM2Cx
SW-264	0.1551	n/a	PEM2Cx
SW-270	0.0011	n/a	PEM2Cx
Seasonal Wetland Pond Fringes:			
SW-83	2.6889	n/a	PEM1/2C
SW-145	0.2648	n/a	PEM1/2C
SW-146	0.1737	n/a	PEM1/2C
SW-220	0.0986	n/a	PEM1/2C
SW-223	0.2390	n/a	PEM1/2C
SW-238	0.0501	n/a	PEM1/2C
Seasonal Wetland Seeps/Swales:			
SW-1	0.0333	n/a	PEM2C
SW-4	0.2160	n/a	PEM2C
SW-8	0.0896	n/a	PEM2C
SW-9	0.3478	n/a	PEM2C
SW-10	0.1099	n/a	PEM2C
SW-11	0.0531	n/a	PEM2C
SW-12	0.0475	n/a	PEM2C
SW-13	3.2082	n/a	PEM2C
SW-14	0.0237	n/a	PEM2C
SW-15	0.0263	n/a	PEM2C
SW-16	0.0237	n/a	PEM2C
SW-19	0.0248	n/a	PEM2C
SW-21	0.0602	n/a	PEM2C
SW-22	0.0806	n/a	PEM2C
SW-23	1.2307	n/a	PEM2C
SW-24	0.0406	n/a	PEM2C
SW-25	0.0865	n/a	PEM2C
SW-26	0.0172	n/a	PEM2C
SW-27	0.0175	n/a	PEM2C
SW-28	0.0274	n/a	PEM2C
SW-30	0.1684	n/a	PEM2C
SW-31	0.2309	n/a	PEM2C
SW-32	0.0133	n/a	PEM2C
SW-33	0.0159	n/a	PEM2C
SW-34	0.0306	n/a	PEM2C
SW-35	0.1487	n/a	PEM2C
SW-37	0.0034	n/a	PEM2C
SW-38	0.7058	n/a	PEM2C
SW-39	0.0065	n/a	PEM2C
SW-40	0.1156	n/a	PEM2C
SW-41	0.0695	n/a	PEM2C
SW-42	0.0259	n/a	PEM2C
SW-43	0.1510	n/a	PEM2C
SW-44	0.0411	n/a	PEM2C
SW-45	0.0594	n/a	PEM2C
SW-46	0.0410	n/a	PEM2C
SW-47	0.0988	n/a	PEM2C
SW-48	0.0824	n/a	PEM2C
SW-49	0.0119	n/a	PEM2C
SW-50	0.0071	n/a	PEM2C
SW-51	0.0231	n/a	PEM2C
SW-52	0.0059	n/a	PEM2C
SW-53	0.0566	n/a	PEM2C
SW-54	0.0428	n/a	PEM2C
SW-55	0.0379	n/a	PEM2C
SW-56	0.0301	n/a	PEM2C
SW-57	0.0507	n/a	PEM2C
SW-58	0.0094	n/a	PEM2C
SW-59	0.3355	n/a	PEM2C
SW-60	0.0685	n/a	PEM2C
SW-62	1.8887	n/a	PEM2C
SW-63	0.0796	n/a	PEM2C
SW-64	0.0072	n/a	PEM2C
SW-65	0.0630	n/a	PEM2C
SW-68	0.0270	n/a	PEM2C
SW-69	0.0682	n/a	PEM2C
SW-70	0.0641	n/a	PEM2C
SW-71	0.0337	n/a	PEM2C
SW-72	0.0409	n/a	PEM2C
SW-73	0.0330	n/a	PEM2C
SW-74	0.1921	n/a	PEM2C
SW-75	0.2935	n/a	PEM2C
SW-76	0.0261	n/a	PEM2C
SW-77	0.0195	n/a	PEM2C
SW-78	0.0112	n/a	PEM2C
SW-79	0.0068	n/a	PEM2C
SW-80	0.0181	n/a	PEM2C
SW-81	0.0148	n/a	PEM2C
SW-82	0.0057	n/a	PEM2C
SW-85	0.5099	n/a	PEM2C
SW-87	0.0237	n/a	PEM2C
SW-88	0.1038	n/a	PEM2C
SW-89	0.0521	n/a	PEM2C
SW-90	0.0863	n/a	PEM2C
SW-91	0.1077	n/a	PEM2C
SW-92	0.2041	n/a	PEM2C
SW-93	0.3130	n/a	PEM2C
SW-94	0.1205	n/a	PEM2C
SW-95	0.3620	n/a	PEM2C
SW-96	0.5855	n/a	PEM2C
SW-98	0.0056	n/a	PEM2C
SW-99	0.0162	n/a	PEM2C
SW-101	0.3396	n/a	PEM2C
SW-102	0.0427	n/a	PEM2C
SW-103	0.0152	n/a	PEM2C
SW-104	0.0448	n/a	PEM2C
SW-105	0.0944	n/a	PEM2C
SW-106	0.0249	n/a	PEM2C
SW-109	0.7125	n/a	PEM2C
SW-110	0.0075	n/a	PEM2C
SW-111	0.0388	n/a	PEM2C
SW-112	0.1779	n/a	PEM2C
SW-114	0.0066	n/a	PEM2C
SW-115	0.0096	n/a	PEM2C
SW-117	0.0218	n/a	PEM2C
SW-118	0.0248	n/a	PEM2C
SW-119	0.1181	n/a	PEM2C
SW-121	0.0798	n/a	PEM2C
SW-122	0.3189	n/a	PEM2C
SW-123	0.0862	n/a	PEM2C
SW-124	0.0383	n/a	PEM2C
SW-125	0.8238	n/a	PEM2C
SW-126	0.4132	n/a	PEM2C
SW-127	0.2695	n/a	PEM2C
SW-128	0.2041	n/a	PEM2C
SW-129	0.0205	n/a	PEM2C
SW-130	0.0563	n/a	PEM2C
SW-131	0.0267	n/a	PEM2C
SW-132	0.2442	n/a	PEM2C
SW-134	0.0258	n/a	PEM2C
SW-135	0.2793	n/a	PEM2C
SW-136	1.6376	n/a	PEM2C
SW-137	0.1159	n/a	PEM2C
SW-138	0.0591	n/a	PEM2C
SW-139	0.0191	n/a	PEM2C
SW-140	0.0273	n/a	PEM2C
SW-141	0.0081	n/a	PEM2C
SW-142	0.0161	n/a	PEM2C
SW-143	0.1609	n/a	PEM2C
SW-144	0.1722	n/a	PEM2C
SW-151	0.0145	n/a	PEM2C
SW-152	0.0116	n/a	PEM2C
SW-153	0.0198	n/a	PEM2C
SW-154	0.0660	n/a	PEM2C
SW-155	0.0057	n/a	PEM2C
SW-156	0.0026	n/a	PEM2C
SW-157	0.0094	n/a	PEM2C
SW-158	0.2368	n/a	PEM2C
SW-159	0.0044	n/a	PEM2C
SW-160	0.0514	n/a	PEM2C
SW-161	0.0366	n/a	PEM2C
SW-162	0.0826	n/a	PEM2C
SW-163	0.1771	n/a	PEM2C
SW-164	0.0116	n/a	PEM2C
SW-165	0.0051	n/a	PEM2C
SW-167	0.0295	n/a	PEM2C
SW-168	0.0398	n/a	PEM2C
SW-169	0.0522	n/a	PEM2C
SW-170	0.0263	n/a	PEM2C
SW-173	0.0469	n/a	PEM2C
SW-178	0.0077	n/a	PEM2C
SW-180	0.0106	n/a	PEM2C
SW-181	0.0369	n/a	PEM2C
SW-182	0.1629	n/a	PEM2C
SW-183	0.0068	n/a	PEM2C
SW-184	0.0212	n/a	PEM2C
SW-185	0.0687	n/a	PEM2C
SW-186	0.0099	n/a	PEM2C
SW-187	1.0058	n/a	PEM2C
SW-188	0.1553	n/a	PEM2C
SW-189	0.0493	n/a	PEM2C
SW-190	0.0108	n/a	PEM2C
SW-191	0.0311	n/a	PEM2C
SW-200	0.0253	n/a	PEM2C
SW-209	0.0726	n/a	PEM2C
SW-211	0.0741	n/a	PEM2C
SW-212	0.0215	n/a	PEM2C
SW-215	0.2259	n/a	PEM2C
SW-217	0.0104	n/a	PEM2C
SW-218	0.2746	n/a	PEM2C
SW-221	0.3180	n/a	PEM2C
SW-222	0.2068	n/a	PEM2C
SW-225	2.0332	n/a	PEM2C
SW-226	0.3102	n/a	PEM2C
SW-228	0.7928	n/a	PEM2C
SW-229	0.0266	n/a	PEM2C
SW-230	2.1539	n/a	PEM2C
SW-231	0.1601	n/a	PEM2C
SW-233	0.1575	n/a	PEM2C
SW-234	0.2036	n/a	PEM2C
SW-235	0.1962	n/a	PEM2C
SW-236	0.0888	n/a	PEM2C
SW-245	0.1539	n/a	PEM2C
SW-246	0.6712	n/a	PEM2C
SW-247	0.3310	n/a	PEM2C
SW-248	0.3266	n/a	PEM2C
SW-249	0.1678	n/a	PEM2C
SW-250	0.0818	n/a	PEM2C
SW-251	0.1503	n/a	PEM2C
SW-252	0.6011	n/a	PEM2C
SW-253	1.3000	n/a	PEM2C
SW-254	4.1211	n/a	PEM2C
SW-255	0.5148	n/a	PEM2C
SW-256	0.6062	n/a	PEM2C
SW-257	0.0785	n/a	PEM2C
SW-258	0.0064	n/a	PEM2C
SW-259	0.0492	n/a	PEM2C
SW-260	0.1095	n/a	PEM2C
SW-261	0.5249	n/a	PEM2C
SW-265	0.0546	n/a	PEM2C
SW-266	0.0092	n/a	PEM2C
SW-271	0.1292	n/a	PEM2C
SW-272	0.2284	n/a	PEM2C
SW-273	0.0133	n/a	PEM2C
SW-274	0.0223	n/a	PEM2C
SW-275	0.0042	n/a	PEM2C
SW-276	0.0391	n/a	PEM2C
SW-277	0.0614	n/a	PEM2C
SW-278	0.0260	n/a	PEM2C
SW-279	0.1576	n/a	PEM2C
SW-280	0.6412	n/a	PEM2C
SW-281	0.1840	n/a	PEM2C
SW-284	0.0006	n/a	PEM2C
SW-285	0.0088	n/a	PEM2C
SW-286	0.4823	n/a	PEM2C
SW-287	0.0572	n/a	PEM2C
SW-357	0.0064	n/a	PEM2C
Seasonal Wetland Wet Meadows:			
SW-36	11.0045	n/a	PEM2C
SW-66	1.9125	n/a	PEM2C
SW-97	2.0580	n/a	PEM2C
SW-113	1.6599	n/a	PEM2C
SW-171	0.1711	n/a	PEM2C
SW-172	0.1051	n/a	PEM2C
SW-174	0.0076	n/a	PEM2C
SW-175	0.1230	n/a	PEM2C
SW-176	0.0131	n/a	PEM2C
SW-177	0.0138	n/a	PEM2C
SW-179	0.1228	n/a	PEM2C
SW-192	0.0435	n/a	PEM2C
SW-193	0.5191	n/a	PEM2C
SW-194	0.4835	n/a	PEM2C
SW-195	3.1235	n/a	PEM2C
SW-196	0.0047	n/a	PEM2C
SW-197	0.3321	n/a	PEM2C
SW-198	0.1883	n/a	PEM2C
SW-283	0.0428	n/a	PEM2C
SW-288	0.0438	n/a	PEM2C
SW-289	0.0039	n/a	PEM2C
SW-290	0.0029	n/a	PEM2C
SW-291	0.0063	n/a	PEM2C
SW-292	17.2090	n/a	PEM2C
SW-293	0.4307	n/a	PEM2C
SW-294	0.0492	n/a	PEM2C
SW-295	0.0634	n/a	PEM2C
SW-296	0.0530	n/a	PEM2C
SW-297	0.0074	n/a	PEM2C
SW-298	0.0497	n/a	PEM2C
SW-299	0.0657	n/a	PEM2C
SW-300	0.0589	n/a	PEM2C
SW-301	0.0655	n/a	PEM2C
SW-302	0.2366	n/a	PEM2C
SW-303	0.0238	n/a	PEM2C
SW-304	0.0252	n/a	PEM2C
SW-305	0.0729	n/a	PEM2C
SW-306	0.1234	n/a	PEM2C
SW-307	0.0260	n/a	PEM2C
SW-308	0.0572	n/a	PEM2C
SW-309	0.0019	n/a	PEM2C
SW-310	0.0029	n/a	PEM2C
SW-311	0.0091	n/a	PEM2C
SW-312	0.0152	n/a	PEM2C
SW-313	0.0043	n/a	PEM2C
SW-314	0.0425	n/a	PEM2C
SW-315	0.0020	n/a	PEM2C
SW-316	0.0031	n/a	PEM2C
SW-317	0.0045	n/a	PEM2C
SW-318	0.0024	n/a	PEM2C
SW-319	0.0036	n/a	PEM2C
SW-320	0.0045	n/a	PEM2C
SW-321	0.0056	n/a	PEM2C
SW-322	0.0018	n/a	PEM2C
SW-323	0.0025	n/a	PEM2C
SW-324	0.0024	n/a	PEM2C
SW-325	0.0290	n/a	PEM2C
SW-326	0.2592	n/a	PEM2C
SW-327	0.0138	n/a	PEM2C
SW-328	0.0286	n/a	PEM2C
SW-329	0.0014	n/a	PEM2C
SW-330	0.0095	n/a	PEM2C
SW-331	0.7218	n/a	PEM2C
SW-332	0.0021	n/a	PEM2C
SW-333	3.2249	n/a	PEM2C
SW-334	0.1810	n/a	PEM2C
SW-335	0.0095	n/a	PEM2C
SW-336	0.0029	n/a	PEM2C
SW-337	0.0104	n/a	PEM2C
SW-338	0.0158	n/a	PEM2C
SW-339	0.0122	n/a	PEM2C
SW-340	0.0137	n/a	PEM2C
SW-341	0.0137	n/a	PEM2C
SW-342	0.0548	n/a	PEM2C
SW-343	0.0803	n/a	PEM2C
SW-344	0.0025	n/a	PEM2C
SW-345	0.0222	n/a	PEM2C
SW-346	0.0129	n/a	PEM2C
SW-347	0.0082	n/a	PEM2C
SW-348	0.0101	n/a	PEM2C
SW-349	0.0051	n/a	PEM2C
SW-350	0.0020	n/a	PEM2C
Stream Fringe/In-Stream Wetlands:			
SF-1	0.0792	n/a	R4SB7
SF-2	0.2426	n/a	R4SB7
SF-3	0.6559	n/a	R4SB7
SF-4	0.0962	n/a	R4SB7
SF-5	0.0101	n/a	R4SB7
SF-6	0.0415	n/a	R4SB7
SF-7	0.0260	n/a	R4SB7
SF-8	0.0223	n/a	R4SB7
SF-9	0.0405	n/a	R4SB7
SF-10	0.0584	n/a	R4SB7
SF-11	0.0321	n/a	R4SB7
SF-12	0.2075	n/a	R4SB7
SF-13	0.1329	n/a	R4SB7
SF-14	0.1123	n/a	R4SB7
SF-15	0.1249	n/a	R4SB7
SF-16	0.0249	n/a	R4SB7
SF-17	0.0234	n/a	R4SB7
SF-18	1.5624	n/a	R4SB7
SF-19	0.3607	n/a	R4SB7
SF-20	0.0391	n/a	R4SB7
SF-21	0.0446	n/a	R4SB7
SF-22	0.0539	n/a	R4SB7
SF-23	0.2032	n/a	R4SB7
SF-24	0.0138	n/a	R4SB7
SF-25	0.0486	n/a	R4SB7
SF-26	0.0689	n/a	R4SB7
SF-27	0.1303	n/a	R4SB7
SF-28	0.1320	n/a	R4SB7
SF-29	0.1869	n/a	R4SB7
SF-30	0.1509	n/a	R4SB7
SF-31	0.4191	n/a	R4SB7
SF-32	0.2762	n/a	R4SB7
SF-33	0.4897	n/a	R4SB7
SF-34	0.0078	n/a	R4SB7
SF-35	0.0057	n/a	R4SB7
SF-36	0.1170	n/a	R4SB7
SF-37	0.8686	n/a	R4SB7
SF-38	0.0539	n/a	R4SB7
SF-39	0.0877	n/a	R4SB7
SF-40	0.0164	n/a	R4SB7
SF-41	0.0168	n/a	R4SB7
SF-42	0.0053	n/a	R4SB7
SF-43	0.0246	n/a	R4SB7
SF-44	0.0121	n/a	R4SB7
SF-45	0.2368	n/a	R4SB7
SF-46	0.0176	n/a	R4SB7
SF-47	0.3395	n/a	R4SB7
SF-48	0.0856	n/a	R4SB7
SF-49	0.5623	n/a	R4SB7
SF-50	0.1462	n/a	R4SB7
SF-51	0.0143	n/a	R4SB7
SF-52	0.0110	n/a	R4SB7
SF-53	0.6031	n/a	R4SB7
SF-54	0.0342	n/a	R4SB7
SF-55	0.9177	n/a	R4SB7
SF-56	0.0399	n/a	R4SB7
SF-57	0.0501	n/a	R4SB7
SF-58	0.0044	n/a	R4SB7
SF-59	0.0376	n/a	R4SB7
SF-60	0.0910	n/a	R4SB7
SF-61	0.2600	n/a	R4SB7
SF-62	0.2671	n/a	R4SB7
SF-63	0.0167	n/a	R4SB7
SF-64	0.0492	n/a	R4SB7
SF-65	0.1461	n/a	R4SB7
SF-66	0.1263	n/a	R4SB7
SF-67	0.0869	n/a	R4SB7
SF-68	0.4860	n/a	R4SB7
SF-69	0.1654	n/a	R4SB7
SF-70	0.0836	n/a	R4SB7
SF-71	0.0466	n/a	R4SB7
SF-72	0.7355	n/a	R4SB7
SF-73	0.0127	n/a	R4SB7
SF-74	0.0071	n/a	R4SB7
SF-75	0.0069	n/a	R4SB7
SF-76	0.1645	n/a	R4SB7
SF-77	0.0788	n/a	R4SB7
SF-78	0.3720	n/a	R4SB7
SF-79	1.3640	n/a	R4SB7
SF-80	0.0324	n/a	R4SB7
SF-81	0.0116	n/a	R4SB7
SF-82	1.2546	n/a	R4SB7
SF-83	0.2418	n/a	R4SB7
SF-84	0.1566	n/a	R4SB7
SF-85	0.2568	n/a	R4SB7
SF-86	0.0660	n/a	R4SB7
SF-87	0.1121	n/a	R4SB7
SF-88	1.6319	n/a	R4SB7
SF-89	1.1460	n/a	R4SB7
SF-90	0.0596	n/a	R4SB7
SF-91	0.5244	n/a	R4SB7
SF-92	0.6891	n/a	R4SB7
SF-93	1.0083	n/a	R4SB7
SF-94	1.2654	n/a	R4SB7
SF-95	0.0298	n/a	R4SB7
SF-96	0.0206	n/a	R4SB7
SF-97	0.0311	n/a	R4SB7
SF-98	0.1037	n/a	R4SB7
SF-99	0.0858	n/a	R4SB7
SF-100	0.1362	n/a	R4SB7
SF-101	0.0062	n/a	R4SB7
SF-102	0.0008	n/a	R4SB7
SF-103	0.0371	n/a	R4SB7
SF-104	0.0696	n/a	R4SB7
SF-105	0.0791	n/a	R4SB7
SF-106	0.0627	n/a	R4SB7
SF-107	0.0515	n/a	R4SB7
SF-108	0.0094	n/a	R4SB7
SF-109	0.0121	n/a	R4SB7
SF-110	0.0196	n/a	R4SB7
SF-111	0.0251	n/a	R4SB7
SF-112	0.1361	n/a	R4SB7
SF-113	0.3493	n/a	R4SB7
SF-114	0.0088	n/a	R4SB7
SF-115	0.0201	n/a	R4SB7
SF-116	0.0094	n/a	R4SB7
SF-117	0.0948	n/a	R4SB7
SF-118	0.0288	n/a	R4SB7
SF-119	0.1127	n/a	R4SB7
SF-120	0.0626	n/a	R4SB7
SF-121	0.3787	n/a	R4SB7
SF-122	0.5175	n/a	R4SB7
SF-123	0.0422	n/a	R4SB7
SF-124	0.0167	n/a	R4SB7
SF-125	0.0138	n/a	R4SB7
SF-126	0.0070	n/a	R4SB7
SF-127	0.0306	n/a	R4SB7
SF-128	0.0049	n/a	R4SB7
SF-129	0.0063	n/a	R4SB7
SF-130	0.0191	n/a	R4SB7
SF-131	0.0652	n/a	R4SB7
Ephemeral Ditch:			
ED-1	0.0345	1,504	R4SBA/Cx
ED-2	0.0021	89	R4SBA/Cx
ED-3	0.0062	312	R4SBA/Cx
ED-4	0.0698	1,050	R4SBA/Cx
ED-5	0.0032	45	R4SBA/Cx
ED-6	0.0288	628	R4SBA/Cx
ED-7	0.0251	549	R4SBA/Cx
ED-8	0.0308	673	R4SBA/Cx
ED-9	0.0015	64	R4SBA/Cx
ED-10	0.0098	427	R4SBA/Cx
ED-11	0.0048	208	R4SBA/Cx
ED-12	0.0098	215	R4SBA/Cx
ED-13	0.0081	177	R4SBA/Cx
ED-14	0.0084	181	R4SBA/Cx
ED-15	0.0068	297	R4SBA/Cx
Ephemeral Stream:			
ES-1	0.0131	189	R4SBA
ES-2	0.0238	345	R4SBA
ES-3	0.0632	689	R4SBA
ES-4	0.1219	1,329	R4SBA
ES-5	0.0091	99	R4SBA
ES-6	0.0188	272	R4SBA
ES-7	0.0225	242	R4SBA
ES-8	0.0014	59	R4SBA
ES-9	0.0377	396	R4SBA
ES-10	0.0040	72	R4SBA
ES-11	0.0761	1,656	R4SBA
ES-12	0.0309	672	R4SBA
ES-13	0.0262	472	R4SBA
ES-14	0.0060	263	R4SBA
ES-15	0.0041	34	R4SBA
ES-16	0.0083	73	R4SBA
ES-17	0.0016	33	R4SBA
ES-18	0.0022	48	R4SBA
ES-19	0.0055	26	R4SBA
ES-20	0.0184	401	R4SBA
ES-21	0.0846	686	R4SBA
ES-22	0.0097	209	R4SBA
ES-23	0.0087	192	R4SBA
ES-24	0.0013	57	R4SBA
ES-25	0.0049	41	R4SBA
ES-26	0.0114	97	R4SBA
ES-27	0.0248	226	R4SBA
ES-28	0.8373	2,088	R4SBA
ES-29	0.0116	253	R4SBA
ES-30	0.0248	269	R4SBA
ES-31	0.0052	224	R4SBA
ES-32	0.0902	1,069	R4SBA
ES-33	0.0562	801	R4SBA
ES-34	0.0180	783	R4SBA
ES-35	0.0163	714	R4SBA
ES-36	0.0022	95	R4SBA
ES-37	0.0427	265	R4SBA
ES-38	0.0039	85	R4SBA
ES-39	0.6932	3,663	R4SBA
ES-40	0.0006	26	R4SBA
ES-41	0.0022	100	R4SBA
ES-42	0.0062	128	R4SBA
ES-43	0.0022	47	R4SBA
ES-44	0.0630	911	R4SBA
ES-45	0.0084	175	R4SBA
ES-46	0.0086	372	R4SBA
ES-47	0.0108	473	R4SBA
ES-48	0.0063	275	R4SBA
ES-49	0.0120	122	R4SBA
ES-50	0.0055	49	R4SBA
ES-51	0.0499	714	R4SBA
ES-52	0.0249	719	R4SBA
ES-53	0.0015	46	R4SBA
ES-54	0.0017	51	R4SBA
ES-55	0.1007	866	R4SBA
ES-58	0.0789	1,190	R4SBA
ES-59	0.0199	606	R4SBA
ES-60	0.0056	61	R4SBA
ES-61	0.0916	794	R4SBA
ES-62	0.0059	124	R4SBA
ES-63	0.0028	119	R4SBA
ES-64	0.0073	155	R4SBA
ES-65	0.1111	1,019	R4SBA
ES-66	0.0030	126	R4SBA
ES-67	0.0029	124	R4SBA
ES-68	0.0188	409	R4SBA
ES-69	0.0234	254	R4SBA
ES-70	0.0075	164	R4SBA
ES-71	0.0094	204	R4SBA
ES-72	0.0599	1,022	R4SBA
ES-73	0.0011	40	R4SBA
ES-74	0.0017	72	R4SBA
ES-75	0.0011	23	R4SBA
ES-76	0.0086	188	R4SBA
ES-77	0.0062	135	R4SBA
ES-78	0.0079	172	R4SBA
ES-79	0.0023	49	R4SBA
ES-80	0.0134	292	R4SBA
ES-81	0.0065	138	R4SBA
ES-82	0.0281	407	R4SBA
ES-83	0.0037	159	R4SBA
ES-84	0.0026	112	R4SBA
ES-85	0.0018	77	R4SBA
ES-86	0.0828	666	R4SBA
ES-87	0.1036	1,225	R4SBA
ES-88	0.0058	124	R4SBA
ES-89	0.0277	478	R4SBA
ES-91	0.0016	27	R4SBA
ES-92	0.0001	4	R4SBA
ES-93	0.0141	224	R4SBA
ES-94	0.0039	55	R4SBA
ES-95	0.0293	208	R4SBA
ES-96	0.0428	628	R4SBA
ES-97	0.0007	14	R4SBA
ES-98	0.0008	17	R4SBA
ES-99	0.0012	24	R4SBA
ES-100	0.0005	10	R4SBA
ES-101	0.0075	164	R4SBA
ES-102	0.0026	56	R4SBA
ES-103	0.0026	55	R4SBA
ES-104	0.0122	265	R4SBA
ES-105	0.0120	263	R4SBA
ES-106	0.0049	106	R4SBA
ES-107	0.0219	426	R4SBA
ES-108	0.0659	1,074	R4SBA
ES-109	0.0090	387	R4SBA
ES-110	0.0043	183	R4SBA
ES-111	0.0286	1,249	R4SBA
ES-112	0.0082	353	R4SBA
ES-113	0.0044	191	R4SBA
ES-114	0.0018	74	R4SBA
ES-115	0.0054	235	R4SBA
ES-116	0.0276	388	R4SBA
ES-117	0.0210	304	R4S

Appendix B. Potential Waters of the United States (Overview Sheet 3)

Maha Resort and Guenoc Valley Development, Phase 1

ID	Acre(s)	Linear Ft	Cowardin Code
Ephemeral Stream (continued):			
ES-256	0.0093	399	R4SBA
ES-257	0.0273	728	R4SBA
ES-258	0.0036	149	R4SBA
ES-259	0.0050	207	R4SBA
ES-260	0.0079	335	R4SBA
ES-261	0.0051	221	R4SBA
ES-262	0.0054	233	R4SBA
ES-263	0.0084	341	R4SBA
ES-264	0.0149	416	R4SBA
ES-265	0.0032	136	R4SBA
ES-266	0.0194	487	R4SBA
ES-267	0.0015	58	R4SBA
ES-268	0.0449	828	R4SBA
ES-269	0.0501	904	R4SBA
ES-270	0.0091	391	R4SBA
ES-271	0.0064	276	R4SBA
ES-272	0.0140	269	R4SBA
ES-273	0.0082	176	R4SBA
ES-274	0.0046	198	R4SBA
ES-275	0.0937	1,017	R4SBA
ES-276	0.0105	93	R4SBA
ES-277	0.0133	313	R4SBA
ES-278	0.0016	71	R4SBA
ES-279	0.0025	110	R4SBA
ES-280	0.0262	624	R4SBA
ES-281	0.0027	115	R4SBA
ES-282	0.0564	1,033	R4SBA
ES-283	0.0013	49	R4SBA
ES-284	0.0092	194	R4SBA
ES-285	0.0025	112	R4SBA
ES-286	0.0041	91	R4SBA
ES-287	0.0642	1,391	R4SBA
ES-288	0.0189	410	R4SBA
ES-289	0.0122	264	R4SBA
ES-290	0.0189	414	R4SBA
ES-291	0.0016	64	R4SBA
ES-292	0.0016	69	R4SBA
ES-293	0.0018	81	R4SBA
ES-294	0.0050	221	R4SBA
ES-295	0.0030	130	R4SBA
ES-296	0.0006	12	R4SBA
ES-297	0.0820	1,783	R4SBA
ES-298	0.0041	116	R4SBA
ES-299	0.1254	1,360	R4SBA
ES-300	0.0915	997	R4SBA
ES-301	0.0760	826	R4SBA
ES-302	0.1081	1,182	R4SBA
ES-303	0.2552	625	R4SBA
ES-304	0.0418	303	R4SBA
ES-305	0.0241	699	R4SBA
ES-306	0.0023	98	R4SBA
ES-307	0.0030	130	R4SBA
ES-308	0.0069	200	R4SBA
ES-309	0.0016	68	R4SBA
ES-310	0.0273	624	R4SBA
ES-311	0.0067	287	R4SBA
ES-312	0.0186	327	R4SBA
ES-313	0.0358	390	R4SBA
ES-314	0.0042	176	R4SBA
ES-315	0.0192	368	R4SBA
ES-316	0.0072	224	R4SBA
ES-317	0.0024	69	R4SBA
ES-318	0.3141	2,366	R4SBA
ES-319	0.0243	1,054	R4SBA
ES-320	0.0054	232	R4SBA
ES-321	0.0064	277	R4SBA
ES-322	0.0046	63	R4SBA
ES-323	0.0009	37	R4SBA
ES-324	0.0128	557	R4SBA
ES-325	0.0017	74	R4SBA
ES-326	0.0139	603	R4SBA
ES-327	0.0127	272	R4SBA
ES-328	0.0022	92	R4SBA
ES-329	0.0416	795	R4SBA
ES-330	0.0086	186	R4SBA
ES-331	0.0102	221	R4SBA
ES-332	0.0234	337	R4SBA
ES-333	0.0131	275	R4SBA
ES-334	0.0041	175	R4SBA
ES-335	0.0187	404	R4SBA
ES-336	0.0146	424	R4SBA
ES-337	0.0225	477	R4SBA
ES-338	0.0196	424	R4SBA
ES-339	0.0486	866	R4SBA
ES-340	0.0062	269	R4SBA
ES-341	0.0070	152	R4SBA
ES-342	0.0286	315	R4SBA
ES-343	0.0025	109	R4SBA
ES-344	0.0161	187	R4SBA
ES-345	0.0038	171	R4SBA
ES-346	0.0551	599	R4SBA
ES-347	0.0143	211	R4SBA
ES-348	0.0047	151	R4SBA
ES-349	0.0011	24	R4SBA
ES-350	0.0056	236	R4SBA
ES-351	0.0026	115	R4SBA
ES-352	0.1661	822	R4SBA
ES-353	0.0212	459	R4SBA
ES-354	0.0226	656	R4SBA
ES-355	0.0026	73	R4SBA
ES-356	0.0018	44	R4SBA
ES-357	0.0019	56	R4SBA
ES-358	0.0134	395	R4SBA
ES-359	0.0007	32	R4SBA
ES-361	0.0115	244	R4SBA
ES-362	0.0198	285	R4SBA
ES-363	0.0325	351	R4SBA
ES-365	0.0034	48	R4SBA
ES-366	0.0021	44	R4SBA
ES-367	0.0035	50	R4SBA
ES-368	0.0053	75	R4SBA
ES-369	0.0056	121	R4SBA
ES-370	0.0013	29	R4SBA
ES-371	0.0015	31	R4SBA
ES-372	0.0010	19	R4SBA
ES-373	0.0010	45	R4SBA
ES-374	0.0261	142	R4SBA
ES-375	0.0039	167	R4SBA
ES-376	0.0187	580	R4SBA
ES-377	0.0181	261	R4SBA
ES-378	0.0026	109	R4SBA
ES-379	0.0033	144	R4SBA
ES-380	0.0054	77	R4SBA
ES-381	0.0094	136	R4SBA
ES-382	0.0669	962	R4SBA
ES-383	0.0321	463	R4SBA
ES-384	0.0900	782	R4SBA
ES-385	0.0318	276	R4SBA
ES-386	0.0553	953	R4SBA
ES-387	0.0179	774	R4SBA
ES-388	0.0017	73	R4SBA
ES-389	0.0087	376	R4SBA
ES-390	0.0033	48	R4SBA
ES-391	0.0175	379	R4SBA
ES-392	0.1137	1,237	R4SBA
ES-393	0.0259	280	R4SBA
ES-394	0.0030	128	R4SBA
ES-395	0.0014	61	R4SBA
ES-396	0.0016	70	R4SBA
ES-397	0.0641	928	R4SBA
ES-398	0.0022	94	R4SBA
ES-399	0.0018	80	R4SBA
ES-400	0.0172	350	R4SBA
ES-401	0.0586	856	R4SBA
ES-402	0.0027	113	R4SBA
ES-403	0.0056	79	R4SBA
ES-404	0.0075	228	R4SBA
ES-405	0.0087	250	R4SBA
ES-406	0.0571	935	R4SBA
ES-407	0.0117	126	R4SBA
ES-408	0.0065	72	R4SBA
ES-409	0.0016	20	R4SBA
ES-410	0.0115	122	R4SBA
ES-411	0.0055	77	R4SBA
ES-412	0.0369	320	R4SBA
ES-413	0.0182	159	R4SBA
ES-414	0.0024	105	R4SBA
ES-415	0.0090	394	R4SBA
ES-416	0.0008	31	R4SBA
ES-417	0.0238	344	R4SBA
ES-418	0.0129	558	R4SBA
ES-419	0.0104	453	R4SBA
ES-420	0.0028	116	R4SBA
ES-421	0.0011	48	R4SBA
ES-422	0.2470	2,671	R4SBA
ES-423	0.0040	165	R4SBA
ES-424	0.0043	246	R4SBA
ES-425	0.0038	106	R4SBA
ES-426	0.0030	128	R4SBA
ES-427	0.0183	423	R4SBA
ES-428	0.0052	228	R4SBA
ES-429	0.0015	64	R4SBA
ES-430	0.0021	90	R4SBA
ES-431	0.0014	60	R4SBA
ES-432	0.0009	37	R4SBA
ES-433	0.0016	68	R4SBA
ES-434	0.0012	53	R4SBA
ES-435	0.0653	945	R4SBA
ES-436	0.0084	180	R4SBA
ES-437	0.0153	491	R4SBA
ES-438	0.0398	844	R4SBA
ES-439	0.0079	344	R4SBA
ES-440	0.0029	97	R4SBA
ES-441	0.0064	277	R4SBA
ES-442	0.0230	620	R4SBA
ES-444	0.0207	410	R4SBA
ES-445	0.0015	64	R4SBA
ES-446	0.0014	63	R4SBA
ES-447	0.0001	6	R4SBA
ES-448	0.0015	67	R4SBA
ES-449	0.0020	59	R4SBA
ES-450	0.0013	58	R4SBA
ES-451	0.0014	60	R4SBA
ES-452	0.0013	56	R4SBA
ES-453	0.0038	40	R4SBA
ES-454	0.0076	36	R4SBA
ES-455	0.0014	41	R4SBA
ES-456	0.0026	74	R4SBA
ES-457	0.0043	62	R4SBA
ES-458	0.0159	72	R4SBA
ES-459	0.0097	63	R4SBA
ES-460	0.0040	42	R4SBA
ES-461	0.0071	50	R4SBA
ES-462	0.0433	731	R4SBA
ES-463	0.0029	124	R4SBA
ES-464	0.0314	455	R4SBA
ES-465	0.0024	90	R4SBA
ES-466	0.0474	1,033	R4SBA
ES-467	0.0665	1,030	R4SBA
ES-469	0.0078	112	R4SBA
ES-470	0.2537	1,502	R4SBA
ES-471	0.1382	854	R4SBA
ES-472	0.0031	67	R4SBA
ES-473	0.0414	293	R4SBA
ES-475	0.0127	551	R4SBA
ES-476	0.1263	876	R4SBA
ES-478	0.3818	2,638	R4SBA
ES-479	0.2921	3,573	R4SBA
ES-480	0.0996	1,086	R4SBA
ES-481	0.0024	90	R4SBA
ES-482	0.0150	84	R4SBA
ES-483	0.0254	548	R4SBA
ES-484	0.0784	1,137	R4SBA
ES-485	0.0079	160	R4SBA
ES-486	0.0915	1,632	R4SBA
ES-488	0.0035	151	R4SBA
ES-489	0.0052	219	R4SBA
ES-490	0.0046	198	R4SBA
ES-491	0.1227	1,109	R4SBA
ES-492	0.1492	1,393	R4SBA
ES-493	0.0330	780	R4SBA
ES-496	0.1469	1,871	R4SBA
ES-497	0.0593	844	R4SBA
ES-499	0.0025	54	R4SBA
ES-500	0.0171	248	R4SBA
ES-501	0.0041	43	R4SBA
ES-502	0.0745	1,245	R4SBA
ES-503	0.0222	482	R4SBA
ES-504	0.0227	326	R4SBA
ES-505	0.0201	425	R4SBA
ES-506	0.0021	89	R4SBA
ES-507	0.0087	69	R4SBA
ES-508	0.0093	63	R4SBA
ES-509	0.0120	136	R4SBA
ES-510	0.0105	296	R4SBA
ES-511	0.0313	333	R4SBA
ES-512	0.0389	336	R4SBA
ES-513	0.0402	688	R4SBA
ES-514	0.0242	304	R4SBA
ES-515	0.0123	268	R4SBA
ES-516	0.0025	109	R4SBA
ES-517	0.0067	195	R4SBA
ES-518	0.0307	667	R4SBA
ES-519	0.0018	77	R4SBA
ES-520	0.0025	107	R4SBA
ES-521	0.0117	284	R4SBA
ES-522	0.0060	129	R4SBA
ES-523	0.0077	333	R4SBA
ES-524	0.0016	70	R4SBA
ES-525	0.0514	800	R4SBA
ES-526	0.1941	1,327	R4SBA
ES-527	0.0072	305	R4SBA
ES-528	0.0152	220	R4SBA
ES-529	0.1010	521	R4SBA
ES-530	0.0456	660	R4SBA
ES-531	0.0228	325	R4SBA
ES-532	0.0142	205	R4SBA
ES-533	0.2710	944	R4SBA
ES-535	0.0103	336	R4SBA
ES-536	0.0098	426	R4SBA
ES-537	0.1859	1,657	R4SBA
ES-538	0.0035	51	R4SBA
ES-539	0.0029	42	R4SBA
ES-540	0.0109	158	R4SBA
ES-541	0.0057	79	R4SBA
ES-542	0.0070	281	R4SBA
ES-543	0.2117	2,331	R4SBA
ES-544	0.0130	566	R4SBA
ES-545	0.0870	631	R4SBA
ES-546	0.0305	443	R4SBA
ES-547	0.0045	64	R4SBA
ES-548	0.0679	984	R4SBA
ES-549	0.0023	93	R4SBA
ES-550	0.0545	555	R4SBA
ES-551	0.0095	413	R4SBA
ES-552	0.0079	172	R4SBA
ES-553	0.0012	53	R4SBA
ES-554	0.0039	59	R4SBA
ES-555	0.0252	368	R4SBA
ES-556	0.0092	133	R4SBA
ES-557	0.1538	2,213	R4SBA
ES-558	0.0061	129	R4SBA
ES-559	0.0141	204	R4SBA
ES-560	0.0272	297	R4SBA
ES-561	0.0355	385	R4SBA
ES-562	0.0051	220	R4SBA
ES-563	0.0100	216	R4SBA
ES-564	0.0133	1,396	R4SBA
ES-565	0.0009	39	R4SBA
ES-566	0.0039	164	R4SBA
ES-567	0.0022	97	R4SBA
ES-568	0.0235	1,018	R4SBA
ES-569	0.0020	87	R4SBA
ES-570	0.0340	664	R4SBA
ES-571	0.0125	540	R4SBA
ES-572	0.0117	339	R4SBA
ES-573	0.0181	786	R4SBA
ES-574	0.0349	395	R4SBA
ES-575	0.0029	58	R4SBA
ES-576	0.0110	472	R4SBA
ES-577	0.0032	90	R4SBA
ES-578	0.0018	77	R4SBA
ES-579	0.0311	337	R4SBA
ES-580	0.0293	320	R4SBA
ES-581	0.0190	408	R4SBA
ES-582	0.1500	1,087	R4SBA
ES-583	0.0441	386	R4SBA
ES-584	0.0678	736	R4SBA
ES-585	0.0079	165	R4SBA
ES-586	0.0017	45	R4SBA
ES-587	0.0761	851	R4SBA
ES-588	0.0010	22	R4SBA
ES-589	0.0046	52	R4SBA
ES-590	0.0078	91	R4SBA
ES-591	0.0170	268	R4SBA
ES-592	0.0012	26	R4SBA
ES-593	0.0067	145	R4SBA
ES-594	0.0226	387	R4SBA
ES-595	0.0043	183	R4SBA
ES-596	0.0493	953	R4SBA
ES-597	0.0165	354	R4SBA
ES-598	0.0032	134	R4SBA
ES-599	0.0234	338	R4SBA
ES-600	0.0439	950	R4SBA
ES-601	0.0041	173	R4SBA
ES-602	0.0207	299	R4SBA
ES-603	0.0009	35	R4SBA
ES-604	0.0572	574	R4SBA
ES-605	0.0174	188	R4SBA
ES-606	0.0064	272	R4SBA
ES-608	0.0101	214	R4SBA
ES-609	0.0027	58	R4SBA
ES-610	0.0273	595	R4SBA
ES-612	0.0327	773	R4SBA
ES-613	0.0093	195	R4SBA
ES-614	0.0021	46	R4SBA
ES-615	0.0021	46	R4SBA
ES-616	0.0289	314	R4SBA
ES-617	0.1217	2,029	R4SBA
ES-618	0.0430	930	R4SBA
ES-619	0.0100	433	R4SBA
ES-620	0.0045	184	R4SBA
ES-621	0.0293	708	R4SBA
ES-622	0.0069	247	R4SBA
ES-623	0.0050	220	R4SBA
ES-624	0.0128	138	R4SBA
ES-625	0.0250	176	R4SBA
ES-626	0.0099	211	R4SBA
ES-627	0.0799	398	R4SBA
ES-628	0.0016	70	R4SBA
ES-629	0.0019	69	R4SBA
ES-630	0.0029	71	R4SBA
ES-631	0.0134	94	R4SBA
ES-632	0.0459	904	R4SBA
ES-635	0.0030	129	R4SBA
ES-637	0.0134	192	R4SBA
ES-638	0.0141	204	R4SBA
ES-639	0.0507	953	R4SBA
ES-640	0.0115	487	R4SBA
ES-641	0.0281	609	R4SBA
ES-642	0.0052	122	R4SBA
ES-643	0.0028	40	R4SBA
ES-644	0.0034	143	R4SBA
ES-645	0.0035	74	R4SBA
ES-646	0.0572	829	R4SBA
ES-647	0.0022	96	R4SBA
ES-648	0.0016	142	R4SBA
ES-649	0.0054	26	R4SBA
ES-650	0.0090	130	R4SBA
ES-651	0.0258	561	R4SBA
ES-652	0.0082	235	R4SBA
ES-653	0.0007	27	R4SBA
ES-654	0.0015	63	R4SBA
ES-655	0.0003	9	R4SBA
ES-656	0.0027	118	R4SBA
ES-657	0.0081	175	R4SBA
ES-658	0.0026	72	R4SBA
ES-659	0.0087	189	R4SBA
ES-660	0.0156	305	R4SBA
ES-661	0.0125	178	R4SBA
ES-662	0.0050	217	R4SBA
ES-663	0.0889	966	R4SBA
ES-664	0.0449	649	R4SBA
ES-665	0.0097	396	R4SBA
ES-666	0.0012	51	R4SBA
ES-667	0.0067	291	R4SBA
ES-668	0.0049	70	R4SBA
ES-669	0.0019	83	R4SBA
ES-670	0.1443	1,406	R4SBA
ES-671	0.0693	374	R4SBA
ES-672	0.0219	417	R4SBA
ES-673	0.0180	392	R4SBA
ES-674	0.0023	48	R4SBA
ES-675	0.0053	114	R4SBA
ES-676	0.0017	72	R4SBA
ES-677	0.0083	89	R4SBA
ES-678	0.0045	66	R4SBA
ES-679	0.0042	62	R4SBA
ES-680	0.0075	115	R4SBA
ES-681	0.0072	81	R4SBA
ES-682	0.0032	73	R4SBA
ES-683	0.0084	110	R4SBA
ES-684	0.0096	104	R4SBA
ES-685	0.0174	126	R4SBA
ES-686	0.0155	112	R4SBA
ES-687	0.0067	96	R4SBA
ES-688	0.0101	72	R4SBA
ES-689	0.0023	38	R4SBA
ES-690	0.0135	198	R4SBA
ES-691	0.0174	252	R4SBA
ES-692	0.0047	206	R4SBA
ES-693	0.0226	385	R4SBA
ES-694	0.0136	197	R4SBA
ES-695	0.0150	650	R4SBA
ES-696	0.0042	182	R4SBA
ES-697	0.0056	242	R4SBA
ES-698	0.0006	24	R4SBA
ES-699	0.0098	428	R4SBA
ES-700	0.0020	82	R4SBA
ES-701	0.0092	133	R4SBA
ES-702	0.0023	35	R4SBA
ES-703	0.0336	726	R4SBA
ES-704	0.0104	37	R4SBA
ES-705	0.0789	350	R4SBA
ES-706	0.0051	229	R4SBA
ES-707	0.0405	535	R4SBA
ES-708	0.0083	122	R4SBA
ES-709	0.0087	193	R4SBA
ES-710	0.0097	147	R4SBA
ES-711	0.0057	129	R4SBA
ES-712	0.0631	723	R4SBA
ES-713	0.0156	297	R4SBA
ES-714	0.0494	380	R4SBA
ES-715	0.0296	429	R4SBA
ES-716	0.1467	1,951	R4SBA
ES-717	0.1422	1,420	R4SBA
ES-718	0.0464	542	R4SBA
ES-719	0.0355	677	R4SBA
ES-720	0.0068	147	R4SBA
ES-721	0.0063	270	R4SBA
ES-722	0.0195	283	R4SBA
ES-723	0.0329	657	R4SBA
ES-724	0.0011	46	R4SBA
ES-725	0.0391	788	R4SBA
ES-726	0.0705	1,438	R4SBA
ES-727	0.0286	620	R4SBA
ES-728	0.0117	253	R4SBA
ES-729	0.1031	735	R4SBA
ES-730	0.0885	1,034	R4SBA
ES-731	0.0299	517	R4SBA
ES-732	0.0029	119	R4SBA
ES-733	0.0255	284	R4SBA
ES-734	0.0047	201	R4SBA
ES-735	0.0048	205	R4SBA
ES-736	0.0009	37	R4SBA
ES-737	0.0065	283	R4SBA
ES-738	0.0039	172	R4SBA
ES-739	0.0262	568	R4SBA
ES-740	0.0032	145	R4SBA
ES-741	0.0650	1,134	R4SBA
ES-742	0.0087	376	R4SBA
ES-743	0.0164	487	R4SBA
ES-744	0.0017	75	R4SBA
ES-745	0.0141	277	R4SBA
ES-746	0.0018	80	R4SBA
ES-747	0.0017	70	R4SBA
ES-748	0.3835	2,794	R4SBA
ES-749	0.0122	130	R4SBA
ES-750	0.0499	559	R4SBA
ES-751	0.0052	75	R4SBA
ES-752	0.0069	150	R4SBA
ES-753	0.0046	99	R4SBA
ES-754	0.0034	139	R4SBA
ES-755	0.0054	102	R4SBA
ES-756	0.0014	60	R4SBA
ES-757	0.0089	75	R4SBA
ES-758	0.0645	346	R4SBA
ES-759	0.0119	163	R4SBA
ES-760	0.0512	444	R4SBA
ES-761	0.0376	429	R4SBA
ES-762	0.0229	498	R4SBA
ES-763	0.0141	304	R4SBA
ES-764	0.0028	120	R4SBA
ES-765	0.0051	223	R4SBA
ES-766	0.0020	86	R4SBA
ES-767	0.0090	130	R4SBA
ES-768	0.0046	100	R4SBA
ES-769	0.0074	81	R4SBA
ES-770	0.0078	167	R4SBA
ES-771	0.0012	50	R4SBA
ES-772	0.0141	243	R4SBA
ES-773	0.0029	124	R4SBA
ES-774	0.0230	334	R4SBA
ES-775	0.0016	69	R4SBA
ES-776	0.0029	59	R4SBA
ES-777	0.0151	319	R4SBA
ES-778	0.0049	213	R4SBA
ES-779	0.0041	177	R4SBA
ES-780	0.0017	37	R4SBA
ES-781	0.0066	143	R4SBA
ES-782	0.0172	377	R4SBA
ES-783	0.0024	52	R4SBA
ES-784	0.0026	56	R4SBA
ES-785	0.0003	6	R4SBA
ES-786	0.0021	45	R4SBA
ES-787	0.0036	78	R4SBA
ES-788	0.0032	136	R4SBA
ES-789	0.0011	47	R4SBA
ES-790	0.0012	53	R4SBA
ES-791	0.0010	45	R4SBA
ES-792	0.0110	242	R4SBA
ES-793	0.0028	122	R4SBA
ES-794	0.0016	69	R4SBA
ES-795	0.0012	51	R4SBA
ES-796	0.0026	115	R4SBA
ES-797	0.0040	57	R4SBA
ES-798	0.0032	45	R4SBA
ES-799	0.0008	33	R4SBA
ES-800	0.0122	88	R4SBA
ES-801	0.0009	19	R4SBA
ES-802	0.0066	95	R4SBA
ES-803	0.0007	30	R4SBA
ES-804	0.0010	27	R4SBA
ES-805	0.0190	275	R4SBA
ES-806	0.0012	24	R4SBA
ES-807	0.0015	11	R4SBA
ES-808	0.0005	22	R4SBA
ES-809	0.0006	8	R4SBA
ES-810	0.0016	23	R4SBA
ES-811	0.0016	22	R4SBA
ES-812	0.0057	60	R4SBA
ES-813	0.0011	8	R4SBA
ES-814	0.0013	55	R4SBA
ES-815	0.0025	72	R4SBA
ES-816	0.0015	20	R4SBA
ES-817	0.0054	114	R4SBA
ES-818	0.0056	120	R4SBA
ES-819	0.0015	20	R4SBA
ES-820	0.0165	248	R4SBA
ES-821	0.0052	227	R4SBA
ES-822	0.0022	97	R4SBA
ES-823	0.0046	202	R4SBA
ES-824	0.0055	236	R4SBA
ES-825	0.0006	13	R4SBA
ES-826	0.0037	81	R4SBA
ES-827	0.0035	152	R4SBA
ES-828	0.0078	339	R4SBA
ES-829	0.0017	76	R4SBA
ES-830	0.0189	204	R4SBA
ES-831	0.0058	126	R4SBA
ES-832	0.0070	76	R4SBA
ES-833	0.0073	212	R4SBA
ES-834	0.0037	157	R4SBA
ES-835	0.0037	157	R4SBA
ES-836	0.0015	64	R4SBA
ES-837	0.0097	210	R4SBA
ES-838	0.0642	310	R4SBA
ES-839	0.2080	481	R4SBA
ES-840	0.0540	1175	R4SBA
ES-841	0.0020	86	R4SBA
ES-842	0.0051	217	R4SBA
ES-843	0.0016	35	R4SBA
ES-844	0.0186	480	R4SBA
ES-845	0.0100	217	R4SBA
ES-846	0.0004	16	R4SBA
ES-847	0.0005	21	R4SBA
ES-848	0.0008	33	R4SBA
ES-849	0.0007	15	R4SBA
ES-850	0.0003	14	R4SBA
ES-852	0.0451	654	R4SBA
ES-853	0.0014	30	R4SBA
ES-854	0.0059	126	R4SBA
ES-855	0.0048	210	R4SBA
ES-856	0.0006	25	R4SBA
ES-857	0.0007	30	R4SBA
ES-858	0.0117	509	R4SBA
ES-859	0.0025	110	R4SBA
ES-860	0.0315	342	R4SBA
ES-861	0.0116	254	R4SBA
ES-862	0.0077	116	R4SBA
ES-863	0.0014	62	R4SBA
ES-864	0.0089	100	R4SBA
ES-865	0.0067	102	R4SBA
ES-866	0.0063	271	R4SBA
ES-867	0.0758	792	R4SBA
ES-868	0.0011	49	R4SBA
ES-869	0.0997	987	R4SBA
ES-870	0.0154	223	R4SBA
ES-871	0.0093	136	R4SBA
ES-872	0.0086	160	R4SBA
ES-873	0.0024	104	R4SBA
ES-874	0.0116	251	R4SBA
ES-875	0.0255	551	R4SBA
ES-876	0.0032	141	R4SBA
ES-877	0.0071	151	R4SBA
ES-878	0.0029	123	R4SBA
ES-879	0.0017	69	R4SBA
ES-880	0.0063	277	R4SBA
ES-881	0.0029	127	R4SBA
ES-882	0.0079	346	R4SBA
ES-883	0.0063	274	R4SBA
ES-884	0.0006	7	R4SBA
ES-885	0.0005	23	R4SBA
ES-886	0.0121	350	R4SBA
ES-887	0.0035	23	R4SBA
ES-888	0.0036	16	R4SBA
ES-889	0.0122	132	R4SBA
ES-890	0.0015	66	R4SBA
ES-891	0.0049	70	R4SBA
ES-892	0.0022	95	R4SBA
ES-893	0.0039	172	R4SBA
ES-894	0.0079	342	R4SBA
ES-895	0.0038	125	R4SBA
ES-896	0.0095	413	R4SBA
ES-897	0.0105	228	R4SBA
ES-898	0.0019	41	R4SBA
ES-899	0.0065	283	R4SBA
ES-900	0.0041	175	R4SBA
ES-901	0.0093	405	R4SBA
ES-902	0.0012	53	R4SBA
ES-903	0.0066	287	R4SBA
ES-904	0.0002	10	R4SBA

Appendix B.
Potential Waters of the United States (Mapbook Sheet 1)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

0 250 500

Feet

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Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 2)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

0 250 500

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\Delineation\Corps Jurisdiction Mapbook.mxd

Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B. Potential Waters of the United States (Mapbook Sheet 3)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

0 250 500

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\Delineation\Corps Jurisdiction Mapbook.mxd

Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 4)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

0 250 500

Feet

ENVIRONMENTAL CONSULTANTS

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Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 5)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Feet

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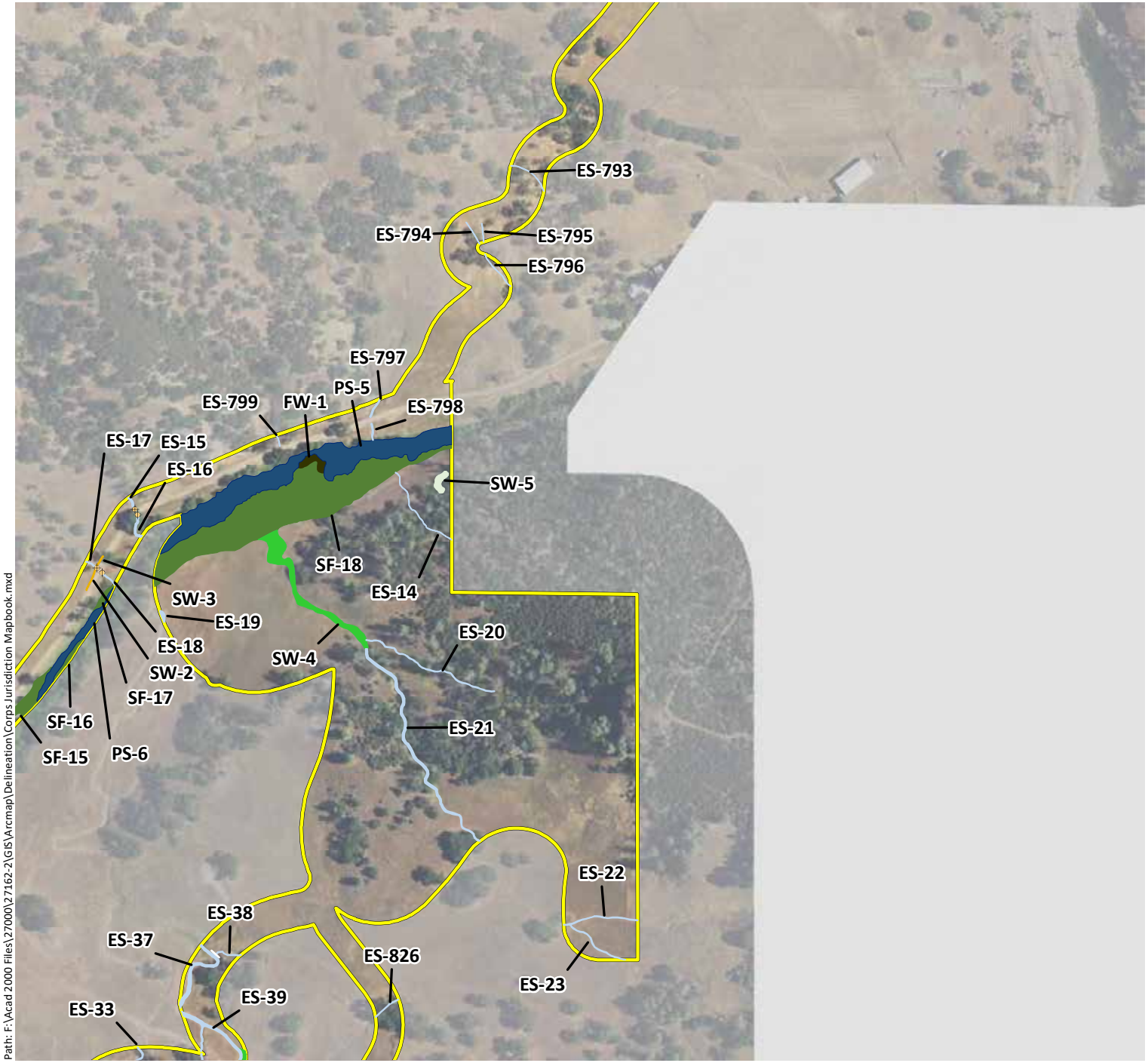
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 6)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Feet

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Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 7)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

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Feet

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Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 8)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

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Feet

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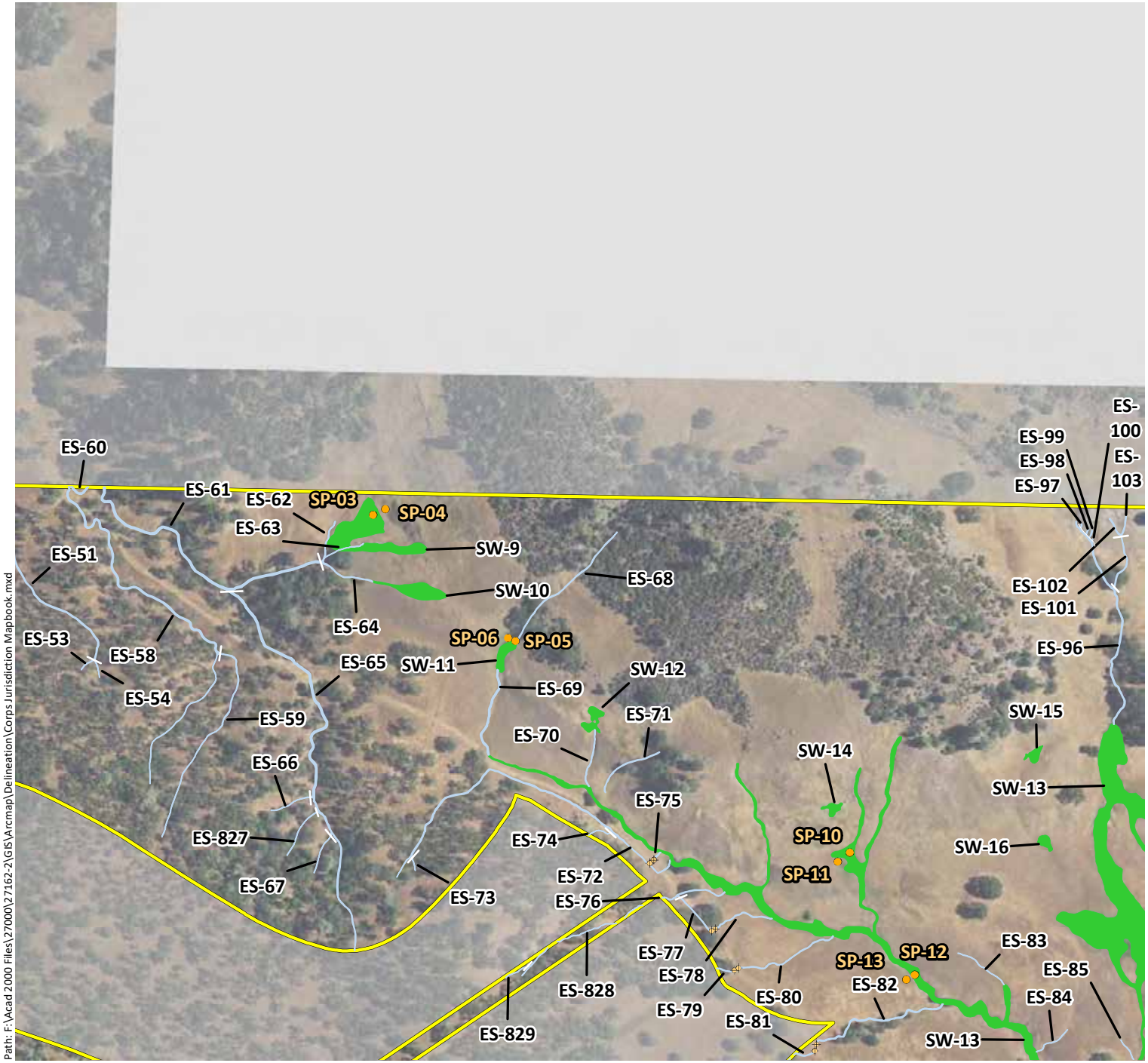
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 9)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

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Feet

ENVIRONMENTAL CONSULTANTS

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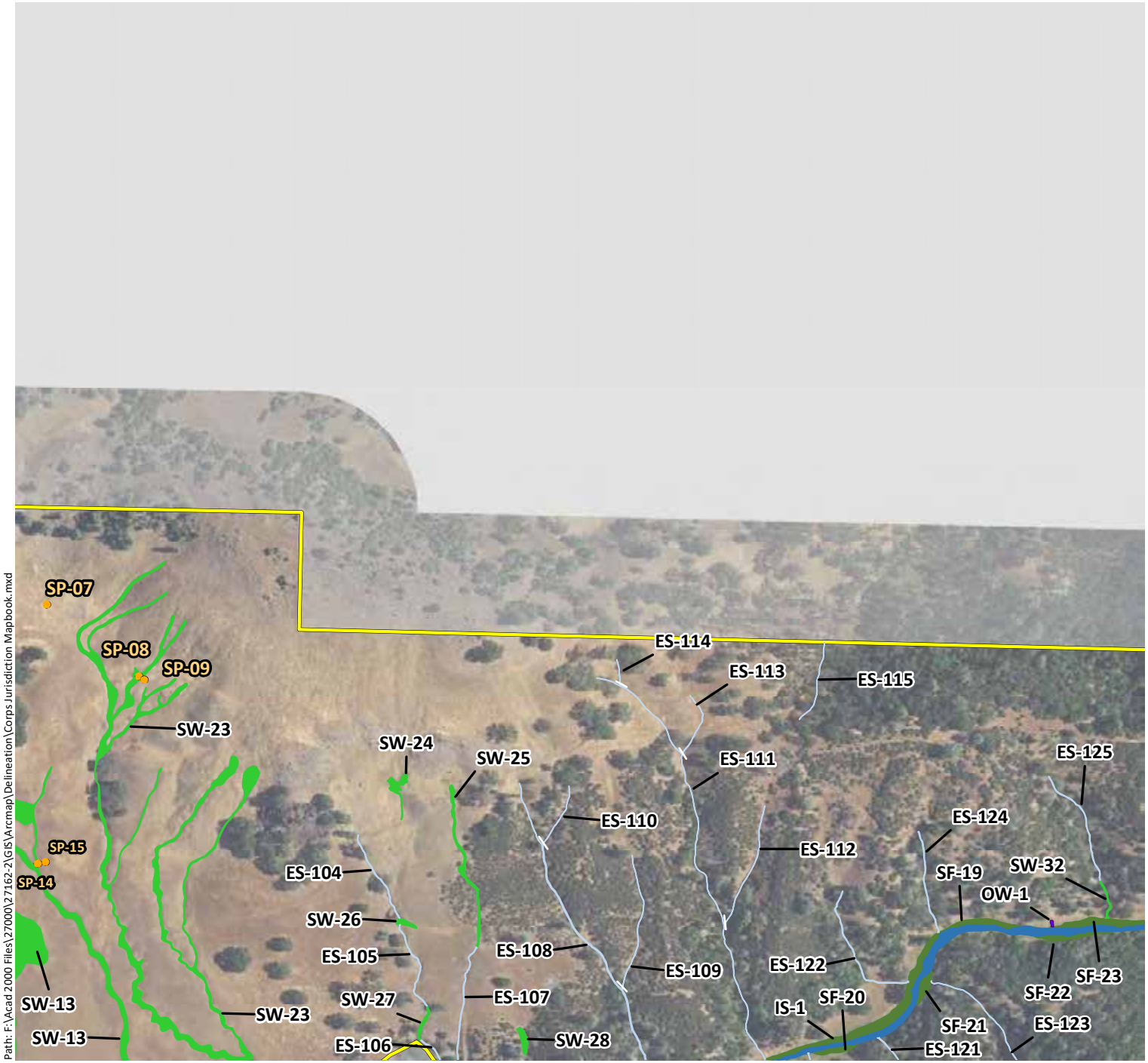
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 10)

Maha Resort and Guenoc Valley Development, Phase 1



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Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

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Feet

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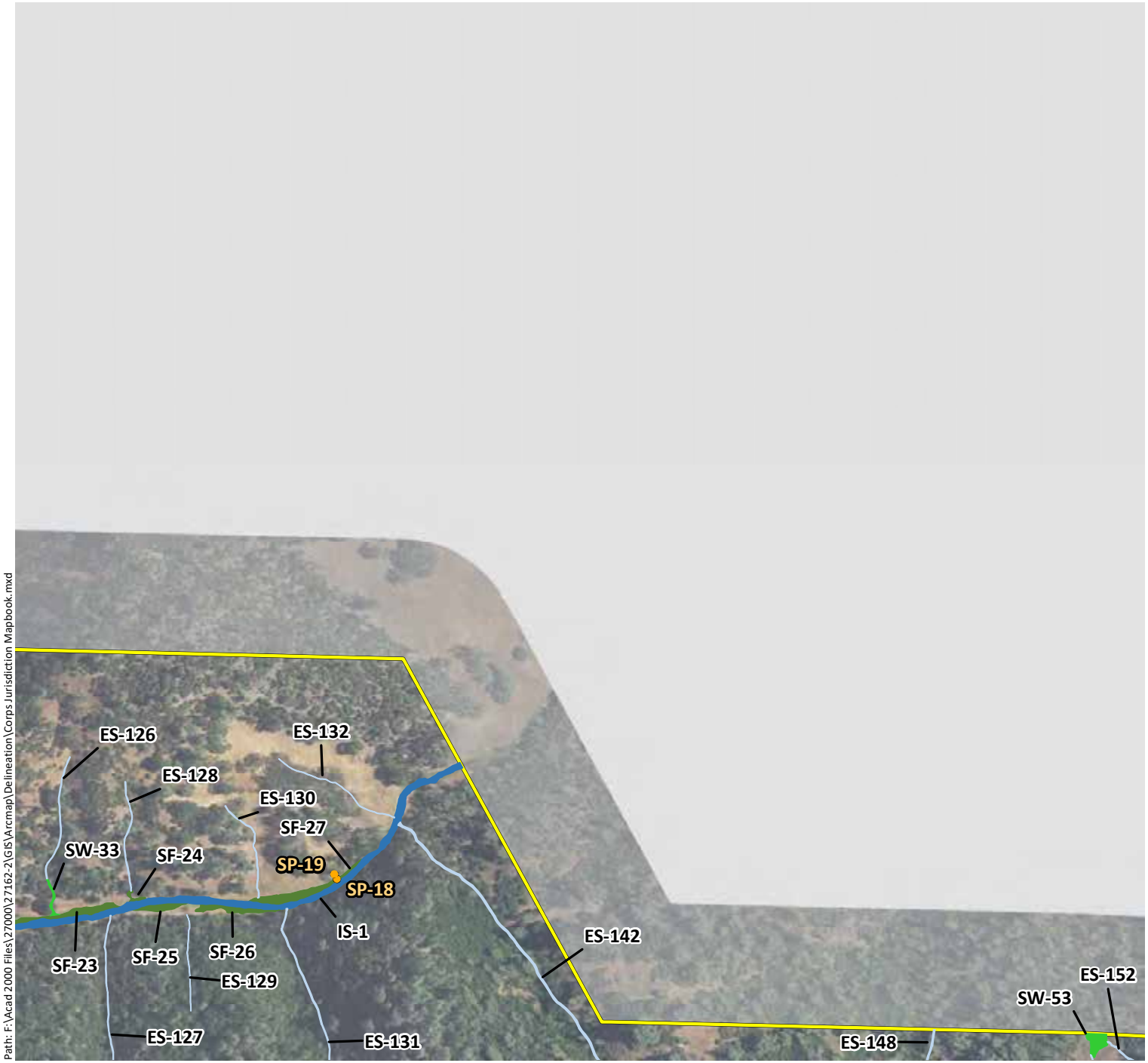
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 11)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Feet

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Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 12)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Feet

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Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 13)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

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Feet

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Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 14)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Feet

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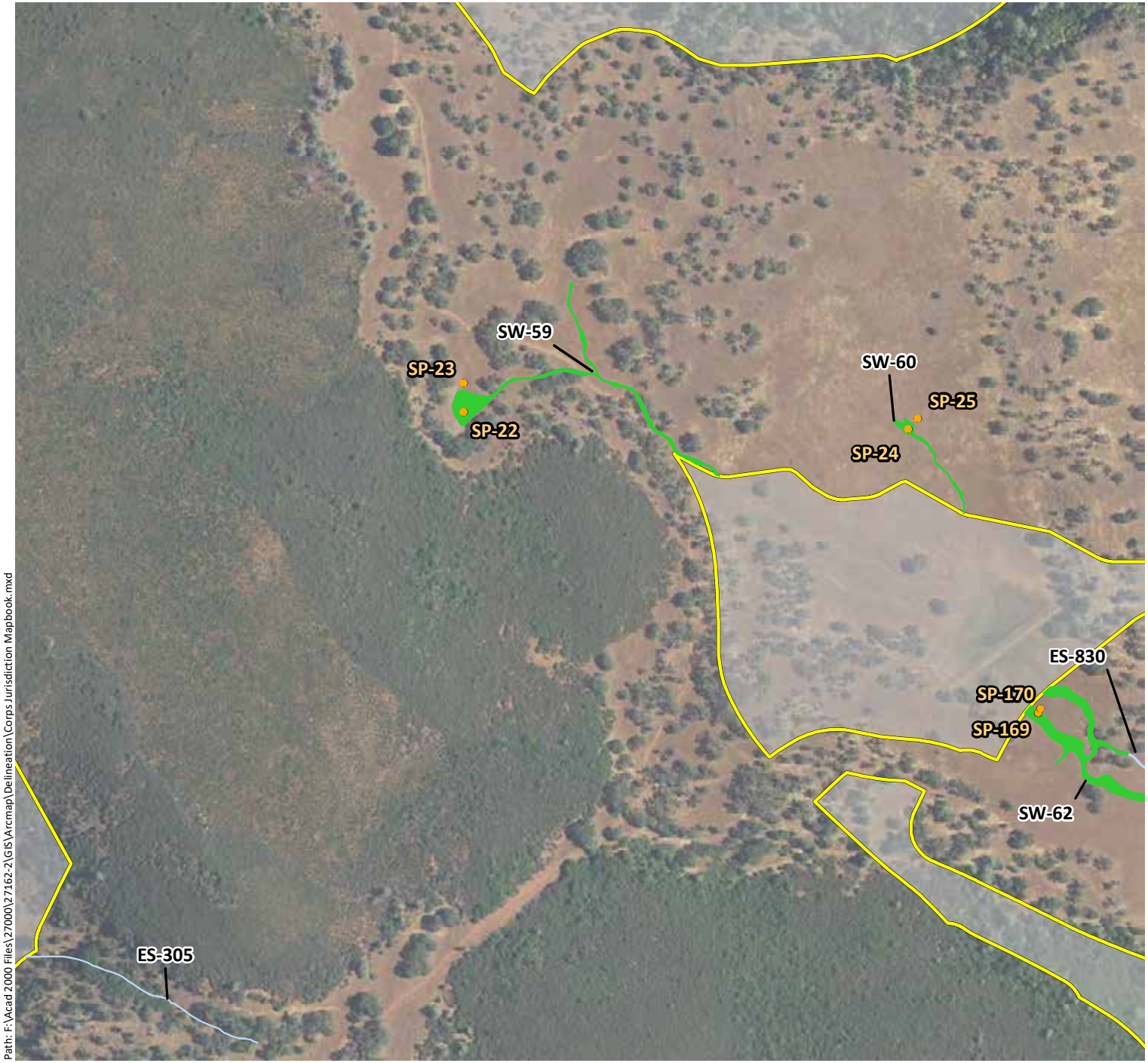
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 15)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.
Sample Points
Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Feet

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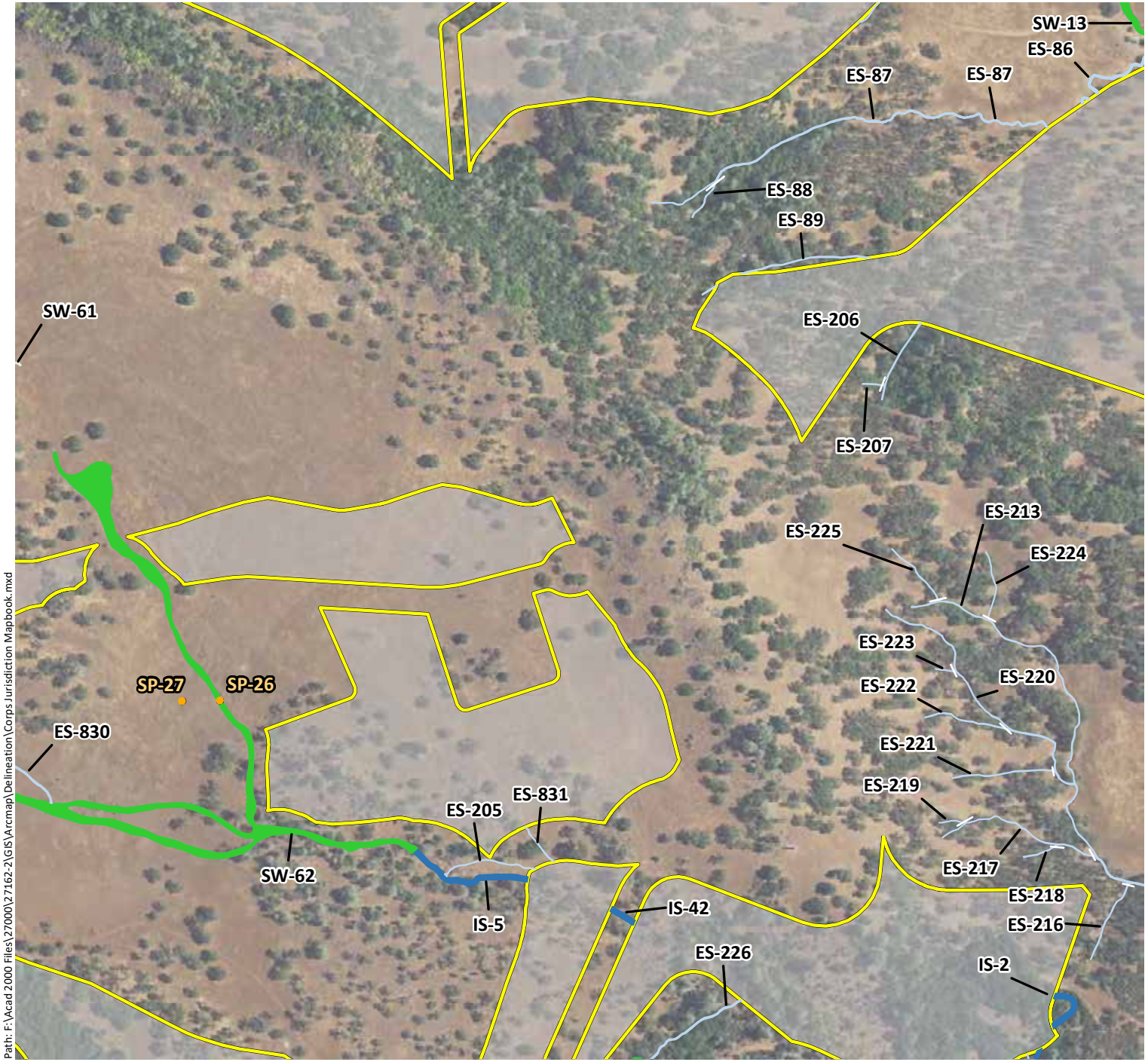
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 16)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

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Feet

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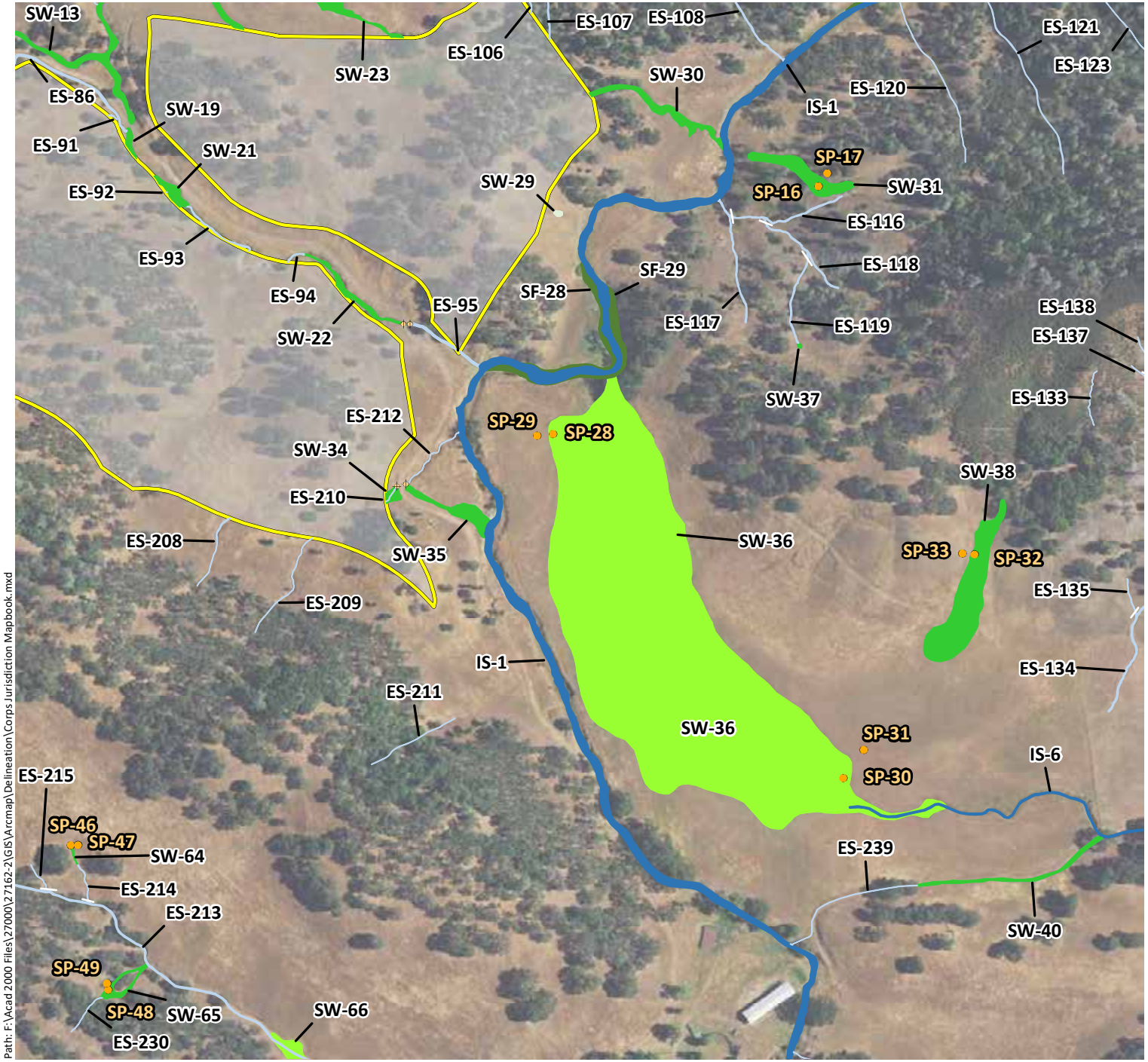
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B. Potential Waters of the United States (Mapbook Sheet 17)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

0 250 500

Feet

ENVIRONMENTAL CONSULTANTS

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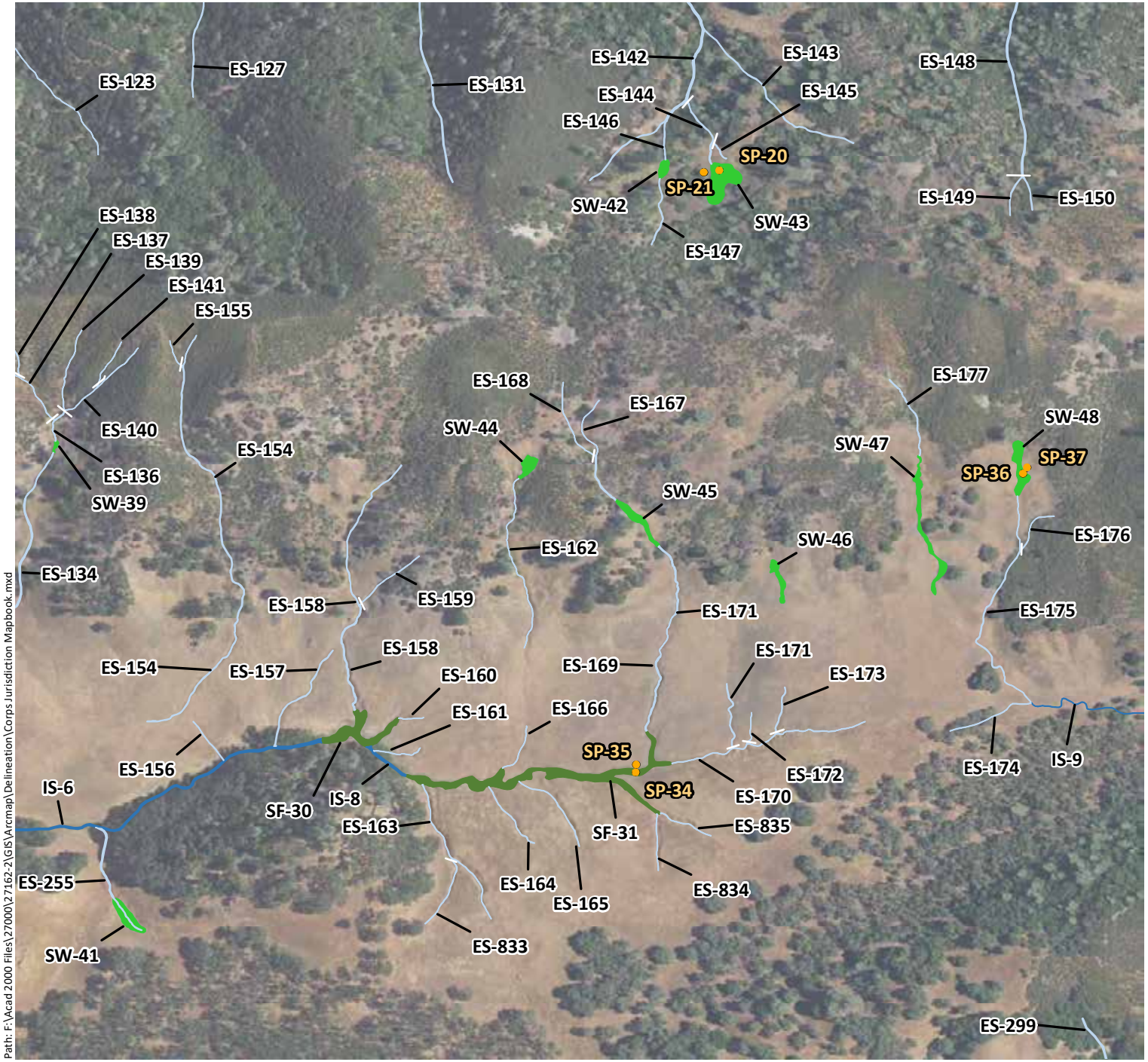
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 18)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

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Feet

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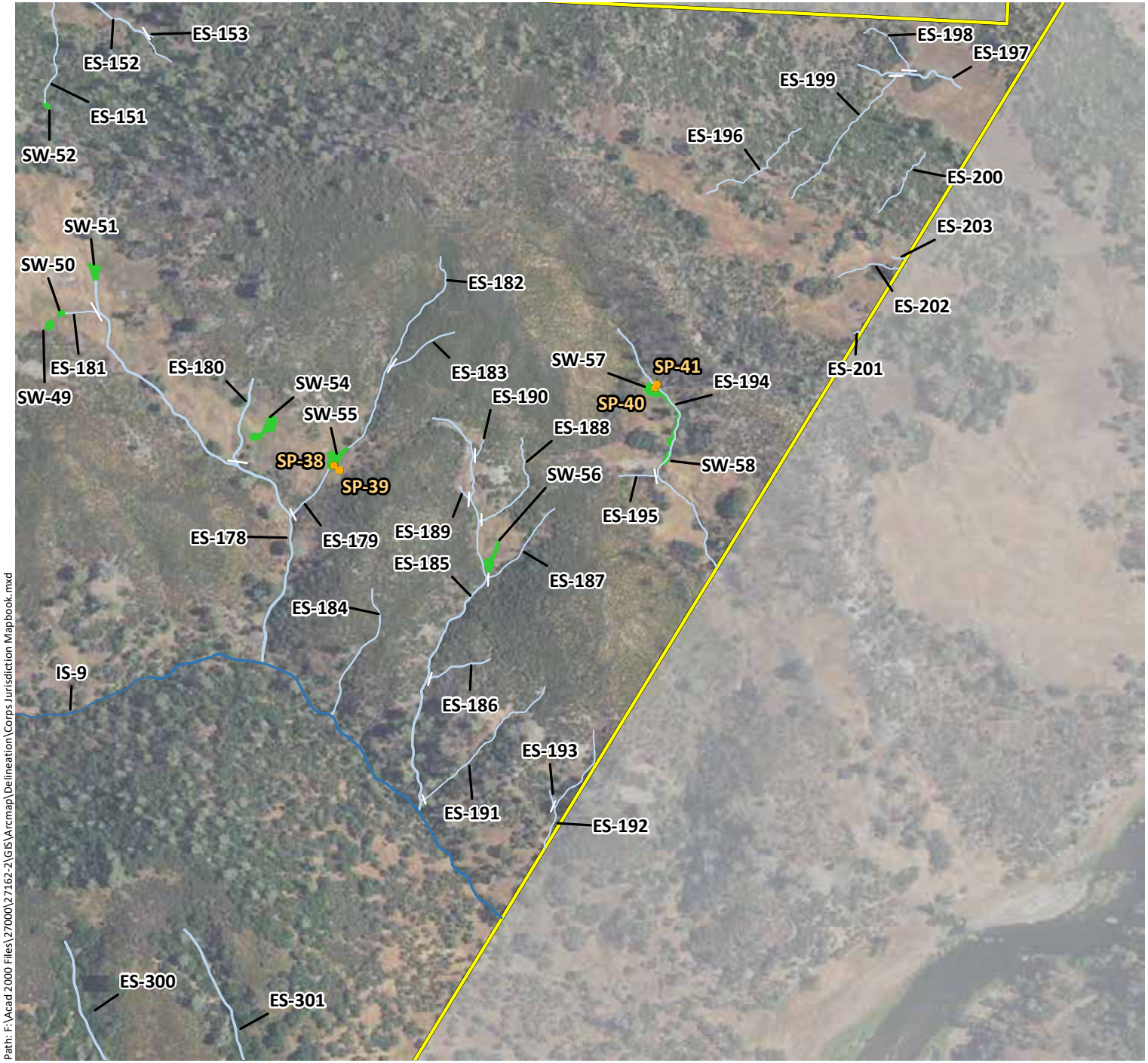
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 19)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

0 250 500

Feet

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Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 20)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

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Feet

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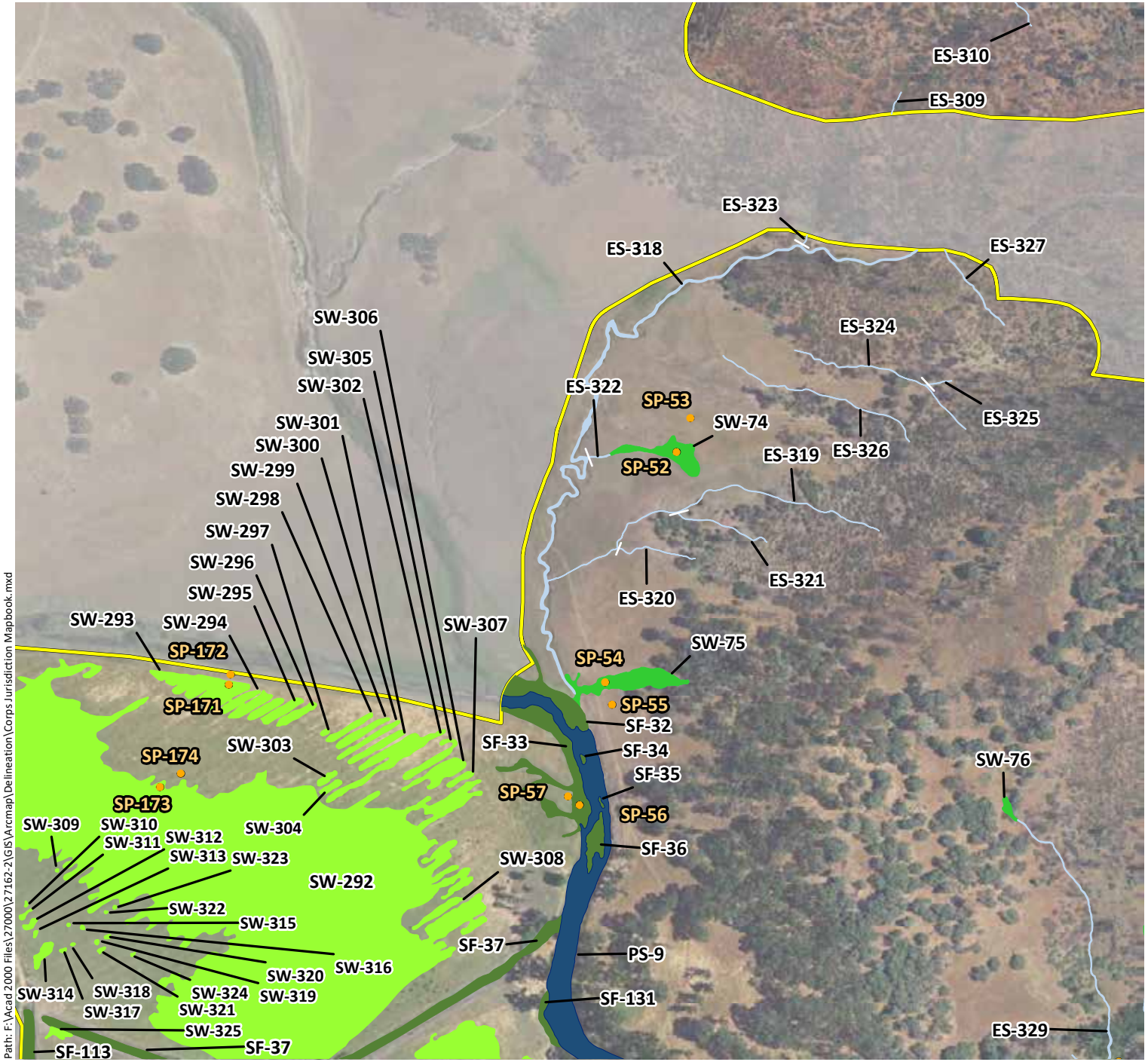
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 21)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Feet

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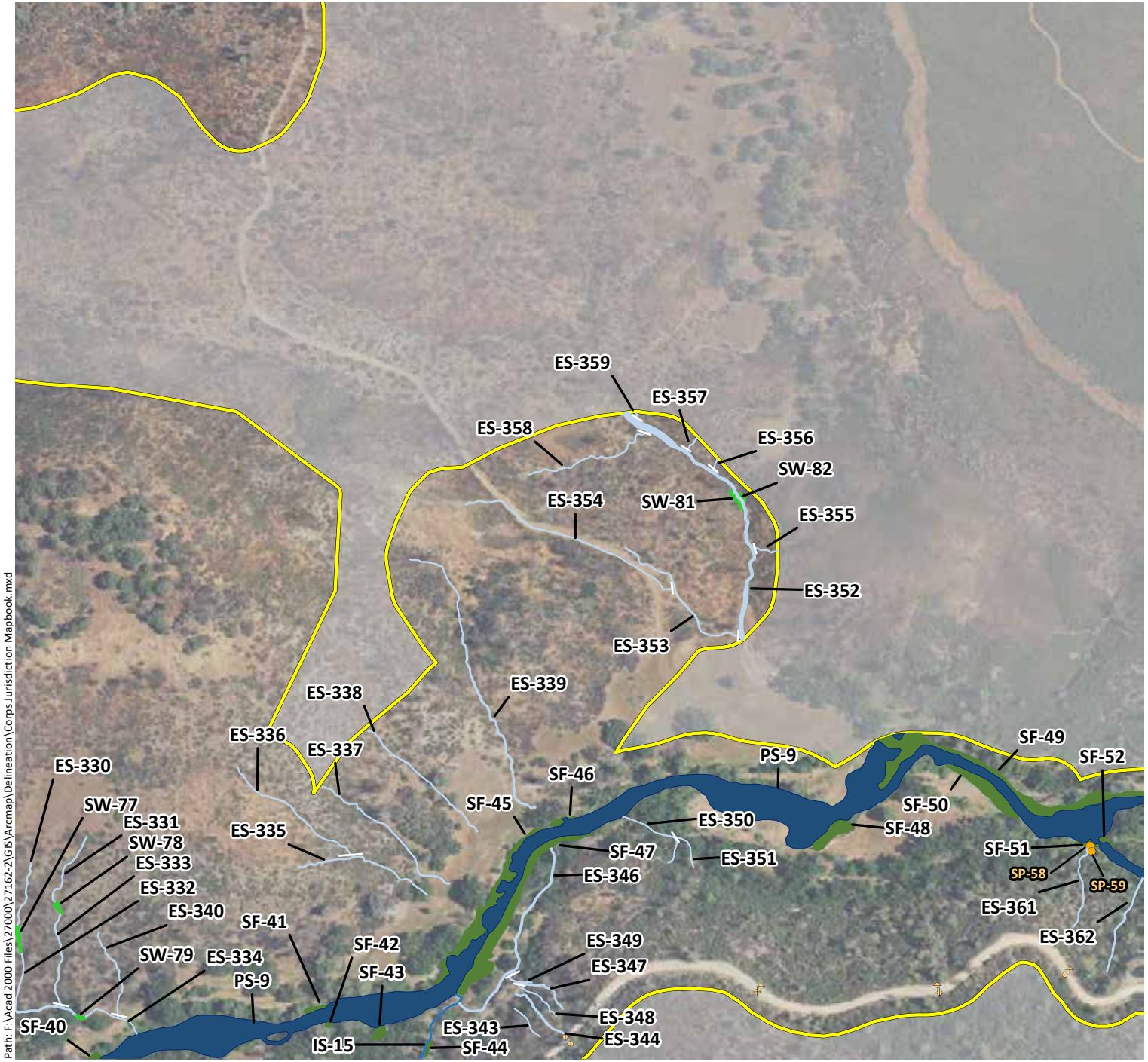
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 22)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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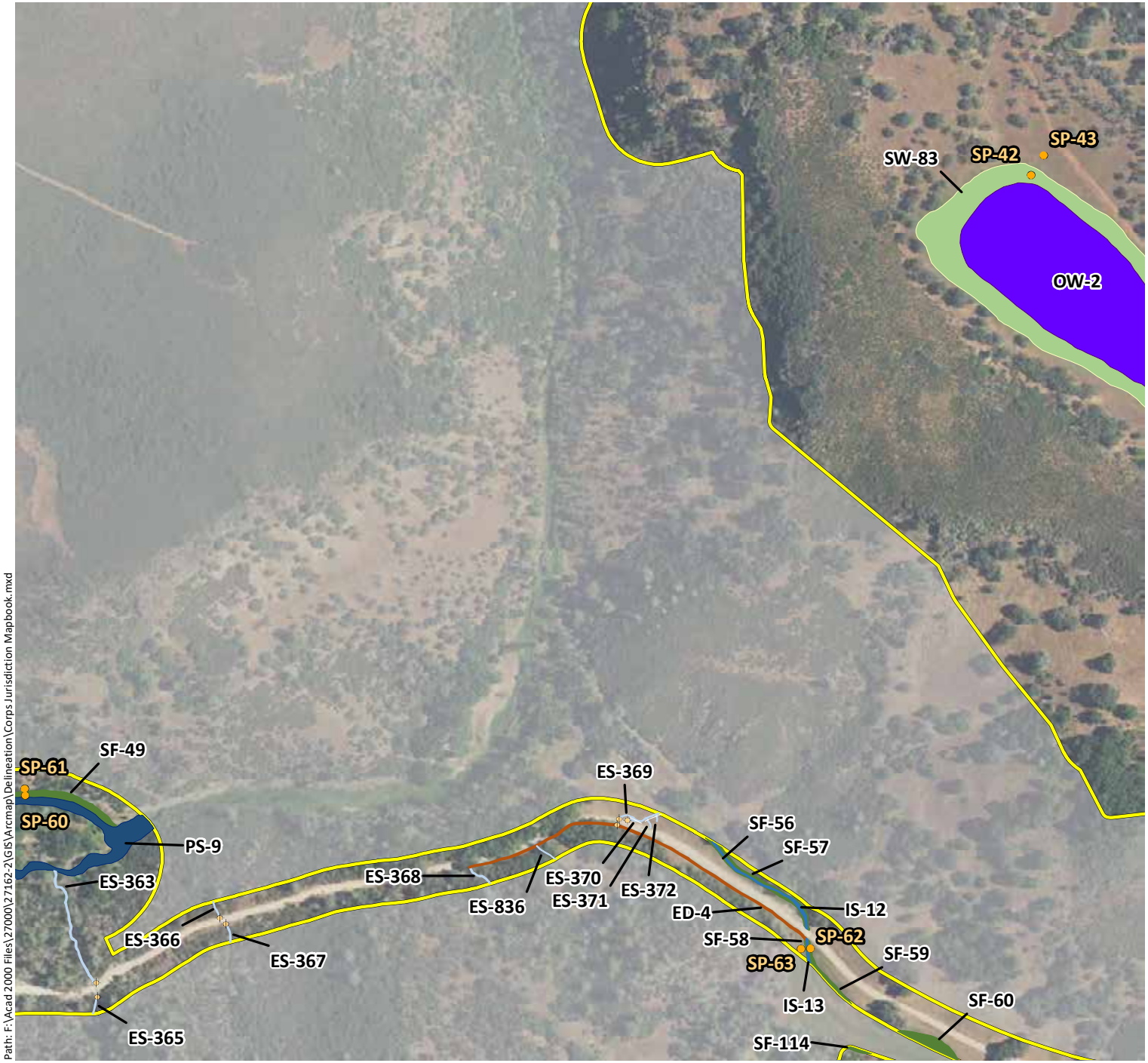
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 23)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Feet

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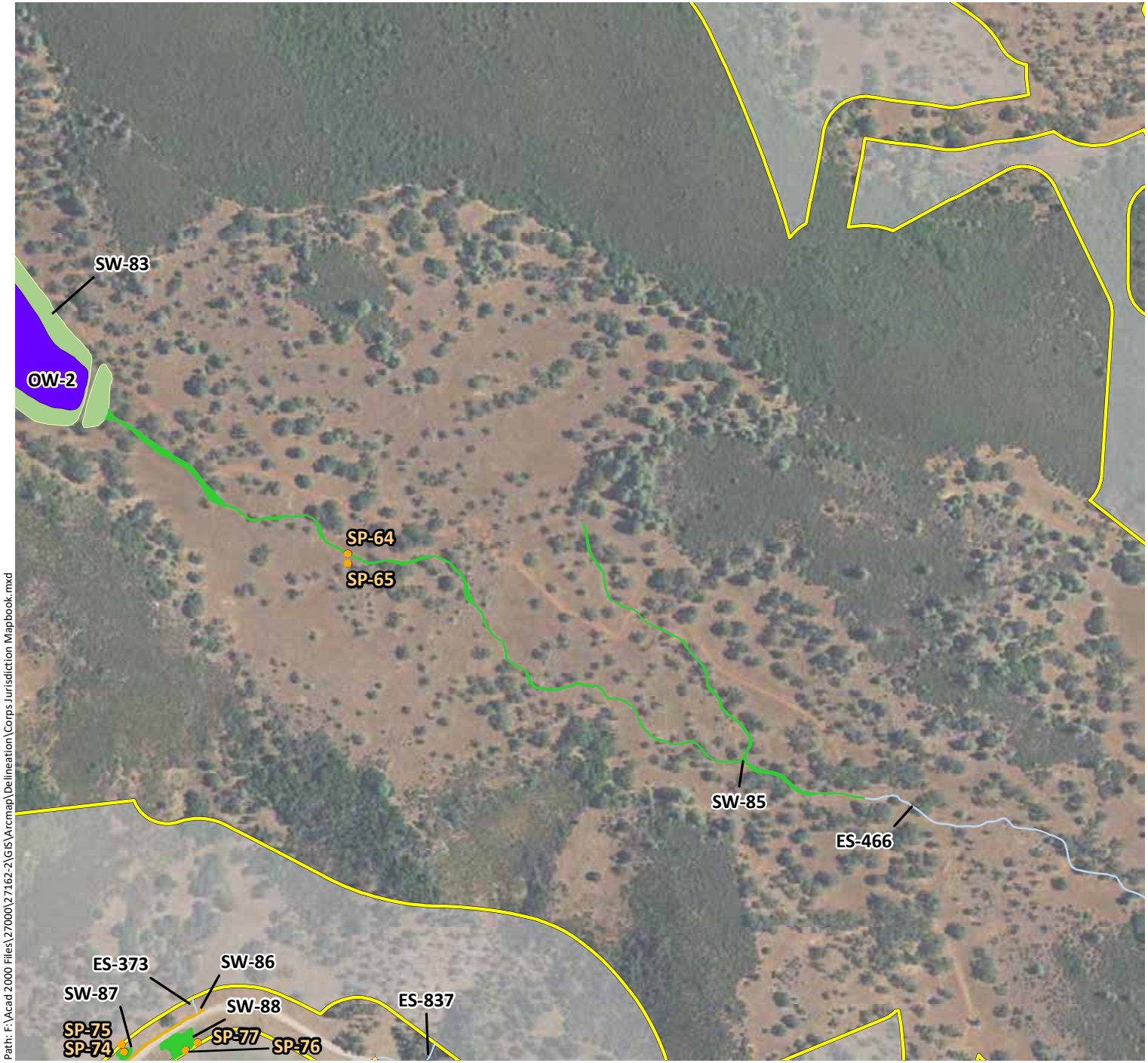
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 24)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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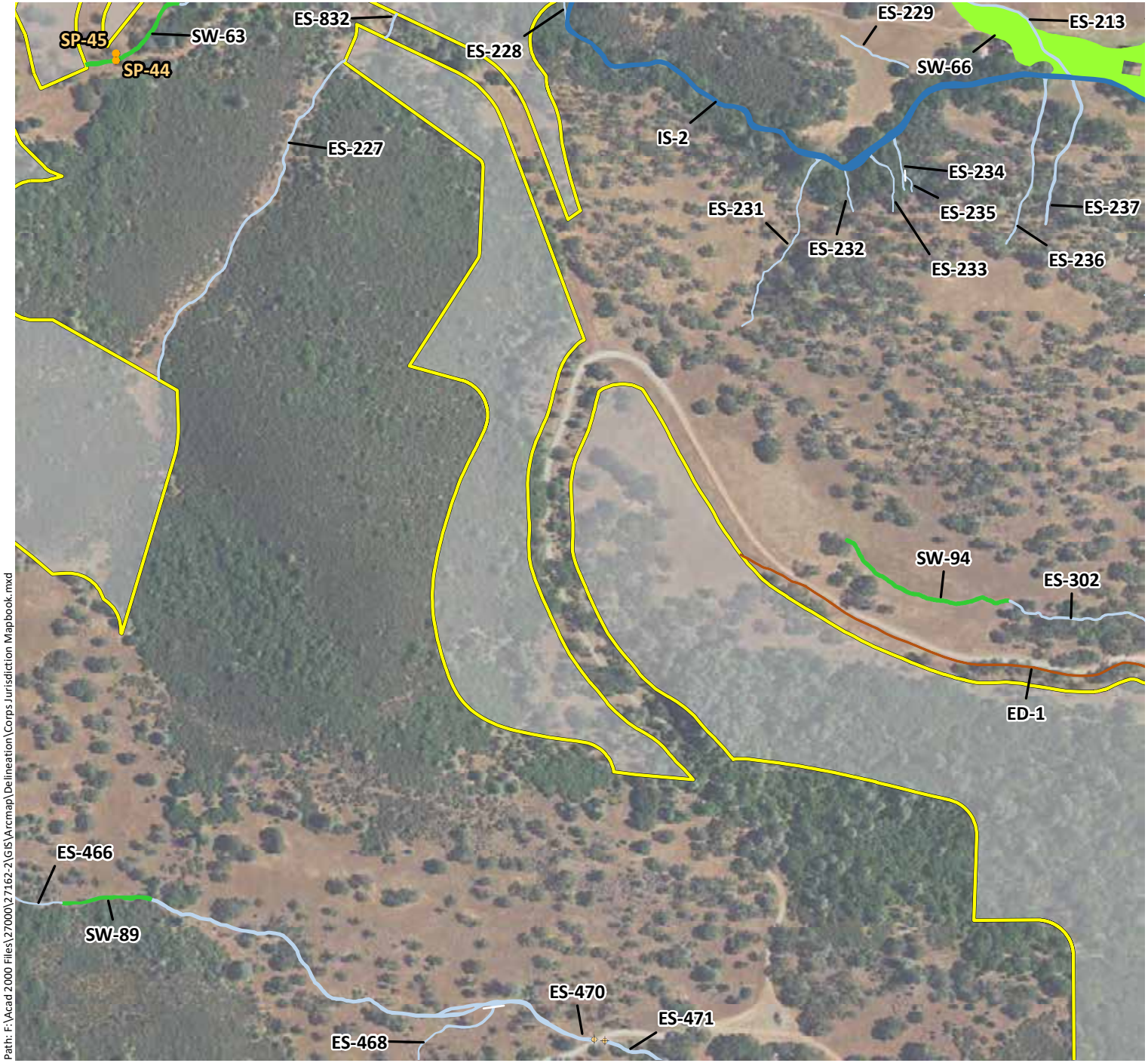
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B. Potential Waters of the United States (Mapbook Sheet 25)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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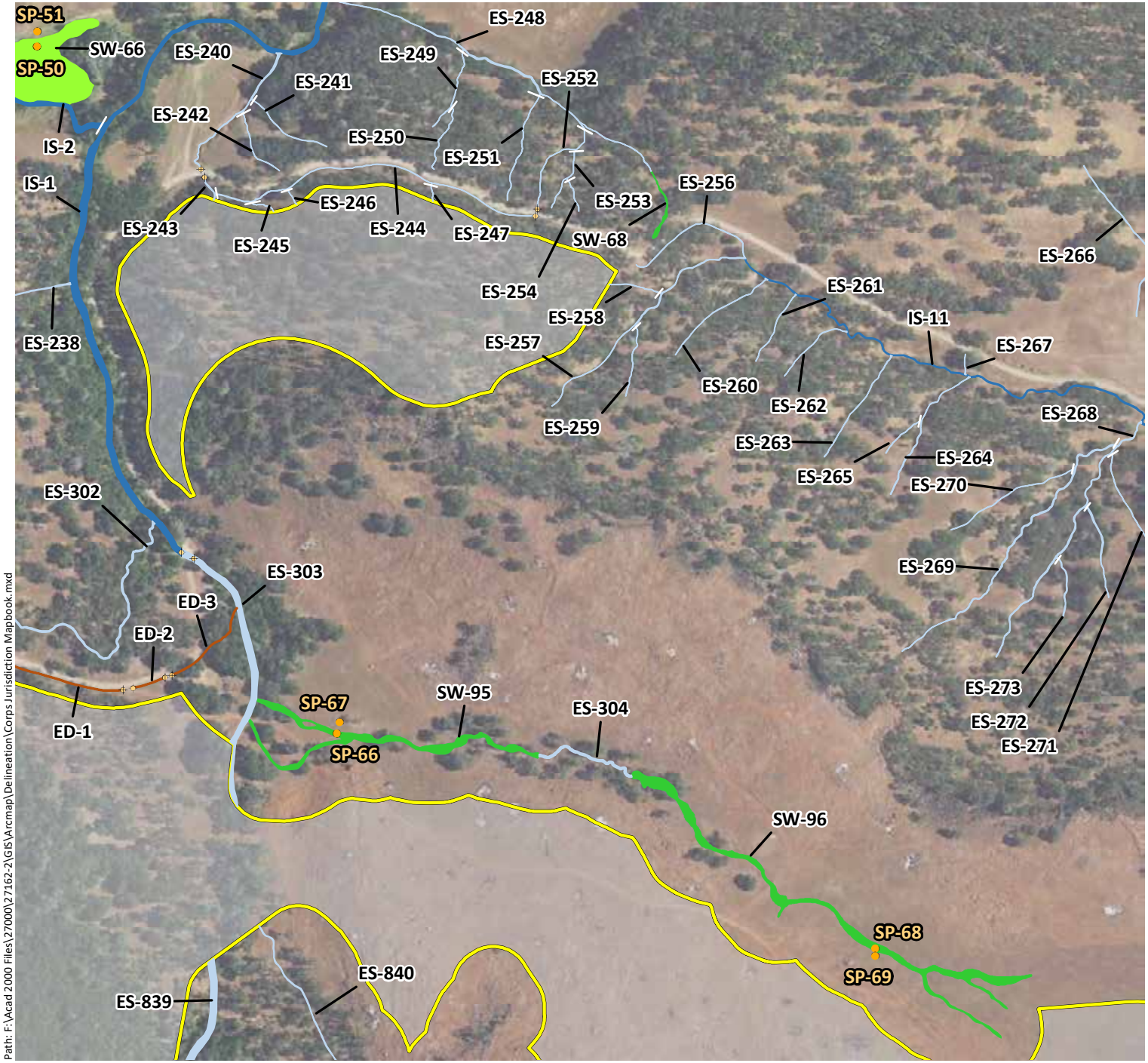
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B. Potential Waters of the United States (Mapbook Sheet 26)

Maha Resort and Guenoc Valley Development, Phase 1



Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\Delineation\Corps Jurisdiction Mapbook.mxd

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 27)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 28)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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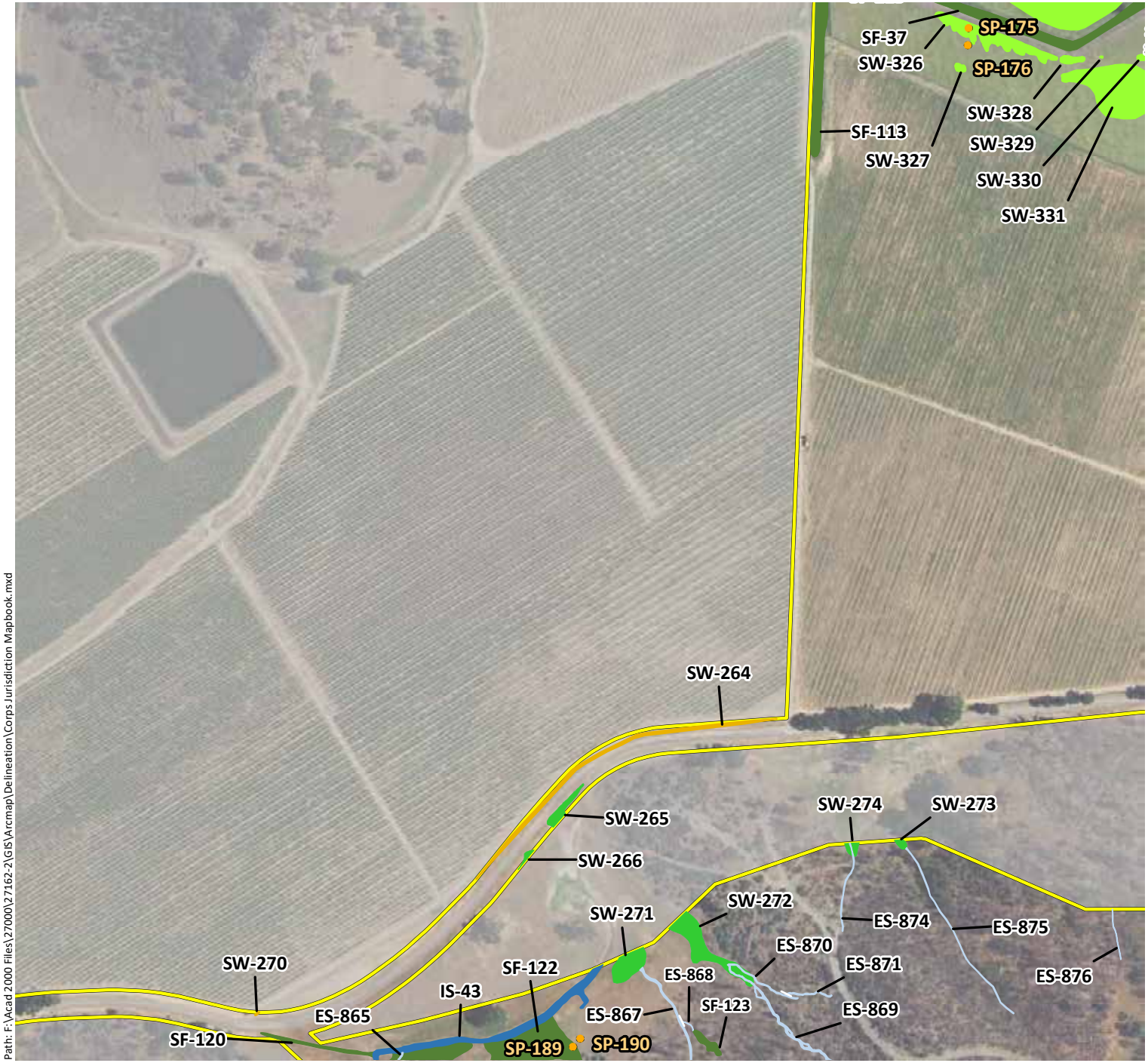
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 29)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Feet

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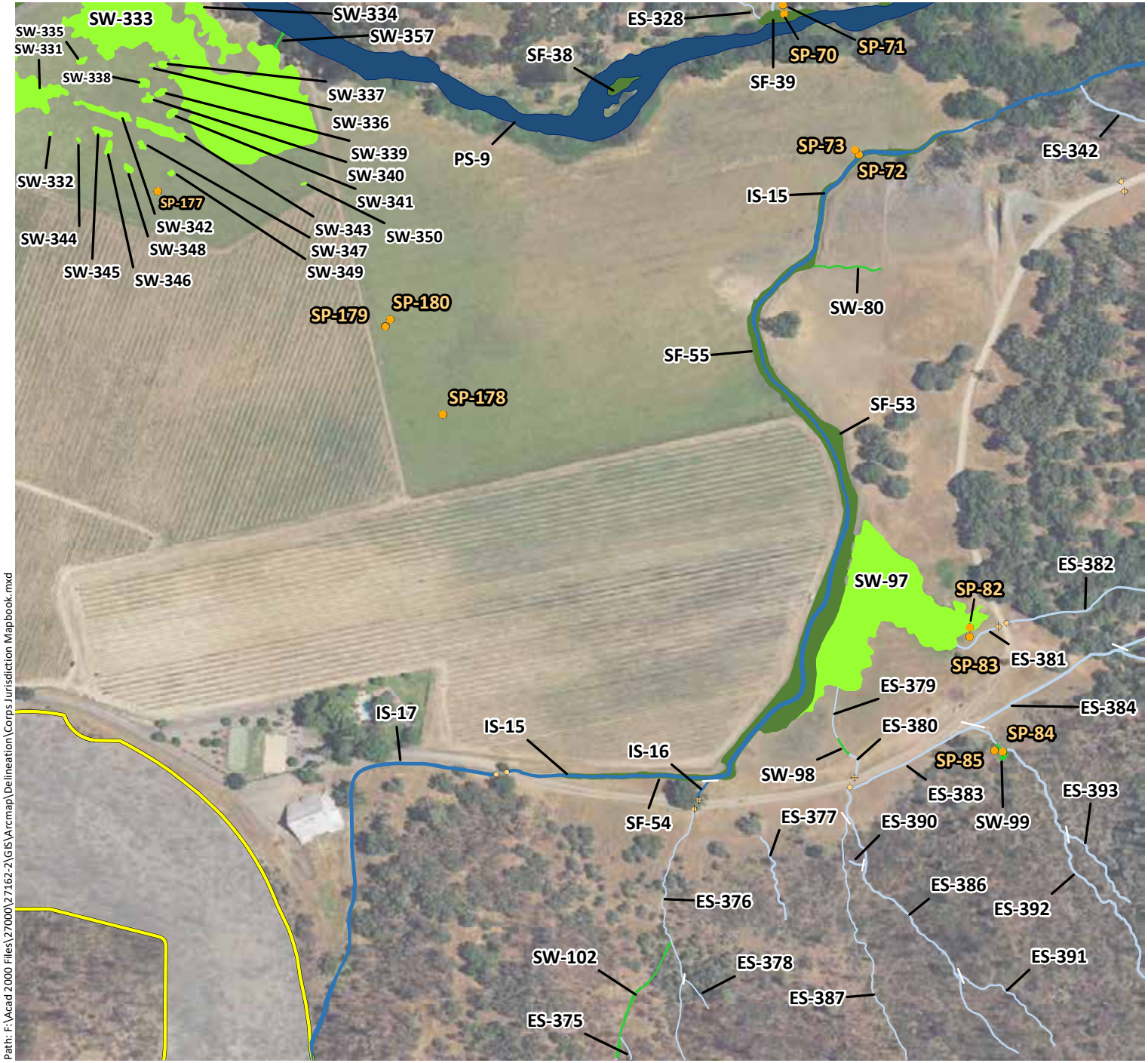
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 30)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Feet

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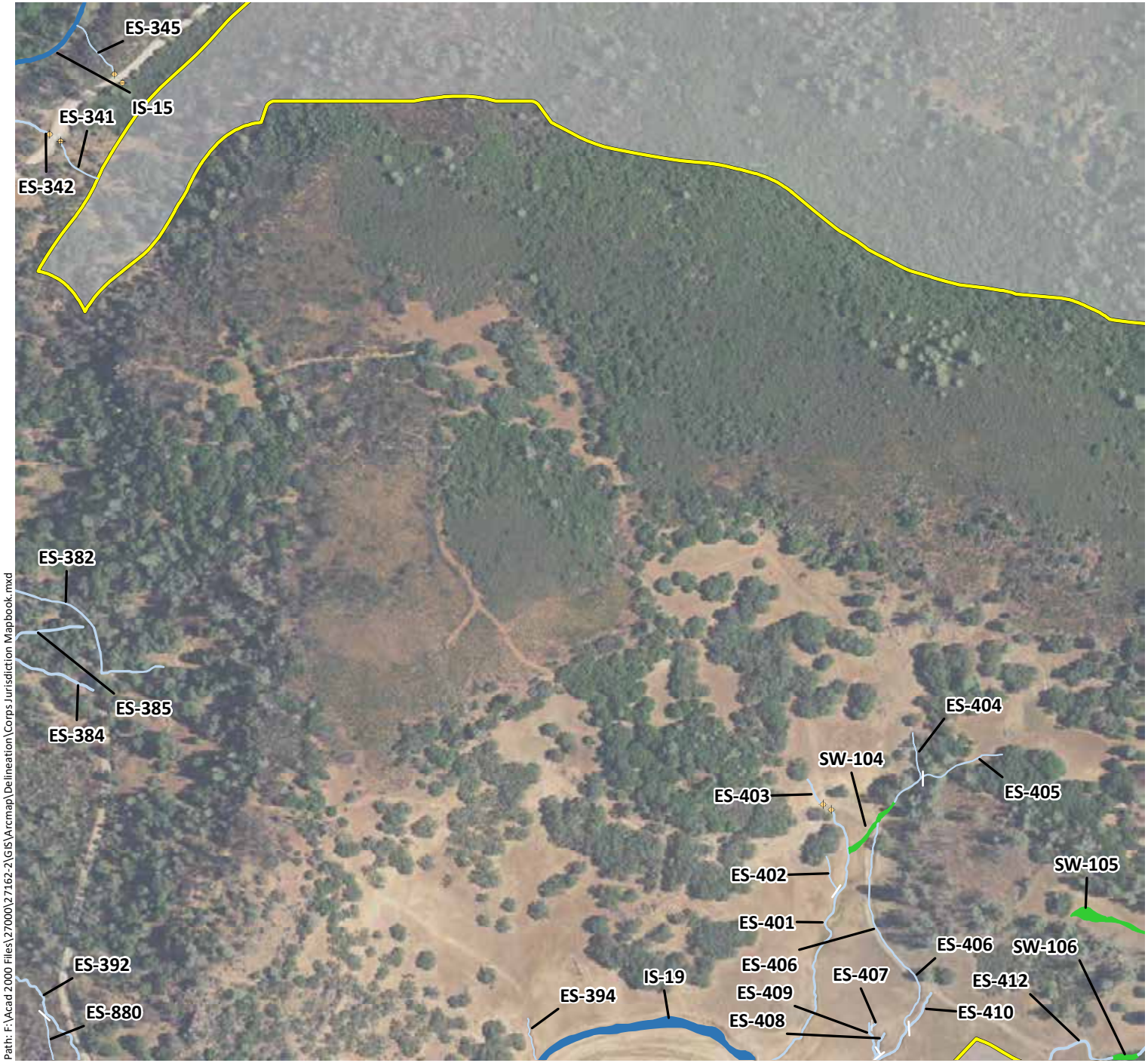
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 31)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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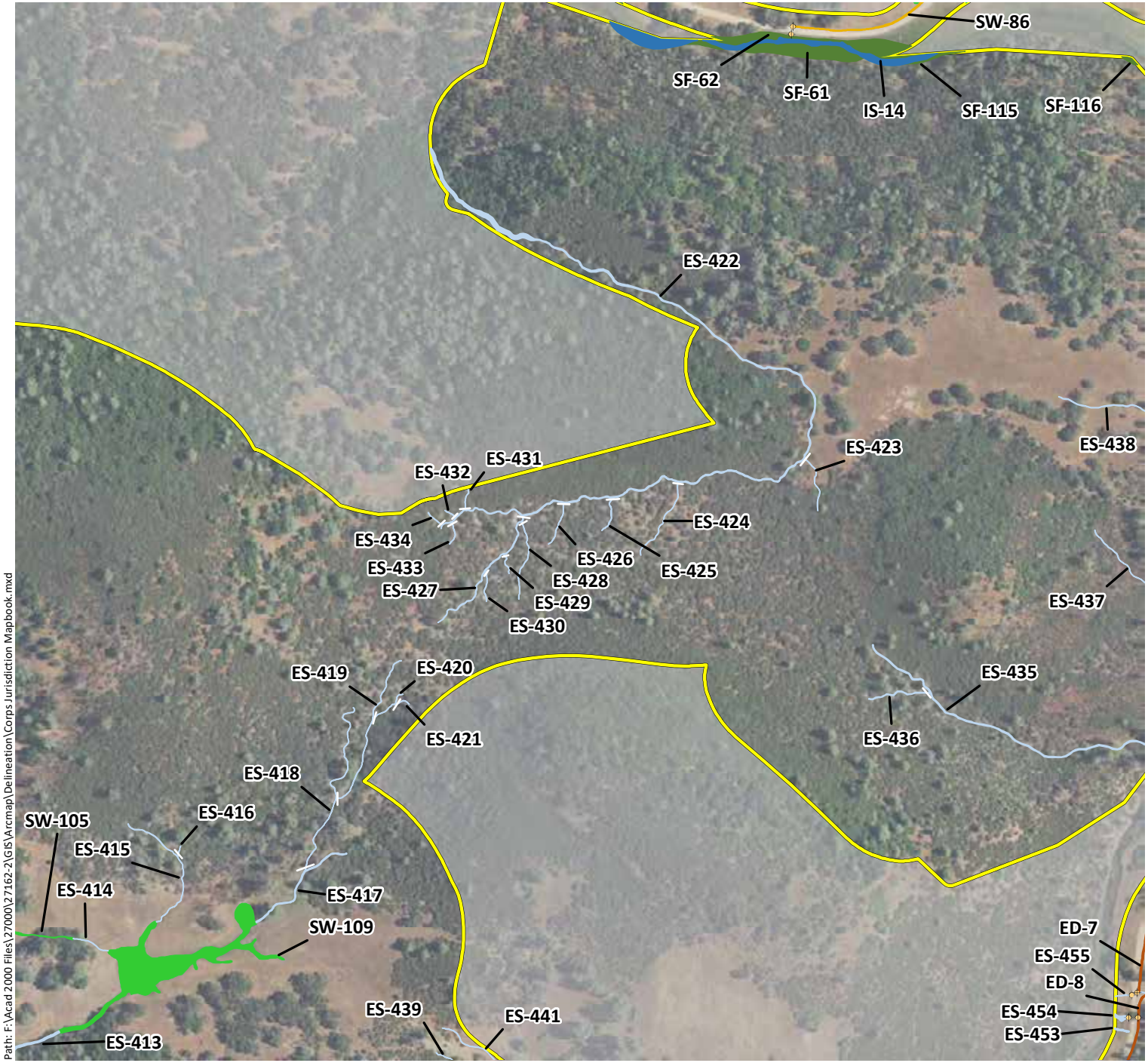
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B. Potential Waters of the United States (Mapbook Sheet 32)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Feet

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Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 33)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Feet

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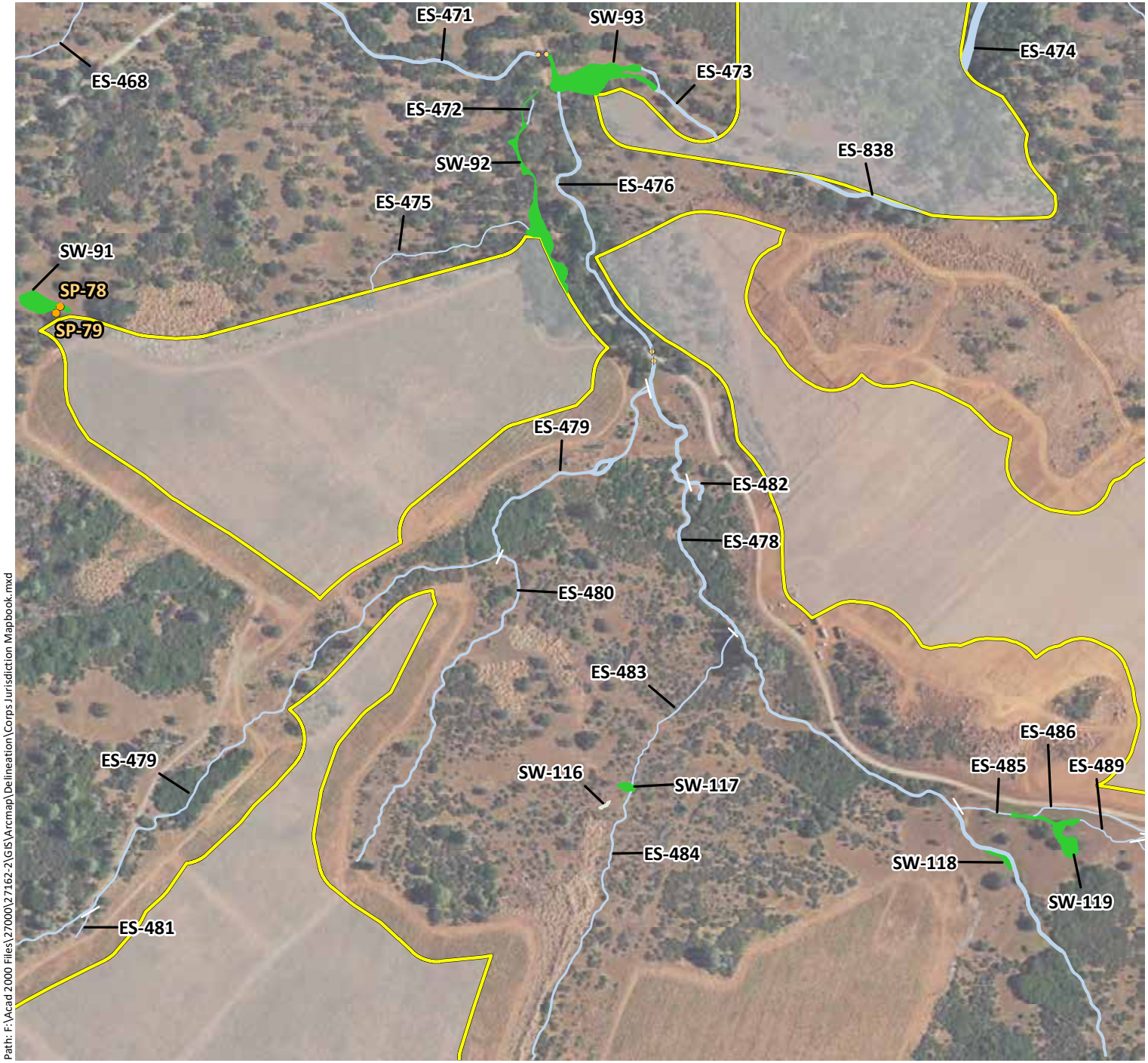
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B. Potential Waters of the United States (Mapbook Sheet 34)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Feet

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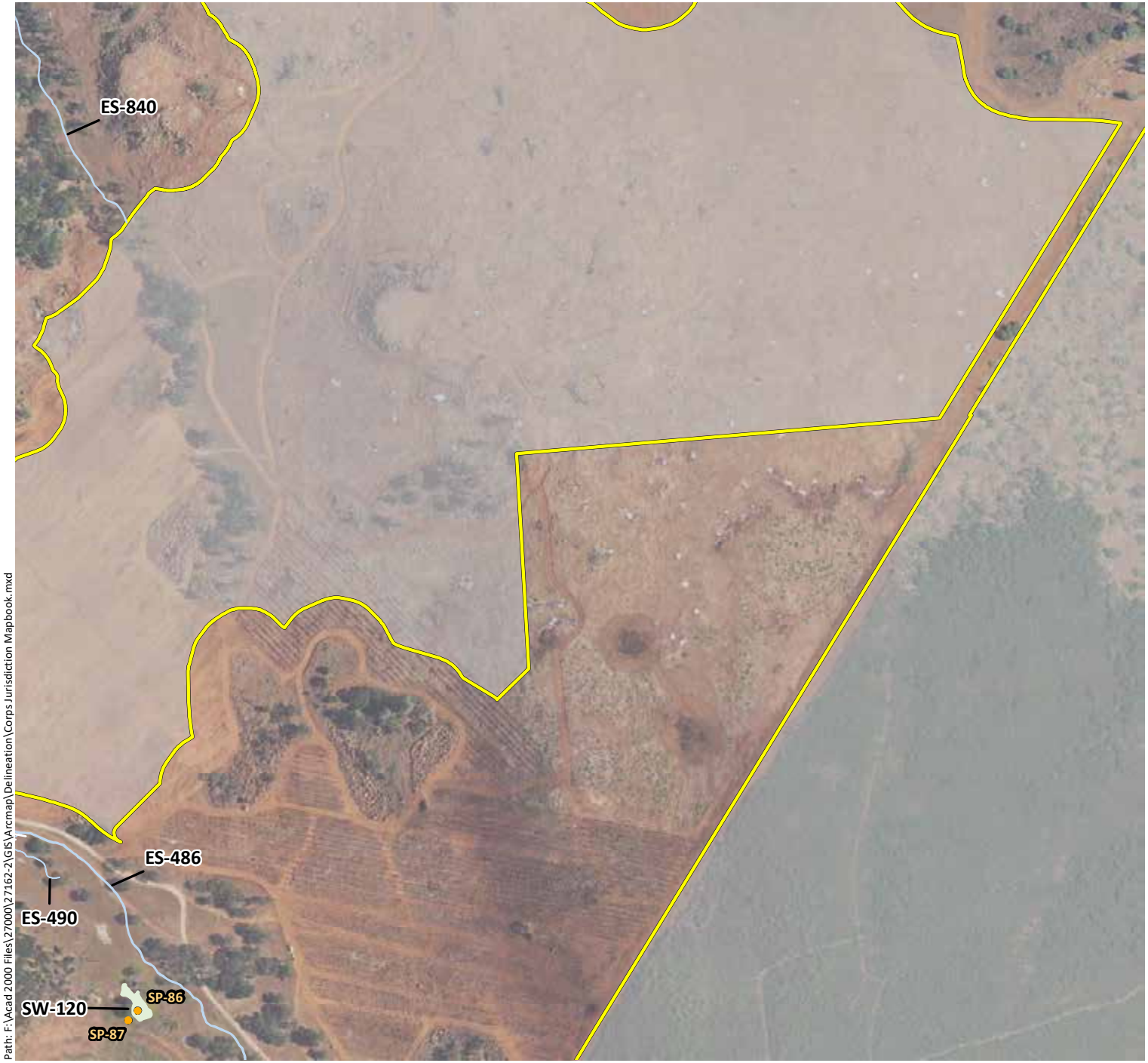
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 35)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Feet

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\Delineation\Corps Jurisdiction Mapbook.mxd

Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 36)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Feet

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Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 37)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Feet

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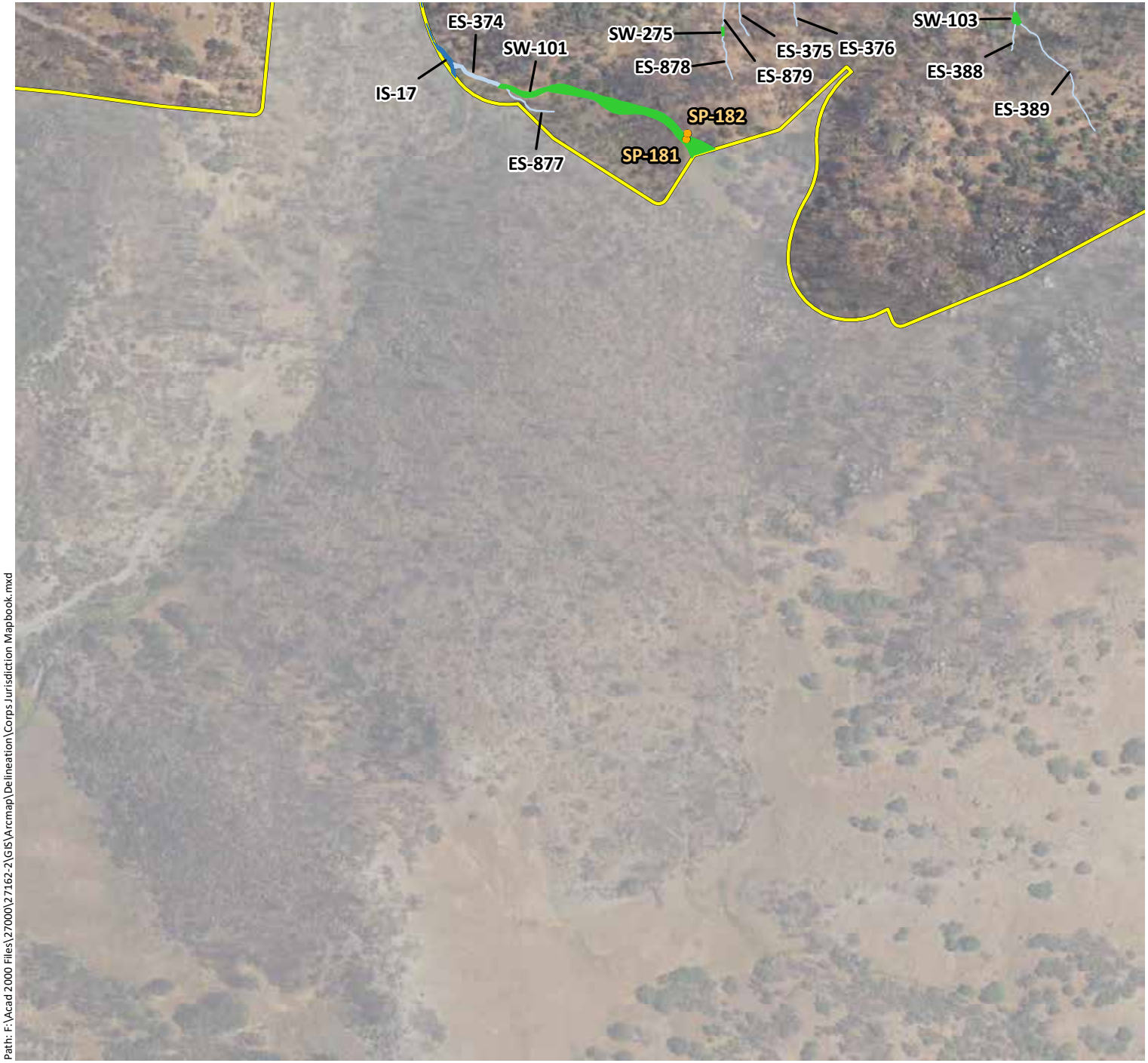
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B. Potential Waters of the United States (Mapbook Sheet 38)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

0 250 500

Feet

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Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B. Potential Waters of the United States (Mapbook Sheet 39)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

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Feet

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Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B. Potential Waters of the United States (Mapbook Sheet 40)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

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Feet

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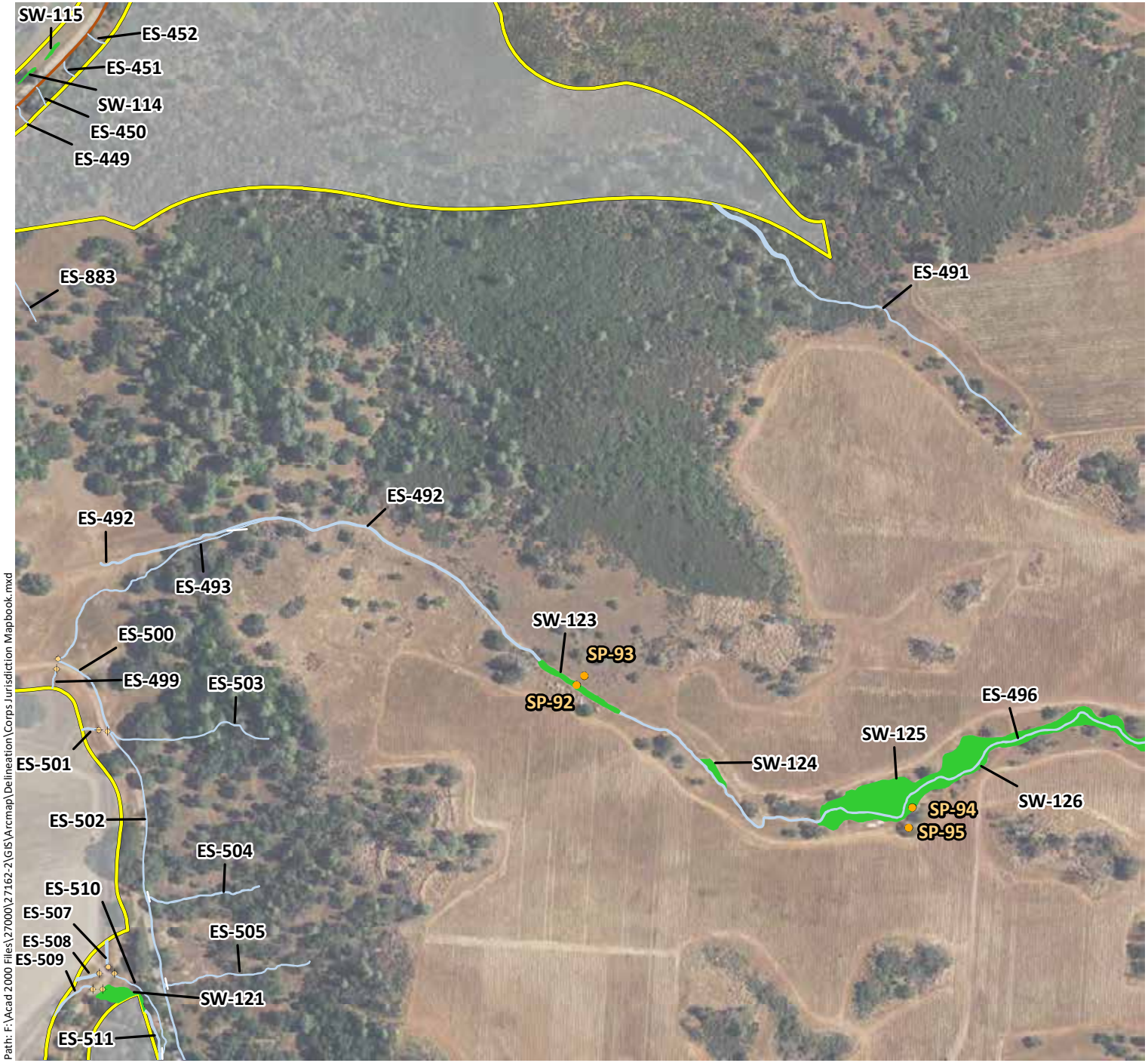
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 41)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

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Feet

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ENVIRONMENTAL CONSULTANTS

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Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 42)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.
Sample Points
Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

0 250 500

Feet

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ENVIRONMENTAL CONSULTANTS

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Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 43)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

0 250 500

Feet

wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\Delineation\Corps Jurisdiction Mapbook.mxd

Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 44)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.
Sample Points
Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

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Feet

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ENVIRONMENTAL CONSULTANTS

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Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 45)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

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Feet

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Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 46)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

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Feet

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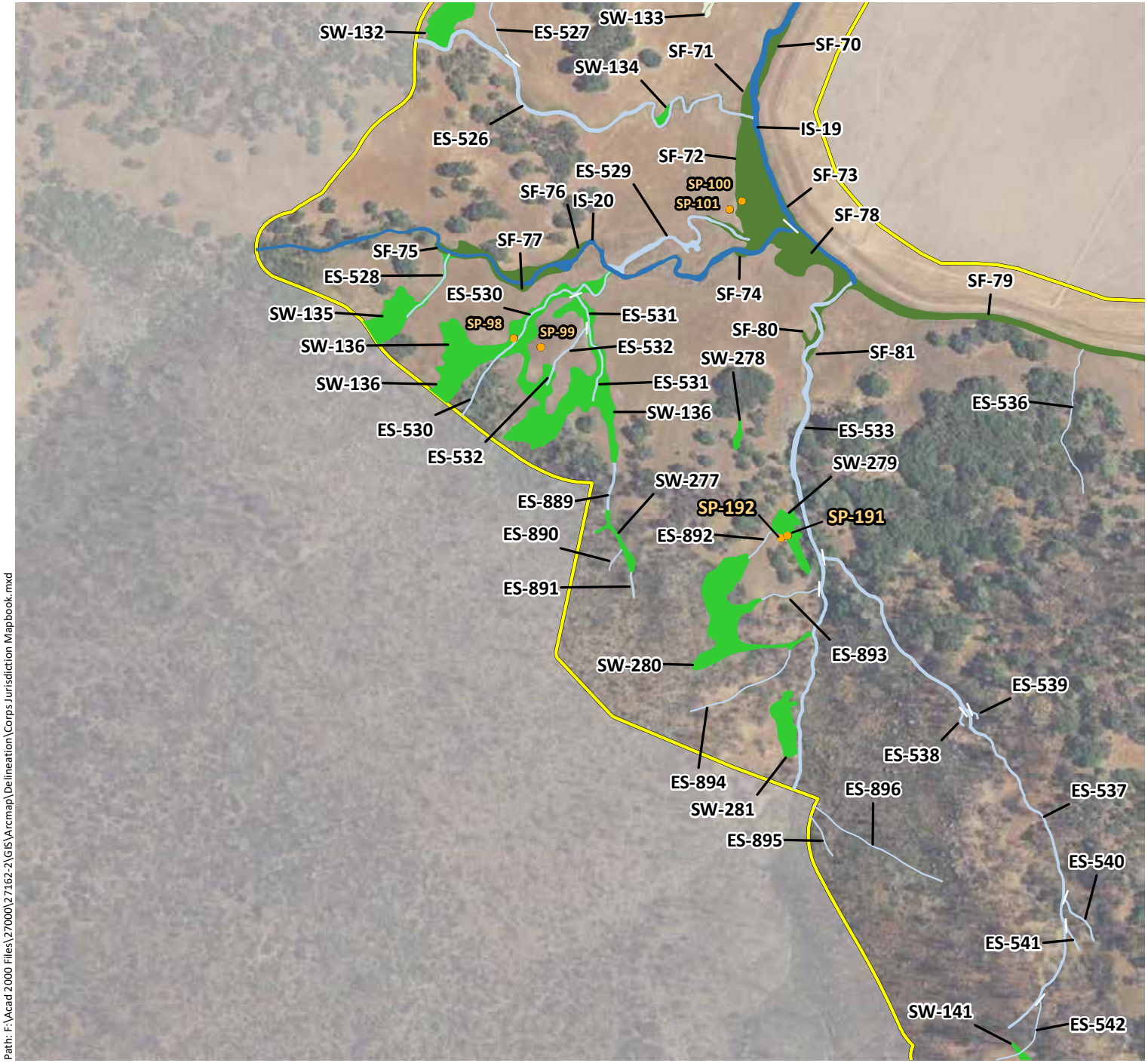
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 47)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

0 250 500

Feet

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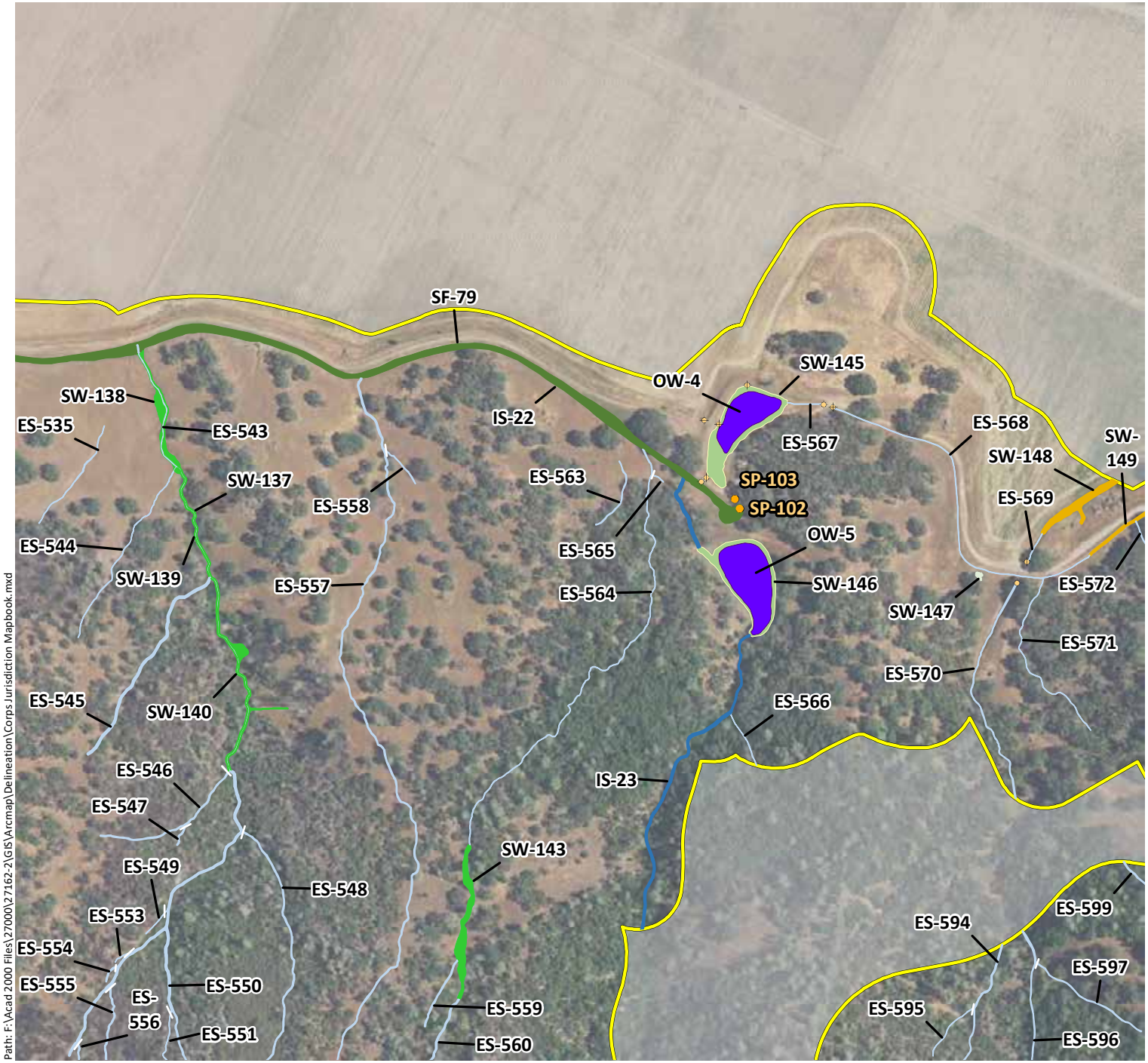
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 48)

Maha Resort and Guenoc Valley Development, Phase 1



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Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

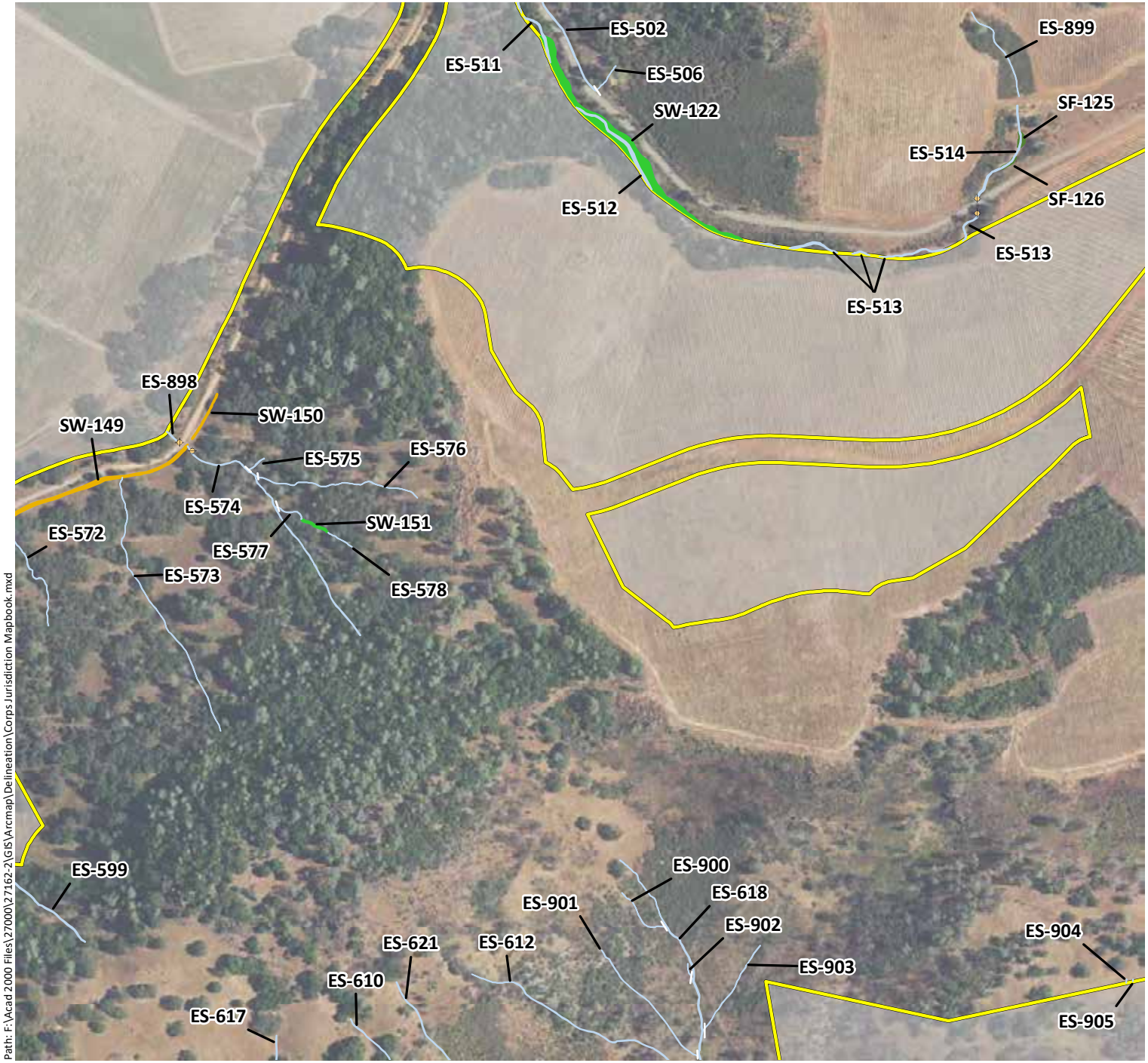
0 250 500

Feet

ENVIRONMENTAL CONSULTANTS

Appendix B.
Potential Waters of the United States (Mapbook Sheet 49)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

0 250 500

Feet

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Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B. Potential Waters of the United States (Mapbook Sheet 50)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

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Feet

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Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 51)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

0 250 500

Feet

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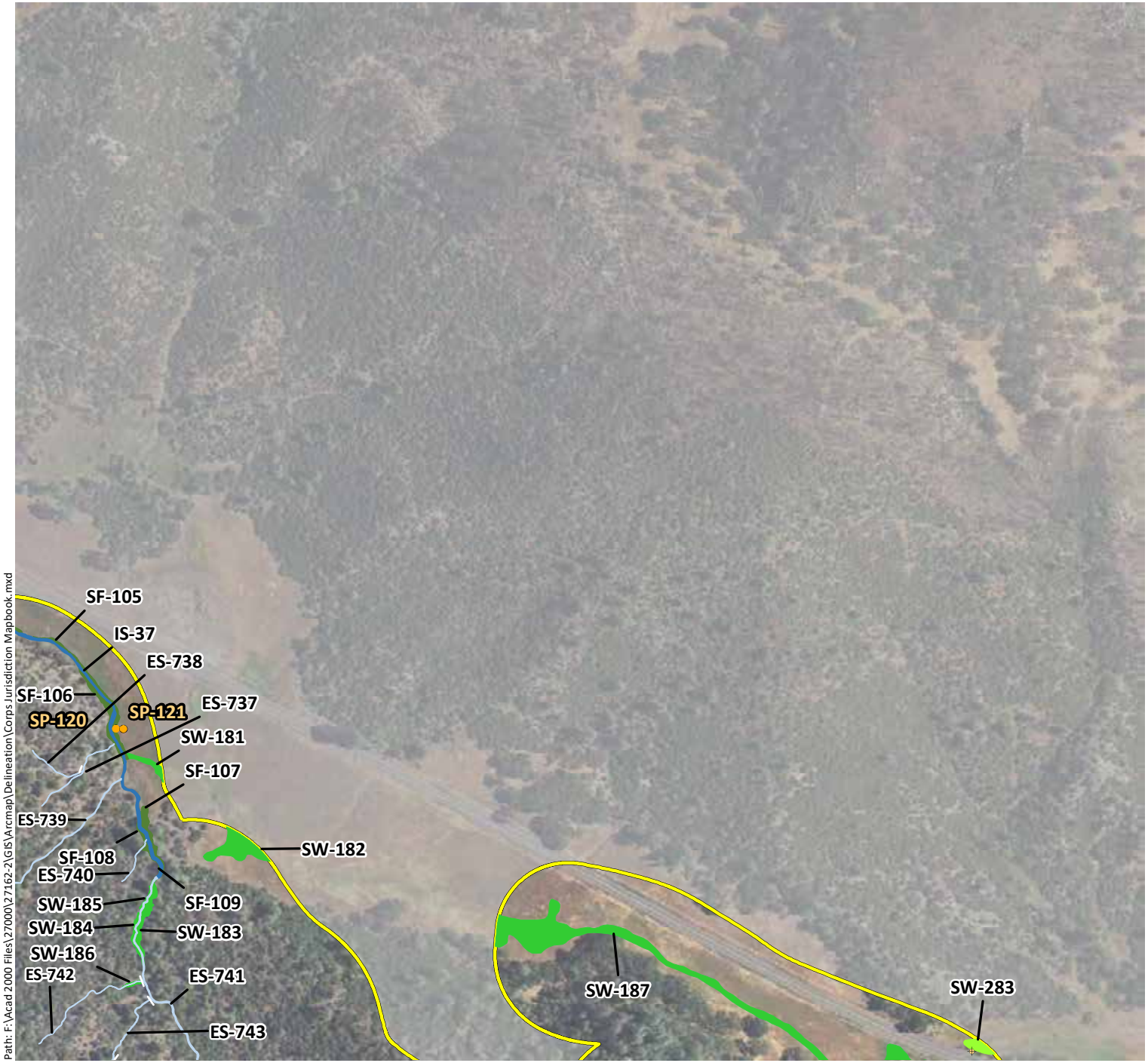
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 52)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

0 250 500

Feet

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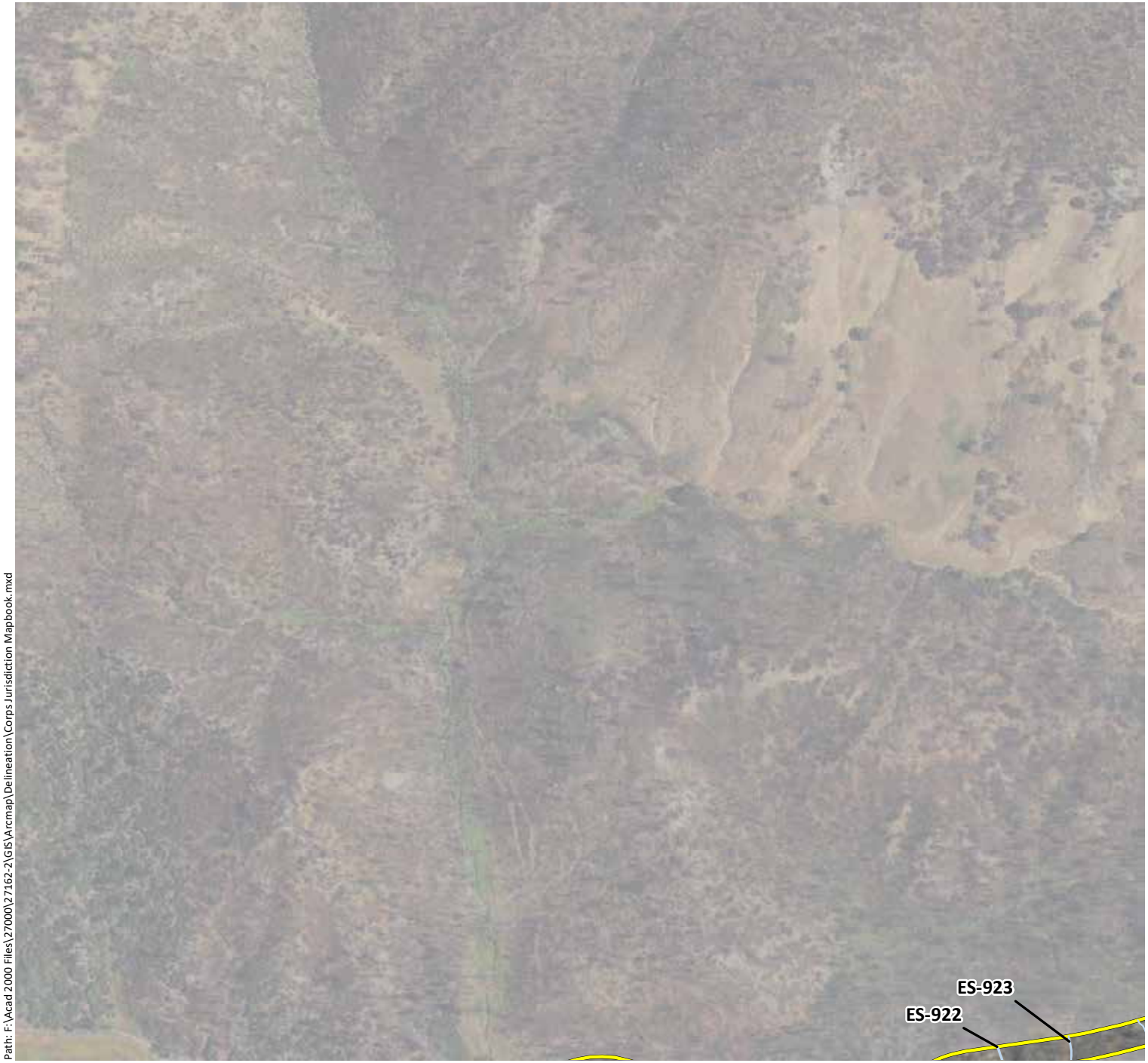
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 53)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

0 250 500

Feet

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Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 54)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

0 250 500

Feet

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ENVIRONMENTAL CONSULTANTS

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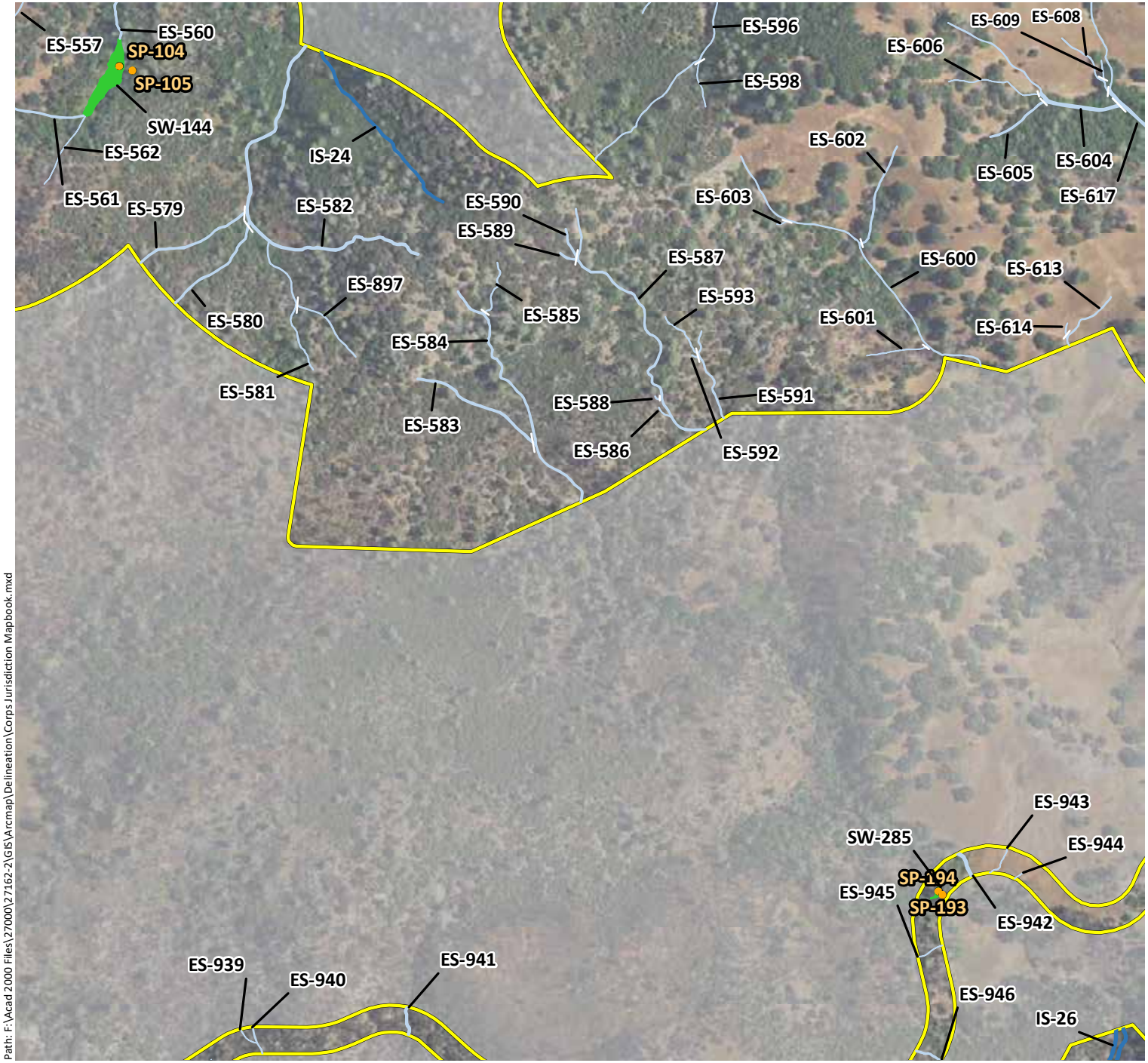
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020



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Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B. Potential Waters of the United States (Mapbook Sheet 55)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 5,350 ac.
- Sample Points
- Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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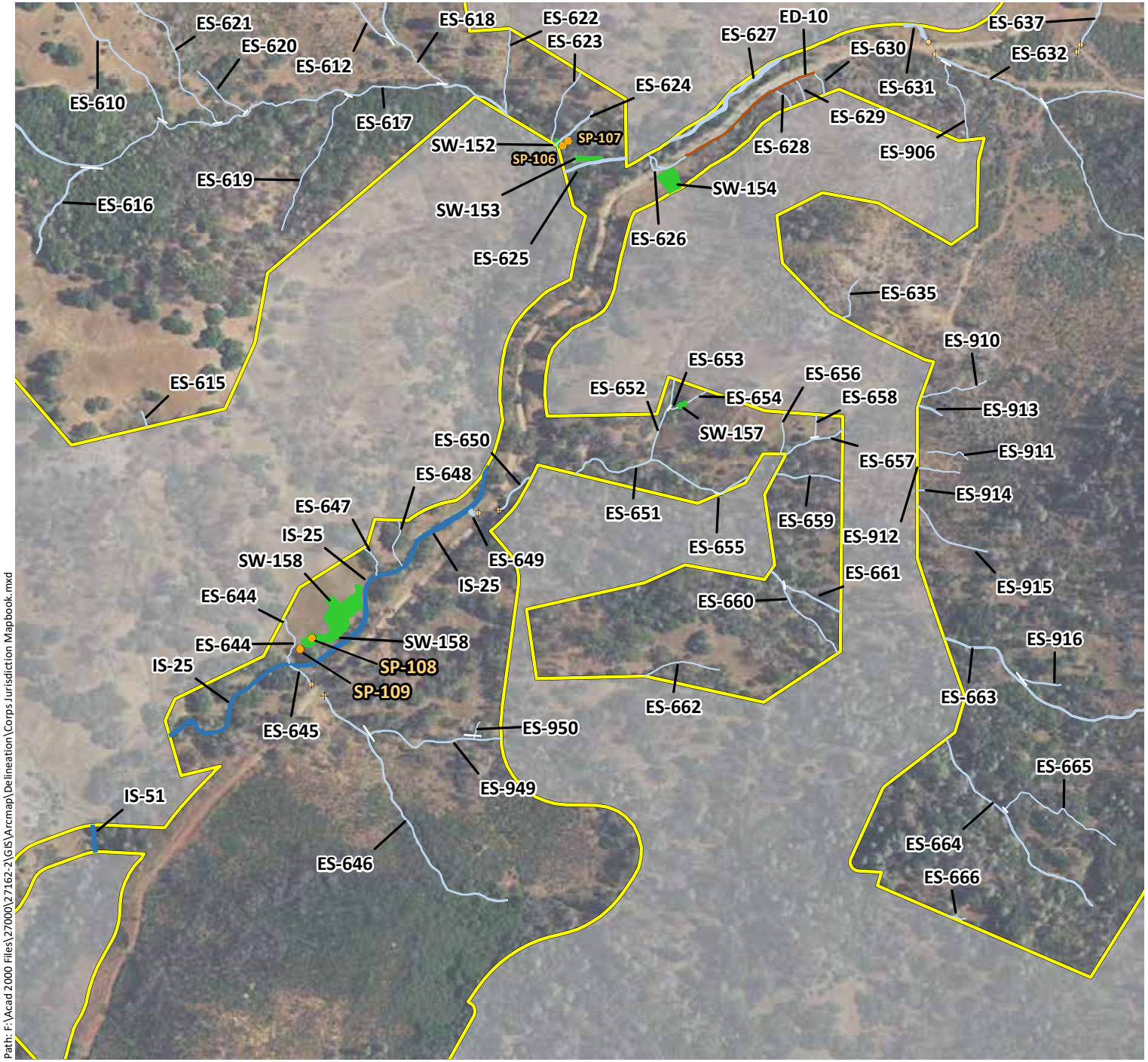
Feet

wra ENVIRONMENTAL CONSULTANTS

Appendix B. Potential Waters of the United States (Mapbook Sheet 56)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\Delineation\Corps Jurisdiction Mapbook.mxd

Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 57)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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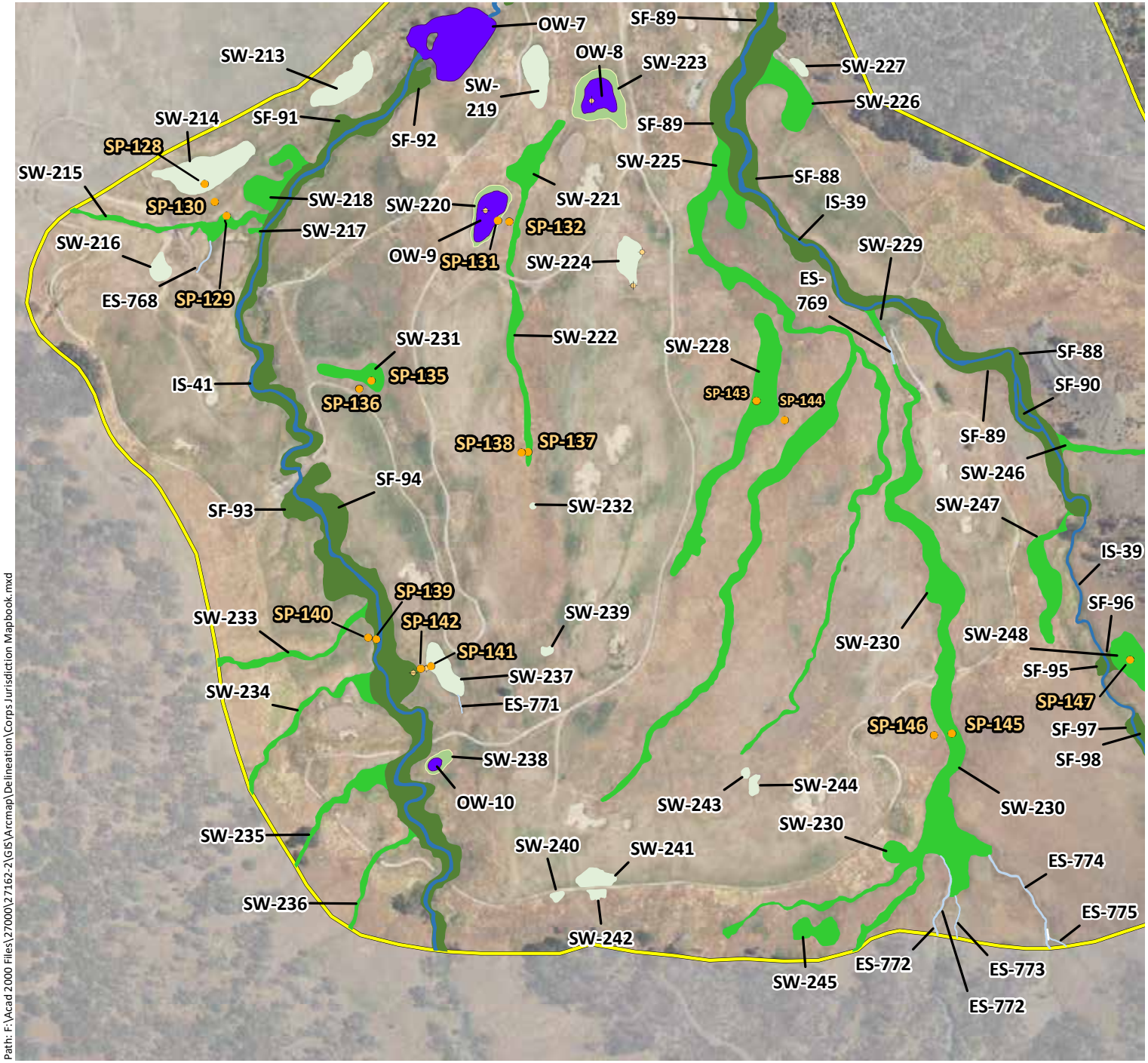
Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B. Potential Waters of the United States (Mapbook Sheet 58)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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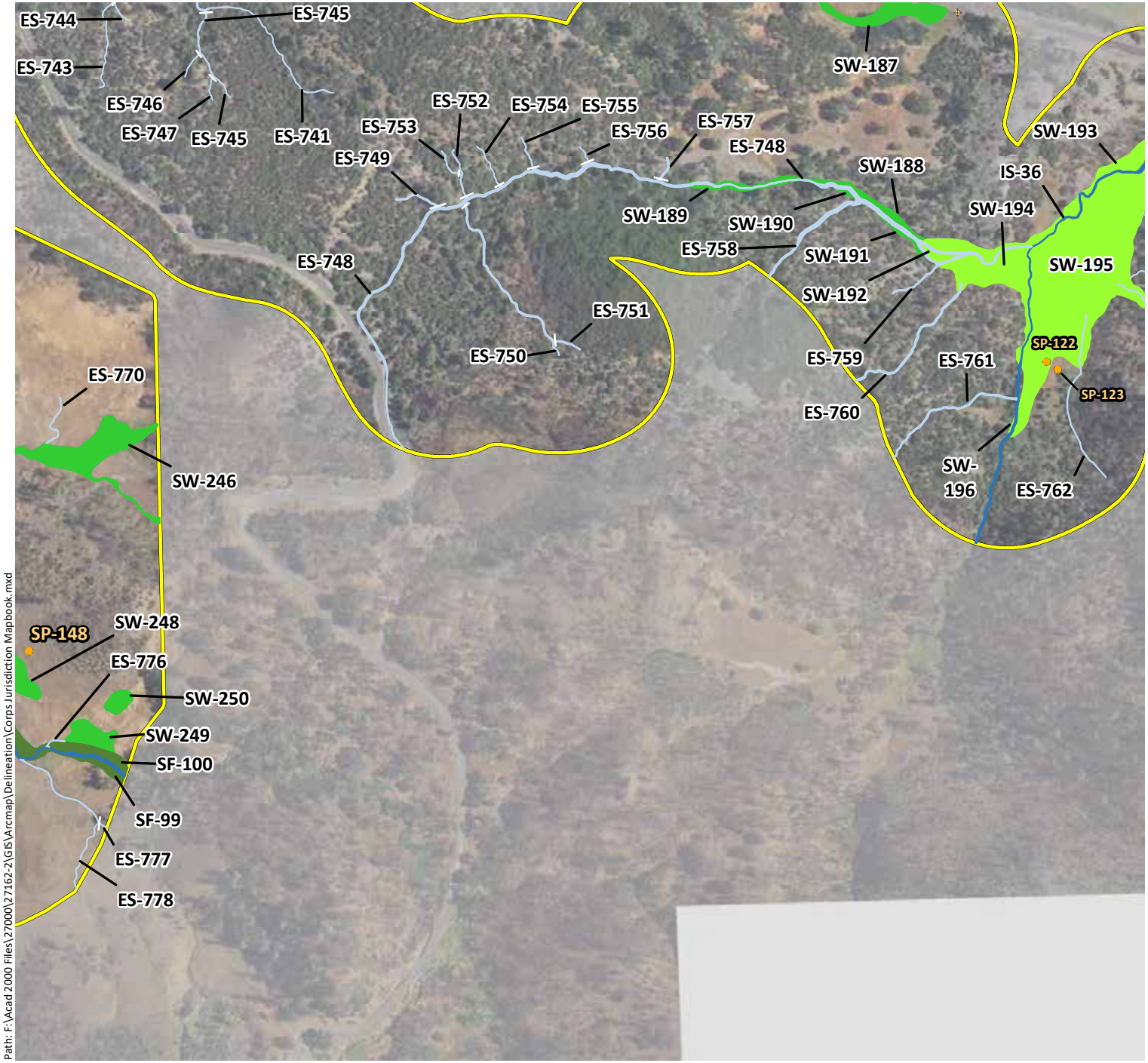
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\Delineation\Corps Jurisdiction Mapbook.mxd

Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B. Potential Waters of the United States (Mapbook Sheet 59)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\Delineation\Corps Jurisdiction Mapbook.mxd

Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B. Potential Waters of the United States (Mapbook Sheet 60)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Feet

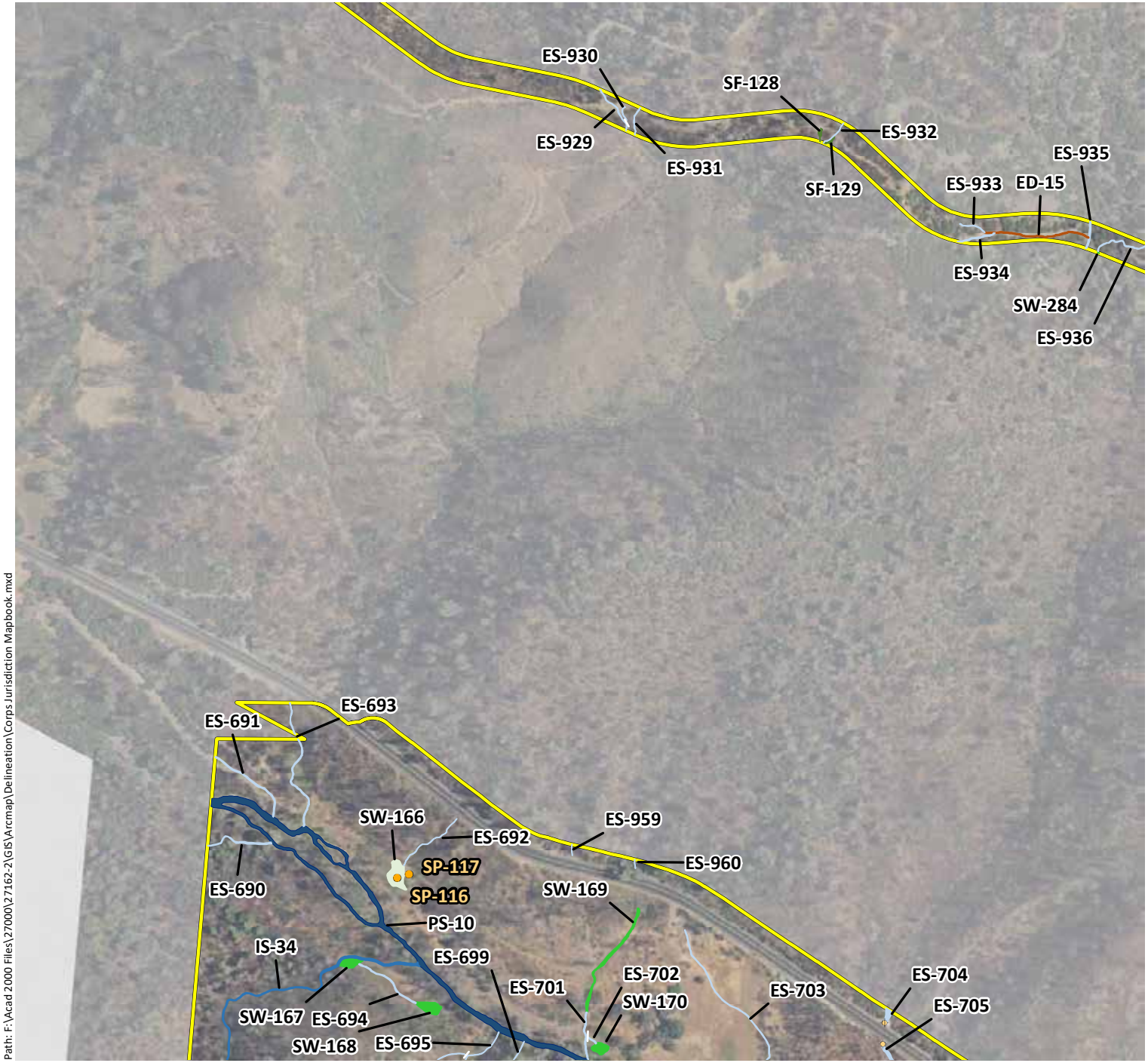
wra ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\Delineation\Corps Jurisdiction Mapbook.mxd

Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 61)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Feet

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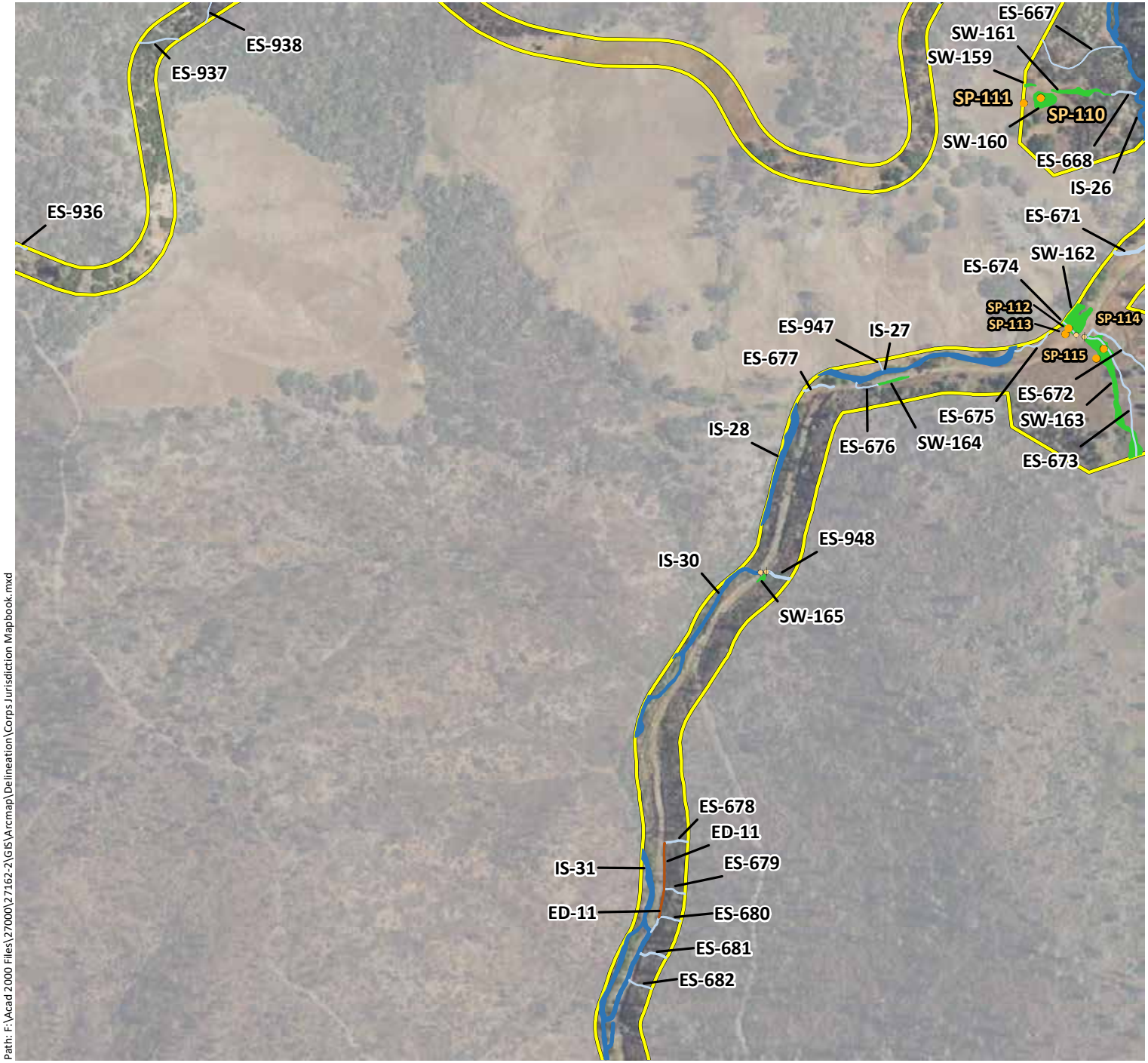
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\Delineation\Corps Jurisdiction Mapbook.mxd

Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 62)

Maha Resort and Guenoc Valley Development, Phase 1



Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Feet

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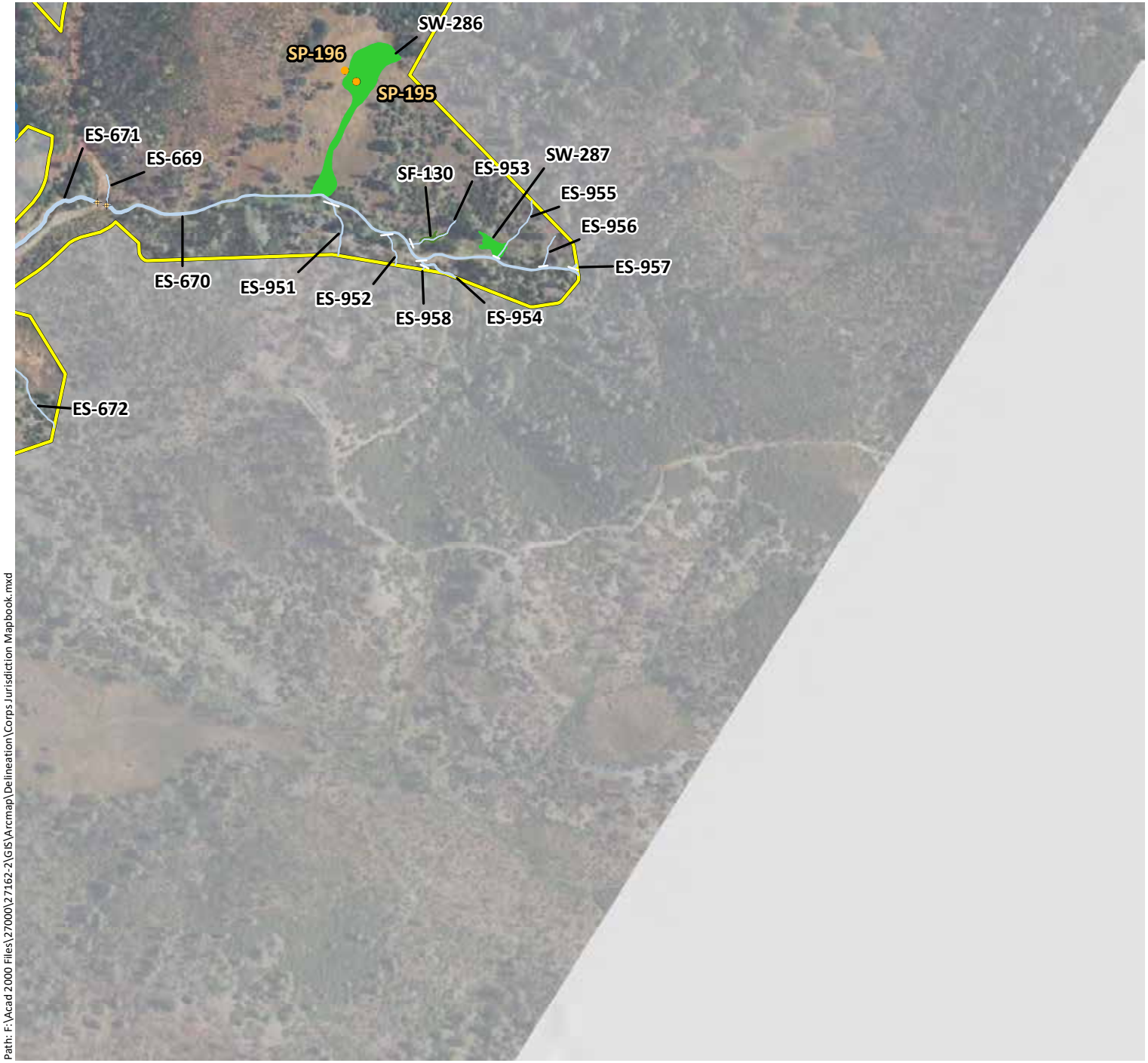
Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\Delineation\Corps Jurisdiction Mapbook.mxd

Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020



Appendix B. Potential Waters of the United States (Mapbook Sheet 63)

Maha Resort and Guenoc Valley Development, Phase 1

- Phase 1 Study Area - 5,350 ac.
- Sample Points
- Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Feet

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\Delineation\Corps Jurisdiction Mapbook.mxd

Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B. Potential Waters of the United States (Mapbook Sheet 64)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

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Feet

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Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\Delineation\Corps Jurisdiction Mapbook.mxd

Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

Appendix B.
Potential Waters of the United States (Mapbook Sheet 65)

Maha Resort and Guenoc Valley Development, Phase 1

Phase 1 Study Area - 5,350 ac.

Sample Points

Culverts

Potential Jurisdictional Wetlands

- Forested Wetlands (FW) - PFO1E
- Scrub-Shrub Wetlands (SS) - PSS1C
- Seasonal Wetland Depressions (SW) - PEM2C
- Seasonal Wetland Ditches (SW) - PEM2Cx
- Seasonal Wetland Pond Fringes (SW) - PEM1/2C
- Seasonal Wetland Seeps/Swales (SW) - PEM2C
- Seasonal Wetland Wet Meadows (SW) - PEM2C
- Stream Fringe/In-Stream Wetlands (SF) - R4SB7

Potential Jurisdictional Waters

- Ephemeral Ditches (ED) - R4SBA/Cx
- Ephemeral Streams (ES) - R4SBA
- Intermittent Streams (IS) - R4SBC
- Perennial Streams (PS) - R5UBF/H
- Open Waters (OW) - PUBK

N

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\27000\27162-2\GIS\Arcmap\Delineation\Corps Jurisdiction Mapbook.mxd

Sources: 2016 Hexagon Aerial, Lake County Lidar, WRA | Prepared By: mrochelle, 1/8/2020

APPENDIX C

WETLAND DETERMINATION DATA FORMS

DRAFT

DRAFT

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/4/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-01**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Convex Slope(%) 0-5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.775905 Long: -122.468045 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point taken in wetland stream fringe associated with perennial stream. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Boundary determined by changes in topography and vegetation. Paired with upland sample point SP-02.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' radius			
1. *Juncus mexicanus*	20	Y	FACW
2. *Cynodon dactylon*	30	Y	FACU
3. *Eleocharis macrostachya*	10		OBL
4. *Schoenoplectus acutus*	10		OBL
5. *Carex sp.*	5		
6. *Cyperus eragrostis*	5		FACW
7.			
8.			
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 10 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 50 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species	20	x1	20
FACW species	25	x2	50
FAC species		x3	
FACU species	30	x4	120
UPL species		x5	
Column Totals	75 (A)		190 (B)

Prevalence Index = B/A = 2.5

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%
☒ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Thatch=10; Vegetation meets Prevalence Index.

SOIL

Sampling Point SP-01

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	5B 2.5/0	95	7.5YR 4/6	5	C	M, PL	Sandy clay	Very gritty with many small pebbles

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet Redox Dark Surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☒ Yes ☐ No Depth (inches): 15"

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-15

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Primary hydrology indicator Saturation (A3) was observed with saturation throughout the profile with an associated water table at 15 inches in depth. One secondary indicator, Saturation Visible on Aerial Imagery (C9), also met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/4/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-02**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) convex Slope(%) 0-5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.746333 Long: -122.486211 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 2 to 15 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Paired point with SP-01. Sample point located in upland on alluvial plain associated with perennial stream. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Avena barbata*	26	Y	UPL
2. *Hypochaeris glabra*	5		UPL
3. *Bromus diandrus*	10		UPL
4. *Trifolium hirtum*	15	Y	UPL
5. *Bromus hordeaceous*	15	Y	FACU
6. *Trifolium glomeratum*	5		UPL
7. *Leontodon saxatili ssp. longirostris*	3		FACU
8. *Carduus pycnocephalus*	1		UPL
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 20 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 0% (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-02

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-4	10YR 3/2	100					Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Shovel refusal

Depth (inches): 4"

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Shovel refusal at 4" due to rock layer. No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/4/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-03**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Concave Slope(%) 7-10

Subregion(LRR) LRR C (Medit. CA) Lat: 38.771374 Long: -122.455304 Datum: D_WGS_1984

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in seasonal wetland near ridgeline. Sample point meets criteria for hydrophytic vegetation and wetland hydrology. Soils are problematic (serpentine) and assumed to be hydric. Wetland boundary based on shift in vegetation and topography. Paired with SP-04.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:	N/A		
HERB STRATUM **Plot Size:** 5'r			
1. *Eleocharis acicularis*	50	Yes	OBL
2. *Festuca perennis*	20	Yes	FAC
3. *Festuca arundinaceae*	20	Yes	FACU
4. *Trifolium repens*	5		FACU
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	95		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	N/A		

% Bare ground in herb stratum 5 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 67 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test.

SOIL

Sampling Point SP-03

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	N2.5/0	100					Loamy clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Dark serpentine parent material may be masking redox. Soils assumed hydric based on dominance of hydrophytic vegetation and presence of primary indicators of wetland hydrology.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☒ Yes ☐ No Depth (inches): 0.5

Water table present? ☒ Yes ☐ No Depth (inches): 12

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-12

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Primary hydrology indicators of Surface Water (A1), High Water Table (A2), and Saturation (A3) observed. Surface water was approximately 0.5 inches in depth and a water table was observed to 12 inches below ground.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/4/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-04**

Investigator(s) Scott Yarger, Sammi Hill, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Convex Slope(%) 0-5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.771418 Long: -122.455186 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Paired point with SP-03; Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Bromus hordeaceous*	30	Y	FACU
2. *Avena barbata*	25	Y	UPL
3. *Festuca perennis*	15		UPL
4. *Acmispon wrangelianus*	8		UPL
5. *Holocarpha virgata ssp. virgata*	8		UPL
6. *Medicago polymorpha*	3		FACU
7.			
8.			
Herb Stratum Total Cover:	89		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 11 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-04

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	10YR 3/1	100					Clay	No redox features

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: High rock/ pebble content throughout profile. No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-05**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) none Slope(%) 10-15

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7704349144 Long: -122.453907737 Datum: D_WGS_1984

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes. NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point paired with SP-06. Sample point located in wetland swale at base of ephemeral stream. Sample point met wetland indicators for hydrophytic vegetation, hydric soils, and wetland hydrology. Average rainfall conditions were documented during the site visit. Sample Point SP-05 occurs in a hillside seep.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' r			
1. *Eleocharis acicularis*	50	Yes	OBL
2. *Stachys albens*	20	Yes	OBL
3. *Polypogon monspeliensis*	5		FACW
4. *Juncus mexicanus*	1		FACW
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	76		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 24 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? (2/2)= 100 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: There is a dominance of hydrophytic vegetation present within the sampled area.

SOIL

Sampling Point SP-05

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-1	7.5YR 3/2	100					Loam	High organics
1-12	10Y 3/1	98	7.5YR 3/2	2	C	PL	Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet Redox Dark Surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☒ Yes ☐ No Depth (inches): 2

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-12

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Soils episaturated to 12 inches below the surface; no water table observed below. Soils meet Surface Water (A1) and Saturation (A3) indicators.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-06**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Convex Slope(%) 10-15

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7704309067 Long: -122.453980833 Datum: D_WGS_1984

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes. NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point paired with SP-05. Sample point located in uplands adjacent to seasonal wetland along ephemeral stream. Sample point did not meet wetland indicators for hydrophytic vegetation, hydric soils, or wetland hydrology. Average rainfall conditions were documented during the site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' r			
1. *Bromus hordeaceus*	30	Yes	FACU
2. *Avena barbata*	20	Yes	UPL
3. *Melilotus indicus*	20	Yes	FACU
4. *Acmispon americanus*	10		UPL
5. *Elymus caput-medusae*	10		UPL
6.			
7.			
8.			
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 10 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: There is a dominance of non-hydrophytic vegetation present within the sampled area.

SOIL

Sampling Point SP-06

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	7.5YR 2.5/1	100					Clay Loam	Small cobble present.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches): _____

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Soil within the sampled point did not display any hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: There were no hydrology indicators present within sample point.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-07**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Convex Slope(%) 18

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7707244703 Long: -122.447519266 Datum: D_WGS_1984

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☒ Yes ☐ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located in uplands along hillslope near ridgeline. Sample point did not meet wetland indicators for hydrophytic vegetation and wetland hydrology. Average rainfall conditions were documented during the site visit.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' r			
1. *Hordeum marinum*	40	Yes	FAC
2. *Bromus hordeaceus*	25	Yes	FACU
3. *Festuca perennis*	15		FAC
4. *Avena barbata*	15		UPL
5. *Lupidium nitidum*	3		FAC
6. *Holocarpha lagomorpha*	2		UPL
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 50 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation is not present within the sampled area.

SOIL

Sampling Point SP-07

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-5	10YR 3/1	95	7.5YR 3/4	5	C	M	Clay loam	
5-7	10YR 3/1	100					Clay loam	Many large cobbles.
7-9	7.5YR 3/4	100					Loamy sand	
9-12	10YR 2/1	10					Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet Redox Dark Surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Secondary indicator of Saturation Visible on Aerial Imagery (C9) indicator is met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-08**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Concave Slope(%) 10

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7701840215 Long: -122.446623048 Datum: D_WGS_1984

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point paired with SP-09. Sample point located in a seasonal wetland along a hillslope. Sample point met wetland indicators for hydrophytic vegetation, hydric soils, and wetland hydrology. Wetland boundary based on shift in vegetation and topography. Average rainfall conditions were documented during the site visit.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' r			
1. *Festuca perennis*	25	Yes	FAC
2. *Bromus hordeaceus*	20	Yes	FACU
3. *Hordeum marinum*	20	Yes	FAC
4. *Medicago polymorpha*	10		UPL
5. *Avena barbata*	10		UPL
6. *Stipa pulchra*	5		UPL
7. *Rumex crispus*	5		FAC
8. *Bromus diandrus*	5		UPL
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 66 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Hydrophytic vegetation is present within the sampled area.

SOIL

Sampling Point SP-08

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-5	5Y 3/1	97	7.5YR 3/4	3	C	M/PL/R	Loamy clay	
5-12	5Y 4/1	95	7.5YR 3/4	5	C	M	Loamy clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: The soil within sample point contains redox dark surface hydric indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): >9

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Saturation wetland indicator is present.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-09**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Concave Slope(%) 10

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7701580445 Long: -122.446570857 Datum: D_WGS_1984

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point paired with SP-08. Sample point located in uplands adjacent to seasonal wetland along hillslope. Sample point did not meet wetland indicators for hydrophytic vegetation, hydric soils, and wetland hydrology. Average rainfall conditions were documented during the site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' r			
1. *Medicago polymorpha*	30	Yes	UPL
2. *Bromus hordeaceus*	10	Yes	FACU
3. *Avena barbata*	10	Yes	UPL
4. *Hordeum marinum*	10	Yes	FAC
5. *Festuca perennis*	10	Yes	UPL
6. *Erodium brachycarpum*	5		UPL
7. *Elymus caput-medusae*	5		UPL
8.			
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 20 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 5 (B)

% of dominant species that are OBL, FACW, or FAC? 20 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation is not present within the sampled area.

SOIL

Sampling Point SP-09

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	10YR 3/1	70					Clay loam	
0-12	10YR 3/2	30					Clay loam	non-redoximorphic mottles

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: There were no hydrology indicators present within sample point.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-10**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Convex Slope(%) 0-5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7688291341 Long: -122.450669174 Datum: D_WGS_1984

Soil Map Unit Name Maxwell clay loam, 2 to 8 percent slopes. NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point paired with SP-11. Sample point located within seasonal wetland along a hillslope. Sample point met wetland indicators for hydrophytic vegetation and wetland hydrology. Soils problematic (serpentine, dark parent material), assumed hydric based on presence of hydrophytic vegetation and wetland hydrology. Average rainfall conditions were documented during the site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' r			
1. *Bromus hordeaceus*	40	Yes	FACU
2. *Juncus mexicanus*	20	Yes	FACW
3. *Hordeum marinum*	20	Yes	FAC
4. *Festuca perennis*	10		FAC
5. *Trifolium variegatum*	4		FAC
6. *Eleocharis acicularis*	4		OBL
7. *Juncus phaeocephalus*	1		FACW
8. *Lactuca saligna*	1		UPL
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 67 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Hydrophytic vegetation present within the sampled area.

SOIL

Sampling Point SP-10

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	10YR 2/1	100					Clay Loam	Redox not present.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Dark serpentine parent material may be masking redox. Soils assumed hydric based on dominance of perennial wetland vegetation and presence of primary and secondary indicators of wetland hydrology.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☒ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Deep hoof marks observed at sample point, relative to adjacent areas, suggesting wetland hydrology present within the sampled area. Sample point meets Saturation Visible on Aerial Imagery (C9).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-11**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Convex Slope(%) 0-5

Subregion(LRR) LRR C (Medit. CA) Lat: 20.4763640066 Long: -122.450786664 Datum: D_WGS_1984

Soil Map Unit Name Maxwell clay loam, 2 to 8 percent slopes. NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point paired with SP-10. Sample point located in uplands adjacent to seasonal wetland. Sample point did not meet wetland indicators for hydrophytic vegetation, hydric soils, or wetland hydrology. Average rainfall conditions were documented during the site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' r			
1. *Bromus hordeaceus*	25	Yes	FACU
2. *Festuca perennis*	20	Yes	FAC
3. *Avena barbata*	20	Yes	UPL
4. *Hordeum marinum*	15		FAC
5. *Acmispon americanus*	4		UPL
6. *Eleocharis acicularis*	4		OBL
7. *Juncus phaeocephalus*	1		FACW
8. *Lactuca saligna*			UPL
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 10 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 33 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation not present within the sampled area.

SOIL

Sampling Point SP-11

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	10YR 2/1	100					Clay Loam	Redox not apparent.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Hoof prints shallower than in paired wetland point. No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/2/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-12**

Investigator(s) Aaron Arthur; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) none Slope(%) 0-5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.767907904 Long: -122.450036164 Datum: D_WGS_1984

Soil Map Unit Name Maxwell clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in a vegetated swale with some open water. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Wetland boundary based on shift in vegetation and topography. Point paired with A-SP15.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' r			
1. *Eleocharis acicularis*	40	Yes	OBL
2. *Juncus mexicanus*	10	Yes	FACW
3. *Avena barbata*	5		UPL
4. *Hordeum marinum*	5		FAC
5. *Bromus hordeaceus*	5		FACU
6. *Rumex crispus*	5		FAC
7. *Lactuca tatarica*	4		FAC
8. *Festuca perennis*	1		UPL
Herb Stratum Total Cover:	75		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 25 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Hydrophytic vegetation is present within the sampled area.

SOIL

Sampling Point SP-12

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-8	2.5Y 3/1	95	7.5YR 3/4	5	C	RC,M	Loamy clay	
8-12	2.5Y 3/1	98	7.5YR 3/4	2	C	M	Loamy clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Sample point contains redox dark surface hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☐ No Depth (inches):

Water table present? ☐ Yes ☐ No Depth (inches):

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-3

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point contains saturation, but no water table below, and oxidized rhizospheres along living roots wetland hydrology indicators.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/2/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-13**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Concave Slope(%) 10

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7678753229 Long: -122.450103425 Datum: D_WGS_1984

Soil Map Unit Name Maxwell clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point did not meet wetland indicators for hydrophytic vegetation, hydric soils, and wetland hydrology. Average rainfall conditions were documented during the site visit. Paired with SP-14.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' r			
1. *Bromus hordeaceus*	60	Yes	UPL
2. *Medicago polymorpha*	10		FACU
3. *Erodium cicutarium*	10		UPL
4. *Trifolium dubium*	5		UPL
5. *Holocarpha lagomorpha*	5		UPL
6. *Rumex crispus*	5		FAC
7. *Hordium murinum*	1		UPL
8.			
Herb Stratum Total Cover:	96		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover: N/A			

% Bare ground in herb stratum 4 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation is not present within the sampled area.

SOIL

Sampling Point SP-13

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	7.5YR 3/2	98	7.5YR 3/4	2	C	M	Loamy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches): _____

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Sample point does not contain hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point does not contain wetland hydrology indicators.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-14**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Convex Slope(%) 7

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7687582478 Long: -122.44759631 Datum: D_WGS_1984

Soil Map Unit Name Maxwell clay loam, 2 to 8 percent slopes. NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point paired with SP-13. Sample point located in seasonal wetland along hillslope. Sample point meets criteria for hydrophytic vegetation and wetland hydrology. Soils are problematic (serpentine) and assumed to by hydric. Average rainfall conditions were documented during the site visit.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' r			
1. *Eleocharis acicularis*	30	Yes	OBL
2. *Hordeum marinum*	20	Yes	FAC
3. *Bromus hordeaceus*	10		FACU
4. *Festuca perennis*	5		FAC
5. *Juncus mexicanus*	5		FACW
6. *Trifolium dubium*	2		UPL
7. *Mimulus guttatus*	1		OBL
8.			
Herb Stratum Total Cover:	73		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 27 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Hydrophytic vegetation present within the sampled area.

SOIL

Sampling Point SP-14

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-4	7.5YR 2.5/1	100					Loamy Clay	
4-12	N2.5/0	100					Loamy Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Dark serpentine parent material may be masking redox. Soils assumed hydric based on dominance of hydrophytic vegetation and presence of primary indicators of wetland hydrology.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☒ Yes ☐ No Depth (inches): 1

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-1

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Surface water present within sample point. Soils saturated but no water table below. Sample point meets Saturation Visible on Aerial Imagery (C9), and the FAC-Neutral test (D5).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-15**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Convex Slope(%) 7

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7687729712 Long: -122.447521016 Datum: D_WGS_1984

Soil Map Unit Name Maxwell clay loam, 2 to 8 percent slopes. NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point paired with SP-14. Sample point located in uplands adjacent to seasonal wetland on hillslope. Sample point did not meet wetland indicators for hydrophytic vegetation, hydric soils, and wetland hydrology. Average rainfall conditions were documented during the site visit.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' r			
1. *Bromus hordeaceus*	20	Yes	FACU
2. *Medicago polymorpha*	10	Yes	FAC
3. *Hordeum marinum*	5		FAC
4. *Festuca perennis*	5		FAC
5. *Erodium brachycarpum*	5		UPL
6. *Microseris douglasii*	5		FACU
7.			
8.			
Herb Stratum Total Cover:	50		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 50 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 50 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation is not present within the sampled area.

SOIL

Sampling Point SP-15

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	7.5YR 3/1	100					Loamy Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/2/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-16**

Investigator(s) Scott Yarger, Sammi Hill, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) concave Slope(%) 20

Subregion(LRR) LRR C (Medit. CA) Lat: 38.765903 Long: -122.440886 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No

Hydric Soil Present? ☒ Yes ☐ No

Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Paired point with SP-17. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Soils are problematic (serpentine) due to dark parent material, however hydric soil indicator A4 was observed. Boundary determined by change in topography and vegetation.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Eleocharis macrostachya*	60	Y	OBL
2. *Epilobium ciliatum*	10		FACW
3. *Juncus phaeocephalus var. phaeocephalus*	5		FACW
4. *Melilotus indicus*	+		FACU
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	75		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 25 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Bare ground= standing water; Vegetation meets dominance test.

SOIL

Sampling Point SP-16

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	N3/0	100					clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☒ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Dark serpentine parent material may be masking redox, however Hydric soil indicator Hydrogen Sulfide (A4) was observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☒ Yes ☐ No Depth (inches): 2

Water table present? ☒ Yes ☐ No Depth (inches): 0

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Hydrology fed by spring uphill. Hydrology indicators Surface Water (A1), High Water Table (A2), and Saturation (A3) were observed. Surface water was observed, approximately 2 inches in depth.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/2/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-17**

Investigator(s) Scott Yarger, Sammi Hill, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) convex Slope(%) 30

Subregion(LRR) LRR C (Medit. CA) Lat: 38.766003 Long: -122.440799 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Paired point with SP-16. Sample point located in upland adjacent to seep. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 25' radius	Absolute % cover	Dominant Species?	Indicator Status
1. *Pinus sabiniana*	10	Y	UPL
2.			
3.			
4.			
Tree Stratum Total Cover:	10		
SAPLING/SHRUB STRATUM **Plot Size:** 15' radius			
1. *Arctostaphylos manzanita ssp. manzanita*	10	Y	UPL
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:	10		
HERB STRATUM **Plot Size:** 5' radius			
1. *Avena fatua*	30	Y	UPL
2. *Bromus hordeaceous*	12		FACU
3. *Medicago polymorpha*	15	Y	FACU
4. *Trifolium hirtum*	5		UPL
5. *Bromus madritensis*	5		
6. *Erodium cicutarium*	1		
7.			
8.			
Herb Stratum Total Cover:	68		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 32 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 4 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-17

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-7	10YR 3/2	50					clay	
	10YR 2/2	50					clay	
7-13	5Y 4/2	50					clay loam	
	2.5Y 4/2	50					clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators of hydric soils observed. Numerous pebbles observed within the profile.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No hydrology indicators observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-18**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley Local Relief (concave, convex, none) Concave Slope(%) 5-10

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7686941966 Long: -122.433752364 Datum: D_WGS_1984

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point paired with SP-19. Sample point located on perennial stream fringe. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Wetland boundary based on shift in vegetation and topography.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' r			
1. *Festuca perennis*	50	Yes	FAC
2. *Bromus hordeaceus*	15		FACU
3. *Geranium dissectum*	15		UPL
4. *Hordeum marinum*	10		FAC
5.			
6.			
7.			
8.			
Herb Stratum Total Cover: 90			
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover: 0			

% Bare ground in herb stratum 10 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Hydrophytic vegetation is present within the sampled area.

SOIL

Sampling Point SP-18

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-8	10YR 3/2	60	10YR 4/1	40	D	RC/PL	Loam	
8-12	10YR 4/1	60	7.5YR 3/4	5	C	PL	Loam	
8-12	10YR 3/2	35						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☒ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Sample pointcontains Depleted Matrix (F3) and Depleted Dark Surface (F7) hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☒ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point contains drift deposits and aerial imagery secondary hydrology indicators.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-19**

Investigator(s) Aaron Arthur; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley Local Relief (concave, convex, none) Concave Slope(%) 3-5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7687293542 Long: -122.43377786 Datum: D_WGS_1984

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located in uplands adjacent to perennial stream fringe. Paired point with SP-18. Sample point did not meet wetland indicators for hydrophytic vegetation, hydric soils, and wetland hydrology. Average rainfall conditions were documented during the site visit.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: 30' r	Absolute % cover	Dominant Species?	Indicator Status
1. *Quercus lobata*	40		
2.			
3.			
4.			
Tree Stratum Total Cover:	40		
SAPLING/SHRUB STRATUM Plot Size: 10'r			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' r			
1. *Bromus diandrus*	30	Yes	UPL
2. *Bromus hordeaceus*	20	Yes	FACU
3. *Avena barbata*	20	Yes	UPL
4. *Hordeum marinum*	10		FAC
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 20 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation is not present within the sampled area.

SOIL

Sampling Point SP-19

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	10YR 3/1	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-20**

Investigator(s) Scott Yarger, Sammi Hill, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) concave Slope(%) 5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.76606 Long: -122.430902 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Paired point with SP-21. Sample point located in wetland swale at base of ephemeral stream on hillslope. Sample point meets criteria for hydrophytic vegetation and wetland hydrology. Soils are problematic (serpentine) and assumed to be hydric. Boundary determined by changing topography and vegetation.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' radius			
1. *Carex serratodens*	65	Y	FACW
2. *Elymus triticoides*	20	Y	FAC
3. *Unknown Asteraceae*	2		
4. *Bromus diandrus*	5		UPL
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	92		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100% (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Thatch=8

SOIL

Sampling Point SP-20

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-14	10YR 2/1	100					clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Dark serpentine parent material may be masking redox. Soils assumed hydric based on topography, dominance of hydrophytic vegetation and presence of primary indicators of wetland hydrology.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☒ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Inundation Visible on Aerial Imagery (B7) primary hydrology indicator observed. Saturation Visible on Aerial Imagery (C9) also met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-21**

Investigator(s) Scott Yarger, Sammi Hill, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) convex Slope(%) 5-10

Subregion(LRR) LRR C (Medit. CA) Lat: 38.766054 Long: -122.431031 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Paired point with SP-20. Sample point located in uplands adjacent to wetland swale at base of ephemeral stream on hillslope.Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 25' radius	Absolute % cover	Dominant Species?	Indicator Status
1. *Pinus sabiniana*	5	Y	UPL
2.			
3.			
4.			
Tree Stratum Total Cover:	5		
SAPLING/SHRUB STRATUM **Plot Size:** 15' radius			
1. *Heteromeles arbutifolia*	25	Y	UPL
2. *Quercus durata var. durata*	5		UPL
3. *Rhus aromatica*	3		FACU
4. *Quercus berberidifolia*	2		UPL
Sapling/Shrub Stratum Total Cover:	35		
HERB STRATUM **Plot Size:** 5' radius			
1. *Festuca californica*	30	Y	FACU
2. *Achillea millefolium*	25	Y	FACU
3. *Sisyrinchium bellum*	5		FACW
4. *Ranunculus occidentalis var. occidentalis*	10		FAC
5. *Plantago erecta*	10		UPL
6. *Aira caryophyllea*	10		FACU
7. *Leptosiphon parviflorus*	+		
8.			
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 5 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 4 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Thatch=5; Vegetation does not meet dominance test.

SOIL

Sampling Point SP-21

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-14	10YR 2/1	100					clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/2/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-22**

Investigator(s) Scott Yarger, Sammi Hill, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) concave Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.764093 Long: -122.466203 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 2 to 15 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Paried points with SP-23. Sample point located at head of wetland swale in blue oak savannah. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Wetland boundary determined based on shift in topography and vegetation composition.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' radius			
1. *Hordeum marinum*	70	Y	FAC
2. *Bromus hordeaceaous*	10		FACU
3. *Hypochaeris radicata*	5		FACU
4. *Trifolium willdenovii*	2		FACW
5. *Festuca bromoides*	2		FACU
6. *Erodium brachycarpum*	+		
7.			
8.			
Herb Stratum Total Cover:	89		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 11 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100% (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test.

SOIL

Sampling Point SP-22

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-10	7.5YR 3/2	90	5YR 3/4	10	C	PL, M	sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: hard pan

Depth (inches): 10

Hydric Soil Present ? ☒ Yes ☐ No

Remarks: Soils meet Redox Dark Surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ Yes ☐ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Hydrology indicators of Water-Stained Leaves (B9) and Drainage Patterns (B10) were observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/2/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-23**

Investigator(s) Scott Yarger, Sammi Hill, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) convex Slope(%)

Subregion(LRR) LRR C (Medit. CA) Lat: 38.764313 Long: -122.466205 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 2 to 15 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Paired point with SP-22. Sample point located in uplands adjacent to wetland swale in blue oak savannah. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 25' radius	Absolute % cover	Dominant Species?	Indicator Status
1. *Qud ou*	25	Y	UPL
2.			
3.			
4.			
Tree Stratum Total Cover:	25		
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Avena barbata*	40	Y	UPL
2. *Bromus hordeaceous*	15	Y	FACU
3. *Medicago polymorpha*	+		FACU
4. *Hypochaeris glabrata*	5		UPL
5. *Geranium dissectum*	5		UPL
6. *Briza minor*	+		FAC
7. *Trifolium willdenovii*	1		FACW
8. *Anthemis cotula*	3		FACU
Herb Stratum Total Cover:	69		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 31 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-23

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	7.5 YR 3/3	98	5YR 3/4	2	C	PL	sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/2/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-24**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) None Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.763979 Long: -122.461894 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 2 to 15 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in small linear wetland swale. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Boundary determined by changes in topography and vegetation. Paired point with SP-25.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Hordeum marinum*	50	Y	FAC
2. *Bromus hordeaceous*	10		FACU
3. *Elymus caput-medusae*	5		NL
4. *Lasthenia californica ssp. californica*	5		UPL
5. *Hypochaeris glabra*	3		NL
6. *Navaretia sp.*	2		-
7.			
8.			
Herb Stratum Total Cover:	75		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 25 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100% (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test.

SOIL

Sampling Point SP-24

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-3	7.5YR 2.5/3	85	5YR 4/6	15	C	PL/M/RC	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: shovel refusal

Depth (inches): 3-4"

Hydric Soil Present ? ☒ Yes ☐ No

Remarks: Soils meet Redox Dark Surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ Yes ☐ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point meets Oxidized Rhizospheres along Living Roots (C3).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/2/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-25**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) None Slope(%) 4

Subregion(LRR) LRR C (Medit. CA) Lat: 38.764039 Long: -122.461812 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 2 to 15 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located in uplands adjacent to small wetland swale. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Paired point with SP-24.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' radius			
1. *Bromus hordeaceous*	40	Y	FACU
2. *Bromus diandrus*	20	Y	UPL
3. *Elymus caput-medusae*	10		NL
4. *Avena barbata*	10		UPL
5. *Erodium cicutarium*	8		UPL
6. *Gastridium phleoides*	5		FACU
7. *Lasthenia californica ssp. californica*	2		UPL
8.			
Herb Stratum Total Cover:	95		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 5 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-25

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-4	7.5YR 3.5/3	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: shovel refusal

Depth (inches): 4"

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/2/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-26**

Investigator(s) Scott Yarger, Sammi Hill, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) concave Slope(%) 0-2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.761932 Long: -122.457605 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 2 to 15 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point is located within narrow wetland swale in a large topographic bowl. Paired point with SP-27. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Wetland boundary based on shift in vegetation and topography.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Hordeum marinum*	40	Y	FAC
2. *Perideridia kelloggii*	5		NL
3. *Trifolium willdenovii*	2		FACW
4. *Avena barbata*	3		UPL
5. *Elymus caput-medusae*	3		UPL
6. *Briza minor*	2		FAC
7. *Eleocharis macrostachya*	2		OBL
8. *Bromus hordeaceous*	2		FACU
Herb Stratum Total Cover:	59		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 16 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100% (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: thatch= 20; algal matting= 5; Vegetation meets dominance test.

SOIL

Sampling Point SP-26

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-3	5YR 3/2	95	5YR 4/6	5	C	M, PL	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: shovel refusal

Depth (inches): 3

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: High pebble content cause of shovel refusal. Soils meet Redox Dark Surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Hydrology indicator Biotic Crust (B12) observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/2/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-27**

Investigator(s) Scott Yarger, Sammi Hill Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) convex Slope(%) 1-2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.761928 Long: -122.45797 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 2 to 15 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point is located in uplands adjacent to a narrow wetland swale in a large topographic bowl. Paired with SP-26. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' radius			
1. *Avena barbata*	20	Y	UPL
2. *Hypochaeris glabra*	25	Y	UPL
3. *Erodium botrys*	20	Y	FACU
4. *Bromus hordeaceous*	10		FACU
5. *Elymus caput-medusae*	5		UPL
6. *Acmispon americanus var. americanus*	5		UPL
7. *Trifolium willdenovii*	3		FACW
8. *Briza minor*	1		FAC
Herb Stratum Total Cover:	89		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 11 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 0% (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-27

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-4	2.5YR 3/3	90	N2.5/0	10	C	M		manganese concretions

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Shovel refusal

Depth (inches): 4

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/2/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-28**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley Local Relief (concave, convex, none) Concave Slope(%) 0-2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7640112615 Long: -122.443445854 Datum: D_WGS_1984

Soil Map Unit Name Maxwell clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in large seasonal wetland in valley. Sample point did met wetland indicators for hydrophytic vegetation, hydric soils, and wetland hydrology. Wetland boundary based on shift in vegetation and topography. Average rainfall conditions were documented during the site visit. Paired with SP-29.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:	N/A		
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:	N/A		
HERB STRATUM **Plot Size:** 5' r			
1. *Hordeum marinum*	50	Yes	FAC
2. *Rumex crispus*	20	Yes	FAC
3. *Bromus hordeaceus*	10		FACU
4. *Trifolium repens*	5		FACU
5. *Hydrocotyle ranunculoides*	5		OBL
6.			
7.			
8.			
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	N/A		

% Bare ground in herb stratum 10 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Hydrophytic vegetation is present within the sampled area.

SOIL

Sampling Point SP-28

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-8	7.5YR 3/1	95	7.5YR 4/6	5	C	M/PL, RC	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Sample point contains redox dark surface hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point met oxidized rhizospheres along living roots wetland hydrology indicators and met Secondary indicator of Saturation Visible on Aerial Imagery (C9).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/2/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-29**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Concave Slope(%) 2-5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7639991455 Long: -122.443598811 Datum: D_WGS_1984

Soil Map Unit Name Maxwell clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☒ Yes ☐ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point did not meet wetland indicators for hydrophytic vegetation and wetland hydrology. Average rainfall conditions were documented during the site visit. Paired with SP-28.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:	N/A		
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:	N/A		
HERB STRATUM **Plot Size:** 5' r			
1. *Bromus hordeaceus*	50	Yes	FACU
2. *Trifolium dubium*	20	Yes	UPL
3. *Erodium brachycarpum*	10		UPL
4. *Geranium dissectum*	5		UPL
5. *Hordeum marinum*	5		FAC
6.			
7.			
8.			
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	N/A		

% Bare ground in herb stratum 10 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation is not present within the sampled area.

SOIL

Sampling Point SP-29

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	7.5YR 2.5/2	98	7.5YR 3/4	2	C	M/PL	Loamy clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Sample point meets redox dark surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-30**

Investigator(s) Tanner Harris, Rhiannon Korhummel,WRA Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) None Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.76141 Long: -122.440617 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Paired point with SP-31. Sample point located in a large seasonal wetland at terminus of intermittent stream along a valley floor. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Wetland boundary based on shift in vegetation and topography.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Festuca perennis*	30	Y	FAC
2. *Hordeum marinum*	30	Y	FAC
3. *Hemizonia congesta ssp. lutescens*	10		NL
4. *Trifolium fucatum*	10		FACU
5. *Medicago polymorpha*	5		FACU
6. *Lactuca serriola*	5		FACU
7. *Parentucellia viscosa*	5		FAC
8.			
Herb Stratum Total Cover:	95		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Thatch=5; Vegetation meets dominance test.

SOIL

Sampling Point SP-30

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-4	10YR 4/2	48	5YR 3/4	5	C	M, PL, RC	Clay loam	
	10YR 2/1	47						
4-12	10YR 2/1	100					Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils with buried A horizon from sediment deposition from stream feeding wetland. Soils meet Depleted Matrix (F3).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Saturation observed on March visit

Remarks: Soils meet Oxidized Rhizospheres along Living Roots (C3).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-31**

Investigator(s) Tanner Harris, Rhiannon Korhummel,WRA Section,Township,Range

Landform (hillslope, terrace, etc.) Valley floor Local Relief (concave, convex, none) None Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.761586 Long: -122.440507 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Paired points with SP-30. Sample point located in uplands adjacent to a large seasonal wetland along valley floor. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Medicago polymorpha*	30	Y	FACU
2. *Festuca perennis*	15	Y	FAC
3. *Bromus hordeaceous*	15	Y	FACU
4. *Vicia villosa ssp. villosa*	10		UPL
5. *Hemizonia congesta ssp. lutescens*	10		UPL
6. *Hordeum marinum*	10		FAC
7. *Lupinus bicolor*	+		UPL
8.			
Herb Stratum Total Cover: 95			
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 33 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Thatch=5 percent; Vegetation does not meet dominance test.

SOIL

Sampling Point SP-31

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-11	10YR 2/1	100					Loamy clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-32**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) concave Slope(%) 15

Subregion(LRR) LRR C (Medit. CA) Lat: 38.763114 Long: -122.439354 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Wetland seep in draw on hillside . Boundary determined by shift in vegetation, and topography. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Paired point with SP-33.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Hordeum marinum*	20	Y	FAC
2. *Festuca perennis*	20	Y	FAC
3. *Eleocharis macrostachya*	15	Y	OBL
4. *Trifolium dubium*	10		UPL
5. *Lathyrus sp.*	10		
6. *Geranium dissectum*	10		UPL
7. *Juncus xiphioides*	5		OBL
8. *Bromus hordeaceous*	5		UPL
Herb Stratum Total Cover:	95		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum thatch=5 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 3 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test.

SOIL

Sampling Point SP-32

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-4	10YR 2/1	95	5YR 3/4	5	C	PL, M	Loamy sand	
4-12	10YR 2/1	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet Redox Dark Surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Saturation observed in March 2018.

Remarks: Sample point meets Oxidized Rhizospheres along Living Roots (C3).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-33**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) convex Slope(%) 20

Subregion(LRR) LRR C (Medit. CA) Lat: 38.76312 Long: -122.43943 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located in adjacent uplands to seep in hillslope. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Paired point with SP-32.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' radius			
1. *Avena barbata*	30	Y	UPL
2. *Bromus madritensis ssp. rubens*	20	Y	UPL
3. *Festuca microstachys*	10	Y	UPL
4. *Geranium dissectum*	5		UPL
5. *Erodium cicutarium*	5		UPL
6. *Plantago erecta*	3		NL
7. *Acmispon wrangelianus*	2		UPL
8. *Holocarpha virgata*	+		NL
Herb Stratum Total Cover:	85		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum thatch=15 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: *Elymus caput-medusae (*UPL)= 10; Vegetation does not meet dominance test.

SOIL

Sampling Point SP-33

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	10YR 2/1	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-34**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) none Slope(%) 1

Subregion(LRR) LRR C (Medit. CA) Lat: 38.761486 Long: -122.431685 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point in stream channel with dominated by perennial vegetation. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Paired point with SP-35.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' x 10'			
1. *Juncus mexicanus*	45	Y	FACW
2. *Festuca perennis*	20	Y	FAC
3. *Hordeum marinum*	10		FAC
4. *Medicago polymorpha*	5		FACU
5. *Lactuca saligna*	+		UPL
6.			
7.			
8.			
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 20 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100% (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation heavily grazed. Vegetation meets dominance test.

SOIL

Sampling Point SP-34

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-12	2.5Y 3/2	85	10YR 3/6	5	C	PL, M,RC	Clay loam	
	2.5Y 2.5/1	10						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet Redox Dark Surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point meets Oxidized Rhizospheres along Living Roots (C3) and Saturation Visible on Aerial Imagery (C9).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-35**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) None Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.761547 Long: -122.431684 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Point taken in uplands above stream channel bank. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology.Paired point with SP-34.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' radius			
1. *Avena barbata*	60	Y	UPL
2. *Bromus hordeaceous*	10		FACU
3. *Acmispon wrangelianus*	5		NL
4. *Elymus caput-medusae*	5		NL
5. *Medicago polymorpha*	+		FACU
6.			
7.			
8.			
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum thatch=20 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-35

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-17	10YR 2/1	100					sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-36**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) Slightly concave Slope(%) 4

Subregion(LRR) LRR C (Medit. CA) Lat: 38.763771 Long: -122.427948 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No

Hydric Soil Present? ☒ Yes ☐ No

Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Seepy patch at bench along drainage; wetland boundary based on signatures. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Paired point with SP-37.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Hordeum marinum*	20	Y	FAC
2. *Juncus mexicanus*	20	Y	FACW
3. *Festuca perennis*	20	Y	FAC
4. *Bromus hordeaceous*	10		FACU
5. *Hemizonia congesta ssp. lutescens*	+		NL
6.			
7.			
8.			
Herb Stratum Total Cover:	70		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum thatch=30 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 3 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation heavily grazed. Vegetation meets dominance test.

SOIL

Sampling Point SP-36

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-6	10YR 3/2	98	10YR 3/6	2	C	M,RC	Clay loam	
6-12	10YR 3/2	75	10YR 3/6	25	C	M,RC	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet Redox Dark Surface (F6). Soil moist at sampling, but not saturated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point meets Oxidized Rhizospheres along Living Roots (C3).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-37**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Convex Slope(%) 10

Subregion(LRR) LRR C (Medit. CA) Lat: Long: Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located in uplands adjacent to wetland seep on hillslope . Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Paired point with SP-36.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Avena barbata*	50	Y	UPL
2. *Bromus hordeaceous*	10		UPL
3. *Medicago polymorpha*	8		FACU
4. *Anagalis aravensis*	2		FAC
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	70		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: thatch=30; Vegetation does not meet dominance test.

SOIL

Sampling Point SP-37

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	7.5YR 2.5/2	100					CC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-38**

Investigator(s) Scott Yarger, Sammi Hill, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) concave Slope(%) 5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.763843 Long: -122.423679 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in a concave wetland seep. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Boundary is determined by shift in topography and vegetation. Paired point with SP-39.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Carex serratodens*	80	Y	FACW
2. *Melilotus indicus*	2		FACU
3.			
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 18 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100% (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test.

SOIL

Sampling Point SP-38

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-4	10Y 4/0	90	10YR 3/4	10	C	M	sandy clay loam	
4-16	10Y 4/0	60					sandy clay loam	fibrous roots
	10YR 4/2	40						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☒ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soil meets Loamy Gleyed Matrix (F2).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☒ Yes ☐ No Depth (inches): 1

Water table present? ☒ Yes ☐ No Depth (inches): 9

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 6

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Hydrology indicators of Surface Water (A1), High Water Table (A2), and Saturation (A3) were observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-39**

Investigator(s) Scott Yarger, Sammi Hill, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) convex Slope(%) 5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.76383 Long: -122.423657 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located on upland convex slope adjacent to wetland. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Paired with SP-38.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' radius			
1. *Stipa pulchra*	65	Y	UPL
2. *Bromus hordeaceous*	30	Y	FACU
3. *Centaurea melitensis*	2		UPL
4. *Acmispon wrangelianus*	+		UPL
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	97		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 3 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0% (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-39

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	10YR 3/2	100					clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/17/2018

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-40**

Investigator(s) Scott Yarger, Scott Batiuk, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) concave Slope(%) 15

Subregion(LRR) LRR C (Medit. CA) Lat: 38.764453 Long: -122.420574 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in a wetland seep on hillslope. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Wetland boundary based on shift in vegetation and topography. Sample point paired with SP-41. Rainfall was above average for time of year.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:**	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:**			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Carex serratodens*	80	Yes	FACW
2. *Stachys albens*	10		OBL
3.			
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM **Plot Size:**			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 2 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Litter/thatch = 8%; Vegetation meets dominance test.

SOIL

Sampling Point SP-40

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-2	10YR 2/1	70	10YR 3/4	30	C	M	Loamy clay	
2-8	2.5Y 2.5/1	95	7.5YR 4/4	5	C	M	Loamy clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet redox dark surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-8

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point has saturated soils to 8 inches in depth, but no water table observed below. Sample point meets biotic crust (B12), saturation on aerial imagery (C9), and FAC-neutral test (D5).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/17/2018

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-41**

Investigator(s) Scott Yarger, Scott Batiuk, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Convex Slope(%) 50

Subregion(LRR) LRR C (Medit. CA) Lat: 38.716602 Long: -122.464712 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point is an upland sample point paired with wetland sample point SP-40. Sample point is located on a steep slope above and directly adjacent to a stream fringe wetland. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Rainfall was above average for time of year.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 15' radius			
1. *Eriodictyon californicum*	8	Yes	NL
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:	8		
HERB STRATUM **Plot Size:** 5' radius			
1. *Bromus hordeaceus*	15	Yes	FACU
2. *Bromus madritensis*	15	Yes	UPL
3. *Centaurea melitensis*	5	No	NL
4. *Avena barbata*	2	No	NL
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	37		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 63 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Sample point does not meet hydrophytic vegetation indicators.

SOIL

Sampling Point SP-41

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	10YR 3/2	100					Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No wetland hydrology indicators observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/2/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-42**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Concave Slope(%) 6

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7578032497 Long: -122.46710315 Datum: D_WGS_1984

Soil Map Unit Name Water NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located within large vernal pool located in small valley. Sample point met wetland indicators for hydrophytic vegetation, hydric soils, and wetland hydrology. Wetland boundary based on shift in vegetation and topography. Average rainfall conditions were documented during the site visit. Paired with SP-43.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:	N/A		
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:	N/A		
HERB STRATUM **Plot Size:** 5' r			
1. *Trifolium variegatum*	30	Yes	FAC
2. *Bromus hordeaceus*	10	Yes	FACU
3. *Hordeum marinum*	10	Yes	FAC
4. *Eryngium artistulatum*	10	Yes	OBL
5. *Eleocharis acicularis*	7		OBL
6. *Triteleia latifolia*	2		UPL
7. *Hypochaeris radicata*	1		FACU
8.			
Herb Stratum Total Cover:	70		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	N/A		

% Bare ground in herb stratum 30 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 3 (A)

Total number of dominant species across all strata? 4 (B)

% of dominant species that are OBL, FACW, or FAC? 75 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test.

SOIL

Sampling Point SP-42

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-4	7.5YR 3/2	95	5YR 3/4	4	C	M/RC	Loam	Extreamly cobbly.
			N 2.5/0	1	C	M	Loam	Manganese

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet Redox Dark Surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point meets oxidized rhizospheres along living roots wetland hydrology indicators and Saturation Visible on Aerial Imagery (C9).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/2/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-43**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Concave Slope(%) 6

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7579883075 Long: -122.467003876 Datum: D_WGS_1984

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located in uplands adjacent to large vernal pool. Sample point did not meet wetland indicators for hydrophytic vegetation, hydric soils, and wetland hydrology. Average rainfall conditions were documented during the site visit. Paired with SP-42.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 30'r	Absolute % cover	Dominant Species?	Indicator Status
1. *Quercus douglasii*	10	Y	UPL
2.			
3.			
4.			
Tree Stratum Total Cover:	10		
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:	N/A		
HERB STRATUM **Plot Size:** 5' r			
1. *Bromus hordeaceus*	40	Yes	FACU
2. *Erodium cicutarium*	15	Yes	UPL
3. *Avena barbata*	10		UPL
4. *Chlorogalum pomeridianum*	10		UPL
5. *Lasthenia gracilis*	5		UPL
6. *Trifolium willdenowii*	5		FACW
7. *Hypochaeris radicata*	5		FACU
8.			
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	N/A		

% Bare ground in herb stratum 10 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation is not present within the sampled area.

SOIL

Sampling Point SP-43

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-4	5YR 3/3	100					Loam	Very cobbly.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Compacted rock

Depth (inches): 4

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Soils assumed non-hydric based on lack of redox at 4 inches, as well as upland vegetation, and no wetland hydrology.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/2/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-44**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) Concave Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.75879 Long: -122.45409 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No

Hydric Soil Present? ☒ Yes ☐ No

Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in swale on gentle slope which feeds into stream downslope. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Boundary determined by changes in topography and vegetation. Paired point with SP-45

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 4' x 5' radius			
1. *Hordeum marinum*	40	Y	FAC
2. *Festuca perennis*	10		FAC
3. *Bromus hordeaceous*	10		FACU
4. *Trifolium variegatum*	5		FAC
5. *Hypochaeris glabra*	3		NL
6. *Briza minor*	2		FAC
7. *Trifolium willdenovii*	+		FACW
8.			
Herb Stratum Total Cover:	70		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 30 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test.

SOIL

Sampling Point SP-44

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-3	7.5YR 2.5/5	90	7.5YR 4/6	10	C	PL, M, RC	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: shovel refusal

Depth (inches): 3"

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet Redox Dark Surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point meets Oxidized Rhizospheres along Living Roots (C3).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/2/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-45**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) None Slope(%) 5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.758841 Long: -122.454088 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located in uplands adjacent to wetland swale. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Paired point with SP-44.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: 15' radius	Absolute % cover	Dominant Species?	Indicator Status
1. *Quercus douglasii*	30	Y	UPL
2.			
3.			
4.			
Tree Stratum Total Cover:	30		
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' radius			
1. *Bromus hordeaceous*	25	Y	FACU
2. *Avena barbata*	25	Y	UPL
3. *Carduus pycnocephalus*	10		NL
4. *Trifolium hirtum*	10		UPL
5. *Daucus pusillus*	5		NL
6. *Elymus caput-medusae*	5		NL
7. *Hypochaeris glabra*	3		NL
8. *Hordeum marinum*	2		FAC
Herb Stratum Total Cover:	85		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 15 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-45

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-4	7.5YR 2.5/3	100					Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Shovel refusal

Depth (inches): 4"

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No hydrology indicators observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/2/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-46**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) toeslope Local Relief (concave, convex, none) concave Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.76087 Long: -122.448102 Datum: WGS 84

Soil Map Unit Name Bressa-Millsholm loams, 8 to 15 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in a swale on a toe slope. Wetland boundary based on shift in vegetation and topography. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Paired point with SP-47.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 10'			
1. *Hordeum marinum*	25	Y	FAC
2. *Festuca perennis*	20	Y	FAC
3. *Trifolium subterraneum*	15		UPL
4. *Erodium cicutarium*	10		UPL
5. *Bromus hordeaceous*	5		FACU
6. *Eleocharis macrostachys*	3		OBL
7. *Bromus diandrus*	1		UPL
8. *Avena barbata*	1		UPL
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 20 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100% (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test.

SOIL

Sampling Point SP-46

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-10	10YR2/1	90	5YR 3/4	10	C	PL/RC	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet Redox Dark Surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point meets Oxidized Rhizospheres along Living Roots (C3).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/2/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-47**

Investigator(s) Tanner Harris, Rhiannon Korhummel Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) None Slope(%) 5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.760875 Long: -122.448032 Datum: WGS 84

Soil Map Unit Name Bressa-Millsholm loams, 8 to 15 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located in uplands adjacent to swale. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Paired point with SP-46.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Bromus hordeaceous*	40	Y	FACU
2. *Avena barbata*	10	Y	UPL
3. *Navaretia squarrosa*	10	Y	FACU
4. *Trifolium hirtum*	10	Y	UPL
5. *Hordeum marinum*	5		FAC
6. *Erodium cicutarium*	5		UPL
7. *Festuca perennis*	5		FAC
8. *see remarks for remainder*	3		
Herb Stratum Total Cover:	92		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 8 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 4 (B)

% of dominant species that are OBL, FACW, or FAC? 0% (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: *Stipa pulchra* (UPL)=3, *Hypochaeris glabra* (NL) = 1, *Erigeron canadensis* (FACU)= 1; Vegetation does not meet dominance test.

SOIL

Sampling Point SP-47

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12+	5YR 2.5/2	100					Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No hydrology indicators observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/2/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-48**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) concave Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.759779 Long: -122.447731 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point in wetland swale on bench in hillside drainage, stream above and below. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Boundary determined by changes in topography and vegetation. Paired point with SP-49 .

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 4' x 10'			
1. *Hordeum marinum*	40	Y	FAC
2. *Festuca perennis*	10	Y	FAC
3. *Bromus hordeaceous*	10	Y	FACU
4. *Eleocharis macrostachys*	5		OBL
5. *Geranium dissectum*	5		UPL
6. *Briza minor*	5		FAC
7. *Rumex pulcher*	5		FAC
8. *see remarks for remainder*			
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 10 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 66 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: *Daucus pusillus* = 3, *Carduus pycnocephala*=2; Vegetation meets dominance test.

SOIL

Sampling Point SP-48

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	10YR 3/1	70	5YR 3/4	20	C	M		
			5YR 4/6	10	C	PL, RC		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet Redox Dark Surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Surface water (1-2") in stream above swale. Sample point meets Oxidized Rhizospheres along Living Roots (C3).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/2/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-49**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) convex Slope(%) 8

Subregion(LRR) LRR C (Medit. CA) Lat: 38.759823 Long: -122.447743 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point on hillslope adjacent to bench with wetland. Wetland boundary based on shift in vegetation and topography. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Paired point with SP-48.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Avena barbata*	25	Y	UPL
2. *Bromus hordeaceous*	25	Y	UPL
3. *Elymus caput-medusae*	15	Y	UPL
4. *Trifolium dubium*	10		UPL
5. *Erodium cicutarium*	5		
6. *Daucus pusillus*	3		
7. *Lupinus bicolor*	1		UPL
8. *Hypochaeris glabra*	1		
Herb Stratum Total Cover:	85		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 15 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-49

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12+	10YR 3/3	100					Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-50**

Investigator(s) Tanner Harris, Rhiannon Korhummel Section,Township,Range

Landform (hillslope, terrace, etc.) toeslope Local Relief (concave, convex, none) none Slope(%) 0

Subregion(LRR) LRR C (Medit. CA) Lat: 38.758934 Long: -122.443914 Datum: WGS 84

Soil Map Unit Name Bressa-Millsholm loams, 8 to 15 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in wet meadow at toeslope and adjacent to perennial stream. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Boundary determined by topography, aerial signature and vegetation.Paired point with SP-51.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Glycyrrhiza lepidota*	40	Y	FAC
2. *Eleocharis macrostachya*	30	Y	OBL
3. *Rumex crispus*	10		FAC
4. *Festuca arundinacea*	5		FACU
5.	5		
6.			
7.			
8.			
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 10 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100% (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test.

SOIL

Sampling Point SP-50

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	5Y 2.5/1	80	5YR 3/4	20	C	PL, M	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils saturated. Soils meet Redox Dark Surface (F6) indicator.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☒ Yes ☐ No Depth (inches): 2"

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-12"

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Standing water in hoof prints (2"). Soils saturated, but no water table below.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/1/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-51**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) Slope Local Relief (concave, convex, none) None Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.759002 Long: -122.44391 Datum: WGS 84

Soil Map Unit Name Bressa-Millsholm loams, 8 to 15 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Upland point on slope adjacent to road. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Paired point with SP-50.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Cynodon dactylon*	30	Y	FACU
2. *Bromus hordeaceous*	20	Y	FACU
3. *Hordeum marinum*	20	Y	FAC
4. *Avena barbata*	10		UPL
5. *Festuca perennis*	5		FAC
6. *Plantago lanceolata*	3		FAC
7. *Rumex pulcher*	2		FAC
8.			
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum thatch=10 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 33 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks:

SOIL

Sampling Point SP-51

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	10YR 3/2	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-52**

Investigator(s) Aaron Arthur, Ra'am Akiba-Hajim Section,Township,Range

Landform (hillslope, terrace, etc.) toeslope Local Relief (concave, convex, none) None Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.755624 Long: -122.492422 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point is located along a toeslope. Sample point meets criteria for hydrophytic vegetation and wetland hydrology. Soils are problematic (serpentine) and assumed to by hydric. Wetland boundary based on shift in vegetation and topography. Paired with upland sample point SP-53. Rainfall amounts were above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' radius			
1. *Hordeum brachyantherum*	30	Y	FACW
2. *Deschampsia danthonioides*	20	Y	FACW
3. *Hordeum murinum*	10	N	FACU
4. *Polypogon monspeliensis*	10	N	FACW
5. *Ranunculus sp.*	10	N	
6. *Castilleja rubicundula*	5	N	UPL
7. *Juncus phaeocephalus*	5	N	FACW
8.			
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 10 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Sample point is dominated by FACW species and meets wetland criteria for hydrophytic vegetation.

SOIL

Sampling Point SP-52

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-12	2.5Y 2.5/1	100	-	-	-	-	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Dark serpentine parent material may be masking redox. Soils assumed hydric based on dominance of hydrophytic vegetation and presence of primary indicators of wetland hydrology.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Area of sample point location contains very evident green features on aerial imagery during wet years. Two secondary indicators of Saturation Visible on Aerial Imagery (C9) and FAC-Neutral Test (D5) indicators were met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-53**

Investigator(s) Aaron Arthur, Ra'am Akiba-Hajim Section,Township,Range

Landform (hillslope, terrace, etc.) Hillside Local Relief (concave, convex, none) None Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.755916 Long: -122.49227 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point is located on an upland hillside. Sample does not meet wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Paired with wetland sample point SP-52. Rainfall amounts were above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Holocarpha virgata*	30	Y	NL
2. *Gastridium phleoides*	30	Y	FACW
3. *Bromus hordeaceus*	20	Y	FACU
4. *Festuca microstachys*	5	N	NL
5. *Plantago erecta*	2	N	NL
6. *Zeltnera muehlenbergii*	1	N	FAC
7. *Brodiaea elegans*	1	N	FACU
8.			
Herb Stratum Total Cover:	89		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 11 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 33 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: The sample is neither dominanted by nor contains a prevalence of hydrophytes.

SOIL

Sampling Point SP-53

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-6	10YR 3/2	100	-	-	-	-	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: shovel refusal

Depth (inches): 6

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Sample does not meet wetland soils criteria for hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample does not meet wetland criteria for hydrology.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-54**

Investigator(s) Tanner Harris, Russel Andrews, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) Toe slope Local Relief (concave, convex, none) None Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.753909 Long: -122.493081 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in seasonal wetland along toeslope. Sample point meets wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Paired with upland sample point SP-55. The boundary of the wetland area was based on area of exposed cobbles and a shift in vegetation.Rainfall amounts were above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Juncus xiphioides*	25	Y	OBL
2. *Polypogon monspeliensis*	20	Y	FACW
3. *Bromus hordeaceus*	8	N	FACU
4. *Hordeum marinum*	5	N	FAC
5. *Hemizonia congesta ssp. lutescens*	2	N	NL
6. *Lactuca serriola*	+	N	FACU
7. *Avena barbata*	+	N	NL
8.			
Herb Stratum Total Cover:	60		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 40 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Sample point is dominated by OBL and FACW species and meets wetland criteria for hydrophytic vegetation.

SOIL

Sampling Point SP-54

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-6	10.5YR 3/2	97	7.5YR 4/6	3	C	PL/RC	C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Shovel refusal/rock

Depth (inches): 6"

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Sample point meets the description of Redox Dark Surface (F6) and is thus considered a hydric soil.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☒ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Surface Soil Cracks (B6) and Oxidized Rhizospheres along Living Roots (C3) were observed and therefore sample point meets wetland criteria for hydrology.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-55**

Investigator(s) Tanner Harris, Russel Andrews, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) Toe slope Local Relief (concave, convex, none) None Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.753739 Long: -122.493014 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located in uplands adjacent to seasonal wetland along toeslope. Sample point does not meet wetland criteria for hydric soils, hydrophytic vegetation and wetland hydrology. Paired with wetland sample point SP-54. Rainfall amounts were above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Bromus hordeaceus*	45	Y	FACU
2. *Hordeum marinum*	15	N	FAC
3. *Gastridium phleoides*	15	N	FACW
4. *Holocarpha virgata*	10	N	NL
5. *Navarretia jepsonii*	5	N	FACW
6. *Brodiaea elegens*	+	N	FACU
7.			
8.			
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 10 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: The sample is neither dominant by nor contains a prevalence of hydrophytes.

SOIL

Sampling Point SP-55

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-6	7.5YR 3/3	98	7.5YR 5/6	2	C	M	Loamy clay	w/ cobble

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Shovel refusal

Depth (inches): 6"

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point does not meet wetland criteria for hydrology.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-56**

Investigator(s) Tanner Harris, Russel Andrews, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) None Slope(%) 0

Subregion(LRR) LRR C (Medit. CA) Lat: 38.752977 Long: -122.493321 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in stream fringe wetland associated with a pernnial stream. Sample point meets wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Wetland boundary based on shift in vegetation and topography. Paired with upland sample point SP-57. Rainfall amounts were above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Festuca arundinacea*	30	Y	FAC
2. *Lotus corniculatus*	30	Y	FAC
3. *Cynodon dactylon*	30	Y	FACU
4. *Juncus sp.*	5	N	FACU
5. *Trifolium repens*	3	N	FACU
6. *Taraxacum officinale*	2	N	FACU
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 67 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☒ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Festuca arundinacea growing in humocks to elevate above saturated soils--considered as morphological adaptation and species treated as FAC instead of FACU. SP-56 therefore meets wetland criteria for hydrophytic vegetation.

SOIL

Sampling Point SP-56

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-3	2.5Y 3/1	97	7.5YR 4/6	3	C	Pl/Rc/M	Clay	
3-5	7.5YR 4/2	95	7.5YR 5/4	5	C	Pl/Rc/M	Loamy silt	
5-7	7.5YR 3/1	97	7.5YR 4/4	3	C	Pl/Rc/M	Clay	
7-9	7.5YR 5/2	97	7.5YR 3/4	3	C	Pl/M	Loamy silt	w/ Cobble
9-14	10YR 3/1	95	7.5YR 4/6	5	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Floodplain soils with mulitple stratified layers, but doesnt meet texture (muck, mucky peats or peat) requirements. However, soils do meet Redox Dark Surface (F6) and Depleted Matrix (F3).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Oxidized Rhizospheres along Living Roots (C3) was observed. Also Saturation Visible on Aerial Imagery (C9) was observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-57**

Investigator(s) Tanner Harris, Russel Andrews, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) None Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.753042 Long: -122.493433 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☒ Yes ☐ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located in upland adjacent to stream fringe wetland associated with a pernnial stream. Sample point does not meet wetland criteria for hydrophytic vegetation and wetland hydrology. Soils met Depleted Matrix (F3) hydric soil indicator. Paired with wetland sample point SP-56. Rainfall amounts were above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Bromus hordeaceus*	30	Y	FACU
2. *Centaurea solstitialis*	30	Y	UPL
3. *Phalaris aquatica*	20	Y	FACU
4. *Elymus caput-medusae*	10	N	UPL
5. *Festuca perennis*	5	N	FAC
6. *Taraxacum officinale*	3	N	FACU
7. *Trifolium repens*	2	N	FACU
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-57

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-10	10YR 4/1	55	7.5YR 4/6	5	C	M	Loamy clay	
	10YR 4/2	40						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet Depleted Matrix (F3).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point does not meet wetland criteria for hydrology.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-58**

Investigator(s) Scott Yarger, Nathaniel Clark, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) None Slope(%) 0

Subregion(LRR) LRR C (Medit. CA) Lat: 38.752733 Long: -122.477431 Datum: WGS 84

Soil Map Unit Name Still loam, stratified substratum NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point is located in a flat seasonal stream fringe. Sample point meets wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Wetland boundary based on shift in vegetation and topography. Paired with upland sample point SP-59. Rainfall amounts above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 10' radius			
1. *Fraxinus latifolia*	5	Y	FACW
2. *Rubus armeniacus*	5	Y	FAC
3.			
4.			
Sapling/Shrub Stratum Total Cover:	10		
HERB STRATUM **Plot Size:** 5' radius			
1. *Hordeum marinum*	70	Y	FAC
2. *Eleocharis macrostachya*	10	N	OBL
3. *Typha angustifolia*	10	N	OBL
4. *Xanthium strumarium*	1	N	FAC
5. *Lotus corniculatus*	1	N	FAC
6. *Festuca arundinacea*	1	N	FACU
7. *Carex serratodens*	1	N	FACW
8.			
Herb Stratum Total Cover:	94		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 4 % cover of biotic crust 2

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 3 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Sample point is dominated by FACW and FAC species and meets wetland criteria for hydrophytic vegetation.

SOIL

Sampling Point SP-58

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-2	10YR 4/2	100	-	-	-	-	Sandy loam	
2-10	10 GY 3/0	90	7.5YR 2.5/3	10	C	PL	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: River cobble

Depth (inches): 10

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet the description of Redox Dark Surface (F6) and is thus considered a hydric soil.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☒ Yes ☐ No Depth (inches): 7

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-6

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: High Water Table (A2) and Saturation (A3) were observed and therefore sample point meets wetland criteria for hydrology.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-59**

Investigator(s) Scott Yarger, Nathaniel Clark, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) Terrace Local Relief (concave, convex, none) Convex Slope(%) 3-5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.752703 Long: -122.477445 Datum: WGS 84

Soil Map Unit Name Still loam, stratified substratum NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point is located on a upland river terrace. Sample point does not meet wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Paired with wetland sample point SP-58. Rainfall amounts above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 25' radius	Absolute % cover	Dominant Species?	Indicator Status
1. *Quercus douglasii*	10	Y	NL
2. *Quercus durata*	5	Y	NL
3.			
4.			
Tree Stratum Total Cover:	15		
SAPLING/SHRUB STRATUM **Plot Size:** 10' radius			
1. *Fraxinus latifolia*	10	Y	FACW
2. *Rubus armeniacus*	3	Y	FAC
3. *Rhus aromatica*	1	N	FACU
4. *Peritoma arborea*	1	N	NL
Sapling/Shrub Stratum Total Cover:	15		
HERB STRATUM **Plot Size:** 5' radius			
1. *Cynosurus echinatus*	50	Y	NL
2. *Artemisia douglasiana*	5	N	FAC
3. *Bromus carinatus*	3	N	NL
4. *Bromus hordeaceus*	3	N	FACU
5. *Elymus glaucus*	2	N	FACU
6. *Bromus diandrus*	+	N	NL
7. *Eriophyllum lanatum*	+	N	NL
8.			
Herb Stratum Total Cover:	63		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 37 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 5 (B)

% of dominant species that are OBL, FACW, or FAC? 40 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: The sample is neither dominant by nor contains a prevalence of hydrophytes.

SOIL

Sampling Point SP-59

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
1-12	10YR 3/2	100	-	-	-	-	Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: Sample point does not meet wetland soils criteria for hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point does not meet wetland criteria for hydrology.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-60**

Investigator(s) Scott Yarger, Nathaniel Clark, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) None Slope(%) 0

Subregion(LRR) LRR C (Medit. CA) Lat: 38.753124 Long: -122.476815 Datum: WGS 84

Soil Map Unit Name Still loam, stratified substratum NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point is located in a fringe wetland. Sample meets wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Wetland boundary based on shift in vegetation and topography. Paired with upland sample point SP-61. Rainfall amounts above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' radius			
1. *Hordeum marinum*	85	Y	FAC
2. *Rumex crispus*	5	N	FAC
3. *Rumex pulcher*	+	N	FAC
4. *Veronica anagalis-aquatica*	+	N	OBL
5. *Eleocharis macrostachya*	+	N	OBL
6.			
7.			
8.			
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 10 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Sample point is dominated by a FAC species and meets wetland criteria for hydrophytic vegetation.

SOIL

Sampling Point SP-60

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	5GY 3/0	90	7.5 3/4	10	C	PL	Sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet Redox Dark Surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-7

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Saturation (A3) was observed and therefore sample point meets wetland criteria for hydrology. No water table was observed, but assumed. Standing water in low flow channel 10 feet away from sample point. FAC-Neutral Test (D5) indicator is also met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-61**

Investigator(s) Scott Yarger, Nathaniel Clark, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) Terrace Local Relief (concave, convex, none) None Slope(%) 0

Subregion(LRR) LRR C (Medit. CA) Lat: 38.753177 Long: -122.47682 Datum: WGS 84

Soil Map Unit Name Still loam, stratified substratum NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point is located on a flat, compacted road bed above ordinary high water mark. Sample does not meet wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Paired with wetland sample point SP-60. Rainfall above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 10' radius			
1. *Quercus durata*	5	Y	NL
2. *Aesculus californica*	5	Y	NL
3.			
4.			
Sapling/Shrub Stratum Total Cover:	10		
HERB STRATUM **Plot Size:** 5' radius			
1. *Hordeum marinum*	20	Y	FAC
2. *Festuca perennis*	15	Y	FAC
3. *Bromus hordeaceus*	10	Y	FACU
4. *Acmispon americanus*	10	Y	UPL
5. *Cynodon dactylon*	10	Y	FACU
6. *Lotus corniculatus*	10	Y	FAC
7. *Festuca microstachys*	+	N	UPL
8.			
Herb Stratum Total Cover:	75		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 25 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 3 (A)

Total number of dominant species across all strata? 8 (B)

% of dominant species that are OBL, FACW, or FAC? 37.5 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: The sample is neither dominant by nor contains a prevalence of hydrophytes.

SOIL

Sampling Point SP-61

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-6	7.5YR 3/3	100	-	-	-	-	Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: shovel refusal

Depth (inches): 6

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Sample point does not meet wetland soils criteria for hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point does not meet wetland criteria for hydrology.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/3/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-62**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Valley floor Local Relief (concave, convex, none) Concave Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7520005076 Long: -122.469191907 Datum: D_WGS_1984

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in seasonal wetland associated with perennial stream. Sample point meets criteria for hydrophytic vegetation and wetland hydrology. Soils are problematic (serpentine) and assumed to by hydric. Wetland boundary based on shift in vegetation and topography. Average rainfall conditions were documented during the site visit. Paired with SP-63

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:	N/A		
HERB STRATUM Plot Size: 5' r			
1. *Horduem marinum*	30	Yes	FAC
2. *Trifolium variegatum*	15	Yes	FAC
3. *Bromus hordeaceus*	15	Yes	FACU
4. *Festuca perennis*	10		FAC
5. *Eleocharis macrostachya*	10		FACW
6. *Mimulus guttatus*	5		OBL
7. *Lactuca tatarica*	3		FAC
8.			
Herb Stratum Total Cover:	88		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	N/A		

% Bare ground in herb stratum 12 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 66 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test.

SOIL

Sampling Point SP-62

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-8	2.5Y 3/1	95					Loamy clay	
0-8	10YR 3/2	5					Loamy clay	
8-12	2.5YR 3/1	100					Loamy clay	Extreamly cobbly.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Dark serpentine parent material may be masking redox. Soils assumed hydric based on dominance of hydrophytic vegetation and presence of primary indicators of wetland hydrology.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-3

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Soils were saturated to 3 inches but no water table was observed below. Sample point meets both Secondary hydrology indicators Saturation Visible on Aerial Imagery (C9), and the FAC-Neutral test (D5).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/3/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-63**

Investigator(s) Scott Yarger, Sammi Hill, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) Valley Local Relief (concave, convex, none) Convex Slope(%) 0-3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.751992 Long: -122.469292 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located in uplands adjacent to perennial stream with fringe wetland, below main ranch road. Paired points with SP-62; Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Bromus hordeaceous*	45	Y	UPL
2. *Centaurea solstitialis*	10		UPL
3. *Trifolium dubium*	10		UPL
4. *Trifolium subterraneum*	8		UPL
5. *Hordeum marinum*	5		FAC
6.			
7.			
8.			
Herb Stratum Total Cover:	78		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 22 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-63

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-4	10YR 3/2	100					clay loam	high pebble content

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: shovel refusal

Depth (inches): 4

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Shovel refusal at 4 inches due to high pebble content. No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/2/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-64**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Concave Slope(%) 3-5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7550131362 Long: --122.462761441 Datum: D_WGS_1984

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No

Hydric Soil Present? ☒ Yes ☐ No

Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located within narrow wetland swale along valley. Sample point met wetland indicators for hydrophytic vegetation, hydric soils, and wetland hydrology. Wetland boundary based on shift in vegetation and topography. Average rainfall conditions were documented during the site visit. Paired with A-SP21.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:	N/A		
HERB STRATUM **Plot Size:** 5' r			
1. *Eleocharis acicularis*	60	Yes	OBL
2. *Hordeum marinum*	10		FAC
3. *Stipa pulchra*	10		UPL
4. *Trifolium hirtum*	10		UPL
5. *Bromus hordeaceus*	5		FACU
6. *Medicago polymorpha*	5		FACU
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	N/A		

% Bare ground in herb stratum % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test.

SOIL

Sampling Point SP-64

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-10	10YR 4/2	95	7.5YR 4/6	5	C	PL/M	Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet Redox Dark Surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point meets Oxidized Rhizospheres along Living Roots (C3).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/2/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-65**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Concave Slope(%) 7-10

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7549415502 Long: -122.462762401 Datum: D_WGS_1984

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located in uplands adjacent to narrow wetland swale. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Paired with A-SP20.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:	N/A		
HERB STRATUM **Plot Size:** 5' r			
1. *Bromus hordeaceus*	30	Yes	FACU
2. *Trifolium hirtum*	20	Yes	UPL
3. *Acmispon wrangelianus*	10		UPL
4. *Avena barbata*	10		UPL
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	70		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	N/A		

% Bare ground in herb stratum 30 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-65

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	7.5YR 4/3	100					Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches): _____

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/3/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-66**

Investigator(s) Scott Yarger, Sammi Hill, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) valley Local Relief (concave, convex, none) concave Slope(%) 0-2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.753736 Long: -122.440978 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Paired point with SP-67. Sample point located in a large wetland swale along a small valley. Sample point meets criteria for hydrophytic vegetation and wetland hydrology. Soils are problematic due to restrictive layer and red parent material potentially maksing redox; soils assumed to be hydric. Boundary determined by elevation changes and vegetation.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Hordeum brachyantherum*	20	Y	FACW
2. *Hordeum marinum*	15	Y	FAC
3. *Festuca perennis*	10		FAC
4. *Perideridia kelloggii*	4		NL
5. *Bromus hordeaceous*	2		OBL
6. *Petrorhagia dubia*	2		NL
7. *Holocarpha virgata ssp. virgata*	+		UPL
8. *Ranunculus occidentalis var. occidentalis*	+		FAC
Herb Stratum Total Cover:	53		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 47 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100% (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test.

SOIL

Sampling Point SP-66

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-4	5YR 3/2	100					clay loam	High pebble content, large boulders

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Shovel refusal

Depth (inches): 4

Hydric Soil Present ? ☒ Yes ☐ No

Remarks: Shovel refusal at 4 inches due to high pebble content and buried rocks. Seasonally ponded feature over shallow restrictive layer (rocks/ hardpan) and red parent material likely masking possible redox. Soils presumed hydric.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ Yes ☐ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Primary hydrology indicator of Biotic Crust (B12) observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/3/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-67**

Investigator(s) Scott Yarger, Sammi Hill, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) valley Local Relief (concave, convex, none) convex Slope(%) 0-1

Subregion(LRR) LRR C (Medit. CA) Lat: 38.753821 Long: -122.44095 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Paired point with SP-66. Sample point located in upland adjacent to a large wetland swale along a small valley. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' radius			
1. *Bromus hordeaceous*	60	Y	FACU
2. *Elymus caput-medusae*	10		UPL
3. *Erodium brachycarpum*	5		UPL
4. *Festuca perennis*	5		FAC
5. *Holocarpha virgata ssp. virgata*	3		UPL
6. *Avena barbata*	+		UPL
7.			
8.			
Herb Stratum Total Cover:	83		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 17 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-67

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-4	5YR 3/4	100					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Shovel refusal

Depth (inches): 4

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Shovel refusal at 4 inches after several attempts at different sample points. No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/3/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-68**

Investigator(s) Scott Yarger, Sammi Hill, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) concave Slope(%) 0-3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.752124 Long: -122.435751 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Paired point with SP-69; Sample point taken within a wetland swale associated with ephemeral stream. Sample point meets criteria for hydrophytic vegetation and wetland hydrology. Soils are problematic due to restrictive layer and red parent material potentially maksing redox; soils assumed to be hydric. Boundary determined by elevation and vegetation changes.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Hordeum marinum*	20	Y	FAC
2. *Festuca perennis*	15	Y	FAC
3. *Polypogon maritimus*	15	Y	OBL
4. *Trifolium variegatum*	5		FAC
5. *Lythrum hyssopifolia*	5		OBL
6. *Hypochaeris radicata*	10		FACU
7.			
8.			
Herb Stratum Total Cover:	70		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 30 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 3 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test.

SOIL

Sampling Point SP-68

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-4	5YR 3/2	100					clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Shovel refusal

Depth (inches): 4

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Shovel refusal at 4 inches due to high pebble content and buried rocks. Seasonally ponded feature over shallow restrictive layer (rocks/ hardpan) and red parent material likely masking possible redox. Soils presumed hydric.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Soils saturated to the surface. Primary hydrology indicators of Saturation (A3) and Biotic Crust (B12), and secondary indicators of Drainage Patterns (B10) and FAC-Neutral Test (D5) observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/3/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-69**

Investigator(s) Scott Yarger, Sammi Hill, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) concave Slope(%) 0-3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.752085 Long: -122.435754 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Point paired with SP-68. Sample point taken in uplands adjacent to wetland swale. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Bromus hordeaceous*	45	Y	FACU
2. *Epilobium barchycarpum*	10		UPL
3. *Festuca perennis*	10		FAC
4. *Hordeum marinum*	5		FAC
5. *Avena barbata*	5		UPL
6. *Holocarpha virgata ssp. virgata*	5		UPL
7. *Trifolium hirtum*	2		UPL
8. *Hypochaeis glabra*	2		UPL
Herb Stratum Total Cover:	84		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 16 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-69

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-7	5YR 3/2	95	N2.5/0	5	C	M	loam	high pebble content, manganese concretions
7-9	5YR 3/2	90	N2.5/0	10	C	M	loam	manganese concretions

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: hard pan

Depth (inches): 9"

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Shovel refusal at 9 inches due to high pebble content. No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-70**

Investigator(s) Tanner Harris, Russel Andrews, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) Terrace Local Relief (concave, convex, none) None Slope(%) 0

Subregion(LRR) LRR C (Medit. CA) Lat: 38.750985 Long: -122.488072 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point is located on a wetland terrace adjacent to a stream and below top of bank (TOB), and meets wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Wetland boundary based on shift in vegetation and topography. Paired with upland sample point SP-71. Rainfall amounts were above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Lotus corniculatus*	30	Y	FAC
2. *Cynodon dactylon*	20	Y	FACU
3. *Festuca perennis*	20	Y	FAC
4. *Hordeum marinum*	10	N	FAC
5. *Juncus xiphioides*	5	N	OBL
6. *Polypogon monspeliensis*	5	N	FACW
7. *Juncus sp.*	5	N	
8. *Rumex crispus*	4	N	FAC
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 66.7 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Sample point is dominated by FAC and FACU species and meets wetland criteria for hydrophytic vegetation. The sample also contains trace amounts of *Xanthium strumarium* (FAC).

SOIL

Sampling Point SP-70

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-3	7.5YR 3/2	95	7.5YR 4/6	5	C	PL/RC/M	Loamy silt	
3-12	10YR 3/1	85	7.5YR 3/4	3	C	M/PL	Sandy clay loam	
			10Y 4/1	12	C	M	Sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ Yes ☐ No

Remarks: Sample point meets the description of Redox Dark Surface (F6) and is thus considered a hydric soil.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☒ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ Yes ☐ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Oxidized Rhizospheres along Living Roots (C3) were observed and therefore meets wetland criteria for hydrology. Secondary indicators Sediment Deposits (B2) and FAC-Neutral Test (D5) indicators were also met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-71**

Investigator(s) Tanner Harris, Russel Andrews, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) Terrace Local Relief (concave, convex, none) None Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.751052 Long: -122.488083 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point is located in uplands above top of bank. Sample point does not meet wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Paired with wetland sample point SP-70. Rainfall amounts were above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Elymus caput-medusae*	30	Y	UPL
2. *Bromus hordeaceus*	30	Y	FACU
3. *Festuca perennis*	15	N	FAC
4. *Bromus diandrus*	10	N	NL
5. *Cynodon dactylon*	5	N	FACU
6. *Centaurea solstitialis*	3	N	UPL
7. *Trifolium hirtum*	2	N	FACW
8.			
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 10 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: The sample is neither dominant by nor contains a prevalence of hydrophytes.

SOIL

Sampling Point SP-71

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-12	10YR 3/1	85	7.5YR 4/6	1	C	M	Clay loam	
	10YR 2/1	14					CLay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-72**

Investigator(s) Aaron Arthur, Ra'am Akiba-Hajim Section,Township,Range

Landform (hillslope, terrace, etc.) toeslope Local Relief (concave, convex, none) Concave Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.749922 Long: -122.487343 Datum: WGS 84

Soil Map Unit Name Still loam, stratified substratum NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point is located in a wetland area. Sample meets wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Soils are problematic due to dark serpentine parent material or high organice matter masking redox, and assumed to by hydric. Paired with upland sample point A201. Wetland boundary was determined based on shifts in vegetation and topography.Rainfall amounts were above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Polypogon monspeliensis*	20	Y	FACW
2. *Schoenoplectus acutus*	20	Y	OBL
3. *Elymus triticoides*	10	N	FAC
4. *Festuca perennis*	10	N	FAC
5. *Polygonum aviculare*	1	N	UPL
6. *Lactuca serriola*	1	N	FACU
7. *Rumex crispus*	1	N	FAC
8.			
Herb Stratum Total Cover:	63		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 37 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Sample point is dominated by FACW and OBL species and meets wetland criteria for hydrophytic vegetation.

SOIL

Sampling Point SP-72

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-12	2.5Y 2.5/1	99	5YR 3/4	1	C	M	Cobbly clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Dark serpentine parent material and/or high organic material may be masking redox. Soils assumed hydric based on dominance of hydrophytic vegetation and presence of primary indicators of wetland hydrology.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☒ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point is located in a existing channel that shows evidence of flow. Surface Soil Cracks (B6) and Drainage Patterns (B10) hydrology indicators were observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-73**

Investigator(s) Aaron Arthur, Ra'am Akiba-Hajim Section,Township,Range

Landform (hillslope, terrace, etc.) toeslope Local Relief (concave, convex, none) None Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.749956 Long: -122.487379 Datum: WGS 84

Soil Map Unit Name Still loam, stratified substratum NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☐ Yes ☒ No
Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point is located in along a channel side. Sample meets wetland criteria for hydrophytic vegetation, but does not meet wetland criteria for hydric soils and wetland hydrology. Paired with wetland sample point SP-72. Rainfall amounts were above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Festuca perennis*	60	Y	FAC
2. *Centaurea solstitialis*	10	N	UPL
3. *Hordeum marinum*	4	N	FAC
4. *Lactuca serriola*	1	N	FACU
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	75		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 25 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Sample point is dominated by a FAC species and meets wetland criteria for hydrophytic vegetation.

SOIL

Sampling Point SP-73

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	2.5Y 2.5/1	100	-	-	-	-	Cobbly clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: Sample point does not meet wetland soils criteria for hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point does not meet wetland criteria for hydrology.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 8/28/2018

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-74**

Investigator(s) Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) Slope(%) 0-3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.751229 Long: -122.4649 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point paired with SP-75. Sample point located in perennial seep above road. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Wetland boundary based on shift in vegetation and topography.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Festuca perennis*	30	Yes	FAC
2. *Hordeum marinum*	20	Yes	FAC
3. *Bromus hordeaceus*	20	Yes	FACU
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover: 70			
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover: 0			

% Bare ground in herb stratum 30 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 67 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test.

SOIL

Sampling Point SP-74

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-3	10YR 3/2	90	7.5YR 3/4	10	C	PL/M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Substrate refusal

Depth (inches): 3

Hydric Soil Present ? ☒ Yes ☐ No

Remarks: Soil within the sampled point displayed an hydric soil indicator of redox dark surface.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ Yes ☐ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Oxidized rhizospheres along living roots indicator of wetland hydrology was present within the sampled area.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Middletown County Lake Sampling Date 8/28/2018

Applicant/Owner _____ State CA Sampling Point **SP-75**

Investigator(s) Rhiannon Korhummel, WRA, Inc. Section,Township,Range _____

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) _____ Slope(%) 0-5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.751283 Long: -122.46493 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point paired with SP-74. Sample point located in uplands adjacent to wetland. Sample point did not meet wetland indicators for hydrophytic vegetation, hydric soils, or wetland hydrology.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: 25' x 25'	Absolute % cover	Dominant Species?	Indicator Status
1. *Quercus douglasii*	15	Yes	UPL
2.			
3.			
4.			
Tree Stratum Total Cover:	15		
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 10' x 10'			
1. *Bromus hordeaceus*	40	Yes	FAC
2. *Bromus daindrus*	30	Yes	UPL
3. *Trifolium hirtum*	10		UPL
4. *Festuca perennis*	5		FAC
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	85		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation is not present within the sampled area.

SOIL

Sampling Point SP-75

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-5	10YR 3/2	100					clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: shovel refusal

Depth (inches): 5

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Soil within the sampled point did not display a hydric soil indicator.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of wetland hydrology were present within the sampled area.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/4/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-76**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) Valley Local Relief (concave, convex, none) Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.746333 Long: -122.486211 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 2 to 15 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in seep on hillside below road. Standing water observed. Sample point meets criteria for hydrophytic vegetation and wetland hydrology. Soils are problematic (serpentine) and assumed to by hydric. Boundary determined by changes in topography and vegetation. Paired point with SP-77.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Juncus mexicanus*	85	Y	FACW
2. *Festuca arundinacea*	5		FACU
3. *Mimulus guttatus*	3		OBL
4. *Epilobium ciliatum*	+		FACW
5. *Veronica anagalis-aquatica*	2		OBL
6. *Polypogon monspeliensis*	3		FACW
7. *Hordeum marinum*	2		FAC
8.			
Herb Stratum Total Cover: 100			
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100% (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test.

SOIL

Sampling Point SP-76

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	10YR 2/1	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Dark serpentine parent material may be masking redox. Soils assumed hydric based on dominance of hydrophytic vegetation and presence of primary indicators of wetland hydrology.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☒ Yes ☐ No Depth (inches): +2"

Water table present? ☒ Yes ☐ No Depth (inches): 2-12"

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-12"

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Surface Water (A1), High Water Table (A2), and Saturation (A3) hydrology indicators observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/4/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-77**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) None Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.775968 Long: -122.468066 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located on uplands adjacent to seep on gentle hillslope below road. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Paired point with SP-76.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' radius			
1. *Bromus hordeaceous*	30	Y	FACU
2. *Centaurea solstitialis*	30	Y	UPL
3. *Hordeum marinum*	10		FAC
4. *Hordeum murinum*	10		UPL
5. *Avena barbata*	5		UPL
6. *Festuca arundinacea*	5		FACU
7. *Bromus diandrus*	5		UPL
8.			
Herb Stratum Total Cover:	95		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 5 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-77

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-6	7.5YR 3/3	100					Clay loam	Gravelly

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: shovel refusal

Depth (inches): 6"

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/3/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-78**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Concave Slope(%) 3-6

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7489128689 Long: -122.451309902 Datum: D_WGS_1984

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in small isolated seasonal wetland. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Wetland boundary based on shift in vegetation and topography. Paired with A-SP23.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover: N/A			
HERB STRATUM **Plot Size:** 5' r			
1. *Juncus mexicanus*	50	Yes	FACW
2. *Carex barbarae*	40	Yes	FAC
3. *Horduem marinum*	10		FAC
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover: 100			
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover: N/A			

% Bare ground in herb stratum % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test.

SOIL

Sampling Point SP-78

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	10YR 3/2	95	7.5YR 4/4	5	C	PL, RC	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet Redox Dark Surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-2

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point contains saturation but no water table below. Sample point meets Oxidized Rhizospheres along Living Roots (C3) and FAC-Neutral Test (D5).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/3/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-79**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Concave Slope(%) 1-4

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7488625488 Long: -122.45134713 Datum: D_WGS_1984

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located in uplands adajcent to small seasonal wetland. Sample point did not meet wetland indicators for hydrophytic vegetation, hydric soils, and wetland hydrology. Average rainfall conditions were documented during the site visit. Paired with A-SP22.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:	N/A		
HERB STRATUM **Plot Size:** 5' r			
1. *Avena barbata*	30	Yes	UPL
2. *Bromus hordeaceus*	30	Yes	FACU
3. *Festuca perennis*	30	Yes	FAC
4. *Stipa pulchra*	10		UPL
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	N/A		

% Bare ground in herb stratum _____ % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 33 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-79

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	10YR 2/1	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/4/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-80**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Concave Slope(%) 0-3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7450353369 Long: -122.493271004 Datum: D_WGS_1984

Soil Map Unit Name Still loam, stratified substratum NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☒ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in isolated seasonal wetland near main ranch road. Sample point met wetland indicators for hydrophytic vegetation and wetland hydrology. Soils are significantly disturbed as they are old road base and assumed to be hydric due to dominance of hydrophytic vegetation and presence of hydrology indicators. Average rainfall conditions were documented during the site visit. Paired with SP-81.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover: N/A			
HERB STRATUM **Plot Size:** 5'r			
1. *Poa annua*	30	Yes	FAC
2. *Epilobium ciliatum*	10		FACW
3. *Hordeum marinum*	5		FAC
4. *Hordeum brachyantherum*	5		FACW
5. *Lythrum hyssopifolium*	5		OBL
6. *Plagiobothrys stipitatus*	2		FACW
7. *Spergularia rubra*	2		FAC
8. *Erodium botrys*	1		UPL
Herb Stratum Total Cover: 60			
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover: N/A			

% Bare ground in herb stratum 40 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test.

SOIL

Sampling Point SP-80

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-2	10YR 4/2	100					Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: shovel refusal

Depth (inches): 2

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Soils are significantly disturbed comprised of old road base. Soils are assumed due to dominance of hydrophytic vegetaion and indicators of hydrology.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☒ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ Yes ☐ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point contains surface soil cracks wetland hydrology indicator.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/4/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-81**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Concave Slope(%) 0-2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.744965 Long: -122.493383 Datum: D_WGS_1984

Soil Map Unit Name Still loam, stratified substratum NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☒ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point did not meet wetland indicators for hydrophytic vegetation, hydric soils, and wetland hydrology. Soils are significantly disturbed as they are of old road bed. Average rainfall conditions were documented during the site visit. Paired with SP-80.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:	N/A		
HERB STRATUM **Plot Size:** 5'r			
1. *Lepidium nitidum*	40	Yes	UPL
2. *Festuca perennis*	9		FAC
3. *Epilobium ciliatum*	5		FACW
4. *Festuca bromoides*	5		UPL
5. *Acmispon americanus*	5		UPL
6. *Calandrinia ciliata*	3		FACU
7. *Bromus hordeaceus*	2		FACU
8.			
Herb Stratum Total Cover:	69		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	N/A		

% Bare ground in herb stratum 31 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-81

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	2.5Y 3/1	60					Loam	
	2.5Y 4/2	40						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches): _____

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Fill material; No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/3/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-82**

Investigator(s) Tanner Harris, Rhiannon Korhummel Section,Township,Range

Landform (hillslope, terrace, etc.) Valley Local Relief (concave, convex, none) slightly concave Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.775905 Long: -122.468045 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in seepy area downslope from road which receives roadside drainage from culvert. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Boundary determined by changes in topography and vegetation. Paired points with SP-83.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Juncus mexicanus*	40	Y	FACW
2. *Juncus xiphioides*	10		OBL
3. *Trifolium dubium*	5		UPL
4. *Geranium dissectum*	5		UPL
5. *Mimulus guttatus*	5		OBL
6. *Hordeum marinum*	5		FAC
7. *Hypochaeris glabra*	5		NL
8. *Bromus hordeaceous*	3		FACU
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 20 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100% (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: *Briza minor* (FAC)=2; Vegetation meets dominance test.

SOIL

Sampling Point SP-82

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	10YR 2/2	90	10YR3/6	10	C	PL, RC	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet Redox Dark Surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☒ Yes ☐ No Depth (inches): 1"

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-12

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Standing water in hoof prints. Soils saturated but no water table observed. Soils meet Surface Water (A1) and Oxidized Rhizospheres along Living Roots (C3).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/3/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-83**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) Valley Local Relief (concave, convex, none) None Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.775968 Long: -122.468066 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located in uplands adjacent to seep. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Paired points with SP-82.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Elymus caput-medusae*	25	Y	UPL
2. *Bromus hordeaceous*	20	Y	FACU
3. *Bromus diandrus*	15		UPL
4. *Centaurea solstitialis*	15		UPL
5. *Geranium dissectum*	10		UPL
6. *Sonchus oleraceus*	3		UPL
7. *Lactuca serriola*	2		UPL
8.			
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum thatch= 10 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0% (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-83

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-8	2.5 YR 2.5/3	100					Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: shovel refusal

Depth (inches): 8

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/3/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-84**

Investigator(s) Scott Yarger, Sammi Hill, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) Concave Slope(%) 20

Subregion(LRR) LRR C (Medit. CA) Lat: 38.745398 Long: -122.485917 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in seep adjacent to ephemeral stream on hillslope. Sample point meets criteria for hydrophytic vegetation and wetland hydrology. Soils are problematic (serpentine) and assumed to be hydric. Boundary determined by shift in vegetation and hydrology. Paired point with SP-85.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' radius			
1. *Toxicoscordion fontanum*	30	Y	OBL
2. *Festuca microstachys*	5		UPL
3. *Hemizonia congesta ssp. lutescens*	2		UPL
4. *Mimulus nudatus*	1		OBL
5. *Hordeum brachyantherum*	3		FACW
6.	5		
7.			
8.			
Herb Stratum Total Cover:	46		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 54 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100% (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test.

SOIL

Sampling Point SP-84

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-3	10YR 3/2	100					Loam	High pebble content

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Shovel refusal

Depth (inches): 3

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Shovel refusal at 3 inches due to high pebble content. Dark serpentine parent material may be masking redox. Soils assumed hydric based on dominance of hydrophytic vegetation and presence of primary indicators of wetland hydrology.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☒ Yes ☐ No Depth (inches): 0.5

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Primary indicators of Surface Water (A1) and Saturation (A3) were observed. Surface water was 0.5 inches deep and saturation was present at the surface. Secondary indicator FAC-Neutral Test (D5) was also met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/3/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-85**

Investigator(s) Scott Yarger, Sammi Hill, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Convex Slope(%) 20

Subregion(LRR) LRR C (Medit. CA) Lat: 38.745416 Long: -122.485975 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located in uplands adjacent to seep associated with an ephemeral stream on hillslope. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Paired with SP-84.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 25' radius	Absolute % cover	Dominant Species?	Indicator Status
1. *Pinus sabiniana*	5	Y	UPL
2.			
3.			
4.			
Tree Stratum Total Cover:	5		
SAPLING/SHRUB STRATUM **Plot Size:** 25' radius			
1. *Eriodictyon californicum*	5	Y	UPL
2. *Quercus durata var. durata*	2	Y	UPL
3.			
4.			
Sapling/Shrub Stratum Total Cover:	7		
HERB STRATUM **Plot Size:** 5' radius			
1. *Festuca microstachys*	30	Y	UPL
2. *Bromus hordeaceous*	10	Y	FACU
3. *Acmispon wrangelianus*	3		UPL
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	43		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 45 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 5 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-85

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-4	10YR 3/2	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Shovel refusal

Depth (inches): 4

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Shovel refusal due to gravel. No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 6/1/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-86**

Investigator(s) Scott Yarger, Nathaniel Clark, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Concave Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.743623 Long: -122.439586 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point is located in an enclosed depression. Sample meets wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Wetland boundary based on shift in vegetation and topography. Paired with upland sample point SP-87. Rainfall amounts above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Eleocharis macrostachya*	35	Y	OBL
2. *Hypochaeris radicata*	20	Y	FACU
3. *Hordeum marinum*	5	N	FAC
4. *Polypogon monspeliensis*	5	N	FACW
5. *Briza minor*	3	N	FAC
6. *Bromus hordeaceus*	1	N	FACU
7. *Navarretia leucocephala*	+	N	OBL
8.			
Herb Stratum Total Cover:	69		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 31 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 50 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species	35	x1	35
FACW species	5	x2	10
FAC species	8	x3	24
FACU species	21	x4	84
UPL species		x5	
Column Totals	69 (A)		153 (B)

Prevalence Index = B/A = 2.21

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%
☒ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Sample point is dominated by both OBL and FACU species, but meets Prevelance Index.

SOIL

Sampling Point SP-86

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-16	7.5YR 3/3	95	7.5YR 2.5/1	5	C	M	Loam	Manganese concentrations in matrix
			5YR 4/6	+	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☒ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Sample meets the description of Red Parent Material (TF2) and is thus considered a hydric soil.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☒ Yes ☐ No Depth (inches): 11

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: High Water Table (A2) and Saturation (A3) were observed and therefore point meets wetland criteria for hydrology.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 6/1/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-87**

Investigator(s) Scott Yarger, Nathaniel Clark, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Convex Slope(%) 0-1

Subregion(LRR) LRR C (Medit. CA) Lat: 38.743556 Long: -122.439665 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point is located in a field above an adjacent wetland depression. Point does not meet wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Paired with wetland sample point SP-86. Wetland boundaries were based on shifts in topography and vegetation. Rainfall amounts were above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Hypochaeris radicata*	70	Y	FACU
2. *Avena barbata*	10	N	NL
3. *Vicia villosa*	5	N	NL
4. *Holocarpha virgata*	2	N	NL
5. *Bromus hordeaceus*	1	N	FACU
6.			
7.			
8.			
Herb Stratum Total Cover:	88		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 12 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: The sample is neither dominant by nor contains a prevalence of hydrophytes.

SOIL

Sampling Point SP-87

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-12	7.5YR 5/3	100	-	-	-	-	Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: Sample does not meet wetland soils criteria for hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample does not meet wetland criteria for hydrology.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/3/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-88**

Investigator(s) Scott Yarger, Sammi Hill, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) concave Slope(%) 0-1

Subregion(LRR) LRR C (Medit. CA) Lat: 38.739485 Long: -122.473383 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Paired point with SP-89. Sample point located within a wetland swale associated with a intermittent stream/drainage. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Boundary determined by changing vegetation and soils.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Festuca perennis*	40	Y	FAC
2. *Rumex crispus*	15		FAC
3. *Hordeum marinum*	20	Y	FAC
4. *Ranunculus occidentalis var. occidentalis*	10		FAC
5. *Pleuropogon californicus var. californicus*	2		OBL
6. *Juncus phaeocephalus var. phaeocephalus*	+		FACW
7.			
8.			
Herb Stratum Total Cover:	87		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100% (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: 13% thatch; Vegetation meets dominance test.

SOIL

Sampling Point SP-88

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-6	10YR 3/1	95	7.5YR 3/4	2	C	M	clay	
			7.5YR 4/6	3	C	M		
6-13	10YR 2/1	100					clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet Redox Dark Surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Three secondary indicators of Saturation Visible on Aerial Imagery (C9), Drainage Patterns (B10), and FAC-Neutral Test (D5) indicators were observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/3/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-89**

Investigator(s) Scott Yarger, Sammi Hill, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) convex Slope(%) 0-1

Subregion(LRR) LRR C (Medit. CA) Lat: 38.739536 Long: -122.473296 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☒ Yes ☐ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Paired point with SP-88. Sample point located in uplands adjacent to a wetland swale associated with a intermittent stream/drainage. Sample point does not meet criteria for hydrophytic vegetation or wetland hydrology; however soils meet Redox Dark Surface (F6) indicator.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Bromus hordeaceous*	40	Y	UPL
2. *Centaurea solstitialis*	15		UPL
3. *Hordeum marinum*	10		FAC
4. *Geranium dissectum*	10		UPL
5. *Trifolium dubium*	2		UPL
6. *Lupinus bicolor*	2		UPL
7. *thatch*			
8.			
Herb Stratum Total Cover: 79			
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 21 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-89

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	10YR 3/2	90	7.5YR 3/4	5	C	PL, M	Clay	iron redox
			N2.5/0	5	C	M	Clay	manganese concretions present

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet Redox Dark Surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/3/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-90**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Valley Local Relief (concave, convex, none) Concave Slope(%) 0-2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7409218244 Long: -122.466946468 Datum: D_WGS_1984

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in a large wetland adjacent to a damed pond. Sample point meets criteria for hydrophytic vegetation and wetland hydrology. Soils are problematic (serpentine) and assumed to by hydric. Average rainfall conditions were documented during the site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:	N/A		
HERB STRATUM **Plot Size:** 5' r			
1. *Eleocharis macrostachya*	80	Yes	FACW
2. *Trifolium variegatum*	5		FAC
3. *Horduem marinum*	5		FAC
4. *Mimulus guttatus*	5		OBL
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	95		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	N/A		

% Bare ground in herb stratum 5 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test.

SOIL

Sampling Point SP-90

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	N 2.5/0	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Dark serpentine parent material may be masking redox. Soils assumed hydric based on dominance of hydrophytic vegetation and presence of primary indicators of wetland hydrology.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-3

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Soils saturated to 3 inches but no water table observed below. Secondary indicators of Saturation Visible on Aerial Imagery (C9), and the FAC-Neutral test (D5) are met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/3/2018

Applicant/Owner Lotusland Investment Holdings State CA Sampling Point **SP-91**

Investigator(s) Aaron Arthur, Russell Andrews; WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Concave Slope(%) 5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7409218244 Long: -122.466946468 Datum: D_WGS_1984

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point is located adjacent to a large wetland adjacent to a damed pond. Sample point does not meet wetland indicators for hydrophytic vegetation, hydric soils, and wetland hydrology. Average rainfall conditions were documented during the site visit. Paired with SP-90

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:	N/A		
HERB STRATUM **Plot Size:** 5' r			
1. *Bromus hordeaceus*	60	Yes	FACU
2. *Avena barbata*	20	Yes	UPL
3. *Horduem marinum*	20	Yes	FAC
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	N/A		

% Bare ground in herb stratum % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 33 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-91

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	10YR 3/1	99	10YR 4/4	1	C	M	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches): _____

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 6/1/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-92**

Investigator(s) Scott Yarger, Nathaniel Clark, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) toeslope Local Relief (concave, convex, none) Concave Slope(%) 4

Subregion(LRR) LRR C (Medit. CA) Lat: 38.738002 Long: -122.458229 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point is located within an in-stream wetland. Sample meets wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Wetland boundary based on shift in vegetation and topography. Paired with upland sample point SP-93. Rainfall amounts above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Epilobium densiflorum*	25	Y	FACW
2. *Eleocharis macrostachya*	15	Y	OBL
3. *Lythrum hyssopifolia*	5	N	OBL
4. *Hordeum marinum*	2	N	FAC
5. *Festuca perennis*	+	N	FAC
6. *Polypogon monspeliensis*	+	N	FACW
7.			
8.			
Herb Stratum Total Cover:	47		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 43 % cover of biotic crust 10

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Sample point is dominated by FACW and OBL species and meets wetland criteria for hydrophytic vegetation.

SOIL

Sampling Point SP-92

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-5	2.5YR 3/2	90	5YR 4/6	10	C	M	C Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☒ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Shovel refusal

Depth (inches): 5

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet Redox Dark Surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☒ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Surface Soil Cracks (B6) and Biotic Crust (B12) were observed and therefore point meets wetland criteria for hydrology. FAC-Neutral Test (D5) indicator was also observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 6/1/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-93**

Investigator(s) Scott Yarger, Nathaniel Clark, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) toeslope Local Relief (concave, convex, none) Convex Slope(%) 0-1

Subregion(LRR) LRR C (Medit. CA) Lat: 38.738019 Long: -122.458183 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☒ Yes ☐ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point is located in an upland area adjacent to in-stream wetland. Sample does not meet wetland criteria for hydrophytic vegetation and wetland hydrology, however soils met Redox Dark Surface (F6) indicator. Paired with wetland sample point SP-92. Rainfall amounts above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Bromus hordeaceus*	25	Y	FACU
2. *Hordeum marinum*	25	Y	FAC
3. *Avena barbata*	5	N	NL
4. *Holocarpha virgata*	5	N	NL
5. *Hypochaeris radicata*	5	N	FACU
6. *Erodium botrys*	5	N	FACU
7. *Elymus caput-medusae*	3	N	UPL
8. *Acmispon americanus*	+	N	UPL
Herb Stratum Total Cover:	73		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 22 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 50 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: The sample is neither dominant by nor contains a prevalence of hydrophytes. The sample has a covering of 5% thatch.

SOIL

Sampling Point SP-93

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-3	2.5YR 3/2	90	5YR 4/6	10	C	M	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Shovel refusal

Depth (inches): 3

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet Redox Dark Surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point does not meet wetland criteria for hydrology.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 8/21/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-94**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) concave Slope(%) 6

Subregion(LRR) LRR C (Medit. CA) Lat: 38.737083 Long: -122.454971 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample Point located in a broad floodplain. Sample point meets criteria for hydrophytic vegetation and wetland hydrology. Soils are problematic (Red Parent Material) and assumed to by hydric. Wetland boundary based on shift in vegetation and topography. Sample Point is paired with upland sample point SP-95.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 10' x10'			
1. *Hordeum marinum*	40	Yes	FAC
2. *Festuca perennis*	20	Yes	FAC
3. *Bromus hordeaceus*	10		FACU
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	70		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Thatch is 30%. Hydrophytic vegetation is present within the sampled area.

SOIL

Sampling Point SP-94

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	5YR 3/4	95	N 2.5/0	5	C	M	clay loam	5% Manganese concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☒ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soil within sample point has 5% Manganese and meets red parent material (TF2). Red soil color is naturally problematic.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): 2

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 12

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Saturation observed but no water table below. Meets Surface Water (A1) indicator.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 8/21/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-95**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) concave Slope(%) 6

Subregion(LRR) LRR C (Medit. CA) Lat: 38.73693 Long: -122.455008 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located in uplands adjacent to broad wetland swale associated with an intermittent stream. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Sample Point is paired with Sample Point SP-94.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: 30' x 30'	Absolute % cover	Dominant Species?	Indicator Status
1. *Quercus ouglasii*	60	Yes	UPL
2.			
3.			
4.			
Tree Stratum Total Cover:	60		
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' x 5'			
1. *Cynosurus echinatus*	20	Yes	UPL
2. *Bromus hordeaceus*	20	Yes	FACU
3. *Elymus caput-madusae*	20	Yes	UPL
4. *Briza minor*	10		FAC
5. *Avena barbata*	10		UPL
6. *Festuca myuros*	10		UPL
7.			
8.			
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 10 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 4 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species	0	x1	0
FACW species	0	x2	0
FAC species	10	x3	30
FACU species	20	x4	80
UPL species	60	x5	300
Column Totals	90 (A)		410 (B)

Prevalence Index = B/A = 410/90=4.5

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation is not present within the sampled area.

SOIL

Sampling Point SP-95

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-3	5YR 3/4	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Gravel and clay

Depth (inches): 3

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Soil does not display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Wetland hydrology indicators were absent within this sample point.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 8/21/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-96**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) concave Slope(%) 6

Subregion(LRR) LRR C (Medit. CA) Lat: 38.73518 Long: -122.452301 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample Point located in a wetland swale bisected by gravel road. Sample Point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Boundary is based on vegetation and swale topography. Paired with SP-97.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Hordeum marinum*	30	Yes	FAC
2. *Festuca perennis*	30	Yes	FAC
3. *Eleocharis macrostachya*	15		OBL
4. *Bromus hordeaceus*	10		FACU
5. *Polypogon monspeliensis*	5		FACW
6. *Juncus occidentalis*	5		FACW
7. *Phalaris paradoxa*	5		FAC
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Hydrophytic vegetation is present within the sampled area.

SOIL

Sampling Point SP-96

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-4	5YR 3/3	90	5YR 4/6	10	C	M/RC/P	Gravel and Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Gravel and Clay

Depth (inches): 4

Hydric Soil Present ? ☒ Yes ☐ No

Remarks: Redox dark surface (F6) hydric soil indicator is present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ Yes ☐ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Oxidized Rhizospheres along living roots (C3) were present within this sample point.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 8/21/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-97**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) concave Slope(%) 6

Subregion(LRR) LRR C (Medit. CA) Lat: 38.735092 Long: -122.452284 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Sample Point paired with SP-96.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Bromus hordeaceus*	20	Yes	FACU
2. *Avena barbata*	20	Yes	UPL
3. *Festuca myuros*	15		UPL
4. *Elymus caput-madusae*	5		UPL
5. *Holocarpha virgata*	5		UPL
6. *Navarretia pubescens*	5		UPL
7. *Micranthes californicus*	5		FACU
8. *Trifolium willdenowii*	5		FACW
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 20 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation is not present within the sampled area.

SOIL

Sampling Point SP-97

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-4	2.5YR 3/2	100					Gravel and Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Gravel and Clay

Depth (inches): 4

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Wetland hydrology indicators were not observed within this sample point.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/31/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-98**

Investigator(s) Tanner Harris, Russel Andrews, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) Concave Slope(%) 4

Subregion(LRR) LRR C (Medit. CA) Lat: 38.732507 Long: -122.484144 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point is located in a wetland swale fed by a hillside seep. Sample point meets wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Wetland boundary based on shift in vegetation and topography. Paired with upland sample point SP-99. Rainfall amounts were above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Eleocharis macrostachya*	30	Y	OBL
2. *Stachys albens*	20	Y	OBL
3. *Juncus xiphioides*	10	N	OBL
4. *Mimulus guttatus*	10	N	OBL
5. *Polypogon monspeliensis*	8	N	FACW
6. *Hordeum brachyantherum*	2	N	FACW
7.			
8.			
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 20 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Sample point is dominated by OBL species and meets wetland criteria for hydrophytic vegetation.

SOIL

Sampling Point SP-98

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-1	5YR 2.5/1	100					Loamy clay	
1-7	5GY 4/1	95	7.5YR 4/6	5%	C	M/PL	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Sample point meets the description of Depleted Matrix (F3) and is thus considered a hydric soil.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☒ Yes ☐ No Depth (inches): 2

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-7

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Surface Water (A1) was observed and thereforesample point meets wetland criteria for hydrology. Two secondary indicators of Saturation Visible on Aerial Imagery (C9) and FAC-Neutral Test (D5) indicators were also met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/31/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-99**

Investigator(s) Tanner Harris, Russel Andrews, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) None Slope(%) 4

Subregion(LRR) LRR C (Medit. CA) Lat: 38.732441 Long: -122.483984 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point does not meet wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Paired with wetland sample point SP-99. Rainfall amounts were above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Bromus hordeaceus*	20	Y	FACU
2. *Festuca perennis*	15	N	FAC
3. *Gastridium phleoides*	15	N	FACU
4. *Stipa pulchra*	10	N	NL
5. *Hemizonia congesta ssp. lutescens*	5	N	NL
6. *Aegilops triuncialis*	5	N	NL
7. *Hordeum brachyantherum*	3	N	FACW
8. *Acmispon americanus*	3	N	UPL
Herb Stratum Total Cover:	85		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 15 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: The sample is neither dominant by nor contains a prevalence of hydrophytes. The sample also contains a covering of 2% *Croton setiger* (UPL) and 2% *Clarkia* sp.

SOIL

Sampling Point SP-99

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-8	7.5YR 3/2	100					Loamy clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Shovel refusal/cobble

Depth (inches): 8

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Sample point does not meet wetland soils criteria for hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point does not meet wetland criteria for hydrology.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/31/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-100**

Investigator(s) Tanner Harris, Russel Andrews, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) Terrace Local Relief (concave, convex, none) None Slope(%) 0

Subregion(LRR) LRR C (Medit. CA) Lat: 38.733556 Long: -122.481942 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point is located on a terrace fed by drainages and is adjacent to an agricultural ditch with wetland vegetation. Sample point meets wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Soils are naturally problematic because they meet portions of several indicators. Paired with upland sample point SP-101. Rainfall amounts were above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Eleocharis macrostachya*	75	Y	OBL
2. *Hordeum marinum*	5	N	FAC
3. *Lactuca saligna*	5	N	UPL
4. *Trifolium sp*	5	N	
5. *Polypogon monspeliensis*	5	N	FACW
6. *Mimulus guttatus*	3	N	OBL
7. *Cotula coronopifolia*	2	N	OBL
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Sample point is dominated by OBL species and meets wetland criteria for hydrophytic vegetation.

SOIL

Sampling Point SP-100

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-6	2.5Y 3/1	100					Clay	
6-14	10YR 4/2	85	5GY 4/1	15	D	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet portions of F2, F3, and F7. Assumed to be hydric based on meeting partial indicators and presence of hydrophytic vegetation and wetland hydrology.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-12

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Saturation (A3) was observed and therefore sample point meets wetland criteria for hydrology. Soils were saturated to 12 inches below ground, but no water table was present below.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/31/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-101**

Investigator(s) Tanner Harris, Russel Andrews, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) terrace Local Relief (concave, convex, none) none Slope(%)

Subregion(LRR) LRR C (Medit. CA) Lat: 38.733492 Long: -122.482062 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located in uplands adjacent to wetland on a terrace. Sample point does not meet wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Paired with wetland sample point SP-100. Rainfall amounts were above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Stipa pulchra*	30	Y	NL
2. *Bromus hordeaceus*	20	Y	FACU
3. *Elymus caput-medusae*	10	N	UPL
4. *Erodium cicutarium*	5	N	NL
5. *Avena barbata*	5	N	NL
6. *Gastridium phleoides*	5	N	FACU
7. *Plantago erecta*	5	N	NL
8. *Holocarpha virgata*	5	N	UPL
Herb Stratum Total Cover:	85		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 15 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: The sample is neither dominant by nor contains a prevalence of hydrophytes. *Hemizonia* sp. and *Brodiaea elegans* are present in trace amounts.

SOIL

Sampling Point SP-101

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	10YR 3/2	100					Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/31/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-102**

Investigator(s) Tanner Harris, Russel Andrews, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) toeslope Local Relief (concave, convex, none) Concave Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.731267 Long: -122.471009 Datum: WGS 84

Soil Map Unit Name Sobrante-Hambright-Guenoc complex, 30 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point is located in a seepy area at the base of a dam fence that flows into a wetland swale. Sample point meets wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. The boundary was based on a shift in topography and vegetation. Paired with upland sample point SP-103.Rainfall amounts were above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Polypogon monspeliensis*	30	Y	FACW
2. *Lotus corniculatus*	30	Y	FAC
3. *Eleocharis macrostachya*	10	N	OBL
4. *Cynodon dactylon*	10	N	FACU
5. *Festuca perennis*	10	N	FAC
6. *Lactuca salinga*	3	N	FACU
7. *Hordeum marinum*	3	N	FAC
8. *Lysimachia arvensis*	2	N	FAC
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum ____ % cover of biotic crust ____

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Sample point is dominated by FACW and FAC species and meets wetland criteria for hydrophytic vegetation. The sample also contains a 2% covering of *Cyperus eragrostis* (FACW).

SOIL

Sampling Point SP-102

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	10YR 4/2	85	7.5YR 4/6	5	C	M	Clay loam	
	7.5YR 5/3	10					Silty loam	Inclusion

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet the description of Depleted Matrix (F3) and is thus considered a hydric soil.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☒ Yes ☐ No Depth (inches): 0.5

Water table present? ☐ Yes ☐ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☐ No Depth (inches):

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Surface water was observed in an adjacent area to the sample point. Saturation Visible on Aerial Imagery (C9) also met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/31/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-103**

Investigator(s) Tanner Harris, Russel Andrews, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) toeslope Local Relief (concave, convex, none) None Slope(%) 1

Subregion(LRR) LRR C (Medit. CA) Lat: 38.73134 Long: -122.471057 Datum: WGS 84

Soil Map Unit Name Sobrante-Hambright-Guenoc complex, 30 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☒ Yes ☐ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point is located in uplands adjacent to seep. Sample point meets wetland criteria for hydric soils (F6), but does not meet wetland criteria for hydrophytic vegetation and wetland hydrology. Paired with wetland sample point SP-102. Rainfall amounts were above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' radius			
1. *Elymus caput-medusae*	60	Y	UPL
2. *Acmispon americanus*	10		UPL
3. *Trifolium hirtum*	20	Y	UPL
4. *Plantago lanceolata*	5		FAC
5. *Lactuca saligna*	3		UPL
6. *Centaurea solstitialis*	2		UPL
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-103

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-6	7.5YR 2.5/2	98	7.5YR 4/6	2	C	M	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Shovel refusal

Depth (inches): 6

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet Redox Dark Surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-104**

Investigator(s) Aaron Arthur, Ra'am Akiba-Hajim Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) None Slope(%) 1

Subregion(LRR) LRR C (Medit. CA) Lat: 38.726593 Long: -122.473941 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point is located in a wetland on a hillslope. Sample point meets criteria for hydrophytic vegetation and wetland hydrology. Soils are problematic (serpentine) and assumed to by hydric. Paired with upland sample point SP-105. Rainfall amounts were above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' radius			
1. *Juncus phaeocephalus*	60	Y	FACW
2. *Festuca perennis*	20	Y	FAC
3. *Briza minor*	10	N	FAC
4. *Sisyrinchium bellum*	2	N	FACW
5. *Lysimachia arvensis*	1	N	FAC
6.			
7.			
8.			
Herb Stratum Total Cover:	93		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 7 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Sample is dominated by FACW and FAC species and meets wetland criteria for hydrophytic vegetation.

SOIL

Sampling Point SP-104

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-12	10YR 2/1	100	-	-	-	-	Loamy clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Dark serpentine parent material may be masking redox. Soils assumed hydric based on dominance of hydrophytic vegetation and presence of primary indicators of wetland hydrology.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point contains biotic crust (B12) and Saturation Visible on Aerial Imagery (C9).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-105**

Investigator(s) Aaron Arthur, Ra'am Akiba-Hajim Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Convex Slope(%) 1

Subregion(LRR) LRR C (Medit. CA) Lat: 38.726582 Long: -122.473881 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☒ Yes ☐ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point is located along the edge of a wetland. Sample meets wetland criteria for hydric soils, but does not meet wetland criteria for hydrophytic vegetation and wetland hydrology. Paired with upland sample point SP-104. Rainfall amounts were above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 20' radius	Absolute % cover	Dominant Species?	Indicator Status
1. *Pinus sabiniana*	20	Y	NL
2. *Quercus wislizeni*	20	Y	NL
3.			
4.			
Tree Stratum Total Cover:	40		
SAPLING/SHRUB STRATUM **Plot Size:** 10' radius			
1. *Arctostaphylos manzanita*	10	Y	NL
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:	10		
HERB STRATUM **Plot Size:** 5' radius			
1. *Bromus hordeaceus*	20	Y	FACU
2. *Acmispon americanus*	10	Y	UPL
3. *Juncus phaeocephalus*	5	N	FACW
4. *Briza minor*	2	N	FAC
5. *Avena barbata*	1	N	NL
6.			
7.			
8.			
Herb Stratum Total Cover:	38		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 62 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 5 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: The sample is neither dominant by nor contains a prevalence of hydrophytes.

SOIL

Sampling Point SP-105

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-10	7.5YR 3/2	48	2.5YR 4/1	3	C	PL	Clay loam	Rocky
	10YR 2/2	49						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Sample meets the description of Redox Dark Surface (F6) and is thus considered a hydric soil.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☐ No Depth (inches): _____

Water table present? ☐ Yes ☐ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☐ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point does not meet wetland criteria for hydrology.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 8/21/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-106**

Investigator(s) Russell Andrews, Scott Yarger, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) convex Slope(%) 10

Subregion(LRR) LRR C (Medit. CA) Lat: 38.726045 Long: -122.458715 Datum: WGS 84

Soil Map Unit Name Sobrante-Hambright-Guenoc complex, 30 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No

Hydric Soil Present? ☒ Yes ☐ No

Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in seep complex at the toe of slope entering McCain Creek. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Sample point is paired with SP-107.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Juncus mexicanus*	40	Yes	FACW
2. *Stachys albens*	25	Yes	OBL
3. *Zeltnera muehlenbergii*	8		FAC
4. *Polypogon monspeliensis*	5		FACW
5. *Trichostema laxum*	5		UPL
6. *Lotus corniculatus*	2		FAC
7.			
8.			
Herb Stratum Total Cover:	85		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 5 % cover of biotic crust 10

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Hydrophytic vegetation is present within the sampled area.

SOIL

Sampling Point SP-106

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-3	10YR 3/2	100					Sandy Clay	
3-12	5Y 4/1	75	7.5YR 3/2	25	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soil within the sampled point displayed depleted matrix hydric soil indicator (F3).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☒ Yes ☐ No Depth (inches): 2

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 11

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Standing water observed within the seep. Saturation present but no water table observed below (epi-saturated).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 8/21/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-107**

Investigator(s) Russell Andrews, Scott Yarger, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) concave Slope(%) 5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.72608 Long: -122.458665 Datum: WGS 84

Soil Map Unit Name Sobrante-Hambright-Guenoc complex, 30 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point is located above seep. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Sample point is paired with SP-106.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' x 5'			
1. *Elymus caput-medusae*	20	Yes	UPL
2. *Avena barbata*	5		UPL
3. *Holocarpha virgata*	5		UPL
4. *Acmispon americanus*	4		UPL
5. *Navarretia pubescens*	4		UPL
6. *Hemizonia congesta*	3		UPL
7. *Aira caryophyllea*	2		FACU
8. *Perideridia californica*	2		UPL
Herb Stratum Total Cover:	45		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 55 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation is not present within the sampled area.

SOIL

Sampling Point SP-107

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-6	10YR 3/2	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Volcanic rock

Depth (inches): 6

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Soil within the sample point did not displayed any hydric soil indicators. Shovel refusal at 6 inches.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No hydrology indicators present within this sample point.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 8/21/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-108**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) concave Slope(%) 5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.722306 Long: -122.461109 Datum: WGS 84

Soil Map Unit Name Sobrante-Hambright-Guenoc complex, 30 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point is within a seep at the toe of a slope. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Boundary based on shift in vegetation to UPL/FACU grasses. Sample Point paired with sample point SP-109.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' x 5'			
1. *Eleocharis macrostachya*	30	Yes	OBL
2. *Polypogon monspeliensis*	30	Yes	FACW
3. *Hordeum brachyantherum*	15		FACW
4. *Hordeum marinum*	15		FAC
5. *Hemizonia congesta*	5		UPL
6. *Bromus hordeaceus*	3		FACU
7. *Elymus caput-madusae*	2		UPL
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 0 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Hydrophytic vegetation is present within the sampled area.

SOIL

Sampling Point SP-108

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-4	10YR 2/2	95	7.5YR 4/6	5	C	PL/M	Clay	
4-12	10YR 2/2	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soil displays redox dark surface hydric soil indicator (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Hydrology indicator Oxidized Rhizospheres Along Living Roots (C3) was present within this sample point.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 8/21/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-109**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) concave Slope(%) 5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.722269 Long: -122.461228 Datum: WGS 84

Soil Map Unit Name Sobrante-Hambright-Guenoc complex, 30 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Sample point is paired with sample point SP-108.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Festuca myuros*	40	Yes	UPL
2. *Bromus hordeaceus*	30	Yes	FACU
3. *Stipa pulchra*	15		UPL
4. *Holocarpha virgata*	5		UPL
5. *Acmispon americanus*	3		UPL
6.			
7.			
8.			
Herb Stratum Total Cover:	93		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 7 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation is not present within the sampled area.

SOIL

Sampling Point SP-109

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-7	7.5YR 2.5/2	80					clay loam	with 20% gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Gravel and clay

Depth (inches): 7

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Soil does not display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Wetland hydrology indicators were absent within this sample point.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 8/21/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-110**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) concave Slope(%) 5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.71837 Long: -122.464965 Datum: WGS 84

Soil Map Unit Name Sobrante-Hambright-Guenoc complex, 30 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point is located on a hillslope seep wetland. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Wetland boundary based on shift in vegetation and topography. Sample point is paired with SP-111.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' x 5'			
1. *Hordeum marinum*	40	Yes	FAC
2. *Festuca perennis*	30	Yes	FAC
3. *Hemizonia congesta*	10		UPL
4. *Bromus hordeaceus*	10		FACU
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 10 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Hydrophytic vegetation is present within the sampled area.

SOIL

Sampling Point SP-110

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	10YR 2/1	95	10YR 3/6	5	C	PL/RC	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soil displays redox dark surface hydric soil indicator (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Oxidized rhizospheres along living roots hydrology indicator is present within this sample point.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 8/21/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-111**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) concave Slope(%) 5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.718359 Long: -122.465066 Datum: WGS 84

Soil Map Unit Name Sobrante-Hambright-Guenoc complex, 30 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Sample point is an upland point, paired with wetland Sample Point SP-110.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' x 5'			
1. *Elymus caput-medusae*	30	Yes	UPL
2. *Holocarpha sp.*	30	Yes	UPL
3. *Bromus hordeaceus*	15		FACU
4. *Briza minor*	10		FAC
5. *Stipa pulchra*	5		UPL
6.			
7.			
8.			
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 10 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation is not present within the sampled area.

SOIL

Sampling Point SP-111

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-8	10YR 3/2	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: gravel and clay

Depth (inches): 8

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Soil does not display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No hydrology indicators present within this sample point.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/17/2018

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-112**

Investigator(s) Scott Yarger, Scott Batiuk, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) Concave Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.716635 Long: -122.464679 Datum: WGS 84

Soil Map Unit Name Sobrante-Hambright-Guenoc complex, 30 to 50 percent slopes NWI classification

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point is a wetland point paired with upland poihnt SP-113. Sample point is located on concave slope within a stream fringe wetland. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Wetland boundary delineated based on distinct change in vegetation and hydrology. Rainfall was above average for time of year.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Hordeum brachyantherum*	60	Yes	FACW
2. *Mimulus guttatus*	10	No	OBL
3. *Festuca perennis*	8	No	FAC
4. *Toxicoscordion fontanum*	2	No	OBL
5. *Triteleia peduncularis*	Tr	No	FACW
6.			
7.			
8.			
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 20 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Sample point meets dominance test.

SOIL

Sampling Point SP-112

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-1	10YR 2/2	100					Clay loam	
1-8	2.5Y 3/1	93	7.5YR 3/4	7	C	M	Clay loam	Prominent redox concentrations.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Sample point meets Redox Dark Surface (F3) hydric soil indicator.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☒ Yes ☐ No Depth (inches): 2

Water table present? ☐ Yes ☒ No Depth (inches): 0

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-8

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Soil sample saturated to 8 inches in depth. Standing water observed in stream in sampled area. Sample point meets Surface Water (A1), wetland hydrology indicator.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/17/2018

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-113**

Investigator(s) Scott Yarger, Scott Batiuk, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Convex Slope(%) 10

Subregion(LRR) LRR C (Medit. CA) Lat: 38.716602 Long: -122.464712 Datum: WGS 84

Soil Map Unit Name Sobrante-Hambright-Guenoc complex, 30 to 50 percent slopes NWI classification

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point is an upland point paired with wetland point SP-112. Sample point is located on convex slope adjacent to and above a stream fringe wetland. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Rainfall was above average for time of year.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Bromus hordeaceus*	30	Yes	FACU
2. *Festuca perennis*	30	Yes	FAC
3. *Castilleja rubicundula ssp. lithospermoides*	15	No	NL
4. *Sidalcea diploscypha*	5	No	NL
5. *Hordeum marinum ssp. gussoneanum*	5	No	FAC
6. *Poa secunda ssp. secunda*	5	No	FACU
7. *Hemizonia congesta ssp. clevelandii*	Tr	No	NL
8. *Lasthenia gracilis*	Tr	No	NL
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 10 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 50 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Sample point does not meet hydrophytic vegetation indicators.

SOIL

Sampling Point SP-113

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	10YR 3/2	100	7.5YR 4/4	Tr	C		Clay loam	Trace distinct redox concentations.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches): _____

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Less than 1 percent redox concentrations. No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No wetland hydrology indicators observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 8/21/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-114**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Toeslope Local Relief (concave, convex, none) None Slope(%) 8

Subregion(LRR) LRR C (Medit. CA) Lat: 38.716476 Long: -122.464337 Datum:

Soil Map Unit Name Sobrante-Hambright-Guenoc complex, 30 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in seep complex at the toe of slope entering McCain Creek. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Wetland boundary based on shift in vegetation and topography. Paired with SP-115.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Hordeum marinum*	20	Yes	FAC
2. *Mimulus nudatus*	20	Yes	OBL
3. *Navarretia jepsonii*	10	Yes	FACW
4. *Juncus xiphioides*	10	Yes	OBL
5. *Hordeum brachyantherum*	10	Yes	FACW
6. *Bromus hordeaceus*	5		FACU
7. *Hemizonia congesta*	5		UPL
8. *Festuca microstachys*	5		UPL
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 10 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 5 (A)

Total number of dominant species across all strata? 5 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Hydrophytic vegetation is present within the sampled area.

SOIL

Sampling Point SP-114

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-7	10YR 3/2	95	7.5YR 4/6	5	C	PL/RC	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Clay/rock

Depth (inches): 7

Hydric Soil Present ? ☒ Yes ☐ No

Remarks: Soil within the sampled point displayed an hydric soil indicator of redox dark surface.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 6

Wetland Hydrology Present ? ☒ Yes ☐ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Saturation observed during rare plant surveys conducted in March 2018.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 8/21/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-115**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) toeslope Local Relief (concave, convex, none) convex Slope(%) 8

Subregion(LRR) LRR C (Medit. CA) Lat: 38.7164 Long: -122.464408 Datum:

Soil Map Unit Name Sobrante-Hambright-Guenoc complex, 30 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located along hillside adjacent to seep wetland. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Sample point is paired with SP-114.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 10' x 10'			
1. *Bromus hordeaceus*	15	Yes	FACU
2. *Gastridium phleoides*	15	Yes	FACU
3. *Stipa pulchra*	5		UPL
4. *Hordeum brachyantherum*	5		FACW
5. *Festuca microstachys*	5		UPL
6. *Croton setiger*	3		UPL
7. *Chlorogalum pomeridianum var. pomeridianum*	2		UPL
8. *Toxicodendron fremontii*	2		UPL
Herb Stratum Total Cover:	60		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 40 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation is not present within the sampled area.

SOIL

Sampling Point SP-115

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-6	7.5YR 3/3	80					Loamy Clay	20% Gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Clay and gravel

Depth (inches): 6

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Soil within the sampled point did not display a hydric soil indicator.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of wetland hydrology were present within the sampled area.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-116**

Investigator(s) Aaron Arthur, Ra'am Akiba-Hajim Section,Township,Range

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) None Slope(%) 0

Subregion(LRR) LRR C (Medit. CA) Lat: 38.712386 Long: -122.482092 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in a small seasonal wetland at the base of a culverted ephemeral stream/drainage ditch off Butts Canyon Road. Sample point meets wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Wetland boundary based on shift in vegetation and topography. Paired with upland sample point SP-117. Rainfall amounts were above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Polypogon monspeliensis*	50	Y	FACW
2. *Hordeum brachyantherum*	20	Y	FACW
3. *Sisyrinchium bellum*	8	N	FACW
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	78		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 22 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Sample is dominated by FACW species and meets wetland criteria for hydrophytic vegetation.

SOIL

Sampling Point SP-116

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	5YR 3/3	100	-	-	-	-		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Sample is assumed to have hydric soils due to strong hydric vegetation indications and saturation. Redox may be masked by red soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Two secondary indicators of Saturation Visible on Aerial Imagery (C9) and FAC-Neutral Test (D5) indicators were met. Saturation observed but no water table below.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-117**

Investigator(s) Aaron Arthur, Ra'am Akiba-Hajim Section,Township,Range

Landform (hillslope, terrace, etc.) Terrace Local Relief (concave, convex, none) None Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.712415 Long: -122.481977 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point is located on an upland terrace adjacent to a seasonal wetland at the base of an ephemeral stream/drainage ditch. Sample does not meet wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Paired with wetland sample point SP-116. Rainfall amounts were above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Aegilops triuncialis*	80	Y	NL
2. *Polypogon monspeliensis*	2	N	FACW
3. *Hesperolinon bicarpellatum*	1	N	NL
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	83		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 17 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: The sample is neither dominant by nor contains a prevalence of hydrophytes.

SOIL

Sampling Point SP-117

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-6	2.5YR 3/3	100	-	-	-	-	Sandy loam	Cobbly

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: Sample does not meet wetland soils criteria for hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample does not meet wetland criteria for hydrology.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-118**

Investigator(s) Scott Yarger, Nathaniel Clark, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Concave Slope(%) 0-1

Subregion(LRR) LRR C (Medit. CA) Lat: Long: Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point is located in a floodplain. Sample point meets wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Wetland boundary based on shift in vegetation and topography. Paired with upland sample point SP-119. Rainfall amounts above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Stachys albens*	60	Y	OBL
2. *Polypogon monspeliensis*	10	N	FACW
3. *Achillea millefolium*	2	N	FACU
4. *Carex serratodens*	2	N	FACW
5. *Aegilops triuncialis*	+	N	NL
6. *Mimulus guttatus*	+	N	OBL
7. *Stipa miliacea*	+	N	NL
8.			
Herb Stratum Total Cover:	74		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 26 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Sample is dominated by an OBL species and meets wetland criteria for hydrophytic vegetation.

SOIL

Sampling Point SP-118

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-5	7.5YR 3/2	100	-	-	-	-	Loam	
5-14	2.5YR 3/3	85	5Y 4/1	15	D	M	Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☒ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Sample meets the description of Red Parent Material (TF2) and is thus considered a hydric soil.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-6

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Saturated soils were observed to 6 inches below ground, but no water table was observed below. Two secondary indicators of Saturation Visible on Aerial Imagery (C9) and FAC-Neutral Test (D5) indicators were met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-119**

Investigator(s) Scott Yarger, Nathaniel Clark, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) Hillslope Local Relief (concave, convex, none) Concave Slope(%) 10

Subregion(LRR) LRR C (Medit. CA) Lat: 38.710377 Long: -122.477809 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point is located on an upland slope. Sample does not meet wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Paired with wetland sample point SP-118 Rainfall amounts above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1. *Adenostoma fasciculatum*	5	Y	NL
2. *Quercus durata*	2	Y	NL
3.			
4.			
Sapling/Shrub Stratum Total Cover:	7		
HERB STRATUM **Plot Size:** 5' radius			
1. *Holocarpha virgata*	8	Y	NL
2. *Hesperolinon bicarpellatum*	5	Y	NL
3. *Bromus hordeaceus*	5	Y	FACU
4. *Hordeum brachyantherum*	5	Y	FACW
5. *Hypericum concinnum*	5	Y	NL
6. *Chlorogalum pomeridianum*	2	N	NL
7. *Aegilops triuncialis*	1	N	NL
8.			
Herb Stratum Total Cover:	31		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 69 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 7 (B)

% of dominant species that are OBL, FACW, or FAC? 14 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Sample point is dominated by NL, FACU, and FACW species and does not meet wetland criteria for hydrophytic vegetation.

SOIL

Sampling Point SP-119

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-6	5YR 4/6	100	-	-	-	-	Loam	Compacted layer

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Compacted

Depth (inches): 6

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Sample does not meet wetland soils criteria for hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample does not meet wetland criteria for hydrology.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-120**

Investigator(s) Tanner Harris, Russel Andrews, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) valley Local Relief (concave, convex, none) None Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.721432 Long: -122.506746 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point is located in a wet meadow on a stream fringe. Sample point meets criteria for hydrophytic vegetation and wetland hydrology. Soils are problematic (serpentine) and assumed to by hydric. The wetland boundary was based on a shift in vegetation. Paired with upland sample point SP-121.Rainfall amounts were above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Hordeum brachyantherum*	40	Y	FACW
2. *Eleocharis macrostachya*	35	Y	OBL
3. *Mimulus guttatus*	10	N	OBL
4. *Trichostema lanceolatum*	5	N	FACU
5. *Aegilops triuncialis*	5	N	NL
6. *Triteleia laxa*	3	N	NL
7. *Sisyrinchium bellum*	2	N	FACW
8. *Navarretia sp.*	1	N	-
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Sample point is dominated by FACW and OBL species and meets wetland criteria for hydrophytic vegetation.

SOIL

Sampling Point SP-120

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-12	10YR 3/1	100	-	-	-	-	Clay loam	w/ cobble (alluvial)

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Dark serpentine parent material may be masking redox. Soils assumed hydric based on dominance of hydrophytic vegetation and presence of primary indicators of wetland hydrology.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☐ No Depth (inches): _____

Water table present? ☒ Yes ☐ No Depth (inches): 3

Saturation Present? (includes capillary fringe) ☐ Yes ☐ No Depth (inches): 0

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: High Water Table (A2) and Saturation (A3) were observed and therefore B208 meets wetland criteria for hydrology. The two secondary indicators of Saturation Visible on Aerial Imagery (C9) and FAC-Neutral Test (D5) were also met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-121**

Investigator(s) Tanner Harris, Russel Andrews, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) valley Local Relief (concave, convex, none) None Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.721429 Long: -122.506676 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located in uplands adjacent to a wet meadow. Sample point does not meet wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Paired with wetland sample point SP-120. Rainfall amounts were above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Aegilops triuncialis*	65	Y	NL
2. *Acmispon americanus*	3	N	UPL
3. *Trichostema lanceolatum*	1	N	FACU
4. *Chlorogalum pomeridianum*	1	N	NL
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	70		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: The sample is neither dominant by nor contains a prevalence of hydrophytes. The sample contains a 30% covering of thatch.

SOIL

Sampling Point SP-121

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-6	10YR 3/2	100					Clay loam	w/ cobble

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Shovel refusal/cobble

Depth (inches): 6

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: B209 does not meet wetland criteria for hydrology.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-122**

Investigator(s) Scott Yarger, Nathaniel Clark, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Concave Slope(%) 8

Subregion(LRR) LRR C (Medit. CA) Lat: 38.716235 Long: -122.4977 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point is located in a large wet meadow on a valley floor. Sample meets wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Wetland boundary based on shift in vegetation and topography. Paired with upland sample point SP-123. Rainfall amounts above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' radius			
1. *Hordeum brachyantherum*	10	Y	FACW
2. *Juncus mexicanus*	10	Y	FACW
3. *Festuca arundinacea*	8	Y	FAC
4. *Poa secunda*	3	N	FACU
5. *Polypogon monspeliensis*	2	N	FACW
6. *Toxicoscordion fontanum*	+	N	OBL
7. *Juncus phaeocephalus*	+	N	FACW
8. *Helianthus exilis*	+	N	FACU
Herb Stratum Total Cover:	33		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 66.7 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☒ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: The sample contains a covering of 67% thatch. Festuca arundinacea growing in humocks to elevate above the saturated zone--treated as hydrophytic morphological adaptation and species considered FAC rather than FACU. Sample point is dominated by FACW and FAC species, meets dominance test.

SOIL

Sampling Point SP-122

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-16	10YR 2/1	98	7.5YR 3/3	2	C	PL, M	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Sample meets the description of Redox Dark Surface (F6) and is thus considered a hydric soil.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-7

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Soils saturated to 7 inches but no water table observed below. Three secondary indicators of Saturation Visible on Aerial Imagery (C9) and FAC-Neutral Test (D5), and Drainage Patterns indicators were also met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 5/30/2018

Applicant/Owner Lotusland Investment Holdings Inc. State CA Sampling Point **SP-123**

Investigator(s) Scott Yarger, Nathaniel Clark, WRA Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Convex Slope(%) 8

Subregion(LRR) LRR C (Medit. CA) Lat: 38.716202 Long: -122.49765 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☒ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point is located on an upland slope. Sample point does not meet wetland criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. Paired with wetland sample point SP-122. Rainfall amounts above average at time of site visit.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Bromus hordeaceus*	30	Y	FACU
2. *Festuca microstachys*	20	Y	NL
3. *Hemizonia congesta*	7	N	NL
4. *Festuca perennis*	5	N	FAC
5. *Sidalcea diploscypha*	5	N	NL
6. *Brodiaea elegans*	+	N	FACU
7. *Calochortus vestae*	+	N	NL
8.			
Herb Stratum Total Cover:	67		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 18 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: The sample is neither dominant by nor contains a prevalence of hydrophytes. The sample contains a 15% covering of thatch.

SOIL

Sampling Point SP-123

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-6	7.5 YR 3/3	100	-	-	-	-	Loam	Cobbles

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: cobbles

Depth (inches): 6

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Sample point does not meet wetland soils criteria for hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point does not meet wetland criteria for hydrology.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/6/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-124**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Concave Slope(%) 4

Subregion(LRR) LRR C (Medit. CA) Lat: 38.72339 Long: -122.514593 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in a depressional wetland at base of old golf course green. Wetland boundary based on shift in vegetation and topography. Sample point meets criteria for hydrophytic vegetation and wetland hydrology. Soils are problematic (serpentine) and assumed to by hydric. Sample point paired with SP-125.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Polypogon monspeliensis*	20	Yes	FACW
2. *Carex c.f. barbarea*	20	Yes	FAC
3. *Typha latifolia*	10		OBL
4. *Festuca arundinacea*	5		FACU
5. *Eleocharis macrostachya*	5		OBL
6.			
7.			
8.			
Herb Stratum Total Cover:	60		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 40 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test.

SOIL

Sampling Point SP-124

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-8	2.5Y3/1	100					Clay	With alluvial gravels

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Heavy Clay

Depth (inches): 8

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Dark serpentine parent material may be masking redox. Soils assumed hydric based on dominance of perennial obligate vegetation and presence of primary indicators of wetland hydrology.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☒ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point meets biotic crust (B12), Saturation Visible on Aerial Imagery (C9), and the FAC-Neutral test (D5)

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/6/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-125**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Convex Slope(%) 5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.723412 Long: -122.514491 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located on berm adjacent to basin. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Sample point paired with SP-124.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Bromus hordeaceus*	50	Yes	FACU
2. *Centaurea solstitialis*	40	Yes	UPL
3. *Festuca arundinacea*	5		FACU
4. *Lactuca saligna*	4		UPL
5. *Cirsium undulatum??*	1		FACU
6.			
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test

SOIL

Sampling Point SP-125

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-10	10YR2/1	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Heavy Clay

Depth (inches): 10

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Hydric soil indicators were not observed within the sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Wetland hydrology indicators were not observed within the sample point.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/6/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-126**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Concave Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.720782 Long: -122.514118 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point within pond in depressional area. Wetland boundary based on shift in vegetation and topography. Sample point meets criteria for hydrophytic vegetation and wetland hydrology. Soils are problematic (serpentine) and assumed to by hydric. Sample point paired with SP-127.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Eleocharis macrostachya*	40	Yes	OBL
2. *Typha latifolia*	10		OBL
3. *Polypogon monspeliensis*	8		FACW
4. *Rumex crispus*	2		FAC
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	60		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 40 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test.

SOIL

Sampling Point SP-126

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	10YR2/1	100					Clay	serpentine soils

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Dark serpentine parent material may be masking redox. Soils assumed hydric based on dominance of perennial obligate vegetation and presence of primary indicators of wetland hydrology.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☒ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point meets biotic crust (B12), Saturation Visible on Aerial Imagery (C9), and the FAC-Neutral test (D5).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/6/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-127**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) None Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.720777 Long: -122.513986 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located on berm adjacent to pond and swale. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Sample point paired with SP-126.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 10' x 10'			
1. *Phalaris aquatica*	60	Yes	FACU
2. *Elymus caput-medusae*	20	Yes	NL
3. *Centaurea solstitialis*	10		UPL
4. *Bromus hordeaceus*	10		FACU
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-127

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	10YR 3/2	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches): _____

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No indicators of hydric soils were observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology were observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/6/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-128**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Concave Slope(%) 4

Subregion(LRR) LRR C (Medit. CA) Lat: -122.516799 Long: 38.7175 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in an old golf course pond with drain, which is now a seasonal wetland. Wetland boundary based on shift in vegetation and topography. Sample point meets criteria for vegetation and hydrology. Soils are problematic (serpentine) and assumed to be hydric. Sample point paired with SP-130.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Polypogon monspeliensis*	35	Yes	FACW
2. *Eleocharis macrostachya*	35	Yes	OBL
3. *Festuca perennis*	15		FAC
4. *Lactuca saligna*	5		UPL
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 10 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Sample point meets dominance test.

SOIL

Sampling Point SP-128

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-10	2.5YR2.5/1	100					Clay	serpentine soils

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Clay Shovel Refusal

Depth (inches): 10

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Dark serpentine parent material may be masking redox. Soils assumed hydric based on dominance of perennial obligate vegetation and presence of primary indicators of wetland hydrology.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point contains biotic crust (B12) and meets FAC-neutral test (D5).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/6/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-129**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Concave Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.71726 Long: -122.516582 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in a wetland swale. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Wetland boundary based on shift in vegetation and topography. Sample point paired with SP-130.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Juncus mexicanus*	35	Yes	FACW
2. *Juncus xiphioides*	20	Yes	OBL
3. *Festuca arundinacea*	20	Yes	FAC
4. *Rumex crispus*	3		FAC
5. *Persicaria punctata*	2		OBL
6.			
7.			
8.			
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 20 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 3 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☒ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Festuca arundinacea growing in humocks to elevate above the saturated zone--treated as hydrophytic morphological adaptation and species considered FAC rather than FACU. Vegetation meets dominance test.

SOIL

Sampling Point SP-129

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-10	2.5Y3/1	98	7.5YR 4/6	2	C	M/PL	Clay	Depletions along pore linings

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet redox dark surface (F6). Deep hoof punch relative to adjacent upland areas suggest long-term saturation.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☐ No Depth (inches): _____

Water table present? ☐ Yes ☐ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☐ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point meets biotic crust (B12), Saturation Visible on Aerial Imagery (C9), and the FAC-Neutral test (D5).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/6/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-130**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Convex Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.717365 Long: -122.516696 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located on a berm between golf course pond and stream/wetland swale. Sample point did not meet wetland indicators for hydrophytic vegetation, hydric soils, or wetland hydrology. Sample point paired with SP-128 and SP-129.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Centaurea solstitialis*	40	Yes	UPL
2. *Elymus caput-medusae*	40	Yes	NL
3. *Phalaris aquatica*	10		FACU
4. *Convolvulus arvensis*	2		NL
5. *Lactuca saligna*	3		UPL
6. *Helminthotheca echiodies*	5		FAC
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-130

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-10	2.5Y2.5/1	50					Clay	
	2.5Y3/2	50					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Hydric soil indicators were not observed within the sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Wetland hydrology indicators were not observed within the sample point.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/6/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-131**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Concave Slope(%) 4

Subregion(LRR) LRR C (Medit. CA) Lat: 38.717233 Long: -122.513955 Datum: WGS 84

Soil Map Unit Name Yorkville variant clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in a depression within dried pond. Wetland boundary based on shift in vegetation and topography. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Sample point paired with SP-132.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Typha latifolia*	30	Yes	OBL
2. *Polypogon monspeliensis*	30	Yes	FACW
3. *Eleocharis macrostachya*	20	Yes	OBL
4. *Juncus xiphioides*	10		OBL
5. *Zeltnera tricantha*	5		FAC
6. *Centaurea solstitialis*	3		UPL
7. *Lactuca saligna*	2		UPL
8.			
Herb Stratum Total Cover:			
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover: 0			

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 3 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test.

SOIL

Sampling Point SP-131

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	5Y4/2	98	5Y5/6	2	C	PL	Loamy Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet depleted matrix (F3).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☒ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point meets biotic crust (B12), Saturation Visible on Aerial Imagery (C9), and the FAC-Neutral test (D5).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/7/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-132**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Convex Slope(%) 0-2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.717236 Long: -122.513832 Datum: WGS 84

Soil Map Unit Name Yorkville variant clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located on upland ridge between pond and swale; higher in topograhy than adjacent features. Sample point does not meet criteria for hydric soils or wetland hydrology. Sample point paired with SP-131.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' x 5'			
1. *Hordeum marinum ssp. gussoneanum*	47	Yes	FAC
2. *Festuca perennis*	30	Yes	FAC
3. *Lactuca saligna*	5		UPL
4. *Bromus hordeaceus*	5		FACU
5. *Elymus caput-medusae*	5		NL
6. *Centaurea solstitialis*	3		UPL
7.			
8.			
Herb Stratum Total Cover:	95		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 0 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: 5% thatch. Vegetation meets dominance test.

SOIL

Sampling Point SP-132

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-12	10YR3/2	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches): _____

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Hydric soil indicators were not observed within the sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology were observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/7/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-133**

Investigator(s) Gavin Albertoli, Scott Yarger, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Concave Slope(%) 0-2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.719096 Long: -122.511443 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point taken in broad wetland swale adjacent to intermittent stream. Wetland boundary delineated based on topography and vegetation. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Sample point paired with SP-134.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Juncus mexicanus*	30	Yes	FACW
2. *Juncus xiphiodes*	25	Yes	OBL
3. *Polypogon monspeliensis*	20	Yes	FACW
4. *Euthamia occidentalis*	15		FACW
5. *Epilobium densiflorum*	5		FACW
6. *Melilotus alba*	1		NL
7. *Rumex crispus*	1		FAC
8.			
Herb Stratum Total Cover:	97		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 0 % cover of biotic crust 3

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 3 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Hydrophytic vegetation was observed within the sampled area.

SOIL

Sampling Point SP-133

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-3	10YR3/2	100					Sand	
3-6	10YR2/1	100					Clay Loam	
6-12	5Y4/1	98	2.5YR3/3	2	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet Depleted Matrix (F3).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point meets biotic crust (B12), Saturation Visible on Aerial Imagery (C9), and the FAC-Neutral test (D5).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/7/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-134**

Investigator(s) Gavin Albertoli, Scott Yarger, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Convex Slope(%) 5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.718977 Long: -122.511521 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point taken on berm adjacent to broad wetland swale.Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Sample point paired with SP-133.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Bromus diandrus*	60	Yes	NL
2. *Avena barbata*	30	Yes	NL
3. *Lactuca serriola*	2		FACU
4. *Festuca arundinacea*	t		FACU
5. *Cynodon dactylon*	t		FACU
6. *Aegilops triuncialis*	t		NL
7. *Bromus hordeaceus*	t		FACU
8.			
Herb Stratum Total Cover: 92			
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover: 0			

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: 8% thatch. Vegetation does not meet dominance test.

SOIL

Sampling Point SP-134

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	10YR3/2	90					Sandy Clay	High pebble content
	5Y4/1	10						Non-redoximorphic mottles

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No hydric soil indicators were observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No hydrology indicators observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/7/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-135**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Concave Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.716016 Long: -122.515173 Datum: WGS 84

Soil Map Unit Name Yorkville variant clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located within a depressional feature. Wetland boundary based on shift in vegetation and topography. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Sample point paired with SP-136.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Hordeum marinum ssp. gussoneanum*	50	Yes	FAC
2. *Lotus corniculatus*	40	Yes	FAC
3. *Rumex crispus*	10		FAC
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test.

SOIL

Sampling Point SP-135

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-1	5Y3/2	100					Loamy Clay	serpentine soils
1-4	5Y2.5/1	100					Clay	serpentine soils
4-8	2.5Y4/2	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Dark serpentine parent material may be masking redox. Soils assumed hydric based on dominance of perennial obligate vegetation and presence of primary indicators of wetland hydrology.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point meets biotic crust (B12), Saturation Visible on Aerial Imagery (C9).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/7/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-136**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Convex Slope(%) 10

Subregion(LRR) LRR C (Medit. CA) Lat: 38.715954 Long: -122.515288 Datum: WGS 84

Soil Map Unit Name Yorkville variant clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located on a slope between an abandonded golf cart path and a small wetland swale. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Sample point paired with SP-135.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Elymus caput-medusae*	80	Yes	NL
2. *Centaurea solstitialis*	10		UPL
3. *Festuca arundinacea*	8		FACU
4. *Convolvulus arvensis*	2		NL
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation is not present within the sampled area.

SOIL

Sampling Point SP-136

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-8	5Y2.5/1	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Hydric soil indicators were not observed within the sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Wetland hydrology indicators were not observed within the sample point.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/7/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-137**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Concave Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.71548 Long: -122.513649 Datum: WGS 84

Soil Map Unit Name Yorkville variant clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in a marginal wetland swale feature with patchy upland/wetland vegetation. Wetland boundary based on shift in vegetation and topography. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Sample point paired with SP-138.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Hordeum marinum ssp. gussoneanum*	40	Yes	FAC
2. *Festuca perennis*	15		FAC
3. *Bromus hordeaceus*	15		FACU
4. *Centaurea solstitialis*	5		UPL
5. *Rumex crispus*	3		FAC
6. *Lactuca saligna*	2		UPL
7.			
8.			
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 20 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Hydrophytic vegetation is present within the sampled area.

SOIL

Sampling Point SP-137

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-10	10YR 3/2	75	7.5YR3/4	25	C	PL/RC	Loamy Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet redox dark surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point meets Oxidized rhizospheres along Living Roots (C3).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/7/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-138**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) None Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.715477 Long: -122.513714 Datum: WGS 84

Soil Map Unit Name Yorkville variant clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located adjacent to a broad wetland swale. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Sample point paired with SP-137.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Centaurea solstitialis*	40	Yes	UPL
2. *Bromus hordeaceus*	40	Yes	FACU
3. *Hordeum marinum ssp. gussoneanum*	18		FAC
4. *Chichorium intybus*	2		FACU
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation is not present within the sampled area.

SOIL

Sampling Point SP-138

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-10	10YR3/2	100					Loamy Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Hydric soil indicators were not observed within the sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Wetland hydrology indicators were not observed within the sample point.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/7/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-139**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Concave Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.714049 Long: -122.515089 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in wetland swale/stream. Wetland boundary based on shift in vegetation and topography. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Sample point paired with SP-140.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Festuca arundinacea*	45	Yes	FAC
2. *Juncus patens*	30	Yes	FACW
3. *Euthamia occidentalis*	20	Yes	FACW
4. *Polypogon monspeliensis*	3		FACW
5. *Cyperus eragrostis*	2		FACW
6.			
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 3 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☒ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Festuca arundinacea growing in humocks to elevate above the saturated zone--treated as hydrophytic morphological adaptation and species considered FAC rather than FACU. Vegetation meets dominance test.

SOIL

Sampling Point SP-139

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-4	5Y2.5/1	100						with alluvial gravel
4-9	5Y2.5/1	98	7.5YR4/6	2	C	PL	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Clay shovel refusal

Depth (inches): 9

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet redox dark surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point meets biotic crust (B12), Saturation Visible on Aerial Imagery (C9), and the FAC-Neutral test (D5).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/7/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-140**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Convex Slope(%) 10

Subregion(LRR) LRR C (Medit. CA) Lat: 38.714074 Long: -122.515148 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Sample point paired with SP-139.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Elymus caput-medusae*	70	Yes	NL
2. *Festuca arundinacea*	15		FACU
3. *Avena sp.*	5		NL
4. *Lactuca saligna*	5		UPL
5. *Centaurea solstitialis*	5		UPL
6.			
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation is not present within the sampled area.

SOIL

Sampling Point SP-140

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-8	5Y2.5/1	100					Loamy Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Hydric soil indicators were not observed within the sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Wetland hydrology indicators were not observed within the sample point.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/7/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-141**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Concave Slope(%) 5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.713852 Long: -122.514579 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in golf course pond with drain. Wetland boundary based on shift in vegetation and topography. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Sample point paired with SP-142.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 10' x 10'			
1. *Eleocharis macrostachya*	98	Yes	OBL
2. *Polypogon monspeliensis*	2		FACW
3.			
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks:

SOIL

Sampling Point SP-141

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	10Y3/1	98	5Y4/4	2	C	PL/M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet redox dark surface (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☒ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point meets biotic crust (B12), Saturation Visible on Aerial Imagery (C9), and the FAC-Neutral test (D5).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/7/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-142**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Convex Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.713833 Long: -122.514678 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Sample point located on a berm between a broad wetland swale associated with a stream and an abandonded golf course pond. Sample point paired with SP-141.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Elymus caput-medusae*	65	Yes	NL
2. *Elymus triticoides*	15		FAC
3. *Centaurea solstitialis*	15		UPL
4. *Festuca arundinacea*	5		FACU
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation is not present within the sampled area.

SOIL

Sampling Point SP-142

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-18	5Y2.5/1	100					Loamy Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Hydric soil indicators were not observed within the sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Wetland hydrology indicators were not observed within the sample point.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/7/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-143**

Investigator(s) Gavin Albertoli, Scott Yarger, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Concave Slope(%) 0-3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.715877 Long: -122.511441 Datum: WGS 84

Soil Map Unit Name Yorkville variant clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in man made swale associated with golf course. Wetland boundary delineated based on topography and vegetation. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Sample point paired with SP-144.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' x 5'			
1. *Hordeum marinum ssp. gussoneanum*	30	Yes	FAC
2. *Eleocharis macrostachya*	30	Yes	OBL
3. *Festuca perennis*	15		FAC
4. *Bromus hordeaceus*	10		FACU
5. *Rumex crispus*	5		FAC
6. *Polypogon monspeliensis*	5		FACW
7.			
8.			
Herb Stratum Total Cover:	95		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 5 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Hydrophytic vegetation was observed within the sampled area.

SOIL

Sampling Point SP-143

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	10YR3/2	95	5YR3/3	5	C	M/PL	Sandy Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point meets Biotic Crust (B12) and Saturation Visible on Aerial Imagery (C9).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/7/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-144**

Investigator(s) Gavin Albertoli, Scott Yarger, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Concave Slope(%) 0-2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.715734 Long: -122.511169 Datum: WGS 84

Soil Map Unit Name Yorkville variant clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point taken adjacent to swale associated with golf course. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Sample point paired with SP-143.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' x 5'			
1. *Elymus caput-medusae*	70	Yes	NL
2. *Centaurea solstitialis*	15		NL
3. *Festuca arundinacea*	3		FACU
4. *Bromus diandrus*	2		NL
5. *Bromus hordeaceus*	2		FACU
6.			
7.			
8.			
Herb Stratum Total Cover:	92		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 3 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: 5% Thatch. Vegetation does not meet dominance test.

SOIL

Sampling Point SP-144

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	7.5YR3/3	100					Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/7/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-145**

Investigator(s) Gavin Albertoli, Scott Yarger, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Concave Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.713365 Long: -122.509533 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point taken in broad wetland swale. Wetland boundary delineated based on topography and vegetation. Sample point meets criteria for hydrophytic vegetation and wetland hydrology. Soils are problematic (serpentine) and assumed to by hydric. Sample point paired with SP-146.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Juncus xiphiodes*	65	Yes	OBL
2. *Festuca perennis*	30	Yes	FAC
3. *Rumex crispus*	1		FAC
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover: 96			
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover: 0			

% Bare ground in herb stratum 4 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Hydrophytic vegetation was observed within the sampled area.

SOIL

Sampling Point SP-145

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	2.5Y3/2	49	7.5YR2/3	1	C	M	Clay	serpentine soils
	2.5Y3/1	50						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Dark serpentine parent material may be masking redox. Soils assumed hydric based on dominance of perennial obligate vegetation and presence of primary indicators of wetland hydrology.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point meets Biotic Crust (B12) and Saturation Visible on Aerial Imagery (C9).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/7/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-146**

Investigator(s) Gavin Albertoli, Scott Yarger, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Convex Slope(%) 5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.713351 Long: -122.509705 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point taken in uplands on edge of large wetland swale. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Sample point paired with SP-145.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Bromus hordeaceus*	80	Yes	FACU
2. *Hemizonia congesta subsp. calyculata*	5		NL
3. *Festuca perennis*	3		FAC
4. *Elymus caput-medusae*	t		NL
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	88		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 8 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: 4% thatch. Vegetation does not meet dominance test.

SOIL

Sampling Point SP-146

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	2.5Y3/2	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators of hydric soil observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/7/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-147**

Investigator(s) Gavin Albertoli, Scott Yarger, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Concave Slope(%) 5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.713919 Long: -122.507858 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located within large wetland swale associated with stream. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Wetland boundary delineated based on topography and vegetation.Sample point paired with SP-148.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Festuca perennis*	60	Yes	FAC
2. *Polypogon monspeliensis*	20	Yes	FACW
3. *Juncus xiphiodes*	20	Yes	OBL
4. *Zeltnera muehlenbergii*	t		FAC
5. *Lactuca serriola*	t		FACU
6.			
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 3 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Hydrophytic vegetation was observed within the sampled area.

SOIL

Sampling Point SP-147

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	N 3/1	80	7.5YR 4/6	20	C	PL/M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet Redox Dark Surface (F6) indicator.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 4

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Saturation observed but no water table associated with it. Two secondary hydrology indicators of Saturation Visible on Aerial Imagery (C9) and FAC-Neutral Test (D5) were met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 9/7/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-148**

Investigator(s) Gavin Albertoli, Scott Yarger, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) valley floor Local Relief (concave, convex, none) Concave Slope(%) 0-2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.713985 Long: -122.507581 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 2 to 8 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located in uplands adjacent to a broad wetland swale. Sample point does not meet criteria for hydrophytic vegetation, hydric soils or wetland hydrology. Sample point paired with SP-147.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Festuca myuros*	35	Y	FACU
2. *Elymus caput-medusae*	20	Y	NL
3. *Hemizonia congesta subsp. calyculata*	5		NL
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover: 60			
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover: 0			

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Vegetation does not meet dominance test.

SOIL

Sampling Point SP-148

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-6	10YR3/3	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: clay shovel refusal

Depth (inches): 6

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Shovel refusal at 6 inches. No indicators of hydric soil observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 8/28/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-149**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Swale Local Relief (concave, convex, none) Concave Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.732011 Long: -122.540729 Datum: WGS 84

Soil Map Unit Name Jafa loam, 2 to 5 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in a marginal swale, paired with SP-150. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Wetland boundary based on shift in vegetation and topography.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 10' x 10'			
1. *Agrostis avenaceae*	40	Yes	FACW
2. *Festuca perennis*	35	Yes	FAC
3. *Holocarpha virgata*	15		NL
4. *Eryngium aristulatum*	5		OBL
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	95		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 5 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Hydrophytic vegetation is present within the sampled area.

SOIL

Sampling Point SP-149

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-5	10YR 5/2	75	7.5YR 4/6	25	C	PL/RC/M	Clay	
5-10	10YR 4/2	50	10YR 3/4	50	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Redox dark surface hydric soil indicator was observed within the sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Surface water incidentally observed March through May 2018.Sample point meets Oxidized Rhizosphere along Living Roots (C3) and Saturation Visible on Aerial Imagery (C9).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 8/28/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-150**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Field Local Relief (concave, convex, none) None Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.732144 Long: -122.540777 Datum: WGS 84

Soil Map Unit Name Jafa loam, 2 to 5 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located in an upland field. Paired with SP-149. Sample point did not meet wetland indicators for hydrophytic vegetation, hydric soils, or wetland hydrology.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Avena barbata*	30	Yes	UPL
2. *Bromus hordeaceus*	20	Yes	FACU
3. *Elymus caput-medusae*	20	Yes	UPL
4. *Holocarpha virgata*	8		UPL
5. *Trifolium hirtum*	2		UPL
6.			
7.			
8.			
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 20 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation is not present within the sampled area.

SOIL

Sampling Point SP-150

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	7.5YR 4/4	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches): _____

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Hydric soil indicators were not observed within the sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Wetland hydrology indicators were not observed within the sample point.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 8/28/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-151**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Swale Local Relief (concave, convex, none) Concave Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.730141 Long: -122.541315 Datum: WGS 84

Soil Map Unit Name Jafa loam, 2 to 5 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point located in a swale adjacent to wet field. Paired with SP-152. Sample point met wetland indicators for hydric soils, wetland hydrology, and hydrophytic vegetation.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 10' x 10'			
1. *Juncus balticus*	40	Yes	FACW
2. *Hemizonia congesta ssp. luzulifolia*	20	Yes	UPL
3. *Leontodon saxatilis*	10		FACU
4. *Juncus occidentalis*	5		FACW
5. *Eryngium aristulatum*	5		OBL
6.			
7.			
8.			
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 20 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 50 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species	5	x1	5
FACW species	45	x2	90
FAC species	0	x3	0
FACU species	10	x4	40
UPL species	20	x5	100
Column Totals	80 (A)		235 (B)

Prevalence Index = B/A = 2.9

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%
☒ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation is not present within the sampled area.

SOIL

Sampling Point SP-151

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-7	10YR3/1	90	7.5YR 3/4	10	C	PL/RC	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Redox dark surface (F6) hydric soil indicator was observed within the sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☒ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Surface water incidentally observed March through May 2018. Deep hoof prints observed.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 8/28/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-152**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Toe slope Local Relief (concave, convex, none) None Slope(%) 5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.730205 Long: -122.54139 Datum: WGS 84

Soil Map Unit Name Jafa loam, 2 to 5 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Upland sample point paired with SP-151. Sample point did not meet wetland indicators for hydrophytic vegetation, hydric soils, or wetland hydrology.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 10' x 10'			
1. *Elymus caput-medusae*	50	Yes	UPL
2. *Bromus hordeaceus*	30	Yes	FACU
3. *Avena barbata*	20	Yes	UPL
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation is not present within the sampled area.

SOIL

Sampling Point SP-152

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	10YR4/3	100					Loamy Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Hydric soil indicators were not observed within the sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Wetland hydrology indicators were not observed within the sample point.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 8/28/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-153**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Swale Local Relief (concave, convex, none) Concave Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.727979 Long: -122.542389 Datum: WGS 84

Soil Map Unit Name Bressa-Millsholm loams, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample Point paired with SP-154. Sample point did meet wetland indicators for hydrophytic vegetation, hydric soils, and wetland hydrology.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 10' x 10'			
1. *Juncus balticus*	55	Yes	FACW
2. *Juncus xiphioides*	5		OBL
3.			
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	60		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 40 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Hydrophytic vegetation is present within the sampled area.

SOIL

Sampling Point SP-153

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-5	10YR 5/2	95	10YR3/6	5	C	PL/RC	Loamy Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Clay

Depth (inches): 5

Hydric Soil Present ? ☒ Yes ☐ No

Remarks: Depleted matrix (F3) hydric soil indicator was observed within the sample point. Deep hoof prints were also observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☒ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ Yes ☐ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Surface water observed indidentally March through May 2018.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 8/28/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-154**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Local Relief (concave, convex, none) Convex Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.727894 Long: -122.542433 Datum: WGS 84

Soil Map Unit Name Bressa-Millsholm loams, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point paired with SP-153. Upland sample point with *Quercus lobata*. Sample point did not meet wetland indicators for hydrophytic vegetation, hydric soils, or wetland hydrology.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 30'	Absolute % cover	Dominant Species?	Indicator Status
1. *Quercus lobata*	60	Yes	FACU
2.			
3.			
4.			
Tree Stratum Total Cover:	60		
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Avena barbata*	30	Yes	UPL
2. *Festuca perennis*	30	Yes	UPL
3. *Bromus hordeaceus*	15		FACU
4. *Carduus pycnocephalus*	5		UPL
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 20 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation is not present within the sampled area.

SOIL

Sampling Point SP-154

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	10YR 4/3	100					Loamy Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Hydric soil indicators were not observed within the sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Wetland hydrology indicators were not observed within the sample point.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 8/28/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-155**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Local Relief (concave, convex, none) Concave Slope(%) 4

Subregion(LRR) LRR C (Medit. CA) Lat: 38.726374 Long: -122.543079 Datum:

Soil Map Unit Name Bressa-Millsholm loams, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample Point located in a swale starting off property. Sample point meets criteria for hydrophytic vegetation, hydric soils and wetland hydrology. Wetland boundary based on shift in aerial signature, vegetation and topography. Sample point paired with SP-156

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Juncus balticus*	85	Yes	FACW
2. *Hordeum marinum*	8		FAC
3. *Rumex crispus*	2		FAC
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	95		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 5 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Hydrophytic vegetation was observed within the sampled area.

SOIL

Sampling Point SP-155

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-5	10YR 3/2	80	7.5YR 3/4	20	C	RC/PL/M	Loamy Clay	
5-12	10YR 3/1	50	7.5YR 3/4	10	C	RC/PL/M	Loamy Clay	40% gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soil within the sampled point displayed an hydric soil indicator of redox dark surface.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Oxidized rhizospheres along living roots (C3) were observed within the sampled area. Surface water incidentally observed from March through May 2018.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City Unincorporated County Lake Sampling Date 8/28/2018

Applicant/Owner Lotus Land Investment Holdings, Inc. State CA Sampling Point **SP-156**

Investigator(s) Tanner Harris, Rhiannon Korhummel, WRA, Inc. Section,Township,Range

Landform (hillslope, terrace, etc.) Local Relief (concave, convex, none) None Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.726445 Long: -122.543088 Datum: WGS 84

Soil Map Unit Name Bressa-Millsholm loams, 15 to 30 percent slopes NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point paired with SP-155. Sample point did not meet wetland indicators for hydrophytic vegetation, hydric soils, or wetland hydrology.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 10' x 10'			
1. *Avena barbata*	30	Yes	UPL
2. *Bromus hordeaceus*	20	Yes	FACU
3. *Briza maxima*	10		UPL
4. *Croton setiger*	10		UPL
5. *Centaurea solstitialis*	5		UPL
6. *Holocarpha virgata*	3		UPL
7. *Acmispon americanus*	2		UPL
8.			
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:	0		

% Bare ground in herb stratum 20 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Hydrophytic vegetation is not present within the sampled area.

SOIL

Sampling Point SP-156

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	7.5YR 4/4	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: Hydric soil indicators were not observed within the sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Wetland hydrology indicators were not observed within the sample point.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 5/7/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-157**

Investigator(s) Scott Yarger, Rhiannon Korhummel (WRA, Inc.) Section,Township,Range S25 T11N R06W

Landform (hillslope, terrace, etc.) plain Local Relief (concave, convex, none) none Slope(%) 0

Subregion(LRR) LRR C (Medit. CA) Lat: 38.778918 Long: -122.470474 Datum: WGS 84

Soil Map Unit Name Water NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☐ Yes ☒ No
Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point taken in FAC/FACW-dominated vernally mesic valley grassland. Sample point meets vegetation criteria but does not have hydric soils or wetland hydrology. Determined to be upland. No paired point.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Festuca perennis*	45	X	FAC
2. *Trifolium wildenovii*	10		FACW
3. *Elymus caput-medusae*	10		UPL
4. *Hemizonia congesta*	5		UPL
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	70		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 30 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Meets Dominance Test indicator.

SOIL

Sampling Point SP-157

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	7.5YR 3/2	100					Clay	hoof punch

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: none

Depth (inches):

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Extensive hoof punch, but no persistent indicators.

No indicators met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 4/24/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-158**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S25 T11N R06W

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) none Slope(%) 10

Subregion(LRR) LRR C (Medit. CA) Lat: 38.777389 Long: -122.47765 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Hillslope seep that flows down road. Boundary based on shift in vegetation and extent of wetland hydrology indicators. Sample point paired with SP-159.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' x 5'			
1. *Eleocharis macrostachya*	40	X	OBL
2. *Festuca perennis*	20	X	FAC
3. *Medicago polymorpha*	8		FACU
4. *Lysimachia arvensis*	5		NL
5. *Carduus pycnocephalus*	5		NL
6. *Lythrum hyssopifolium*	2		OBL
7.			
8.			
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM Plot Size: 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 20 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Meets Dominance Test indicator.

SOIL

Sampling Point SP-158

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-8	5Y 2.5/1	93	7.5YR 3/4	7	C	PL/M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils meet F6.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☒ Yes ☐ No Depth (inches): 2-4

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-8

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Meets primary hydrology indicator A1; meets secondy hydrology indicator D5.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 4/24/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-159**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S25 T11N R06W

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) none Slope(%) 15

Subregion(LRR) LRR C (Medit. CA) Lat: 38.777353 Long: 38.777353 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Upland point paired with SP-158. Hillslope adjacent to seep.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Avena barbata*	15	X	NL
2. *Festuca perennis*	15	X	FAC
3. *Bromus hordeaceus*	15	X	FACU
4. *Medicago polymorpha*	10		FACU
5. *Trifolium hirtum*	10		NL
6. *Centaurea melitensis*	5		NL
7. *Carduus pycnocephalus*	3		NL
8. *Amsinckia sp.*	2		NL
Herb Stratum Total Cover:	75		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 15 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 33 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species _____	x1 _____
FACW species _____	x2 _____
FAC species _____	x3 _____
FACU species _____	x4 _____
UPL species _____	x5 _____
Column Totals _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: thatch ~ 10%

No indicators met.

SOIL

Sampling Point SP-159

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	2.5Y 3/2	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators met

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Soil cracking present, but deep. Shrink-swell clays.

No indicators met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 5/7/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-160**

Investigator(s) Scott Yarger, Rhiannon Korhummel (WRA, Inc.) Section,Township,Range S25 T11N R06W

Landform (hillslope, terrace, etc.) toe of slope Local Relief (concave, convex, none) convex Slope(%) 5-30

Subregion(LRR) LRR C (Medit. CA) Lat: 38.777068 Long: -122.477086 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Wetland sample point in seep at toe of slope at the edge of a road. Seep extends up hill on slope. Boundary based on shift in vegetation. Paired with SP-161.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' x 5'			
1. *Hordeum marinum ssp. gussoneanum*	45	X	FACW
2. *Festuca perennis*	30	X	FAC
3. *Juncus bufonius*	8		FACW
4. *Bromus hordeaceus*	3		FACU
5. *Trifolium glomeratum*	1		NL
6. *Erodium brachycarpum*	1		NL
7.			
8.			
Herb Stratum Total Cover:	88		
WOODY VINE STRATUM Plot Size: 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust 12

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Meets Dominance Test indicator.

SOIL

Sampling Point SP-160

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-8	10YR 3/1	80	10YR 3/3	20	C	M/PL	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: none

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Meets hydric soil indicator F6.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Meets primary hydrology indicator B12 (Biotic Crust).

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 5/7/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-161**

Investigator(s) Scott Yarger, Rhiannon Korhummel (WRA, Inc.) Section,Township,Range S25 T11N R06W

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) none Slope(%) 20

Subregion(LRR) LRR C (Medit. CA) Lat: 38.777102 Long: -122.477172 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Upland point paired with SP-160 on hillslope adjacent to seep above road.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Festuca perennis*	20	X	FAC
2. *Bromus hordeaceus*	15	X	FACU
3. *Avena barbata*	10		NL
4. *Medicago polymorpha*	5		FACU
5. *Agoseris sp.*	3		?
6.			
7.			
8.			
Herb Stratum Total Cover:	53		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 47 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 50 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species _____	x1 _____
FACW species _____	x2 _____
FAC species _____	x3 _____
FACU species _____	x4 _____
UPL species _____	x5 _____
Column Totals _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: No indicators met.

SOIL

Sampling Point SP-161

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	10YR 3/1	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: none

Depth (inches):

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 4/24/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-162**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S25 T11N R06W

Landform (hillslope, terrace, etc.) toe of slope Local Relief (concave, convex, none) none Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.775327 Long: -122.476112 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Seepy area at toe of slope adjacent to floodplain. Sample point paired with SP-163. Boundary based on shift in vegetation and extent of saturated soils.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Eleocharis macrostachya*	40	X	OBL
2. *Ranunculus muricatus*	20	X	FACW
3. *Medicago polymorpha*	10		FACU
4. *Trifolium dubium*	10		UPL
5. *Lysimachia arvensis*	5		NL
6. *Festuca perennis*	5		FAC
7.			
8.			
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 10 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Meets Dominance Test indicator.

SOIL

Sampling Point SP-162

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-8	2.5Y 3/1	93	7.5YR 3/4	7	C	PL/M	Clay	
8-10	2.5Y 3/2	90	7.5YR 3/4	10	C	PL/M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: F6 - thickness requirement 4". Requires matrix value 3 or less and chroma 1 or less w/ 2% distinct or prominent redox. Have 7% in layer 1 with prominent redox. Meets indicator F6.

Meets hydric soil indicator F6.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☒ Yes ☐ No Depth (inches): 2-4 in hoof punch

Water table present? ☒ Yes ☐ No Depth (inches): 10+

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-10

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Meets primary hydrology indicators A1, A2, and A3 and secondary indicator D5.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 4/24/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-163**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S25 T11N R06W

Landform (hillslope, terrace, etc.) toe of slope Local Relief (concave, convex, none) none Slope(%) 5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.775379 Long: -122.476104 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Upland sample point paired with SP-162.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Medicago polymorpha*	60	X	FACU
2. *Trifolium dubium*	15		UPL
3. *Festuca perennis*	10		FAC
4. *Bromus hordeaceus*	5		FACU
5. *Trifolium hirtum*	5		NL
6. *Hypochaeris glabra*	3		NL
7. *Avena barbata*	2		NL
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species _____	x1 _____
FACW species _____	x2 _____
FAC species _____	x3 _____
FACU species _____	x4 _____
UPL species _____	x5 _____
Column Totals _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: No indicators met

SOIL

Sampling Point SP-163

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-10	10YR 3/2	100					Clay loam	
10-12	10YR 3/2	100	7.5YR 3/4	trace	C	M	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 4/24/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-164**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S25 T11N R06W

Landform (hillslope, terrace, etc.) toe of slope Local Relief (concave, convex, none) none Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.773577 Long: -122.47728 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Unpaired sample point in potential wetland signature. FAC-dominated vegetation, but soils and hydrology criteria not met; determined to be upland.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Trifolium variegatum*	20	X	FAC
2. *Bromus hordeaceus*	15	X	FACU
3. *Briza minor*	10	X	FAC
4. *Festuca perennis*	10	X	FAC
5. *Hordeum marinum ssp. gussoneanum*	10	X	FAC
6. *Hypochaeris glabra*	10	X	NL
7. *Ranunculus muricatus*	10	X	FACW
8. *Erodium cicutarium*	5		NL
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 5 (A)

Total number of dominant species across all strata? 7 (B)

% of dominant species that are OBL, FACW, or FAC? 71 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species _____	x1 _____
FACW species _____	x2 _____
FAC species _____	x3 _____
FACU species _____	x4 _____
UPL species _____	x5 _____
Column Totals _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Herb stratum cont. Juncus bufonius 5% FACW, Trifolium fucatum 5% FACU

SOIL

Sampling Point SP-164

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-2	7.5YR 2.5/1	90	7.5YR 3/4	2	C	PL	Loam	
2-10	7.5YR 3/4	90	2.5YR 4/2	10	D	PL	Loam	Matrix = redox
10-12	7.5YR 4/4	90	2.5YR 4/3	10	D	PL	Clay loam	Matrix = redox

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No indicators met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 4/24/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-165**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S25 T11N R06W

Landform (hillslope, terrace, etc.)_____ Local Relief (concave, convex, none) concave Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.773764 Long: -122.474893 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Wetland swale in paleo channel. Boundary based on shift in vegetation and channel topography. Paired with SP-166.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' x 5'			
1. *Ranunculus muricatus*	35	X	FACW
2. *Erythranthe guttata*	20	X	OBL
3. *Festuca perennis*	15		FAC
4. *Hordeum marinum ssp. gussoneanum*	5		FAC
5. *Plagiobothrys sp.*	5		?
6. *Montia sp.*	3		?
7. *Poa annua*	2		FAC
8.			
Herb Stratum Total Cover:	85		
WOODY VINE STRATUM Plot Size: 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 15 % cover of biotic crust Trace

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Meets Dominance Test indicator.

SOIL

Sampling Point SP-165

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-6	10YR 2/1	100					Loam	
6-10	10YR 3/2	95	7.5YR 3/4	5	C	M/PL	Sandy loam	with rocks and boulders

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Cobble / rocks

Depth (inches): 10"

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils very dark. Distinct redox concentrations.

Meets hydric soil indicator F6

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☒ Yes ☐ No Depth (inches): 9-10

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-9

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Deeper hoof prints relative to adjacent upland areas.

Meets primary hydrology indicators A2, A3, B13 and secondary hydrology indicator D5.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 4/24/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-166**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S25 T11N R06W

Landform (hillslope, terrace, etc.) terrace Local Relief (concave, convex, none) none Slope(%) 5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.773819 Long: -122.474924 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Upland point on swale edge. Paired with SP-165.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Bromus hordeaceus*	20	X	FACU
2. *Hordeum murinum*	20	X	FACU
3. *Erodium cicutarium*	10		NL
4. *Medicago polymorpha*	10		FACU
5. *Sisymbrium officinale*	5		NL
6. *Festuca bromoides*	5		FACU
7. *Amsinckia cf. intermedia*	3		NL
8. *Hypochaeris glabra*	1		NL
Herb Stratum Total Cover:	75		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 25 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Herb stratum cont.: Carduus pycnocephalus 1% NL

No indicators met.

SOIL

Sampling Point SP-166

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-4	7.5YR 3/2	100					Sandy clay loam	
4-11	7.5YR 3/3	100					Sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: cobble / rock

Depth (inches): 11

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 4/24/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-167**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S25 T11N R06W

Landform (hillslope, terrace, etc.) terrace Local Relief (concave, convex, none) concave Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.774844 Long: -122.473548 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Wetland swale. Boundary based on shift in vegetation and topography. Sample point paired with SP-168.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 2' x 5'			
1. *Ranunculus muricatus*	60	X	FACW
2. *Plagiobothrys sp.*	10		?
3. *Festuca perennis*	7		FAC
4. *Poa annua*	3		FAC
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM Plot Size: 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 20 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Meets Dominance Test indicator.

SOIL

Sampling Point SP-167

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-3	2.5YR 3/2	85	7.5YR 3/4	15	C	M/PL	Clay loam	
3-8	7.5YR 4/2	95	7.5YR 4/6	5	C	M/PL	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: rock / gravel

Depth (inches): 8

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Meets F3.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☒ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Meets primary hydrology indicators B6 and B9 and secondary indicator D5.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 4/24/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-168**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S25 T11N R06W

Landform (hillslope, terrace, etc.) terrace Local Relief (concave, convex, none) none Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.774792 Long: -122.473583 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Upland point paired with SP-167.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Bromus hordeaceus*	20	X	FACU
2. *Festuca bromoides*	20	X	FACU
3. *Hordeum murinum*	15		FACU
4. *Trifolium hirtum*	15		NL
5. *Medicago polymorpha*	10		FACU
6. *Capsella bursa-pastoris*	10		NL
7. *Festuca perennis*	5		FAC
8.			
Herb Stratum Total Cover:	95		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 5 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: No indicators met.

SOIL

Sampling Point SP-168

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-2	10YR 3/3100	100					Loam	
2-8	7.5YR 4/4	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: gravel / rock

Depth (inches): 8

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Shovel refusal at 8 inches.

No indicators met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 5/2/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-169**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S31 T11N R05W

Landform (hillslope, terrace, etc.) terrace Local Relief (concave, convex, none) slight concave Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.761985 Long: -122.46082 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 2 to 15 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Wetland swale. Paired with SP-170. Boundary based on shift in vegetation and topography.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' x 5'			
1. *Hordeum marinum ssp. gussoneanum*	25	X	FACW
2. *Trifolium variegatum*	25	X	FAC
3. *Eleocharis macrostachya*	25	X	OBL
4. *Leontodon saxatilis*	10		FACU
5. *Eryngium aristulatum*	3		OBL
6. *Erythranthe guttata*	2		OBL
7.			
8.			
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM Plot Size: 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 10 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 3 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Meets Dominance Test indicator.

SOIL

Sampling Point SP-169

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-10	7.5YR 3/2	83	10YR2/1	10	C	M		[ma]
			5YR 3/4	7	C	PL/M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: cobble

Depth (inches): 10"

Hydric Soil Present ? ☒ Yes ☐ No

Remarks: Meets F6.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☒ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☒ Yes ☐ No Depth (inches): 2

Water table present? ☒ Yes ☐ No Depth (inches): 9-10

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-9

Wetland Hydrology Present ? ☒ Yes ☐ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Meets primary wetland hydrology indicators A1, A2, A3, A4 and secondary hydrology indicator D5. Standing water in microdepressions.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 5/2/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-170**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S31 T11N R05W

Landform (hillslope, terrace, etc.) terrace Local Relief (concave, convex, none) slight convex Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.76202 Long: -122.460795 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 2 to 15 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Upland sample point. Paired with SP-169.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Bromus hordeaceus*	30	X	FACU
2. *Acmispon americanus*	20	X	UPL
3. *Avena barbata*	15		NL
4. *Trifolium dubium*	10		UPL
5. *Erodium cicutarium*	10		NL
6. *Trifolium hirtum*	5		NL
7. *Hordeum marinum ssp. gussoneanum*	5		FACW
8.	t		
Herb Stratum Total Cover:	95		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Thatch - 5%

No indicators met.

SOIL

Sampling Point SP-170

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-12	7.5YR 5/3	95	10YR 2/1	5	C	M	Clay loam	Mn concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: none

Depth (inches):

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No indicators met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 5/7/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-171**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S2 T10N R06W

Landform (hillslope, terrace, etc.) valley bottom Local Relief (concave, convex, none) none Slope(%) 0

Subregion(LRR) LRR C (Medit. CA) Lat: 38.753874 Long: -122.496726 Datum: WGS 84

Soil Map Unit Name Still loam, stratified substratum NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point in depression in wet meadow. Boundary based on shift in vegetation and topography. Paired with SP-172.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' x 5'			
1. *Hordeum marinum*	60	X	FAC
2. *Lasthenia glabrata*	5		FACW
3. *Pleuropogon californicus*	3		OBL
4. *Rumex crispus*	2		FAC
5. *Veronica peregrina*	t		FAC
6.			
7.			
8.			
Herb Stratum Total Cover:	70		
WOODY VINE STRATUM Plot Size: 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 10 % cover of biotic crust 20

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Meets Dominance Test indicator.

SOIL

Sampling Point SP-171

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	2.5Y 2.5/1	75	2.5Y 4/3	15	D	M	Clay	
			7/5YR 3/4	7	C	PL/M	Clay	
			7/5YR 4/6	3	C	PL/M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: none

Depth (inches):

Hydric Soil Present ? ☒ Yes ☐ No

Remarks: Meets hydric soil indicator F6.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☒ Yes ☐ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Meets primary hydrology indicators B9 and B12.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 5/7/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-172**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S2 T10N R06W

Landform (hillslope, terrace, etc.) valley bottom Local Relief (concave, convex, none) none Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.753952 Long: -122.49671 Datum: WGS 84

Soil Map Unit Name Still loam, stratified substratum NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Margin of field, adjacent to stream. Separated from adjacent wetland by low berm at fenceline. Paired with SP-171. Boundary based on shift in vegetation and topography.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Bromus hordeaceus*	30	X	FACU
2. *Festuca arundinacea*	15	X	FACU
3. *Festuca perennis*	15	X	FAC
4. *Lactuca serriola*	10		FACU
5. *Taraxacum officinale*	3		FACU
6. *Convolvulus arvensis*	1		NL
7. *Vicia sativa*	1		FACU
8. *Hemizonia congesta*	t		UPL
Herb Stratum Total Cover:	75		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 25 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 33 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species _____	x1 _____
FACW species _____	x2 _____
FAC species _____	x3 _____
FACU species _____	x4 _____
UPL species _____	x5 _____
Column Totals _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Meets Dominance Test indicator.

SOIL

Sampling Point SP-172

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	2.5Y 2.5/1	98	7.5YR 3/4	2	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: none

Depth (inches):

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: Soil with vertic cracking.

No indicators met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 6/20/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-173**

Investigator(s) Tanner Harris (WRA, Inc.) Scott Batiuk (WRA, Inc.) Section,Township,Range S2 T10N R6W

Landform (hillslope, terrace, etc.) depression Local Relief (concave, convex, none) concave Slope(%) 0-1

Subregion(LRR) LRR C (Medit. CA) Lat: 38.753096 Long: -122.49739 Datum: WGS 84

Soil Map Unit Name Still loam, stratified substratum NWI classification none

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Wetland in former agricultural field. Edge of broad shallow depression where Carex praegracilis (clustered field sedge) is dominant. Paired with SP-174.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' x 5'			
1. *Carex praegracilis*	70	X	FACW
2. *Lactuca saligna*	10		UPL
3. *Festuca arundinacea*	10		FACU
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM Plot Size: 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust 10

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Meets Dominance Test indicator.

SOIL

Sampling Point SP-173

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-16	N 2.5/-	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: none

Depth (inches):

Hydric Soil Present ? ☒ Yes ☐ No

Remarks: Soils assumed hydric based on dominance of obligate wetland vegetation and primary hydrology indicators.

3-inch layer of organic matter on surface, suggestive of long-term inundation. Dark soils may be masking redox.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☒ Yes ☐ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Meets primary wetland hydrology indicator B12 and secondary indicator D5.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 6/20/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-174**

Investigator(s) Tanner Harris (WRA, Inc.) Scott Batiuk (WRA, Inc.) Section,Township,Range S2 T10N R6W

Landform (hillslope, terrace, etc.) field Local Relief (concave, convex, none) none Slope(%) 0-1

Subregion(LRR) LRR C (Medit. CA) Lat: 38.753197 Long: -122.497187 Datum: WGS 84

Soil Map Unit Name Still loam, stratified substratum NWI classification none

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Upland sample point adjacent to wetland feature. SP taken where hydrology indicators not observed and vegetation is not hydrophytic. Paired with SP-173.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Festuca arundinacea*	35	X	FACU
2. *Lactuca salgina*	25	X	UPL
3. *Lotus tenuis*	20		FACU
4. *Trifolium fragiferum*	15		FAC
5. *Hordeum marinum*	3		FAC
6.			
7.			
8.			
Herb Stratum Total Cover:	98		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 2 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: No indicators met.

SOIL

Sampling Point SP-174

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	N 2.5/-	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: none

Depth (inches):

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 6/17/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-175**

Investigator(s) Tanner Harris, Rhiannon Korhummel (WRA, Inc.) Section,Township,Range S2 T10N R6W

Landform (hillslope, terrace, etc.) terrace Local Relief (concave, convex, none) concave Slope(%) 0

Subregion(LRR) LRR C (Medit. CA) Lat: 38.75084 Long: -122.497225 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification none

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point taken in swale adjacent to raised berm. Paired with SP-176. Boundary based on shift in vegetation and topography.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Eleocharis macrostachya*	50	X	OBL
2. *Polypogon monspeliensis*	10		FACW
3. *Festuca arundinacea*	10		FACU
4. *Juncus xiphioides*	5		OBL
5. *Trifolium fragiferum*	5		FAC
6.			
7.			
8.			
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 10 % cover of biotic crust 10

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Meets Dominance Test indicator.

SOIL

Sampling Point SP-175

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-11	N 2.5/-	100					Clay	
11-12	N 2.5/-	99	5YR 3/4	1	C	M	Clay	slightly more moist

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: none

Depth (inches):

Hydric Soil Present ? ☒ Yes ☐ No

Remarks: Soils assumed hydric based on dominance of obligate wetland vegetation and strong primary hydrology indicators. Dark soils may be masking redox.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☒ Yes ☐ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Meets primary wetland hydrology indicator B12 and secondary hydrology indicator D5.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 6/17/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-176**

Investigator(s) Tanner Harris (WRA, Inc.) Rhiannon Korhummel (WRA, Section,Township,Range S2 T10N R6W

Landform (hillslope, terrace, etc.) terrace Local Relief (concave, convex, none) convex Slope(%) 0

Subregion(LRR) LRR C (Medit. CA) Lat: 38.750711 Long: -122.497231 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification none

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Upland sample point paired with SP-175.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Festuca arundinacea*	70	x	FACU
2. *Lotus corniculatus*	25	X	FAC
3. *Trifolium fragiferum*	5		FAC
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover: 100			
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 50 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: No indicators met.

SOIL

Sampling Point SP-176

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-4	10YR 2/2	100					Clay	root zone
4-12	2.5Y 2.5/1	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: none

Depth (inches):

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No indicators met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 6/20/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-177**

Investigator(s) Tanner Harris (WRA, Inc.) Scott Batiuk (WRA, Inc.) Section,Township,Range S2 T10N R6W

Landform (hillslope, terrace, etc.) field Local Relief (concave, convex, none) none Slope(%) 0-1

Subregion(LRR) LRR C (Medit. CA) Lat: 38.749616 Long: -122.494129 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification none

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Upland sample point on gentle slope near vineyards in former agricultural field. Sample point representative of upland conditions in area.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Festuca arundinacea*	55	X	FACU
2. *Trifolium fragiferum*	30	X	FAC
3. *Lotus corniculatus*	15		FAC
4. *Polypogon monspliensis*	t		FACW
5.			
6.			
7.			
8.			
Herb Stratum Total Cover: 100			
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 50 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: No indicators met.

SOIL

Sampling Point SP-177

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	N 2.5/-	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: none

Depth (inches):

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No indicators met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 6/20/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-178**

Investigator(s) T. Harris, S. Batiuk (WRA, Inc.) Section,Township,Range S2 T10N R6W

Landform (hillslope, terrace, etc.) field Local Relief (concave, convex, none) none Slope(%) 0

Subregion(LRR) LRR C (Medit. CA) Lat: 38.747935 Long: -122.491359 Datum: WGS 84

Soil Map Unit Name Still loam, stratified substratum NWI classification none

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Unpaired sample point taken in representative FACU-dominated portion of field. Sample point lacks hydrophytic vegetation, hydric soils, and wetland hydrology, determined to be upland.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' x 5'			
1. *Trifolium fragiferum*	60	Y	FAC
2. *Festuca arundinacea*	40	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM Plot Size: 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 50 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: No indicators met.

SOIL

Sampling Point SP-178

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	N2.5/0	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: none

Depth (inches):

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of wetland hydrology.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 6/20/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-179**

Investigator(s) T. Harris, S. Batiuk (WRA, Inc.) Section,Township,Range S2 T10N R6W

Landform (hillslope, terrace, etc.) depression Local Relief (concave, convex, none) concave Slope(%) 0

Subregion(LRR) LRR C (Medit. CA) Lat: 38.748601 Long: -122.49192 Datum: WGS 84

Soil Map Unit Name Maxwell clay loam, 0 to 2 percent slopes NWI classification none

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Sample point taken in slight depression at edge of field. Sample point contains hydrophytic vegetation and has indicators of hydric soils and wetland hyrdrology. Boundary based on topography and shift in vegetation. Paired with SP-180.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Carex pragracilis*	60	Y	FACW
2. *Festuca arundinacea*	10	N	FACU
3. *Trifolium fragiferum*	5	N	FAC
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	75		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 10 % cover of biotic crust 15

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Meets dominance test.

SOIL

Sampling Point SP-179

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-6	N 2.5/0	100					Clay	
6-12	N 2.5/0	75	2.5Y 4/1	20	D	M	Clay	
			5YR 4/6	5	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☒ Depleted Dark Surface (F7)
- ☒ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: none

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Meets multiple hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Sample point contains biotic crust and meets FAC-neutral test.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 6/20/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-180**

Investigator(s) Tanner Harris (WRA, Inc.) Scott Batiuk (WRA, Inc.) Section,Township,Range S2 T10N R6W

Landform (hillslope, terrace, etc.) field Local Relief (concave, convex, none) none Slope(%) 0

Subregion(LRR) LRR C (Medit. CA) Lat: 38.748652 Long: -122.491871 Datum: WGS 84

Soil Map Unit Name Still loam, stratified substratum NWI classification none

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☒ Yes ☐ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Upland sample point taken adjacent to wetland depression in former agricultural field. Sample point contains indicators of hydric soils (possibly relict from previous flood irrigation), it does not contain hydrophytic vegetation or indicators of wetland hydrology. Sample point paired with SP-179.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' x 5'			
1. *Festuca arundinacea*	60	X	FACU
2. *Trifolium fragerifum*	39	X	FAC
3. *Polypogon monspliensis*	1		FACW
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM Plot Size: 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 50 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: No indicators met.

SOIL

Sampling Point SP-180

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-6	N 2.5/-	100					Clay	
6-12	N 2.5/-	85	2.5Y 4/1	10	D	M	Clay	
			5YR 4/6	5	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: none

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Meets hydric soil indicator F6, Redox Dark Surface. Redox potentially relict, from previous history of flood irrigation.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 5/7/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-181**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S2 T10N R06W

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) concave Slope(%) 5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.742011 Long: -122.490009 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Wetland sample point in hillslope seep. Boundary based on shift in vegetation and topography. Paired with SP-182.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' radius			
1. *Festuca perennis*	100	X	FAC
2. *Erythranthe microphylla*	t		OBL
3. *Rumex crispus*	t		FAC
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM Plot Size: 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Meets Dominace Test indicator.

SOIL

Sampling Point SP-181

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-4	10YR 2/1	100					Mucky gravelly	loam
4+								restrictive layer rock

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☒ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: rock

Depth (inches): 4

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Meets hydric soil indicator F1.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☒ Yes ☐ No Depth (inches): 1-0

Water table present? ☒ Yes ☐ No Depth (inches): surface

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Meets primary wetland hydrology indicators A1, A2, and A3.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 5/7/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-182**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S2 T10N R06W

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) convex Slope(%) 3

Subregion(LRR) LRR C (Medit. CA) Lat: 38.742055 Long: -122.49 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Upland sample point on slope adjacent to seep. Paired with SP-181.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Bromus madratensis*	30	X	UPL
2. *Elymus caput-medusae*	30	X	NL
3. *Bromus hordeaceus*	25	X	FACU
4. *Chlorogalum pomeridianum*	1		NL
5. *Torilis arvensis*	1		NL
6. *Lactuca serriola*	1		FACU
7. *Geranium dissectum*	1		NL
8.			
Herb Stratum Total Cover:	89		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 1 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Litter 10%

No indicators met.

SOIL

Sampling Point SP-182

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-8	5YR 3/3	100					cobbly clay loam	
8+								restrictive rocky layer

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: rock

Depth (inches): 8

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No indicators met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 5/7/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-183**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S3 T10N R06W

Landform (hillslope, terrace, etc.) valley bottom Local Relief (concave, convex, none) slight concave Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.743051 Long: -122.515067 Datum: WGS 84

Soil Map Unit Name Still loam, stratified substratum NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Seepy area/overflow from spring-fed cattle trough. Paired with SP-184. Boundary based on shift in vegetation.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Typha sp.*	10	X	OBL
2. *Epilobium ciliatum*	10	X	FACW
3. *Rumex crispus*	10	X	FAC
4. *Unknown grass*	5		unknown
5. *Festuca perennis*	3		FAC
6. *Lactuca serriola*	2		FACU
7.			
8.			
Herb Stratum Total Cover:	40		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 3 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species _____	x1 _____
FACW species _____	x2 _____
FAC species _____	x3 _____
FACU species _____	x4 _____
UPL species _____	x5 _____
Column Totals _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Thatch 60%.

Meets Dominance Test indicator.

SOIL

Sampling Point SP-183

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-8	10YR 3/2	100					Loam	gravelly
8-12	10YR 3/2	100					Loam	gravels (mostly gravel)

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: none

Depth (inches):

Hydric Soil Present ? ☒ Yes ☐ No

Remarks: Soils very dark; naturally problematic.

Soils assumed hydric based on obligate and faculative wetland vegetation and primary hydrology indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☒ Yes ☐ No Depth (inches): 1-2

Water table present? ☒ Yes ☐ No Depth (inches): 2-12

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-2

Wetland Hydrology Present ? ☒ Yes ☐ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Meets primary hydrology indicators A1, A2, A3, and secondary hydrology indicator D5.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 5/7/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-184**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S3 T10N R06W

Landform (hillslope, terrace, etc.) valley bottom Local Relief (concave, convex, none) none Slope(%) 2

Subregion(LRR) LRR C (Medit. CA) Lat: 38.74315 Long: -122.515096 Datum: WGS 84

Soil Map Unit Name Still loam, stratified substratum NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☒ Yes ☐ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Upland paired with SP-183. Redox features potentially relict.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Bromus diandrus*	30	X	NL
2. *Bromus hordeaceus*	30	X	FACU
3. *Festuca perennis*	10		FAC
4. *Lactuca serriola*	5		FACU
5. *Rumex crispus*	3		FAC
6. *Festuca bromoides*	2		FACU
7.			
8.			
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Thatch 20%

No indicators met.

SOIL

Sampling Point SP-184

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-6	10YR 3/2	95	7.5YR 3/4	5	C	M/PL	Clay	
6-12	10YR 3/1	70	7.5YR 3/4	20	C	M/PL	Clay	
	10YR 3/2	10						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: none

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Redox may be relict features from before spring was developed.

Meets hydric soil indicator F6.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 5/2/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-185**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S3 T10N R06W

Landform (hillslope, terrace, etc.) valley bottom Local Relief (concave, convex, none) slight concave Slope(%) 0

Subregion(LRR) LRR C (Medit. CA) Lat: 38.742252 Long: -122.512136 Datum: WGS 84

Soil Map Unit Name Kelsey fine sandy loam NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☒ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Shallow ponded area in work yard on compacted soils and with strong hydrology indicators. Paired with SP186. Boundary based on shift in vegetation and slight shift in topography.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' x 5'			
1. *Lythrum hyssopifolium*	10	X	OBL
2. *Hordeum marinum ssp. gussoneanum*	10	X	FACW
3. *Veronica anagalis-aquatica*	10	X	OBL
4. *Poa secunda*	5		FACU
5. *Plagiobothrys sp.*	5		
6.			
7.			
8.			
Herb Stratum Total Cover:	40		
WOODY VINE STRATUM Plot Size: 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 60 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 3 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Meets Dominance Test indicator.

SOIL

Sampling Point SP-185

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-4	2.5Y 3/2	100					Clay loam	with gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: shovel refusal (clay & gravel)

Depth (inches): 4

Hydric Soil Present ? ☒ Yes ☐ No

Remarks: Shallow inundated area on compacted fill. Redoxomorphic features on surface, but not visible in profile. Soils assumed hydric based on hydrophytic vegetation and primary hydrology indicators being met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☒ Surface Soil Cracks (B6)
- ☒ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☒ Yes ☐ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Meets primary hydrology indicators B6 and B7 and secondary indicator D5.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 5/2/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-186**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S3 T10N R06W

Landform (hillslope, terrace, etc.) valley bottom Local Relief (concave, convex, none) none Slope(%) 0

Subregion(LRR) LRR C (Medit. CA) Lat: 38.742181 Long: -122.512063 Datum: WGS 84

Soil Map Unit Name Kelsey fine sandy loam NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Upland point paired with SP-185.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Bromus hordeaceus*	50	X	FACU
2. *Hordeium murinum*	25	X	FACU
3. *Amsinckia sp.*	10		NL
4. *Trifolium hirtum*	5		NL
5. *Centaurea melitensis*	5		NL
6. *Cerastium arvense*	5		FACU
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: No indicators met.

SOIL

Sampling Point SP-186

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-4	10YR 2/2	100					Clay loam	with gravel
4-12	10YR 3/2	100					Clay loam	with gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: none

Depth (inches):

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 5/7/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-187**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S3 T10N R06W

Landform (hillslope, terrace, etc.) toe of slope Local Relief (concave, convex, none) none Slope(%) 5

Subregion(LRR) LRR C (Medit. CA) Lat: 38.742669 Long: -122.502699 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Seep adjacent to stream. Paired with SP-188. Boundary based on shift in vegetation.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Hordeum brachyantherum*	40	X	FACW
2. *Festuca perennis*	10		FAC
3. *Carex serratodens*	10		FACW
4. *Juncus xiphioides*	10		OBL
5. *Sisyrinchium bellum*	5		FACW
6. *Elymus triticoides*	5		FAC
7.			
8.			
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 20 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Meets Dominance Test indicator.

SOIL

Sampling Point SP-187

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-4	2.5Y 3/2	100					Clay	
4-5	2.5Y 2.5/1	100					Clay	burried horizon?
5-12	2.5Y 3/2	82	5GY 3/1	3	D	PL	Clay	
			7.5YR 3/4	5	C	M/PL	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: none

Depth (inches):

Hydric Soil Present ? ☒ Yes ☐ No

Remarks: Meets hydric soil indicator F6.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☒ Yes ☐ No Depth (inches): 2-4

Water table present? ☒ Yes ☐ No Depth (inches): 8-12

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-8

Wetland Hydrology Present ? ☒ Yes ☐ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Meets primary hydrology indicators A1, A2, A3, and secondary hydrology indicators C9 and D5.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 5/7/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-188**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S3 T10N R06W

Landform (hillslope, terrace, etc.) toe of slope Local Relief (concave, convex, none) none Slope(%) 10

Subregion(LRR) LRR C (Medit. CA) Lat: 38.742625 Long: -122.50262 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Upland paired with SP-187.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Bromus hordeaceus*	60	X	FACU
2. *Acmispon americanus*	15		UPL
3. *Bromus diandrus*	5		NL
4. *Erodium cicutarium*	t		NL
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 20 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: No indicators met.

SOIL

Sampling Point SP-188

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-8	7.5YR 3/3	100					Clay loam	with gravels & cobbles
8+								rocky restrictive layer

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: shovel refusal (rocks)

Depth (inches): 8

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 5/7/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-189**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S2 T10N R06W

Landform (hillslope, terrace, etc.) toe of slope Local Relief (concave, convex, none) none Slope(%) 4

Subregion(LRR) LRR C (Medit. CA) Lat: 38.743097 Long: -122.501005 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Hordeum brachyantherum patch at seepy area. Paired with SP-190. Boundary based on shift in vegetation.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Hordeum brachyantherum*	30	X	FACW
2. *Erythranthe microphylla*	20	X	OBL
3. *Triteleia peduncularis*	10		FACW
4. *Plagiobothrys sp.*	5		?
5. *Festuca microstachys*	5		NL
6.			
7.			
8.			
Herb Stratum Total Cover:	70		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 30 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Meets Dominance Test indicator.

SOIL

Sampling Point SP-189

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[1]	Texture	Remarks
0-6	10YR 2/2	100					Loam	high concentration of gravel
6+								gravel restrictive layer

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: gravel

Depth (inches): 6

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: Soils assumed hydric based on obligate and faculative wetland vegetation and primary hydrology indicators. Dark serpentine soils may be masking redox.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☒ Yes ☐ No Depth (inches): 2

Water table present? ☒ Yes ☐ No Depth (inches): 4-6

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-4

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Meets primary hydrology indicators A1, A2, A3, and secondary hydrology indicators C9 and D5.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 5/7/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-190**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S2 T10N R06W

Landform (hillslope, terrace, etc.) toe of slope Local Relief (concave, convex, none) none Slope(%) 5

Subregion(LRR) LRR C (Medit. CA) Lat: -122.501005 Long: -122.500932 Datum: WGS 84

Soil Map Unit Name Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Hillside adjacent to seep. Paired with SP-189.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Hypochaeris glabra*	10	X	NL
2. *Festuca microstachys*	10	X	NL
3. *Acmispon wrangelianus*	5		NL
4. *Acmispon americanus*	5		UPL
5. *Hemizonia sp.*	5		?
6. *Trichostema lanceolatum*	3		FACU
7. *Chlorogalum pomeridianum*	2		NL
8. *Erythranthe microphylla*	t		OBL
Herb Stratum Total Cover:	40		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 60 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: No indicators met.

SOIL

Sampling Point SP-190

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-8	10YR 2/2	100					Clay	with gravel and cobble
8+								cobble / gravel restrictive layer

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: cobble / gravel

Depth (inches): 8

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No indicators met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 5/2/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-191**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S12 T10N R06W

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) none Slope(%) 10

Subregion(LRR) LRR C (Medit. CA) Lat: 38.731022 Long: -122.481485 Datum: WGS 84

Soil Map Unit Name Sobrante-Hambright-Guenoc complex, 30 to 50 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Hillside seep above stream. Paired with SP-192. Boundary based on shift in vegetation.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Juncus xiphioides*	30	X	OBL
2. *Carex serratodens*	30	X	FACW
3. *Festuca perennis*	20	X	FAC
4. *Festuca arundinacea*	10		FACU
5. *Lotus corniculatus*	5		FAC
6. *Acmispon americanus*	3		UPL
7. *Lactuca saligna*	1		UPL
8. *Cirsium vulgare*	1		FACU
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 3 (A)

Total number of dominant species across all strata? 3 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Meets Dominance Test indicator

SOIL

Sampling Point SP-191

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	2.5Y 3/1	95	10GY 3/1	5	D	M/PL	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: none

Depth (inches):

Hydric Soil Present ? ☒ Yes ☐ No

Remarks: Soils very dark. Naturally problomatic serpentine soils. Assumed hydric based on obligate and facultative wetland vegetation and primary hydrology indicators being met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☒ Yes ☐ No Depth (inches): 2-0

Water table present? ☒ Yes ☐ No Depth (inches): 12+

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-12

Wetland Hydrology Present ? ☒ Yes ☐ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Standing water in hoof marks. Soils saturated.

Meets primary hydrology indicators A1, A2, A3, and secondary hydrology indicator D5.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 5/2/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-192**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S12 T10N R06W

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) none Slope(%) 10

Subregion(LRR) LRR C (Medit. CA) Lat: 38.731002 Long: -122.481548 Datum: WGS 84

Soil Map Unit Name Sobrante-Hambright-Guenoc complex, 30 to 50 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Upland paired with SP-191.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Bromus hordeaceus*	20	X	FACU
2. *Micropus californicus*	20	X	FACU
3. *Madia elegans*	15		NL
4. *Achyrachaena mollis*	15		FAC
5. *Lasthenia californica*	5		FACU
6. *Festuca perennis*	3		FAC
7. *Navarretia sp.*	2		?
8.			
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Thatch - 20%

No indicators met.

SOIL

Sampling Point SP-192

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-7	2.5Y 3/2	99	7.5YR 3/3	1	C	M	Clay loam	
7-12	2.5Y 3/1	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: none

Depth (inches):

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No indicators met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 5/7/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-193**

Investigator(s) Scott Yarger, Rhiannon Korhummel (WRA, Inc.) Section,Township,Range S12 T10N R06W

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) convex Slope(%) 4

Subregion(LRR) LRR C (Medit. CA) Lat: 38.720372 Long: -122.465969 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Seep wetland within Pinus sabiniana and Quercus wislizeni stand at toe of steeper slope. Paired with SP-194.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Eleocharis macrostachya*	30	X	OBL
2. *Helenium bigelovii*	30	X	FACW
3. *Nasturtium officinale*	15		OBL
4. *Festuca perennis*	5		FAC
5. *Polypogon sp.*	5		?
6. *Carex serratodens*	5		FACW
7.			
8.			
Herb Stratum Total Cover:	90		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 10 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Meets Dominance Test indicator.

SOIL

Sampling Point SP-193

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-12	10YR 3/1	85	7.5YR 2.5/3	15	C	M/PL	Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: none

Depth (inches):

Hydric Soil Present ? ☒ Yes ☐ No

Remarks: Meets hydric soil indicator F6.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☒ Yes ☐ No Depth (inches): 0

Water table present? ☒ Yes ☐ No Depth (inches): 0

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0

Wetland Hydrology Present ? ☒ Yes ☐ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Meets primary hydrology indicators A1, A2, and A3 and secondary hydrology indicator D5.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 5/7/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-194**

Investigator(s) Scott Yarger, Rhiannon Korhummel (WRA, Inc.) Section,Township,Range S12 T10N R06W

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) convex Slope(%) 15

Subregion(LRR) LRR C (Medit. CA) Lat: 38.720343 Long: -122.465929 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Upland on hillslope. Paired with SP-193.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 25' radius	Absolute % cover	Dominant Species?	Indicator Status
1. *Pinus sabiniana*	15	X	NL
2. *Quercus douglasii*	5	X	NL
3.			
4.			
Tree Stratum Total Cover:	20		
SAPLING/SHRUB STRATUM **Plot Size:** 10' radius			
1. *Frangula californica*	5	X	NL
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:	5		
HERB STRATUM **Plot Size:** 10' x 10'			
1. *Festuca bromoides*	50	X	FACU
2. *Ranunculus californicus*	5		FACU
3. *Sanicula crassicaulis*	5		NL
4. *Elymus glaucus*	1		FACU
5. *Acmispon sp.*	t		UPL/NL
6. *Trifolium bifidum*	t		NL
7. *Aira caryophyllea*	t		NL
8.			
Herb Stratum Total Cover:	61		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 4 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:	
OBL species	x1	
FACW species	x2	
FAC species	x3	
FACU species	x4	
UPL species	x5	
Column Totals	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Litter 39%

No indicators met.

SOIL

Sampling Point SP-194

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	7.5YR 3/3	100					Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: none

Depth (inches):

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators met.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 5/7/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-195**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S18 T10N R05W

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) none Slope(%) 10

Subregion(LRR) LRR C (Medit. CA) Lat: 38.718514 Long: -122.460659 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Hillside seep. Boundary based on hydrophytic vegetation, aerial signatures, and extent of soil saturation. Paired with SP-196.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' x 5'			
1. *Eleocharis macrostachya*	35	X	OBL
2. *Juncus xiphioides*	20	X	OBL
3. *Toxicoscordion fremontii*	10		NL
4. *Melilotus indicus*	10		FACU
5. *Acmispon sp.*	10		?
6. *Sisyrinchium bellum*	10		FACW
7. *Trifolium variegatum*	3		FAC
8. *Lysimachia arvensis*	3		NL
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM Plot Size: 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 2 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Herb stratum cont.: Lactuca saligna 2% UPL

Meets Dominance Test indicator.

SOIL

Sampling Point SP-195

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-5	7.5YR 3/2	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: cobble

Depth (inches): 5

Hydric Soil Present ? ☒ Yes ☐ No

Remarks: Soils assumed hydric based on dominance of obligate wetland vegetation and strong primary hydrology indicators.

Dark red soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☒ Yes ☐ No Depth (inches): 0.25-0

Water table present? ☒ Yes ☐ No Depth (inches): 2-5

Saturation Present? (includes capillary fringe) ☒ Yes ☐ No Depth (inches): 0-2

Wetland Hydrology Present ? ☒ Yes ☐ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: Thin layer of surfce water at seepy spots and around rocks.

Meets primary wetland hydrology indicators A1, A2, A3 and secondary hydrology indicator C9 and D5.

Wetland Determination Data Form - Arid West Region

Project/Site Guenoc Valley Development City _____ County Lake Sampling Date 5/7/2019

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-196**

Investigator(s) Tanner Harris (WRA, Inc.), Scott Batiuk (WRA, Inc.) Section,Township,Range S18 T10N R05W

Landform (hillslope, terrace, etc.) hillslope Local Relief (concave, convex, none) none Slope(%) 0

Subregion(LRR) LRR C (Medit. CA) Lat: 38.718595 Long: -122.460767 Datum: WGS 84

Soil Map Unit Name Henneke-Montara-Rock outcrop complex, 15 to 50 percent slopes NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Upland adjacent to seep paired with SP-195.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 0	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** 0			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' x 5'			
1. *Bromus hordeaceus*	25	X	FACU
2. *Festuca perennis*	25	X	FAC
3. *Medicago polymorpha*	10		FACU
4. *Melilotus indicus*	10		FACU
5. *Acmispon cf. wrangelianus*	4		NL
6. *Erodium cicutarium*	3		NL
7. *Geranium dissectum*	2		NL
8. *Elymus caput-medusae*	1		NL
Herb Stratum Total Cover:	85		
WOODY VINE STRATUM **Plot Size:** 0			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 0 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 2 (B)

% of dominant species that are OBL, FACW, or FAC? 50 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species _____	x1 _____
FACW species _____	x2 _____
FAC species _____	x3 _____
FACU species _____	x4 _____
UPL species _____	x5 _____
Column Totals _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Herb stratum cont.: Lactuca saligna 1% UPL, Holocarpha virgata 1% NL, Sonchus oleraceus 1% UPL, Hordeum murinum 1% FACU, Avena sp. 1% UPL

No indicators met.

SOIL

Sampling Point SP-196

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-10	7.5YR 3/3	100					Clay loam	with gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: gravel

Depth (inches): 10

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No indicators met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators met.

APPENDIX D

STUDY AREA PHOTOGRAPHS

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Photo 1. Example of forested wetland along Bucksnort Creek.

Photo 2. Example of forested wetland along Bucksnort Creek.

Photo 3. Example of scrub-shrub wetland within the Study Area.

Photo 4. Example of scrub-shrub wetland along Butts Creek.

Photo 5. Example of a seasonal wetland depression within the Study Area.

Photo 6. Example of a seasonal wetland depression within the Study Area.

Photo 7. Example of a seasonal wetland ditch within the Study Area.

Photo 8. Example of a seasonal wetland ditch within the Study Area.

Photo 9. Example of seasonal wetland pond fringe within the Study Area.

Photo 10. Example of seasonal wetland pond fringe within the Study Area.

Photo 11. Example of a seasonal wetland seep/swale within the Study Area.

Photo 12. Example of a seasonal wetland seep/swale within the Study Area.

Photo 13. Example of a seasonal wetland wet meadow within the Study Area.

Photo 14. Example of a seasonal wetland wet meadow within the Study Area.

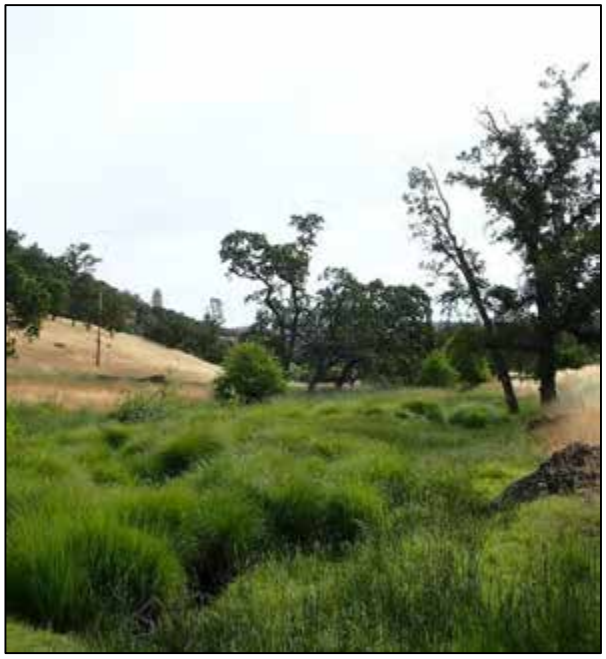

Photo 15. Example of a stream fringe/in-stream wetland within the Study Area.

Photo 16. Example of a stream fringe/in-stream wetland within the Study Area.

Photo 17. Example of an ephemeral ditch within the Study Area.

Photo 18. Example of an ephemeral ditch within the Study Area.

Photo 19. Example of an ephemeral stream within the Study Area.

Photo 20. Example of an ephemeral stream within the Study Area.

Photo 21. Example of an intermittent stream (McCain Creek) within the Study Area.

Photo 22. Example of an intermittent stream (Butcherknife Creek) within the Study Area.

Photo 23. Example of a perennial stream (Putah Creek) within the Study Area.

Photo 24. Example of a perennial stream (Bucksnort Creek) within the Study Area.

Photo 25. Example of open water (Upper Bohn Lake) within the Study Area.

Photo 26. Example of open water (Lower Bohn Lake) within the Study Area.

APPENDIX E

PLANT SPECIES OBSERVED WITHIN THE STUDY AREA

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Appendix E. List of Plant Species Observed within Guenoc Ranch

Surveys were conducted by WRA biologists between 2017 and 2019. Plant nomenclature follows Baldwin et al. (2012) and subsequent revisions by the Jepson Flora Project (2019).

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Acer macrophyllum	Bigleaf maple	native	tree	-	-	FAC	-
Achillea millefolium	Yarrow	native	perennial herb	-	-	FACU	-
Achyrachaena mollis	Blow wives	native	annual herb	-	-	FAC	-
Acmispon americanus var. *americanus*	Spanish lotus	native	annual herb	-	-	UPL	-
Acmispon brachycarpus	Short podded lotus	native	annual herb	-	-	-	-
Acmispon glaber var. *glaber*	Deerweed	native	perennial herb	-	-	-	-
Acmispon parviflorus	Hill lotus	native	annual herb	-	-	-	-
Acmispon wrangelianus	Chilean trefoil	native	annual herb	-	-	-	-
Adenostoma fasciculatum var. *fasciculatum*	Chamise	native	tree, shrub	-	-	-	-
Adiantum jordanii	California maidenhair fern	native	fern	-	-	FAC	-
Aegilops triuncialis	Goatgrass	non-native (invasive)	annual grass	-	High	-	-
Aesculus californica	Buckeye	native	tree	-	-	-	-
Agoseris grandiflora var. *grandiflora*	Giant mountain dandelion	native	perennial herb	-	-	-	-
Agoseris heterophylla var. *cryptopleura*	Mountain dandelion	native	annual herb	-	-	-	-
Agoseris heterophylla var. *heterophylla*	Annual agoseris	native	annual herb	-	-	-	-
Agrostis avenacea	Pacific bentgrass	non-native (invasive)	perennial grass	-	Limited	FACW	-
Agrostis stolonifera	Redtop	non-native (invasive)	perennial grass	-	Limited	FACW	-
Aira caryophyllea	Silvery hairgrass	non-native	annual grass	-	-	FACU	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Alisma lanceolatum	Water plantain	non-native	perennial herb (aquatic)	-	-	OBL	-
Allium amplectens	Narrow leaved onion	native	perennial herb (bulb)	-	-	-	2.3
Allium falcifolium	Sickle leaf onion	native	perennial herb (bulb)	-	-	-	4.2
Allium fimbriatum var. *fimbriatum*	Fringed onion	native	perennial herb (bulb)	-	-	-	-
Allium serra	Jeweled onion	native	perennial herb (bulb)	-	-	-	2.6
Alnus rhombifolia	White alder	native	tree	-	-	FACW	-
Alopecurus pratensis	Meadow foxtail	non-native	perennial grass	-	Watch	FACW	-
Amaranthus retroflexus	Rough pigweed	non-native	annual herb	-	-	FACU	-
Amsinckia intermedia	Common fiddleneck	native	annual herb	-	-	-	-
Amsinckia lycopsoides	Tarweed fiddleneck	native	annual herb	-	-	-	-
Amsinckia menziesii	Fiddleneck	native	annual herb	-	-	-	-
Amsinckia retrorsa	Rigid fiddleneck	native	annual herb	-	-	-	-
Ancistrocarphus filagineus	Woolly fishhooks	native	annual herb	-	-	-	3.3
Angelica californica	California angelica	native	perennial herb	-	-	-	-
Angelica tomentosa	Woolly angelica	native	perennial herb	-	-	-	2.7
Anisocarpus madioides	Woodland madia	native	perennial herb	-	-	-	-
Anthemis cotula	Dog fennel	non-native	annual herb	-	-	FACU	-
Antirrhinum vexillocalyculatum ssp. *vexillocalyculatum*	Wiry snapdragon	native	annual herb	-	-	-	-
Antirrhinum virga	Tall snapdragon	native	perennial herb	Rank 4.3	-	-	2.8
Aphanes occidentalis	Ladie's mantle	native	annual, perennial herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Apiastrum angustifolium	Wild celery	native	annual herb	-	-	UPL	1.5
Aphyllon fasciculatum	Clustered broomrape	native	perennial herb (parasitic)	-	-	-	-
Apocynum cannabinum	Indian hemp	native	perennial herb	-	-	FAC	-
Aquilegia eximia	Serpentine columbine	native	perennial herb	-	-	OBL	4.2
Arbutus menziesii	Madrone	native	tree	-	-	-	-
Arceuthobium campylopodum	Pine dwarf mistletoe	native	perennial herb (parasitic)	-	-	-	-
Arctostaphylos glandulosa ssp. *cushingiana*	Cushing manzanita	native	shrub	-	-	-	-
Arctostaphylos manzanita ssp. *elegans*	Konocti manzanita	native	shrub	Rank 1B.3	-	-	-
Arctostaphylos manzanita ssp. *manzanita*	Common manzanita	native	shrub	-	-	-	-
Arctostaphylos viscida ssp. *pulchella*	White leaf manzanita	native	tree, shrub	-	-	-	5
Arctostaphylos viscida ssp. *viscida*	Smooth white leaf manzanita	native	tree, shrub	-	-	-	2.2
Arnica discoidea	Rayless arnica	native	perennial herb	-	-	-	-
Artemisia douglasiana	California mugwort	native	perennial herb	-	-	FAC	-
Asclepias cordifolia	Purple milkweed	native	perennial herb	-	-	-	-
Asclepias eriocarpa	Indian milkweed	native	perennial herb	-	-	-	-
Asclepias fascicularis	Milkweed	native	perennial herb	-	-	FAC	-
Aspidotis densa	Lace fern	native	fern	-	-	-	3.4
Astragalus breweri	Brewer's milk vetch	native	annual herb	Rank 4.2	-	-	3.2
Astragalus clevelandii	Cleveland's milk vetch	native	perennial herb	Rank 4.3	-	FAC	6.1
Astragalus gambelianus	Gambel's dwarf milk vetch	native	annual herb	-	-	-	-
Astragalus rattanii var. *jepsonianus*	Jepson's milk vetch	native	annual herb	Rank 1B.2	-	-	4.3

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Athyrium filix-femina var. *cyclosorum*	Western lady fern	native	fern	-	-	FAC	-
Athysanus pusillus	Dwarf athysanus	native	annual herb	-	-	-	-
Avena barbata	Slim oat	non-native (invasive)	annual, perennial grass	-	Moderate	-	-
Avena fatua	Wildoats	non-native (invasive)	annual grass	-	Moderate	-	-
Baccharis pilularis ssp. *consanguinea*	Coyote brush	native	shrub	-	-	-	-
Baccharis salicifolia ssp. *salicifolia*	Mule fat	native	shrub	-	-	FAC	-
Balsamorhiza macrolepis	Big scale balsam root	native	perennial herb	Rank 1B.2	-	-	-
Barbarea vulgaris	Yellow rocket	non-native	perennial herb	-	-	FAC	-
Bellardia trixago	Mediterranean lineseed	non-native (invasive)	annual herb	-	Limited	-	-
Brickellia californica	California brickellia	native	perennial herb	-	-	FACU	-
Briza maxima	Rattlesnake grass	non-native (invasive)	annual grass	-	Limited	-	-
Briza minor	Little rattlesnake grass	non-native	annual grass	-	-	FAC	-
Brodiaea elegans ssp. *elegans*	Harvest brodiaea	native	perennial herb	-	-	FACU	-
Brodiaea leptandra	Narrow-anthered brodiaea	native	perennial herb	Rank 1B.2	-	-	-
Bromus carinatus var. *carinatus*	California brome	native	perennial grass	-	-	-	-
Bromus diandrus	Ripgut brome	non-native (invasive)	annual grass	-	Moderate	-	-
Bromus hordeaceus	Soft chess	non-native (invasive)	annual grass	-	Limited	FACU	-
Bromus laevipes	Narrow flowered brome	native	annual, perennial grass	-	-	-	1.7

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Bromus madritensis ssp. *madritensis*	Foxtail chess	non-native	annual grass	-	-	UPL	-
Bromus madritensis ssp. *rubens*	Foxtail brome	non-native (invasive)	annual grass	-	High	UPL	-
Calandrinia menziesii	Red maids	native	annual herb	-	-	FACU	-
Callitriche heterophylla var. *bolanderi*	Bolander's water starwort	native	annual herb	-	-	OBL	-
Calochortus amabilis	Golden fairy lantern	native	perennial herb	-	-	-	-
Calochortus luteus	Yellow mariposa	native	perennial herb	-	-	-	-
Calochortus splendens	Splendid mariposa	native	perennial herb	-	-	-	-
Calochortus tolmiei	Hairy star tulip	native	perennial herb	-	-	-	-
Calochortus uniflorus	Large flowered star tulip	native	perennial herb	Rank 4.2	-	FACW	1.7
Calochortus vestae	Yellow mariposa	native	perennial herb	-	-	-	2
Calycadenia fremontii	Fremont's calycadenia	native	annual herb	-	-	-	-
Calycadenia pauciflora	Small flowered calycadenia	native	annual herb	-	-	-	5.3
Calycanthus occidentalis	Spicebush	native	shrub	-	-	FAC	-
Calystegia collina ssp. *collina*	Hillside morning glory	native	perennial herb	-	-	-	4.7
Calystegia collina ssp. *oxyphylla*	Mt. Saint Helena morning glory	native	perennial herb (rhizomatous)	Rank 4.2	-	-	5.6
Calystegia occidentalis ssp. *occidentalis*	Modoc morning glory	native	perennial herb	-	-	-	-
Calystegia purpurata ssp. *purpurata*	Smooth western morning glory	native	perennial herb	-	-	-	-
Camissoniopsis intermedia	Intermediate sun cups	native	annual herb	-	-	-	-
Campanula angustiflora	Eastwood's harebell	native	annual herb	-	-	-	3.9
Capsella bursa-pastoris	Shepherd's purse	non-native	annual herb	-	-	FACU	-
Cardamine hirsuta	Hairy bitter cress	non-native	annual herb	-	-	FACU	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Cardamine oligosperma	Idaho bittercress	native	annual, perennial herb	-	-	FAC	-
Carduus pycnocephalus ssp. *pycnocephalus*	Italian thistle	non-native (invasive)	annual herb	-	Moderate	-	-
Carex barbarae	Valley sedge	native	perennial grasslike herb	-	-	FAC	-
Carex densa	Dense sedge	native	perennial grasslike herb	-	-	OBL	-
Carex multicaulis	Forest sedge	native	perennial grasslike herb	-	-	-	-
Carex nudata	Torrent sedge	native	perennial grasslike herb	-	-	FACW	-
Carex pellita	Woolly sedge	native	perennial grasslike herb	-	-	OBL	-
Carex praegracilis	Field sedge	native	perennial grasslike herb	-	-	FACW	-
Carex serratodens	Bifid sedge	native	perennial grasslike herb	-	-	FACW	4.9
Carex tumulicola	Split awn sedge	native	perennial grasslike herb	-	-	FACU	-
Castilleja affinis ssp. *affinis*	Coast Indian paint brush	native	perennial herb	-	-	-	-
Castilleja applegatei ssp. *martinii*	Martin's paintbrush	native	perennial herb	-	-	-	-
Castilleja attenuata	Narrow leaved owl's clover	native	annual herb	-	-	-	-
Castilleja densiflora ssp. *densiflora*	Dense flower owl's clover	native	annual herb	-	-	-	-
Castilleja exserta ssp. *exserta*	Purple owl's clover	native	annual herb	-	-	-	-
Castilleja foliolosa	Texas paintbrush	native	perennial herb	-	-	-	2.3
Castilleja minor	Little paintbrush	native	annual herb	-	-	OBL	-
Castilleja rubicundula ssp. *lithospermoides*	Cream sacs	native	annual herb	-	-	-	2.4
Caulanthus lasiophyllus	California mustard	native	annual herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Ceanothus cuneatus var. *cuneatus*	Buck brush	native	shrub	-	-	-	1.5
Ceanothus foliosus var. *foliosus*	Wavy leaved ceanothus	native	shrub	-	-	-	-
Ceanothus integerrimus var. *macrothyrsus*	Deerbrush	native	shrub	-	-	-	-
Ceanothus jepsonii	Musk brush	native	shrub	-	-	-	6
Centaurea calcitrapa	Purple star thistle	non-native (invasive)	annual, perennial herb	-	Moderate	-	-
Centaurea melitensis	Tocalote	non-native (invasive)	annual herb	-	Moderate	-	-
Centaurea solstitialis	Yellow starthistle	non-native (invasive)	annual herb	-	High	-	-
Centromadia fitchii	Spikeweed	native	annual herb	-	-	FACU	-
Cephalanthus occidentalis	Common buttonbush	native	shrub	-	-	OBL	-
Cerastium glomeratum	Large mouse ears	non-native	annual herb	-	-	UPL	-
Cercis occidentalis	Western redbud	native	tree, shrub	-	-	-	-
Cercocarpus betuloides var. *betuloides*	Birch leaf mountain mahogany	native	tree, shrub	-	-	-	-
Chaenactis glabriuscula var. *heterocarpha*	Variable fruited yellow chaenactis	native	annual herb	-	-	-	2.5
Chenopodium album	Lambs quarters	non-native	annual herb	-	-	FACU	-
Chlorogalum pomeridianum var. *pomeridianum*	Common soaproot	native	perennial herb	-	-	-	-
Chorizanthe membranacea	Pink spineflower	native	annual herb	-	-	-	-
Chorizanthe polygonoides var. *polygonoides*	Knotweed spineflower	native	annual herb	-	-	-	-
Cichorium intybus	Chicory	non-native	perennial herb	-	-	FACU	-
Cirsium cymosum var. *cymosum*	Peregrine thistle	native	perennial herb	-	-	-	-
Cirsium douglasii	Swamp thistle	native	perennial herb	-	-	OBL	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Cirsium occidentale var. *venustum*	Coulter's thistle	native	perennial herb	-	-	-	-
Cirsium vulgare	Bullthistle	non-native (invasive)	perennial herb	-	Moderate	FACU	-
Clarkia amoena ssp. *huntiana*	Farewell to spring	native	annual herb	-	-	-	-
Clarkia concinna ssp. *concinna*	Red ribbons	native	annual herb	-	-	-	-
Clarkia gracilis ssp. *tracyi*	Tracy's clarkia	native	annual herb	Rank 4.2	-	-	5
Clarkia purpurea ssp. *quadrivulnera*	Purple clarkia	native	annual herb	-	-	-	-
Clarkia rhomboidea	Tongue clarkia	native	annual herb	-	-	-	-
Clarkia unguiculata	Woodland clarkia	native	annual herb	-	-	-	-
Claytonia exigua ssp. *exigua*	Serpentine springbeauty	native	annual herb	-	-	-	3.4
Claytonia parviflora ssp. *parviflora*	Miner'slettuce	native	annual herb	-	-	FACU	-
Claytonia perfoliata ssp. *perfoliata*	Miner's lettuce	native	annual herb	-	-	FAC	-
Clematis lasiantha	Pipestem	native	perennial herb, vine	-	-	-	-
Clematis ligusticifolia	Creek clematis	native	perennial herb, vine	-	-	FAC	-
Collinsia greenei	Greene's collinsia	native	annual herb	-	-	-	5.2
Collinsia heterophylla var. *heterophylla*	Purple chinese houses	native	annual herb	-	-	-	-
Collinsia sparsiflora var. *sparsiflora*	Few flowered collinsia	native	annual herb	-	-	-	-
Collomia diversifolia	Serpentine collomia	native	annual herb	Rank 4.3	-	-	5.6
Collomia heterophylla	Varied leaved collomia	native	annual herb	-	-	-	-
Convolvulus arvensis	Field bindweed	non-native	perennial herb, vine	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Cordylanthus pilosus ssp. *pilosus*	Hairy bird's beak	native	annual herb	-	-	-	-
Cordylanthus tenuis ssp. *brunneus*	Serpentine bird's beak	native	annual herb (hemiparasitic)	Rank 4.3	-	-	5.1
Cornus nuttallii	Mountain dogwood	native	shrub	-	-	FACU	-
Cornus sericea ssp. *occidentalis*	Western dogwood	native	shrub	-	-	FACW	-
Crassula aquatica	Aquatic pygmy weed	native	annual herb	-	-	OBL	-
Crassula connata	Sand pygmy weed	native	annual herb	-	-	FAC	-
Crassula tillaea	Mediterranean pygmy weed	non-native	annual herb	-	-	FACU	-
Crocanthemum scoparium	Peak rush-rose	native	shrub	-	-	-	-
Croton setiger	Turkey-mullein	native	perennial herb	-	-	-	-
Crypsis sp.	Prickle grass	non-native	annual grass	-	-	FACW-OBL-	-
Cryptantha flaccida	Beaked cryptantha	native	annual herb	-	-	-	1.6
Cryptantha hispidula	Napa cryptantha	native	annual herb	-	-	-	6
Cuscuta brachycalyx	San joaquin dodder	native	annual herb, vine (parasitic)	-	-	-	-
Cynodon dactylon	Bermuda grass	non-native (invasive)	perennial grass	-	Moderate	FACU	-
Cynoglossum grande	Houndstongue	native	perennial herb	-	-	-	-
Cynosurus echinatus	Dogtail grass	non-native (invasive)	annual grass	-	Moderate	-	-
Cyperus eragrostis	Tall cyperus	native	perennial grasslike herb	-	-	FACW	-
Cytisus scoparius	Scotch broom	non-native (invasive)	shrub	-	High	-	-
Dactylis glomerata	Orchardgrass	non-native (invasive)	perennial grass	-	Limited	FACU	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Damasonium californicum	California damsonium	native	perennial herb (aquatic)	-	-	OBL	-
Danthonia californica	California oatgrass	native	perennial grass	-	-	FAC	-
Datisca glomerata	Durango root	native	perennial herb	-	-	FACW	-
Datura stramonium	Jimson weed	non-native	annual herb	-	-	-	-
Daucus pusillus	Wild carrot	native	annual herb	-	-	-	-
Delphinium hesperium ssp. *pallescens*	Western larkspur	native	perennial herb	-	-	FAC	-
Delphinium nudicaule	Canyon larkspur	native	perennial herb	-	-	-	-
Delphinium uliginosum	Swamp larkspur	native	perennial herb	Rank 4.2	-	OBL	5.7
Delphinium variegatum ssp. *variegatum*	Royal larkspur	native	perennial herb	-	-	-	-
Dendromecon rigida	Bush poppy	native	shrub	-	-	-	-
Deschampsia cespitosa ssp. *cespitosa*	Tufted hairgrass	native	perennial grass	-	-	FACW	-
Deschampsia danthonioides	Annual hairgrass	native	annual grass	-	-	FACW	-
Dichelostemma capitatum ssp. *capitatum*	Wild hyacinth	native	perennial herb	-	-	FACU	-
Dichelostemma congestum	Fork toothed ookow	native	perennial herb	-	-	-	-
Digitaria sanguinalis	Crabgrass	non-native	annual grass	-	-	FACU	-
Diplacus aurantiacus	Sticky monkeyflower	native	shrub	-	-	FACU	-
Diplacus congdonii	Congdon's monkeyflower	native	annual herb	-	-	FAC	-
Diplacus douglasii	Purple mouse ears	native	annual herb	-	-	FACW	2.7
Diplacus kelloggii	Kellogg's monkeyflower	native	annual herb	-	-	-	-
Diplacus tricolor	Tricolor monkeyflower	native	annual herb	-	-	OBL	-
Downingia concolor var. *concolor*	Spotted throat downingia	native	annual herb	-	-	OBL	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Downingia cuspidata	Toothed downingia	native	annual herb	-	-	OBL	-
Drymocallis glandulosa	Sticky cinquefoil	native	perennial herb	-	-	FAC	-
Dryopteris arguta	Wood fern	native	fern	-	-	-	-
Dudleya cymosa ssp. *cymosa*	Canyon dudleya	native	perennial herb	-	-	-	-
Echinochloa crus-galli	Barnyard grass	non-native	annual grass	-	-	FACW	-
Ehrendorferia chrysantha	Golden eardrops	native	perennial herb	-	-	-	1.1
Eleocharis acicularis	Needle spikerush	native	perennial grasslike herb	-	-	OBL	-
Eleocharis macrostachya	Spike rush	native	perennial grasslike herb	-	-	OBL	-
Elymus caput-medusae	Medusa head	non-native (invasive)	annual grass	-	High	-	-
Elymus elymoides var. *elymoides*	Squirrel tail grass	native	perennial grass	-	-	FACU	-
Elymus glaucus ssp. *glaucus*	Blue wild rye	native	perennial grass	-	-	FACU	-
Elymus multisetus	Big squirreltail grass	native	perennial grass	-	-	-	-
Elymus triticoides	Beardless wild rye	native	perennial grass	-	-	FAC	-
Epilobium brachycarpum	Willow herb	native	annual herb	-	-	-	-
Epilobium campestre	Smooth boisduvalia	native	annual herb	-	-	OBL	-
Epilobium canum ssp. *canum*	California fuchsia	native	perennial herb	-	-	-	-
Epilobium ciliatum	Slender willow herb	native	perennial herb	-	-	FACW	-
Epilobium densiflorum	Willow herb	native	annual herb	-	-	FACW	-
Epilobium minutum	Minute willowherb	native	annual herb	-	-	FACU	2
Epilobium torreyi	Narrow boisduvalia	native	annual herb	-	-	FACW	-
Epipactis gigantea	Stream orchid	native	perennial herb	-	-	OBL	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Equisetum hyemale ssp. *affine*	Giant scouring rush	native	fern	-	-	FACW	-
Equisetum laevigatum	Smooth scouring rush	native	fern	-	-	FACW	-
Ericameria arborescens	Golden fleece	native	shrub	-	-	-	1.3
Erigeron canadensis	Canada horseweed	native	annual herb	-	-	FACU	-
Erigeron greenei	Greene's narrow-leaved daisy	native	perennial herb	Rank 1B.2	-	-	-
Erigeron philadelphicus var. *philadelphicus*	Philadelphia fleabane	native	perennial herb	-	-	FACU	-
Eriodictyon californicum	Yerba santa	native	shrub	-	-	-	-
Eriogonum luteolum var. *luteolum*	Golden buckwheat	native	annual herb	-	-	-	3.8
Eriogonum nudum var. *nudum*	Nude buckwheat	native	shrub	-	-	-	-
Eriophyllum lanatum var. *achilleoides*	Yarrow leaved woolly sunflower	native	perennial herb	-	-	-	-
Erodium botrys	Big heron bill	non-native	annual herb	-	-	FACU	-
Erodium brachycarpum	White stemmed filaree	non-native	annual herb	-	-	-	-
Erodium cicutarium	Red stemmed filaree	non-native (invasive)	annual herb	-	Limited	-	-
Erodium moschatum	Whitestem filaree	non-native	annual herb	-	-	-	-
Eryngium aristulatum var. *aristulatum*	Jepson's button celery	native	perennial herb	-	-	OBL	-
Erythranthe guttata	Seep monkeyflower	native	perennial herb (rhizomatous)	-	-	OBL	-
Erythranthe latidens	Broad toothed monkeyflower	native	annual herb	-	-	OBL	-
Erythranthe microphylla	Seep monkeyflower	native	annual herb	-	-	OBL	-
Erythranthe nudata	Bare monkeyflower	native	annual herb	Rank 4.3	-	OBL	5.6
Erythronium helenae	St. Helena fawn lily	native	perennial herb (bulb)	Rank 4.2	-	-	4.5
Eschscholzia caespitosa	Tufted poppy	native	annual herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Eschscholzia californica	California poppy	native	annual, perennial herb	-	-	-	-
Eucalyptus camaldulensis	Red gum	non-native (invasive)	tree	-	Limited	FAC	-
Euphorbia serpyllifolia	Thyme-leaved spurge	native	annual herb	-	-	-	-
Euphorbia spathulata	Reticulate seeded spurge	native	annual herb	-	-	FAC	-
Eurybia radulina	Roughleaf aster	native	perennial herb				
Euthamia occidentalis	Western goldenrod	native	perennial herb	-	-	FACW	-
Festuca arundinacea	Reed fescue	non-native (invasive)	perennial grass	-	Moderate	FACU	-
Festuca bromoides	Brome fescue	non-native	annual grass	-	-	FACU	-
Festuca californica	California fescue	native	perennial grass	-	-	FACU	2.4
Festuca idahoensis	Blue fescue	native	perennial grass	-	-	FACU	1.3
Festuca microstachys	Small fescue	native	annual grass	-	-	-	-
Festuca myuros	Rattail sixweeks grass	non-native (invasive)	annual grass	-	Moderate	FACU	-
Festuca perennis	Italian rye grass	non-native (invasive)	annual, perennial grass	-	Moderate	FAC	-
Ficus carica	Common fig	non-native (invasive)	tree	-	Moderate	FACU	-
Frangula californica ssp. *tomentella*	Hoary coffeeberry	native	shrub	-	-	-	1.5
Fraxinus dipetala	Two petaled ash	native	tree, shrub	-	-	-	-
Fraxinus latifolia	Oregon ash	native	tree	-	-	FACW	-
Fritillaria affinis	Checker lily	native	perennial herb (bulb)	-	-	-	2
Fritillaria purdyi	Purdy's fritillary	native	perennial herb (bulb)	Rank 4.3	-	-	4.5

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Fritillaria recurva	Scarlet fritillary	native	perennial herb	-	-	-	-
Galium andrewsii ssp. *andrewsii*	Phlox leaved bedstraw	native	perennial herb	-	-	-	3.2
Galium aparine	Cleavers	native	annual herb	-	-	FACU	-
Galium bolanderi	Bolander's bedstraw	native	perennial herb	-	-	-	-
Galium californicum	California bedstraw	native	perennial herb	-	-	-	-
Galium murale	Tiny bedstraw	non-native	annual herb	-	-	-	-
Galium parisiense	Wall bedstraw	non-native	annual herb	-	-	UPL	-
Galium porrigens var. *porrigens*	Graceful bedstraw	native	vine, shrub	-	-	-	-
Galium porrigens var. *tenue*	Graceful bedstraw	native	vine, shrub	-	-	-	-
Garrya congdonii	Silk tassel	native	shrub	-	-	-	5
Gastridium phleoides	Nit grass	non-native	annual grass	-	-	FACU	-
Genista monspessulana	French broom	non-native (invasive)	shrub	-	High	-	-
Geranium dissectum	Wild geranium	non-native (invasive)	annual herb	-	Limited	-	-
Geranium molle	Crane's bill geranium	non-native	annual, perennial herb	-	-	-	-
Gilia capitata ssp. *capitata*	Blue field gilia	native	annual herb	-	-	-	1.6
Gilia clivorum	Purple spot gilia	native	annual herb	-	-	-	-
Gilia tricolor ssp. *diffusa*	Bird's eyes	native	annual herb	-	-	-	-
Githopsis specularioides	Venus' looking glass	native	annual herb	-	-	FACU	-
Glyceria declinata	Waxy mannagrass	non-native (invasive)	perennial grass	-	Moderate	FACW	-
Glycyrrhiza glabra	Licorice	non-native	perennial herb	-	-	-	-
Glycyrrhiza lepidota	American licorice	native	perennial herb	-	-	FAC	-
Gnaphalium palustre	Lowland cudweed	native	annual herb	-	-	FACW	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Gratiola ebracteata	Common hedge hyssop	native	annual herb	-	-	OBL	-
Grindelia hirsutula	Gumweed	native	perennial herb	-	-	FACW	1.4
Helenium bigelovii	Bigelow's sneezeweed	native	perennial herb	-	-	FACW	2.9
Helenium puberulum	Sneezeweed	native	perennial herb	-	-	FACW	-
Helianthella californica var. *californica*	California helianthella	native	perennial herb	-	-	-	-
Helianthus exilis	Serpentine sunflower	native	annual herb	Rank 4.2	-	FACU	5.7
Heliotropium curassavicum var. *oculatum*	Seaside heliotrope	native	perennial herb	-	-	FACU	-
Helminthotheca echioides	Bristly ox-tongue	non-native (invasive)	annual, perennial herb	-	Limited	FAC	-
Hemizonia congesta ssp. *clevelandii*	Cleveland's tarweed	native	annual herb	-	-	-	-
Hesperevax sparsiflora var. *sparsiflora*	Few flowered evax	native	annual herb	-	-	FACU	1.8
Hesperocyparis sargentii	Sargent cypress	native	tree, shrub	-	-	-	4.9
Hesperolinon bicarpellatum	Two carpellate western flax	native	annual herb	Rank 1B.2	-	-	6.2
Hesperolinon californicum	California western flax	native	annual herb	-	-	-	2.8
Hesperolinon didymocarpum	Lake County western flax	native	annual herb	SE, Rank 1B.2	-	-	6.2
Hesperolinon disjunctum	Coast range western flax	native	annual herb	-	-	-	6
Hesperolinon micranthum	Small flower western flax	native	annual herb	-	-	-	2.4
Hesperolinon spergulinum	Slender western flax	native	annual herb	-	-	-	4.7
Heterocodon rariflorum	Heterocodon	native	annual herb	-	-	FACW	-
Heteromeles arbutifolia	Toyon	native	shrub	-	-	-	-
Heterotheca oregona	Oregon golden aster	native	perennial herb	-	-	FACU	-
Hirschfeldia incana	Short-podded mustard	non-native (invasive)	perennial herb	-	Moderate	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Hoita macrostachya	California hemp	native	perennial herb	-	-	OBL	-
Holocarpha virgata ssp. *virgata*	Narrow tarplant	native	annual herb	-	-	-	-
Hordeum brachyantherum ssp. *brachyantherum*	Meadow barley	native	perennial grass	-	-	FACW	-
Hordeum brachyantherum ssp. *californicum*	Meadow barley	native	perennial grass	-	-	FACW	3.1
Hordeum marinum ssp. *gussoneanum*	Mediterranean barley	non-native (invasive)	annual grass	-	Moderate	FAC	-
Hordeum murinum ssp. *glaucum*	Foxtail	non-native (invasive)	annual grass	-	Moderate	FACU	-
Hordeum murinum ssp. *leporinum*	Farmer's foxtail	non-native (invasive)	annual grass	-	Moderate	FACU	-
Hypericum concinnum	Gold wire	native	perennial herb	-	-	-	-
Hypericum perforatum ssp. *perforatum*	Klamathweed	non-native	perennial herb	-	Moderate	FACU	-
Hypochaeris glabra	Smooth cats ear	non-native (invasive)	annual herb	-	Limited	-	-
Hypochaeris radicata	Hairy cats ear	non-native (invasive)	perennial herb	-	Moderate	FACU	-
Iris fernaldii	Fernald's iris	native	perennial herb	-	-	-	-
Iris macrosiphon	Ground iris	native	perennial herb	-	-	-	1.1
Juglans hindsii	Northern California black walnut	native	tree	Rank 1B.1	-	FAC	-
Juncus balticus ssp. *ater*	Baltic rush	native	perennial grasslike herb	-	-	FACW	-
Juncus bufonius	Common toad rush	native	annual grasslike herb	-	-	FACW	-
Juncus effusus ssp. *pacificus*	Pacific rush	native	perennial grasslike herb	-	-	FACW	-
Juncus mexicanus	Mexican rush	native	perennial grasslike herb	-	-	FACW	-
Juncus occidentalis	Western rush	native	perennial grasslike herb	-	-	FACW	-

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Juncus patens	Common rush	native	perennial grasslike herb	-	-	FACW	-
Juncus phaeocephalus var. *phaeocephalus*	Brown headed rush	native	perennial grasslike herb	-	-	FACW	-
Juncus tenuis	Slender rush	native	perennial grasslike herb	-	-	FACW	-
Juncus xiphioides	Iris leaved rush	native	perennial grasslike herb	-	-	OBL	-
Keckiella breviflora var. *glabrisepala*	Hairless gaping keckiella	native	shrub	-	-	-	-
Kickxia elatine	Sharp point fluellin	non-native	perennial herb	-	-	UPL	-
Koeleria macrantha	June grass	native	perennial grass	-	-	-	-
Lactuca saligna	Willow lettuce	non-native	annual herb	-	-	UPL	-
Lactuca serriola	Prickly lettuce	non-native	annual herb	-	-	FACU	-
Lagophylla minor	Little hareleaf	native	annual herb	-	-	-	4.7
Lagophylla ramosissima	Common hareleaf	native	annual herb	-	-	-	-
Lamium amplexicaule	Henbit	non-native	annual herb	-	-	-	-
Lasthenia californica ssp. *californica*	California goldfields	native	annual herb	-	-	FACU	-
Lasthenia glaberrima	Smooth goldfields	native	annual herb	-	-	OBL	-
Lasthenia glabrata ssp. *glabrata*	Yellow rayed goldfields	native	annual herb	-	-	FACW	-
Lasthenia gracilis	Needle goldfields	native	annual herb	-	-	-	-
Lathyrus cicera	Red peavine	non-native	annual herb	-	-	-	-
Lathyrus hirsutus	Caley pea	non-native	annual herb	-	-	FAC	-
Lathyrus tingitanus	Tangier pea	non-native	annual herb	-	-	-	-
Lathyrus vestitus var. *vestitus*	Hillside pea	native	perennial herb	-	-	-	1.8
Layia chrysanthemoides	Smooth tidy tips	native	annual herb	-	-	FACW	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Layia septentrionalis	Colusa layia	native	annual herb	Rank 1B.2	-	-	3.2
Leontodon saxatilis ssp. *longirostris*	Hawkbit	non-native	annual herb	-	-	FACU	-
Lepechinia calycina	Pitcher sage	native	shrub	-	-	-	-
Lepidium latifolium	Perennial pepperweed	non-native (invasive)	perennial herb	-	High	FAC	-
Lepidium nitidum	Shining pepper grass	native	annual herb	-	-	FAC	-
Lepidium strictum	Peppergrass	native	annual herb	-	-	-	-
Leptosiphon bicolor	True babystars	native	annual herb	-	-	UPL	-
Leptosiphon ciliatus	Whiskerbrush	native	annual herb	-	-	-	-
Leptosiphon parviflorus	Variable linanthus	native	annual herb	-	-	-	-
Lessingia ramulosa	Sonoma lessingia	native	annual herb	-	-	-	5.4
Lewisia rediviva var. *rediviva*	Bitter root	native	perennial herb	-	-	-	-
Limnanthes douglasii ssp. *nivea*	Douglas' meadowfoam	native	annual herb	-	-	OBL	-
Linanthus dichotomus ssp. *meridianus*	Evening snow	native	annual herb	-	-	-	-
Lithophragma affine	Common woodland star	native	perennial herb	-	-	-	-
Lithophragma heterophyllum	Woodland star	native	perennial herb	-	-	-	-
Logfia filaginoides	California cottonrose	native	annual herb	-	-	-	-
Logfia gallica	Narrowleaf cottonrose	non-native	annual herb	-	-	-	-
Lomatium californicum	Celery weed	native	perennial herb	-	-	-	-
Lomatium dasycarpum ssp. *tomentosum*	Woolly fruited lomatium	native	perennial herb	-	-	-	-
Lomatium hooveri	Hoover's lomatium	native	perennial herb	Rank 4.3	-	-	5.9
Lomatium marginatum var. *marginatum*	Hartweg's lomatium	native	perennial herb	-	-	-	-
Lomatium marginatum var. *purpureum*	Jepson's lomatium	native	perennial herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Lomatium utriculatum	Hog fennel	native	perennial herb	-	-	-	1.7
Lonicera hispidula	Pink honeysuckle	native	vine, shrub	-	-	FACU	-
Lonicera interrupta	Chaparral honeysuckle	native	vine, shrub	-	-	-	-
Lotus corniculatus	Bird's foot trefoil	non-native	perennial herb	-	-	FAC	-
Lotus tenuis	Narrow-leaf bird’s foot trefoil	non-native	perennial herb	-	-	FACU	-
Lupinus albifrons var. *albifrons*	Silver bush lupine	native	shrub	-	-	-	-
Lupinus albifrons var. *collinus*	Silver bush lupine	native	shrub	-	-	-	-
Lupinus bicolor	Miniature lupine	native	annual, perennial herb	-	-	-	-
Lupinus latifolius var. *latifolius*	Broad leaf lupine	native	perennial herb	-	-	FACW	-
Lupinus microcarpus var. *densiflorus*	Dense-flowered chick lupine	native	annual herb	-	-	-	-
Lupinus microcarpus var. *microcarpus*	Chick lupine	native	annual herb	-	-	-	-
Lupinus nanus	Sky lupine	native	annual herb	-	-	-	-
Lupinus succulentus	Arroyo lupine	native	annual herb	-	-	-	-
Luzula comosa var. *comosa*	Hairy wood rush	native	perennial grasslike herb	-	-	FAC	-
Lysimachia arvensis	Scarlet pimpernel	non-native	annual herb	-	-	FAC	-
Lysimachia latifolia	Pacific starflower	native	perennial herb	-	-	FAC	-
Lythrum hyssopifolia	Hyssop loosestrife	non-native (invasive)	annual, perennial herb	-	Limited	OBL	-
Madia elegans	Common madia	native	annual herb	-	-	-	-
Madia exigua	Small tarweed	native	annual herb	-	-	-	1.8
Madia gracilis	Gumweed	native	annual herb	-	-	-	-
Malacothrix floccifera	Woolly malacothrix	native	annual herb	-	-	-	2.1
Malva nicaeensis	Bull mallow	non-native	annual herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Malva parviflora	Cheeseweed	non-native	annual herb	-	-	-	-
Malvella leprosa	Alkali mallow	native	perennial herb	-	-	FACU	-
Marah watsonii	Watson's wild cucumber	native	perennial herb, vine	-	-	-	-
Marrubium vulgare	White horehound	non-native (invasive)	perennial herb	-	Limited	FACU	-
Marsilea vestita ssp. *vestita*	Hairy pepperwort	native	fern	-	-	OBL	-
Matricaria discoidea	Pineapple weed	native	annual herb	-	-	FACU	-
Medicago polymorpha	California burclover	non-native (invasive)	annual herb	-	Limited	FACU	-
Melica californica	California melic	native	perennial grass	-	-	-	-
Melica torreyana	Torrey's melica	native	perennial grass	-	-	-	-
Melilotus albus	White sweetclover	non-native	annual, biennial herb	-	-	-	-
Melilotus indicus	Annual yellow sweetclover	non-native	annual herb	-	-	FACU	-
Mentha pulegium	Pennyroyal	non-native (invasive)	perennial herb	-	Moderate	OBL	-
Micranthes integrifolia	Smooth leaf saxifrage	native	perennial herb	-	-	FACW	-
Micropus californicus var. *californicus*	Slender cottonweed	native	annual herb	-	-	FACU	-
Microseris douglasii ssp. *douglasii*	Douglas' microseris	native	annual herb	-	-	FACU	-
Microseris elegans	Elegant silverpuffs	native	annual herb	-	-	-	-
Mimetanthe pilosa	Snouted monkey flower	native	annual herb	-	-	FACW	-
Minuartia californica	Sandwort	native	annual herb	-	-	FACU	1.7
Minuartia douglasii	Douglas' sandwort	native	annual herb	-	-	-	3
Monardella villosa ssp. *villosa*	Coyote mint	native	perennial herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Monardella viridis	Green monardella	native	perennial herb	Rank 4.3	-	-	1
Montia fontana	Water montia	native	annual herb	-	-	OBL	-
Morus alba	Mulberry	non-native	tree	-	-	FACU	-
Muhlenbergia rigens	Deergrass	native	perennial grass	-	-	FAC	-
Myriophyllum sp.	Water-milfoil	non-native	perennial herb	-	-	OBL	-
Myriopteris covillei	Coville's lip fern	native	fern	-	-	-	-
Narcissus pseudonarcissus	Daffodil	non-native	perennial herb (bulb)	-	-	-	-
Navarretia atractyloides	Holly leaf navarretia	native	annual herb	-	-	-	-
Navarretia cotulifolia	Cotula navarretia	native	annual herb	Rank 4.2	-	OBL	-
Navarretia intertexta	Interwoven navarretia	native	annual herb	-	-	FACW	-
Navarretia jepsonii	Jepson's navarretia	native	annual herb	Rank 4.3	-	FACW	5.6
Navarretia leucocephala ssp. *leucocephala*	White headed navarretia	native	annual herb	-	-	OBL	-
Navarretia mellita	Skunk navarretia	native	annual herb	-	-	FAC	-
Navarretia pubescens	Purple navarretia	native	annual herb	-	-	-	2
Navarretia squarrosa	Skunkweed	native	annual herb	-	-	FACU	-
Nemacladus montanus	Mountain nemacladus	native	annual herb	-	-	-	6
Nemophila heterophylla	Canyon nemophila	native	annual herb	-	-	-	-
Nemophila menziesii var. *atomaria*	Baby blue eyes	native	annual herb	-	-	-	-
Nemophila menziesii var. *menziesii*	Baby blue eyes	native	annual herb	-	-	-	-
Nemophila parviflora var. *parviflora*	Small flowered nemophila	native	annual herb	-	-	-	-
Nicotiana acuminata var. *multiflora*	Many flowered tobacco	non-native	annual herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Oemleria cerasiformis	Oso berry	native	shrub	-	-	FACU	-
Packera eurycephala var. *eurycephala*	Widehead groundsel	native	perennial herb	-	-	-	-
Packera greenei	Flame ragwort	native	perennial herb	-	-	-	-
Parentucellia viscosa	Yellow glandweed	non-native (invasive)	annual herb	-	Limited	FAC	-
Paspalum dilatatum	Dallis grass	non-native	perennial grass	-	-	FAC	-
Pectocarya pusilla	Little pectocarya	native	annual herb	-	-	-	1.3
Pedicularis densiflora	Indian warrior	native	perennial herb	-	-	-	-
Pellaea andromedifolia	Coffee fern	native	fern	-	-	-	-
Pellaea mucronata var. *mucronata*	Bird's foot fern	native	fern	-	-	-	-
Penstemon heterophyllus var. *heterophyllus*	Foothill penstemon	native	perennial herb	-	-	-	-
Penstemon heterophyllus var. *purdyi*	Purdy's foothill penstemon	native	perennial herb	-	-	-	-
Pentagramma triangularis	Gold back fern	native	fern	-	-	-	-
Perideridia gairdneri ssp. *borealis*	Northern Gairdner's yampah	native	perennial herb	-	-	FAC	-
Perideridia kelloggii	Kellogg's yampah	native	perennial herb	-	-	-	2.1
Persicaria amphibia	Water smartweed	native	perennial herb (aquatic)	-	-	OBL	-
Persicaria maculosa	Spotted ladysthumb	non-native	annual herb	-	-	FACW	-
Persicaria punctata	Dotted smartweed	native	perennial herb	-	-	OBL	-
Petrorhagia dubia	Windmill pink	non-native	annual herb	-	-	-	-
Phacelia distans	Common phacelia	native	annual herb	-	-	OBL	1.1
Phacelia imbricata var. *imbricata*	Imbricate phacelia	native	annual herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Phalaris aquatica	Harding grass	non-native (invasive)	perennial grass	-	Moderate	FACU	-
Phalaris lemmonii	Lemmon's canarygrass	native	annual grass	-	-	FACW	-
Phalaris minor	Mediterranean canarygrass	non-native	annual grass	-	-	-	-
Phalaris paradoxa	Hood canarygrass	non-native	annual grass	-	-	FAC	-
Phoradendron bolleanum	Bollean mistletoe	native	shrub (parasitic)	-	-	-	-
Phoradendron leucarpum ssp. *tomentosum*	Mistletoe	native	shrub (parasitic)	-	-	-	-
Phyla nodiflora	Common lippia	native	perennial herb	-	-	FACW	-
Physalis lanceifolia	Narrow leaf tomatillo	non-native	annual herb	-	-	UPL	-
Pickeringia montana var. *montana*	Chaparral pea	native	shrub	-	-	-	-
Pinus attenuata	Knobcone pine	native	tree	-	-	-	2.5
Pinus ponderosa var. *pacifica*	Pacific ponderosa pine	native	tree	-	-	FACU	-
Pinus sabiniana	Bull pine	native	tree	-	-	-	1.4
Piperia transversa	Mountain piperia	native	perennial herb	-	-	-	-
Plagiobothrys bracteatus	Bracted allocarya	native	annual herb	-	-	FACW	-
Plagiobothrys fulvus var. *campestris*	Tawny popcorn flower	native	annual herb	-	-	-	-
Plagiobothrys glyptocarpus var. *glyptocarpus*	Sculptured allocarya	native	annual herb	-	-	FACW	-
Plagiobothrys greenei	Greene's allocarya	native	annual herb	-	-	FACW	-
Plagiobothrys nothofulvus	Rusty haired popcorn flower	native	annual herb	-	-	FAC	-
Plagiobothrys stipitatus var. *micranthus*	Common vernal pool allocarya	native	annual herb	-	-	FACW	-
Plantago coronopus	Cut leaf plantain	non-native	annual herb	-	-	FAC	-
Plantago erecta	California plantain	native	annual herb	-	-	-	1

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Plantago lanceolata	Ribwort	non-native (invasive)	perennial herb	-	Limited	FAC	-
Plantago patagonica	Patagonia plantain	native	annual herb	-	-	-	-
Platanus ×hispanica	London plane tree	non-native	tree	-	-	-	-
Platystemon californicus	Cream cups	native	annual herb	-	-	-	1.7
Plectritis ciliosa	Long spurred plectritis	native	annual herb	-	-	FACU	-
Plectritis macrocera	Plectritis	native	annual herb	-	-	FACU	-
Pleuropogon californicus var. *californicus*	Annual semaphoregrass	native	annual grass	-	-	OBL	-
Poa annua	Annual blue grass	non-native	annual grass	-	-	FAC	-
Poa bulbosa ssp. *bulbosa*	Bulbous blue grass	non-native	perennial grass	-	-	FACU	-
Poa pratensis ssp. *pratensis*	Kentucky blue grass	non-native (invasive)	perennial grass	-	Limited	FAC	-
Poa secunda ssp. *secunda*	Sandberg's bluegrass	native	perennial grass	-	-	FACU	-
Pogogyne douglasii	Douglas' pogogyne	native	annual herb	-	-	OBL	-
Pogogyne zizyphoroides	Sacramento mint	native	annual herb	-	-	OBL	-
Polygala californica	Milkwort	native	perennial herb	-	-	-	-
Polygonum aviculare ssp. *aviculare*	Prostrate knotweed	non-native	annual, perennial herb	-	-	FACW	-
Polypodium californicum	California polypody	native	fern	-	-	-	-
Polypodium calirhiza	Licorice fern	native	fern	-	-	-	-
Polypogon interruptus	Ditch beard grass	non-native	perennial grass	-	-	FACW	-
Polypogon maritimus	Mediterranean beard grass	non-native	annual grass	-	-	OBL	-
Polypogon monspeliensis	Annual beard grass	non-native (invasive)	annual grass	-	Limited	FACW	-
Populus fremontii ssp. *fremontii*	Cottonwood	native	tree	-	-	FAC	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Portulaca oleracea	Common purslane	non-native	annual herb	-	-	FAC	-
Primula hendersonii	Mosquito bill	native	perennial herb	-	-	-	-
Prunus cerasifera	Cherry plum	non-native (invasive)	tree	-	Limited	-	-
Pseudognaphalium californicum	Ladies' tobacco	native	annual, perennial herb	-	-	-	-
Pseudognaphalium luteoalbum	Jersey cudweed	non-native	annual herb	-	-	FAC	-
Pseudotsuga menziesii var. *menziesii*	Douglas fir	native	tree	-	-	FACU	-
Psilocarphus brevissimus var. *brevissimus*	Woolly heads	native	annual herb	-	-	FACW	-
Psilocarphus chilensis	Round woolly marbles	native	annual herb	-	-	FACW	-
Pteridium aquilinum var. *pubescens*	Western bracken fern	native	fern	-	-	FACU	-
Pterostegia drymarioides	Fairy mist	native	annual herb	-	-	-	-
Quercus ×morehus	Oracle oak	native	tree	-	-	-	-
Quercus berberidifolia	Inland scrub oak	native	tree	-	-	-	-
Quercus chrysolepis	Gold cup live oak	native	tree	-	-	-	-
Quercus douglasii	Blue oak	native	tree	-	-	-	-
Quercus durata var. *durata*	Leather oak	native	shrub	-	-	-	5.8
Quercus kelloggii	California black oak	native	tree	-	-	-	-
Quercus lobata	Valley oak	native	tree	-	-	FACU	-
Quercus wislizeni var. *wislizeni*	Interior live oak	native	tree, shrub	-	-	-	-
Rafinesquia californica	California chicory	native	annual herb	-	-	-	-
Ranunculus aquatilis var. *aquatilis*	Whitewater crowfoot	native	perennial herb (aquatic)	-	-	OBL	-
Ranunculus californicus var. *californicus*	Common buttercup	native	perennial herb	-	-	FACU	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Ranunculus hebecarpus	Pubescent fruited buttercup	native	annual herb	-	-	-	-
Ranunculus muricatus	Buttercup	non-native	annual, perennial herb	-	-	FACW	-
Ranunculus occidentalis var. *occidentalis*	Western buttercup	native	perennial herb	-	-	FAC	-
Raphanus raphanistrum	Jointed charlock	non-native	annual, perennial herb	-	-	-	-
Raphanus sativus	Wild radish	non-native (invasive)	annual, biennial herb	-	Limited	-	-
Rhamnus ilicifolia	Evergreen buckthorn	native	shrub	-	-	-	-
Rhododendron occidentale	Western azalea	native	tree, shrub	-	-	FAC	-
Rhus aromatica	Fragrant sumac	native	shrub	-	-	FACU	-
Ribes malvaceum var. *malvaceum*	Chaparral currant	native	shrub	-	-	-	-
Rigiopappus leptocladus	Wire weed	native	annual herb	-	-	-	1.9
Robinia pseudoacacia	Black locust	non-native (invasive)	tree	-	Limited	FACU	-
Rosa californica	California wild rose	native	shrub	-	-	FAC	-
Rubus armeniacus	Himalayan blackberry	non-native (invasive)	shrub	-	High	FAC	-
Rumex crispus	Curly dock	non-native (invasive)	perennial herb	-	Limited	FAC	-
Rumex pulcher	Fiddleleaf dock	non-native	perennial herb	-	-	FAC	-
Salix breweri	Serpentine willow	native	shrub	-	-	FAC	6
Salix exigua var. *hindsiana*	Sandbar willow	native	tree, shrub	-	-	FACW	-
Salix gooddingii	Gooding's willow	native	tree	-	-	FACW	-
Salix laevigata	Polished willow	native	tree	-	-	FACW	-
Salix lasiolepis	Arroyo willow	native	tree, shrub	-	-	FACW	-
Salsola sp.	Russian thistle	non-native	annual herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Salvia columbariae	Chia sage	native	annual herb	-	-	-	-
Salvia sonomensis	Sonoma sage	native	perennial herb	-	-	-	1.6
Sambucus nigra ssp. *caerulea*	Blue elderberry	native	shrub	-	-	FAC	-
Sanicula bipinnata	Poison sanicle	native	perennial herb	-	-	-	-
Sanicula bipinnatifida	Purple sanicle	native	perennial herb	-	-	-	1.8
Sanicula crassicaulis	Pacific sanicle	native	perennial herb	-	-	-	-
Sanicula tuberosa	Turkey pea	native	perennial herb	-	-	-	1.3
Schoenoplectus acutus var. *occidentalis*	Tule	native	perennial grasslike herb	-	-	OBL	-
Schoenoplectus tabernaemontani	Softstem bulrush	native	perennial grasslike herb	-	-	OBL	-
Scleranthus annuus ssp. *annuus*	German knotgrass	non-native	annual herb	-	-	FACU	-
Scrophularia californica	California bee plant	native	perennial herb	-	-	FAC	-
Scutellaria antirrhinoides	Snapdragon skullcap	native	perennial herb	-	-	-	2.3
Scutellaria californica	California skullcap	native	perennial herb	-	-	-	-
Scutellaria siphocampyloides	Gray leaved skullcap	native	perennial herb	-	-	FACU	-
Scutellaria tuberosa	Dannie's skullcap	native	perennial herb	-	-	-	-
Senecio aronicoides	Butterweed	native	perennial herb	-	-	-	-
Senecio clevelandii var. *clevelandii*	Cleveland's ragwort	native	perennial herb	Rank 4.3	-	-	-
Senecio vulgaris	Common groundsel	non-native	annual herb	-	-	FACU	-
Sherardia arvensis	Field madder	non-native	annual herb	-	-	-	-
Sidalcea diploscypha	Fringed checker mallow	native	annual herb	-	-	-	2.6
Sidalcea hartwegii	Hartweg's checkerbloom	native	annual herb	-	-	-	1.6
Sidalcea hirsuta	Hairy checkerbloom	native	annual herb	-	-	OBL	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Sidalcea keckii	Keck's checkerbloom	native	annual herb	FE, Rank 1B.1	-	-	3
Silene gallica	Common catchfly	non-native	annual herb	-	-	-	-
Silene laciniata ssp. *californica*	California indian pink	native	perennial herb	-	-	-	-
Silybum marianum	Milk thistle	non-native (invasive)	annual, perennial herb	-	Limited	-	-
Sisymbrium irio	London rocket	non-native (invasive)	annual herb	-	Moderate	-	-
Sisymbrium officinale	Hedge mustard	non-native	annual herb	-	-	-	-
Sisyrinchium bellum	Blue eyed grass	native	perennial herb	-	-	FACW	-
Solanum parishii	Parish's purple nightshade	native	shrub	-	-	-	-
Solanum xanti	Nightshade	native	perennial herb, shrub	-	-	-	-
Solidago elongata	West coast canada goldenrod	native	perennial herb	-	-	FACU	-
Soliva sessilis	South american soliva	non-native	annual herb	-	-	FACU	-
Sonchus asper ssp. *asper*	Prickly sow thistle	non-native	annual herb	-	-	FAC	-
Sonchus oleraceus	Common sow thistle	non-native	annual herb	-	-	UPL	-
Sorghum halepense	Johnsongrass	non-native	perennial grass	-	-	FACU	-
Spartium junceum	Spanish broom	non-native (invasive)	shrub	-	High	-	-
Spergularia rubra	Purple sand spurry	non-native	annual, perennial herb	-	-	FAC	-
Spiranthes porrifolia	Western ladies tresses	native	perennial herb	-	-	FACW	-
Stachys albens	Cobwebby hedge nettle	native	perennial herb	-	-	OBL	-
Stachys rigida var. *quercetorum*	Rough hedgenettle	native	perennial herb	-	-	FACW	-
Stebbinsoseris heterocarpa	Grassland stebbinsoseris	native	annual herb	-	-	-	-
Stellaria media	Chickweed	non-native	annual herb	-	-	FACU	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Stephanomeria virgata ssp. *pleurocarpa*	Tall stephanomeria	native	annual herb	-	-	-	-
Stipa cernua	Nodding needle grass	native	perennial grass	-	-	-	-
Stipa lepida	Foothill needle grass	native	perennial grass	-	-	-	-
Stipa miliacea var. *miliacea*	Smilo grass	non-native (invasive)	perennial grass	-	Limited	-	-
Stipa pulchra	Purple needle grass	native	perennial grass	-	-	-	-
Streptanthus breweri	Brewer's jewelflower	native	annual herb	-	-	-	5.7
Streptanthus glandulosus ssp. *glandulosus*	Jewelflower	native	annual herb	-	-	-	-
Streptanthus hesperidis	Green jewel-flower	native	annual herb	Rank 1B.2	-	-	-
Streptanthus morrisonii	Morrison's jewelflower	native	perennial herb	Rank 1B.2	-	-	6.1
Symphoricarpos albus var. *laevigatus*	Common snowberry	native	shrub	-	-	FACU	-
Symphoricarpos mollis	Creeping snowberry	native	shrub	-	-	FACU	-
Tamarix parviflora	Tamarisk	non-native (invasive)	tree, shrub	-	High	FAC	-
Taraxacum officinale	Red seeded dandelion	non-native	perennial herb	-	-	FACU	-
Taraxia ovata	Sun cup	native	perennial herb	-	-	-	-
Tetrapteron graciliflorum	Hill sun cup	native	annual herb	-	-	-	-
Thalictrum fendleri var. *polycarpum*	Torrey's meadow rue	native	perennial herb	-	-	FAC	-
Thermopsis californica var. *californica*	California goldenbanner	native	perennial herb (rhizomatous)	-	-	-	-
Thysanocarpus curvipes ssp. *curvipes*	Fringe pod	native	annual herb	-	-	-	-
Torilis arvensis	Field hedge parsley	non-native (invasive)	annual herb	-	Moderate	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Torilis nodosa	Wild parsley	non-native	annual herb	-	-	-	-
Toxicodendron diversilobum	Poison oak	native	vine, shrub	-	-	FACU	-
Toxicoscordion fontanum	Marsh zigadenus	native	perennial herb	Rank 4.2	-	OBL	-
Toxicoscordion fremontii	Fremont's star lily	native	perennial herb	-	-	-	-
Toxicoscordion micranthum	Small flowered star lily	native	perennial herb	-	-	OBL	-
Tragopogon porrifolius	Salsify	non-native	perennial herb	-	-	-	-
Tribulus terrestris	Puncture vine	non-native (invasive)	annual herb	-	Limited	-	-
Trichostema lanceolatum	Vinegarweed	native	annual herb	-	-	FACU	-
Trichostema laxum	Turpentine weed	native	annual herb	-	-	-	4
Trifolium albopurpureum	Indian clover	native	annual herb	-	-	FACU	-
Trifolium bifidum var. *bifidum*	Pinole clover	native	annual herb	-	-	-	-
Trifolium campestre	Hop clover	non-native	annual herb	-	-	-	-
Trifolium ciliolatum	Tree clover	native	annual herb	-	-	-	-
Trifolium depauperatum var. *depauperatum*	Dwarf sack clover	native	annual herb	-	-	FAC	-
Trifolium depauperatum var. *truncatum*	Dwarf sack clover	native	annual herb	-	-	FAC	-
Trifolium dichotomum	Branched indian clover	native	annual herb	-	-	-	-
Trifolium dubium	Shamrock	non-native	annual herb	-	-	UPL	-
Trifolium fucatum	Bull clover	native	annual herb	-	-	FACU	1.3
Trifolium glomeratum	Clustered clover	non-native	annual herb	-	-	-	-
Trifolium gracilentum	Pin point clover	native	annual herb	-	-	-	1
Trifolium hirtum	Rose clover	non-native (invasive)	annual herb	-	Limited	-	-
Trifolium incarnatum	Crimson clover	non-native	annual herb	-	-	-	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Trifolium microcephalum	Small head clover	native	annual herb	-	-	FAC	1.4
Trifolium microdon	Valparaiso clover	native	annual herb	-	-	-	-
Trifolium pratense	Red clover	non-native	perennial herb	-	-	FACU	-
Trifolium subterraneum	Subterranean clover	non-native	annual herb	-	-	-	-
Trifolium tomentosum	Woolly clover	non-native	annual herb	-	-	-	-
Trifolium variegatum var. *geminiflorum*	Small-flowered variegated clover	native	annual herb	-	-	FAC	-
Trifolium variegatum var. *major*	Large variegated clover	native	annual herb	-	-	FAC	-
Trifolium variegatum var. *variegatum*	Variegated clover	native	annual herb	-	-	FAC	-
Trifolium willdenovii	Tomcat clover	native	annual herb	-	-	FACW	1.3
Triglochin scilloides	Flowering-quillwort	native	annual herb (aquatic)	-	-	OBL	-
Triphysaria eriantha ssp. *eriantha*	Butter 'n' eggs	native	annual herb	-	-	-	-
Triphysaria pusilla	Little owl's clover	native	annual herb	-	-	-	-
Triphysaria versicolor ssp. *faucibarbata*	Yellow owl's clover	native	annual herb	-	-	-	-
Triteleia hyacinthina	Wild hyacinth	native	perennial herb	-	-	FAC	-
Triteleia laxa	Ithuriel's spear	native	perennial herb	-	-	-	-
Triteleia lugens	Dark-mouthed triteleia	native	perennial herb	Rank 4.3	-	-	-
Triteleia peduncularis	Marsh triteleia	native	perennial herb	-	-	FACW	3.8
Typha angustifolia	Narrow leaf cattail	non-native	perennial herb (aquatic)	-	-	OBL	-
Typha latifolia	Broadleaf cattail	native	perennial herb (aquatic)	-	-	OBL	-
Ulmus pumila	Siberian elm	non-native	tree	-	-	UPL	-
Umbellularia californica	California bay	native	tree	-	-	FAC	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Uropappus lindleyi	Silver puffs	native	annual herb	-	-	-	-
Urtica dioica ssp. *holosericea*	Stinging nettle	native	perennial herb	-	-	FAC	-
Velezia rigida	Velezia	non-native	annual herb	-	-	-	-
Verbascum blattaria	Moth mullein	non-native	perennial herb	-	-	UPL	-
Verbascum thapsus	Woolly mullein	non-native (invasive)	perennial herb	-	Limited	FACU	-
Verbena lasiostachys var. *scabrida*	Robust vervain	native	perennial herb	-	-	FAC	-
Veronica anagallis-aquatica	Water speedwell	non-native	perennial herb	-	-	OBL	-
Veronica peregrina ssp. *xalapensis*	Speedwell	native	annual herb	-	-	FAC	-
Vicia benghalensis	Purple vetch	non-native	annual herb, vine	-	-	-	-
Vicia sativa ssp. *nigra*	Smaller common vetch	non-native	annual herb, vine	-	-	FACU	-
Vicia sativa ssp. *sativa*	Common vetch	non-native	annual herb, vine	-	-	FACU	-
Vicia villosa ssp. *varia*	Smooth vetch	non-native	annual herb, vine	-	-	-	-
Vicia villosa ssp. *villosa*	Hairy vetch	non-native	annual herb, vine	-	-	-	-
Viola douglasii	Douglas' violet	native	perennial herb	-	-	-	2.8
Viola purpurea ssp. *quercetorum*	Goosefoot yellow violet	native	perennial herb	-	-	-	-
Vitis californica	California wild grape	native	vine, shrub	-	-	FACU	-
Vitis vinifera	Cultivated grape	non-native	vine, shrub	-	-	-	-
Whipplea modesta	Modesty	native	vine, shrub	-	-	-	-
Woodwardia fimbriata	Western chain fern	native	fern	-	-	OBL	-
Wyethia angustifolia	Narrow leaved mule ears	native	perennial herb	-	-	FACU	-

Scientific Name	Common Name	Origin	Form	Conservation Status[1]	Cal-IPC Status[2]	Wetland Status[3]	Serpentine Affinity[4]
Wyethia glabra	Smooth mule ears	native	perennial herb	-	-	-	-
Wyethia helenioides	Gray mule ears	native	perennial herb	-	-	-	-
Xanthium strumarium	Cocklebur	native	annual herb	-	-	FAC	-
Zannichellia palustris	Horned pondweed	native	perennial herb	-	-	OBL	-
Zeltnera muehlenbergii	Muehlenberg's centaury	native	annual herb	-	-	FAC	-
Zeltnera trichantha	Alkali centaury	native	annual herb	-	-	FAC	-

[1]Key to Conservation Status (CNPS 2019a):

FE	Federal Endangered
FT	Federal Threatened
SE	State Endangered
ST	State Threatened
Rank 1A	CNPS Rank 1A: Presumed extirpated in California and either rare or extinct elsewhere
Rank 1B.1	CNPS Rank 1B.1: Rare, threatened, or endangered in California and elsewhere (seriously threatened in California)
Rank 1B.2	CNPS Rank 1B.2: Rare, threatened, or endangered in California and elsewhere (moderately threatened in California)
Rank 1B.3	CNPS Rank 1B.3: Rare, threatened, or endangered in California and elsewhere (not very threatened in California)
Rank 2A	CNPS Rank 2A: Presumed extirpated in California, but more common elsewhere
Rank 2B.1	CNPS Rank 2B.1: Rare, threatened, or endangered in California, but more common elsewhere (seriously threatened in California)
Rank 2B.2	CNPS Rank 2B.2: Rare, threatened, or endangered in California, but more common elsewhere (moderately threatened in California)
Rank 2B.3	CNPS Rank 2B.3: Rare, threatened, or endangered in California, but more common elsewhere (not very threatened in California)
Rank 3.1	CNPS Rank 3.1: Plants about which more information is needed - A review list (seriously threatened in California)
Rank 3.2	CNPS Rank 3.2: Plants about which more information is needed - A review list (moderately threatened in California)
Rank 3.3	CNPS Rank 3.3: Plants about which more information is needed - A review list (not very threatened in California)
Rank 4.1	CNPS Rank 4.1: Plants of limited distribution - A watch list (seriously threatened in California)
Rank 4.2	CNPS Rank 4.2: Plants of limited distribution - A watch list (moderately threatened in California)
Rank 4.3	CNPS Rank 4.3: Plants of limited distribution - A watch list (not very threatened in California)

[2]Key to Cal-IPC Status (Cal-IPC 2019):

High: These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

Moderate: These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited: These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

[3]Key to Wetland Status (Lichvar et al. 2016):

OBL Obligate plant; almost always occurs in wetlands.
FACW Facultative wetland plant; usually occurs in wetlands, but may occur in non-wetlands.
FAC Facultative plant; occurs in wetlands and nonwetlands.
FACU Facultative upland plant; usually occurs in non-wetlands, but may occur in wetlands.
UPL Upland plant; almost never occur in wetlands.

[4]Key to Serpentine Affinity (Safford et al. 2005):

6 95–100% of records occur on ultramafics
5 85–94% of records occur on ultramafics
4 75–84% of records occur on ultramafics
3 65–74% of records occur on ultramafics
2 55–64% of records occur on ultramafics
1 45–54% of records occur on ultramafics
0.75 35–44% of records occur on ultramafics
0.5 25–34% of records occur on ultramafics
0.25 15–24% of records occur on ultramafics
0.1 0–14% of records occur on ultramafics
0 0% of records occur on ultramafics

APPENDIX WD-MIDDLETOWN

WETLAND DELINEATION MIDDLETOWN

Section 404 Aquatic Resources Report

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1.0 INTRODUCTION

1.1 Study Background

On October 22, 2018, WRA conducted a routine wetland delineation at 21000 Santa Clara Road, Middletown, Lake County, California (Study Area) (Figure 1) to determine the presence of potential wetlands and non-wetland waters (collectively referred to as "Waters of the U.S.") subject to federal jurisdiction under Section 404 of the Clean Water Act (CWA). This report presents the methods and results of the delineation.

All figures referenced in the text are included in Appendix A.

1.2 Regulatory Background

Section 404 of the Clean Water Act

Section 404 of the Clean Water Act gives the Environmental Protection Agency (EPA) and the Corps regulatory and permitting authority regarding discharge of dredged or fill material into "navigable waters of the United States." Section 502(7) of the CWA defines "navigable waters" as "waters of the United States, including territorial seas." Section 328 of Chapter 33 in the Code of Federal Regulations (CFR) defines the term "waters of the United States" as it applies to the jurisdictional limits of the authority of the Corps under the CWA. A summary of the definition of "waters of the United States" in 33 CFR 328.3 (a) includes (1) waters used for commerce; (2) interstate waters and wetlands; (3) territorial seas; (4) impoundments of waters listed here; (5) tributaries to the above waters; (6) waters and wetlands adjacent to the above waters; and (7) prairie potholes, Carolina and Delmarva bays, Pocosins, western vernal pools, and Texas coastal prairie wetlands, provided these features have a significant nexus to the above listed waters[1]; (8) all waters located within the 100-year floodplain of waters listed above in items 1-3 or within 4,000 feet of the high tide line (HTL) or ordinary high water mark (OHWM) of a water listed above in items 1-5, provided those waters are determined to have a significant nexus to waters identified in items 1-3 above. For purposes of the determining Corps jurisdiction under the CWA, "navigable waters" as defined in the CWA are the same as "waters of the U.S." defined in 33 CFR 328.3.

Areas not considered to be "waters of the United States" as defined in 33 CFR 328.3 (b), are summarized as follows: (1) waste treatment systems; (2) prior converted cropland; (3) specific classes of ditches, including (i) ditches with ephemeral flow that are not a relocated tributary or excavated in a tributary, (ii) ditches with intermittent flow that are not a relocated tributary, excavated in a tributary, or drain wetlands, and (iii) ditches that do not flow, either directly or through another water, into a water identified in 33 CFR 328.3 paragraphs (a) (1) through (3); (4) artificially irrigated areas that would otherwise revert to dry land and manmade aquatic features in otherwise dry land such as stock watering ponds, irrigation ponds, settling basins, fields flooded for rice growing, log cleaning ponds, cooling ponds, reflecting pools, swimming pools, small ornamental waters, depressions incidental to mining and construction activity, erosional features, and puddles; (5) groundwater; (6) stormwater control features; (7)

[1] Wetlands and non-wetland waters in this category are similarly situated and are combined, for purposes of a significant nexus analysis, in the watershed that drains to the nearest water identified in paragraphs (a)(1) through (3) of 33 CFR 328.3.

wastewater recycling structures, groundwater recharge basins, percolation ponds for wastewater recycling, and distribution networks for wastewater recycling.

1.2.1 Wetlands

Wetlands are defined in 33 CFR 328.3 (c) as:

> *…those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.*

The basis for determining whether a given area is a wetland for the purposes of Section 404 of the CWA is outlined in the Corps *Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers* Delineation Manual for the respective region. As defined in 33 CFR 328.4 (c), the extent of federal jurisdiction within wetlands is defined as extending to the limit of the wetland as determined using the methods outlined in the manuals.

1.2.2 Non-Wetland Waters

The limit of federal jurisdiction in non-tidal non-wetland waters extends to the OHWM which is defined in 33 CFR 328.3 (e) as:

> *...that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impresses on the bank, shelving, changes in the characteristics of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.*

2.0 SUMMARY OF POTENTIAL JURISDICTIONAL AREAS

Figure 2 in Appendix A depicts the extent of Corps jurisdiction within the Study Area based on a wetland delineation conducted by WRA on October 22, 2018. The acreage of potential Section 404 jurisdictional areas is summarized in Table 1 below.

Table 1. Summary of Potential Section 404 Jurisdictional Areas within the Study Area

Habitat Type	Size	"Potentially Isolated" Areas (acres)	Potential Jurisdictional Waters of the U.S.
Non-Wetland Waters:			
Intermittent Stream (within OHWM)	0.41 ac (227 l.f.)	0	0.41 ac (227 l.f.)
TOTAL			**0.41 ac (227 l.f.)**

3.0 METHODS

Prior to conducting field surveys, reference materials were reviewed, including the Soil Survey of Lake County (USDA 1989), online soil data (CSRL 2018, USDA 2018a), National Wetland Inventory (NWI) data (USFWS 2018), rainfall data (NRCS 2019), regional precipitation data (NCRS 2018b), the Middletown USGS 7.5' quadrangle (USGS 2018), and aerial photos of the site (Google Earth 2018).

A focused evaluation of indicators of wetlands and non-wetland waters was performed in the Study Area on October 22, 2018. The methods used in this study to delineate jurisdictional wetlands and non-wetland waters are based on the *U.S. Army Corps of Engineers Wetlands Delineation Manual* ("Corps Manual"; Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* ("Arid West Supplement"; Corps 2008). The routine method for wetland delineation described in the Corps Manual was used to identify areas potentially subject to Corps Section 404 jurisdiction within the Study Area. A general description of the Study Area, including plant communities present, topography, and land use was also generated during the delineation visit. The methods for evaluating the presence of wetlands and non-wetland waters employed during the site visit are described in detail below.

3.1 Potential Section 404 Waters of the U.S.

3.1.1 Wetlands

The Study Area was evaluated for the presence or absence of indicators of the three wetland parameters described in the Corps Manual (Environmental Laboratory 1987) and Arid West Supplement (Corps 2008).

Section 328.3 of the Federal Code of Regulations defines wetlands as:

"Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

EPA, 40 CFR 230.3 and CE, 33 CFR 328.3 (b)

The three parameters used to delineate wetlands are the presence of: (1) hydrophytic vegetation, (2) wetland hydrology, and (3) hydric soils. According to the Corps Manual, for areas not considered "problem areas" or "atypical situations":

"....[E]vidence of a minimum of one positive wetland indicator from each parameter (hydrology, soil, and vegetation) must be found in order to make a positive wetland determination."

Data on vegetation, hydrology, and soils collected at sample points during the delineation site visit was reported on Arid West Supplement data forms. Once an area was determined to be a potential jurisdictional wetland, its boundaries were delineated using GPS equipment and mapped on a topographic map. The areas of potential jurisdictional wetlands were measured digitally using ArcGIS software. Indicators described in the Arid West Supplement were used to make wetland determinations at each sample point in the Study Area and are summarized below.

Vegetation

Plant species observed in the Study Area were identified using the Jepson Manual, Second Edition (Baldwin et al. 2012) and the Jepson eFlora (Jepson Flora Project 2018). Plants were assigned a wetland indicator status according to the National Wetland Plant List (NWPL; Lichvar 2016). Where differences in nomenclature occur between the Jepson Manual or the Jepson eFlora, and the NWPL, the species name as it occurred in the NWPL is listed in brackets. Other relevant synonyms may also be provided in brackets.

Wetland indicator statuses listed in the NWPL are based on the expected frequency of occurrence in wetlands as follows:

Indicator Status	Definition	Hydrophytic Species? (Y/N)
Obligate (OBL)	Almost always is a hydrophyte, rarely in uplands	Y
Facultative Wetland (FACW)	Usually is a hydrophyte but occasionally found in uplands	Y
Facultative (FAC)	Commonly occurs as either a hydrophyte or non-hydrophyte	Y
Facultative Upland (FACU)	Occasionally is a hydrophyte but usually occurs in uplands	N
Upland/Not Listed (UPL/NL)	Rarely is a hydrophyte, almost always in uplands	N

The presence of hydrophytic vegetation was then determined based on indicator tests described in the Arid West Supplement. The Arid West Supplement requires that a three-step process be conducted to determine if hydrophytic vegetation is present. The procedure first requires the delineator to apply the "50/20 rule" (Indicator 1; Dominance Test) described in the manual. To apply the "50/20 rule", dominant species are chosen independently from each stratum of the community. Dominant species are determined for each vegetation stratum from a sampling plot of an appropriate size surrounding the sample point. Dominants are the most abundant species that individually or collectively account for more than 50 percent of the total vegetative cover in the stratum, plus any other species that, by itself, accounts for at least 20 percent of the total vegetative cover. If greater than 50 percent of the dominant species has an OBL, FACW, or FAC status, the sample point meets the hydrophytic vegetation criterion.

If the sample point fails Indicator 1 and both hydric soils and wetland hydrology are not present, then the sample point does not meet the hydrophytic vegetation criterion, unless the site is a problematic wetland situation. However, if the sample point fails Indicator 1 but hydric soils and wetland hydrology are both present, the delineator must apply Indicator 2.

Indicator 2 is known as the Prevalence Index. The prevalence index is a weighted average of the wetland indicator status for all plant species within the sampling plot. Each indicator status is given a numeric code (OBL = 1, FACW = 2, FAC = 3, FACU = 4, and UPL = 5). Indicator 2 requires the delineator to estimate the percent cover of each species in every stratum of the community and sum the cover estimates for any species that is present in more than one stratum. The delineator must then organize all species into groups according to their wetland indicator status and calculate the Prevalence Index using the following formula, where A equals total percent cover:

$$PI = \frac{A_{OBL} + 2A_{FACW} + 3A_{FAC} + 4A_{FACU} + 5A_{UPL}}{A_{OBL} + A_{FACW} + A_{FAC} + A_{FACU} + A_{UPL}}$$

The Prevalence Index will yield a number between 1 and 5. If the Prevalence Index is equal to or less than 3, the sample point meets the hydrophytic vegetation criterion. However, if the community fails Indicator 2, the delineator must proceed to Indicator 3.

Indicator 3 is known as Morphological Adaptations. If more than 50 percent of the individuals of a FACU species have morphological adaptations for life in wetlands, that species is considered to be a hydrophyte and its indicator status should be reassigned to FAC. If such observations are made, the delineator must recalculate Indicators 1 and 2 using a FAC indicator status for this species. The sample point meets the hydrophytic vegetation criterion if either test is satisfied.

Hydrology

The Corps jurisdictional wetland hydrology criterion is satisfied if an area is inundated or saturated for a period sufficient to create anoxic soil conditions during the growing season (a minimum of 14 consecutive days in the Arid West region). Evidence of wetland hydrology can include primary indicators, such as visible inundation or saturation, drift deposits, oxidized root channels, and salt crusts, or secondary indicators such as the FAC-neutral test, presence of a shallow aquitard, or crayfish burrows. The Arid West Supplement contains 16 primary

hydrology indicators and 10 secondary hydrology indicators. Only one primary indicator is required to meet the wetland hydrology criterion; however, if secondary indicators are used, at least two secondary indicators must be present to conclude that an area has wetland hydrology.

The presence or absence of the primary or secondary indicators described in the Arid West Supplement was utilized to determine if sample points within the Study Area met the wetland hydrology criterion.

Soils

The Natural Resource Conservation Service (NRCS) defines a hydric soil as follows:

> *"A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part."*
>
> Federal Register July 13, 1994,
> U.S. Department of Agriculture, NRCS

Soils formed over long periods of time under wetland (anaerobic) conditions often possess characteristics that indicate they meet the definition of hydric soils. Hydric soils can have a hydrogen sulfide (rotten egg) odor, low chroma matrix color, generally designated 0, 1, or 2, used to identify them as hydric, presence of redox concentrations, gleyed or depleted matrix, or high organic matter content.

Specific indicators that can be used to determine whether a soil is hydric for the purposes of wetland delineation are provided in the NRCS *Field Indicators of Hydric Soils in the U.S.* (USDA 2010). The Arid West Supplement provides a list of 23 of these hydric soil indicators which are known to occur in the Arid West region. Soil samples were collected and described according to the methodology provided in the Arid West Supplement. Soil chroma and values were determined by utilizing a standard Munsell soil color chart (Munsell Color 2009).

Hydric soils were determined to be present if any of the soil samples met one or more of the 23 hydric soil indicators described in the Arid West Supplement.

3.1.2 Non-Wetland Waters

This study also evaluated the presence of non-wetland waters potentially subject to U.S. Army Corps of Engineers jurisdiction under Section 404 of the Clean Water Act. Non-wetland areas subject to Corps jurisdiction include lakes, rivers and streams (including intermittent streams) in addition to all areas below the HTL in areas subject to tidal influence. Jurisdiction in non-tidal areas extends to the ordinary high water mark (OHW) defined as:

> "*...that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impresses on the bank, shelving, changes in the characteristics of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.*"
>
> Federal Register Vol. 51, No. 219,
> Part 328.3 (e). November 13, 1986

Identification of the ordinary high water mark followed the Corps Regulatory Guidance Letter No. 05-05, *Ordinary High Water Mark Identification* (Corps 2005).

4.0 STUDY AREA DESCRIPTION

The Study Area is approximately 13.33 acres and is located in Middletown, Lake County California (Figure 1). The site is generally flat, with an elevation of approximately 1,098 feet WGS84. The Study Area is bound on the east and south by residential parcels, to the north by ruderal grassland and to the west by Dry Creek, a tributary of Putah Creek which flows into the Sacramento River, a Traditional Navigable Water (TNW).

A majority of the Study Area was burned in the Valley Fire of September 2015; the fire intensity was at a level which charred trees and large shrubs and cleared the herbaceous layer. The property is not developed. Portions of the site appear to be regularly disced to create fire breaks with the neighboring parcels. Regional land-uses include residential and commercial (Google Earth 2019). Historically, the region was likely open rangeland composed of small ranches.

Vegetation

Vegetation within the Study Area is composed of native and non-native grasslands and small patches of oak woodland, with a narrow band of riparian scrub associated with Dry Creek. The non-native grasslands are dominated by non-native grasses including wild oat (*Avena barbata*, NL), soft chess (*Bromus hordeaceus*, FACU), medusa head (*Elymus caput-medusae*, NL), and rye (*Secale* sp., NL). Non-native forbs including vetch (*Vicia* spp., FACU), rose clover (*Trifolium hirtum*, NL), western filaree (*Erodium moschatum*, NL), big heron bill (*Erodium botrys*, FACU), and yellow star thistle (*Centaurea solstitialis*, NL) are characteristically present within the non-native grassland. The native grassland is dominated by squirreltail grass (*Elymus multisetus*, NL) with California poppy (*Eschscholzia californica*, NL), California plantago (*Plantago erecta*, NL), tarweed (*Hemizonia congesta* ssp. *clevelandii*, NL.), q-tips (*Micropus californicus*, FACU), soft chess, purple flower owl's clover (*Castilleja exserta*, NL) as associated species. The oak woodland is dominated by valley oak (*Quercus lobata*, FACU) with non-native grassland understory. The riparian scrub is characterized by arroyo willow thickets. The riparian scrub was burned during the Valley Fire and is returning, forming woody thickets mixed with open herbaceous areas. The herbaceous areas have dense cover of wetland species including tall cyperus (*Cyperus eragrostis*, FACW), iris-leaved rush (*Juncus xiphioides*, OBL), fiddleleaf dock (*Rumex pulcher*, FAC), annual beard grass (*Polypogon monspeliensis*, FACW), and western goldenrod (*Euthamia occidentalis*, FACW).

Hydrology

The primary hydrologic sources are direct precipitation and consequent sheet flow, as well as channelized stream flow within the creek. Dry Creek, an intermittent stream located along the western boundary of the Study Area, captures water from the Study Area and moves it downstream approximately 0.39 miles northeast to Putah Creek which eventually enters Lake Berryessa before flowing into the Sacramento River via the Yolo Bypass.

Precipitation predominantly falls as rainfall with an annual average for Middletown of 44.1 inches. Precipitation-bearing weather systems are predominantly from the west and south with

the majority of rain falls between November and March, with a combined average of 36.95 inches (NRCS 2019).

Soils

The overall topography of the Study Area is flat, and elevations are at approximately 1,100 feet above sea level. According to the *Soil Survey of Lake County* (USDA 1989), the Study Area is underlain by three soil mapping units: Kelsey Fine Sandy Loam, Talmage Very Gravelly Sandy Loam, and Xerofluvents, Very Gravelly. The parent soil series of these mapping units are summarized below. Figure 3 in Appendix A depicts the extent of each soil type.

Kelsey series: This series consists of very deep fine sandy loam that formed in alluvium from mixed rock sources situated on floodplains ranging from 900 to 1,600 feet. Soil pH is neutral (7.0) to slightly alkaline (7.4). These soils are listed as hydric in Lake County, but are well drained with very slow runoff and moderately rapid permeability and did not display field indicators of hydric soils. Native vegetation includes annual grasses and forbs with scattered valley oaks (*Quercus lobata*). A typical pedon contains an A horizon of fine sandy loam from 0 to 11 inches in depth with colors consisting of very dark greyish brown (10YR 3/2). The A horizon is underlain by a series of sandy loam alluvial depositional layers from 11 inches to 60 inches in depth. (USDA 1989, CSRL 2019).

Talmage Series: This series consist of very deep gravelly sandy loam formed in alluvium from mixed rock alluvial fans and plains at elevations ranging from 350 to 1,800 feet. Soil pH is slightly acidic (6.5) to neutral (7.0). These soils are listed as hydric in Lake County, but are somewhat excessively drained with slow to medium runoff and moderately rapid permeability and did not display field indicators of hydric soils. Native vegetation typically includes annual grasses and forbs with scattered oaks (*Quercus* spp.). A typical pedon contains an A horizon of gravelly or very gravelly sandy loam from 0 to 19 inches in depth with colors consisting of very dark greyish brown (10YR 3/2) to dark brown (10YR 3/3) and a C horizon of extremely gravelly coarse sandy loam from 19 to 66 inches below the surface with colors consisting of dark brown (10YR 4/3) (USDA 1989, CSRL 2019).

Xerofluvents Very Gravelly: This map unit consist of very deep, excessively drained soils formed from gravelly alluvium from mixed rock on narrow floodplains adjacent to stream channels.. These soils are listed as hydric in Lake County, but have very slow runoff with rapid permeability and did not display field indicators of hydric soils. Native vegetation typically includes vinegar weed (*Trichostema* spp.), foxtail fescue (*Festuca myuros*), and filaree (*Geranium* spp.) (USDA 1989).

5.0 RESULTS

Potential Waters of the U.S. are described in the following sections and depicted on Figure 2 in Appendix A. Vegetation, soils and hydrology data collected during delineation site visits are reported on standard Corps Arid West Region data forms provided in Appendix B. Photos of representative portions of the Study Area and sample points are shown in Appendix C. A list of plant species observed during the site visit is included in Appendix D.

5.1 Potential Section 404 Waters of the U.S

5.1.1 Wetlands

The riparian scrub is the only location within the Study Area dominated by hydrophytic vegetation. However, soils did not display field indicators of hydric soils and indicators of wetland hydrology were not observed, therefore the riparian scrub was not considered wetland. No other areas within the Study Area contained any of the three parameters; upland sample points were taken to document upland conditions. Besides the riparian scrub vegetation, no areas within the Study Area showed indicators of wetlands.

5.1.2 Non-Wetland Waters

Approximately 227 linear feet of Dry Creek is located along the western boundary of the Study Area. The OHWM is approximately 60 to 90 feet in width, with a gravelly, unvegetated bed. No water was observed within the stream during the October site visit. Features used to delineate the OHWM included absence of vegetation, shelving, wrack, and scour. The banks are steep to somewhat steep, consisting of sand and soil, ranging from 5 to 8 feet in height.

6.0 POTENTIAL CORPS OF ENGINEERS JURISDICTION

The 13.33 acre Study Area has no wetlands and 0.41 acre (227 linear feet) of non-wetland waters that may be considered jurisdictional under Section 404 of the Clean Water Act. The riparian scrub vegetation was the only area meeting hydrophytic vegetation and no areas containing hydric soil or hydrology indicators were observed. Dry Creek has clear indicators of an OWHM and is a tributary to a “navigable waters of the U.S.” and therefore meets the definition of a Waters of the U.S. under Section 404 of the Clean Water Act.

The conclusion of this delineation is based on conditions observed at the time of the field surveys conducted on October 22, 2018.

7.0 REFERENCES

Baldwin, BG, DH Goldman, DJ Keil, R Patterson, TJ Rosatti, and DH Wilken (eds.). 2012. The Jepson Manual: Vascular Plants of California, second edition. University of California Press, Berkeley, CA.

[CSRL] California Soil Resource Lab. 2018. SoilWeb: An online soil resource browser. http://casoilresource.lawr.ucdavis.edu/gmap/ Accessed October 2018.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Department of the Army, Waterways Experiment Station, Vicksburg, Mississippi 39180-0631.

Federal Register. November 13, 1986. Department of Defense, Corps of Engineers, Department of the Army, 33 CFR Parts 320 through 330, Regulatory Programs of the Corps of Engineers; Final Rule. Vol. 51, No. 219; page 41217.

Google Earth. 2018. Aerial Imagery 1993-2018. Accessed October 2018

Jepson Flora Project (eds.). 2018. Jepson eFlora. Online at: http://ucjeps.berkeley.edu/IJM.html; accessed October 2018

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016-30: 1–17. Published 28 April 2016.

Munsell Color. 2009. Munsell Soil Color Charts. Munsell Color. Grand Rapids, MI. 40pp.

U.S. Army Corps of Engineers (Corps). 2005. Regulatory Guidance Letter No. 05-05. Ordinary High Water Mark Identification. December 7.

[Corps.] U.S. Army Corps of Engineers. 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). September.

U.S. Department of Agriculture, Natural Resources Conservation Service (USDA). 1989. Soil Survey of Lake County, California. In cooperation with the University of California Agricultural Experiment Station.

[USDA] U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS). 2019. Climate Information for Lake County in the State of California. Available at: http://www.wcc.nrcs.usda.gov/. Accessed: March 2019

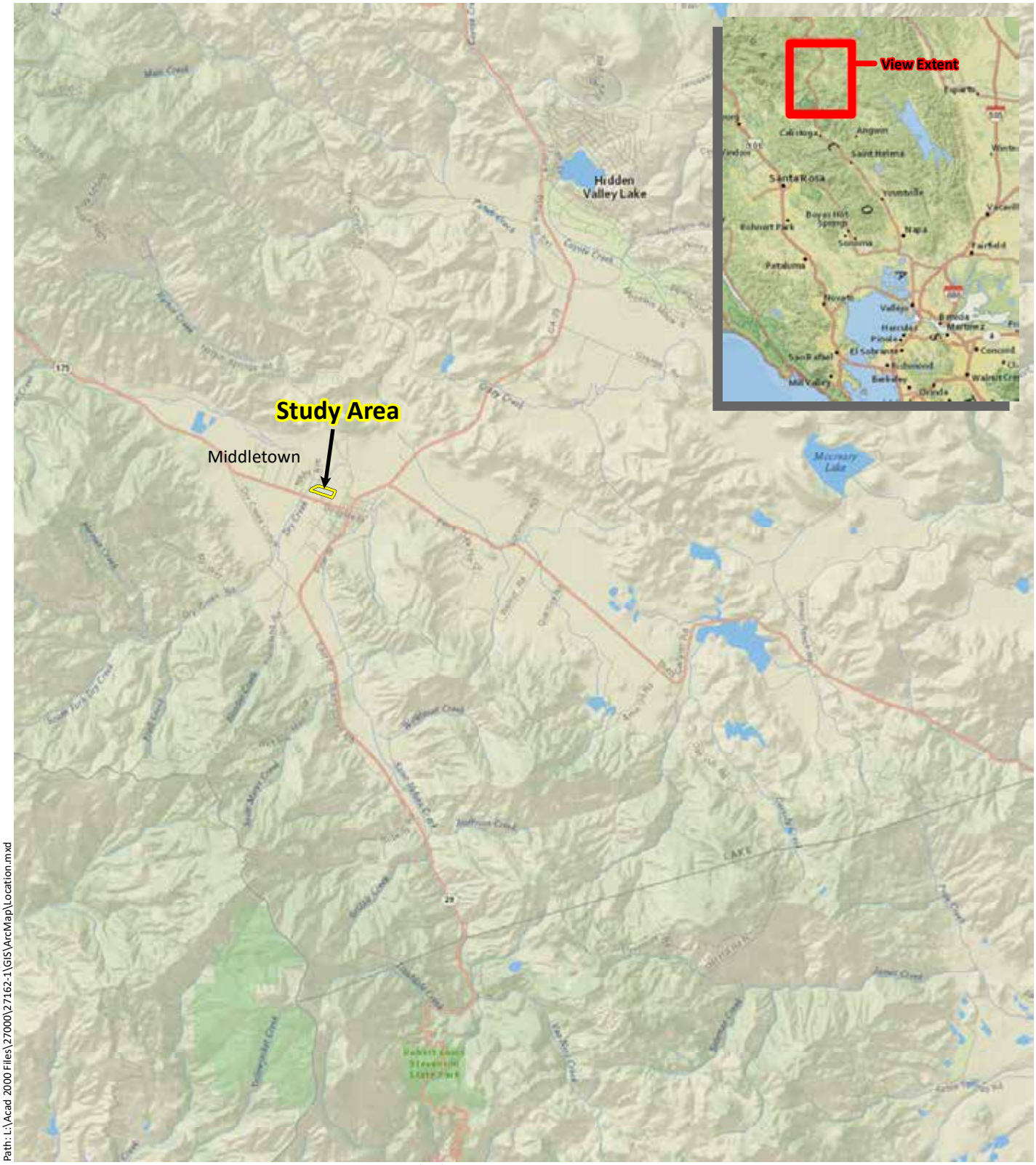
[USDA] U.S. Department of Agriculture, National Resource Conservation Service (NRCS). 2018b. Official List of US Hydric Soils.

[USDA] U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS). 2010. Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils, Version 7.0, 2010.

[USFWS] U.S. Fish and Wildlife Service. 2018. National Wetlands Inventory website. U.S. Department of the Interior, USFWS, Washington, D.C. http://www.fws.gov/nwi/ Accessed October 2018.

[USGS] U.S. Geological Survey. 2018. Middletown 7.5-minute quadrangle. Originally published in 1954; photorevised in 1988. http://www.usgsquads.com/index.php Accessed April 2014.

Appendix A
Figures



Sources: National Geographic, WRA | Prepared By: mrochelle, 2/22/2019

Figure 1. Study Area Location

21000 Santa Clara Road
Middletown, Lake County, California

0 1 2 Miles

N

wra
ENVIRONMENTAL CONSULTANTS

Sources: Esri Streaming - NAIP 2016, WRA | Prepared By: mrochelle, 5/2/2019

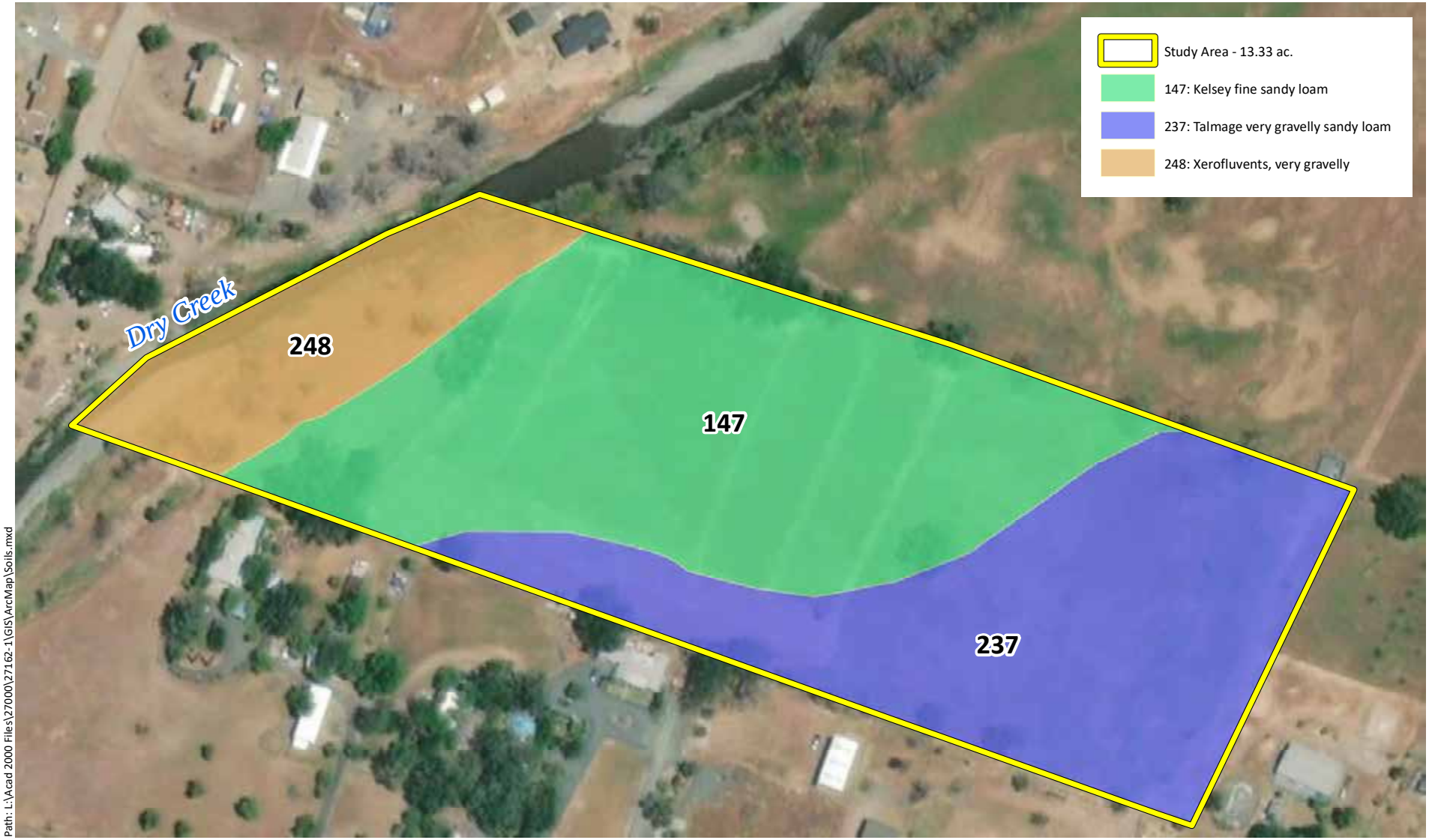
Figure 2. Potential Jurisdictional Waters of the U.S.

21000 Santa Clara Road
Middletown, Lake County, California

0 200 400 Feet

N

wra
ENVIRONMENTAL CONSULTANTS



Path: L:\Acad 2000 Files\27000\27162-1\GIS\ArcMap\Soils.mxd

Sources: Esri Streaming - NAIP 2016, WRA | Prepared By: mrochelle, 2/22/2019

Figure 3. Soils Mapped within the Study Area

21000 Santa Clara Road
Middletown, Lake County, California

0 200 400 Feet

N

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Appendix B
Arid West Wetland Delineation Data Sheets

Wetland Determination Data Form - Arid West Region

Project/Site 21000 Santa Clara Road (27162-1) City Middletown County Lake Sampling Date 10/22/2018

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-01**

Investigator(s) T. Harris, M. Weidenbach (WRA, Inc.) Section,Township,Range

Landform (hillslope, terrace, etc.) stream terrace Local Relief (concave, convex, none) None Slope(%) 1

Subregion(LRR) LRR C (Medit. CA) Lat: 38.756736 Long: -122.622389 Datum: WGS 84

Soil Map Unit Name Xerofluvents NWI classification none

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☐ Yes ☒ No
Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located on sandy terrace on the bank of Dry Creek within the riparian vegetation. Hydrophytic vegetation was present; however, indicators of hydric soils and wetland hydrology were not observed. Sample point was determined to be upland.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: 10'x10'			
1. *Salix lasiolepis*	30	Y	FACW
2. *Fraxinus latifolia*	10	Y	FACW
3.			
4.			
Sapling/Shrub Stratum Total Cover:	40		
HERB STRATUM Plot Size: 10'x10'			
1. *Polypogon monspeliensis*	35	Y	FACW
2. *Melilotus indicus*	25	Y	FACU
3. *Artemisia douglasiana*	15		FAC
4. *Euthamia occidentalis*	15		FACW
5. *Rumex pulcher*	3		FAC
6. *Epilobium sp.*	1		-
7. *Xanthium strumarium*	1		FAC
8.			
Herb Stratum Total Cover:	95		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 5 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 3 (A)

Total number of dominant species across all strata? 4 (B)

% of dominant species that are OBL, FACW, or FAC? 75 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets the Dominance Test for hydrophytic vegetation.

SOIL

Sampling Point SP-01

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-12	10YR 2/2	100					Sand	No redox observed

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: No indicators of hydric soils were observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology were observed, although vegetation meets FAC-neutral test.

Wetland Determination Data Form - Arid West Region

Project/Site 21000 Santa Clara Road (27162-1) City Middletown County Lake Sampling Date 10/22/2018

Applicant/Owner Lotusland Investment Holdings, Inc. State CA Sampling Point **SP-02**

Investigator(s) T. Harris, M. Weidenbach (WRA, Inc.) Section,Township,Range

Landform (hillslope, terrace, etc.) terrace Local Relief (concave, convex, none) None Slope(%) 1

Subregion(LRR) LRR C (Medit. CA) Lat: 38.755928 Long: -122.620758 Datum: WGS 84

Soil Map Unit Name Kelsey fine sandy loam NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Hydric Soil Present? ☐ Yes ☒ No

Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Sample point located within grassland habitat. No indicators of hydrophytic vegetation, hydric soils, or weltand hydrololgy were observed. Sample point was determined to be upland.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 10'x10'			
1. *Bromus hordeaceus*	40	Y	FACU
2. *Avena barbata*	10		NL
3. *Elymus caput-medusea*	10		NL
4. *Clarkia sp.*	5		-
5. *Elymus multisetus*	3		NL
6. *Erodium botrys*	2		FACU
7. *Trichostema lanceolatum*	2		FACU
8. *Centaurea solstalis*	2		NL
Herb Stratum Total Cover:	75		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 25 % cover of biotic crust

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:	Multiply by:
OBL species	x1
FACW species	x2
FAC species	x3
FACU species	x4
UPL species	x5
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ Dominance Test is >50%

☐ Prevalence Index is </= 3.0[1]

☐ Morphological adaptations (provide supporting data in remarks)

☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: Bromus diandrus (NL) 1 percent cover. Vegetation does not meet Dominance Test.

SOIL

Sampling Point SP-02

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
1-6	7.5YR 3/2	100					clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Gravel/shovel refusal

Depth (inches): 6

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No indicators of hydric soils were observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of wetland hydrology were observed.

Appendix C
Representative Photographs of the Study Area

Photo 1. Photo looking northeast (downstream) along Dry Creek.

Photo 2. Photo showing the riparian vegetation along Dry Creek.

Photo 3. Photo showing the soils at SP-01. No indicators of hydric soils were observed.

Photo 4. Photo showing sample point location within the riparian vegetation.

Photo 5. Photo looking northeast at SP-02.

Photo 6. Photo looking west at SP-02.

Appendix D
Plant Species Observed in the Study Area

Appendix D: Plant Species Observed within the Study Area.

Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Acmispon americanus var. *americanus*	Spanish lotus	native	annual herb	-	-	UPL
Acmispon brachycarpus	Short podded lotus	native	annual herb	-	-	-
Acmispon wrangelianus	Chilean trefoil	native	annual herb	-	-	-
Aegilops cylindrica	Jointed goatgrass	non-native	annual grass	-	Watch	-
Agoseris heterophylla	Mountain dandelion	native	annual herb	-	-	-
Ailanthus altissima	Tree of heaven	non-native (invasive)	tree	-	Moderate	FACU
Aira caryophyllea	Silvery hairgrass	non-native	annual grass	-	-	FACU
Ancistrocarphus filagineus	Woolly fishhooks	native	annual herb	-	-	-
Aphanes occidentalis	Ladie's mantle	native	annual, perennial herb	-	-	-
Artemisia douglasiana	California mugwort	native	perennial herb	-	-	FAC
Avena barbata	Slim oat	non-native (invasive)	annual, perennial grass	-	Moderate	-
Baccharis pilularis	Coyote brush	native	shrub	-	-	-
Brassica nigra	Black mustard	non-native (invasive)	annual herb	-	Moderate	-
Brickellia californica	California brickellia	native	perennial herb	-	-	FACU

Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Briza minor	Little rattlesnake grass	non-native	annual grass	-	-	FAC
Brodiaea elegans ssp. *elegans*	Harvest brodiaea	native	perennial herb	-	-	FACU
Bromus diandrus	Ripgut brome	non-native (invasive)	annual grass	-	Moderate	-
Bromus hordeaceus	Soft chess	non-native (invasive)	annual grass	-	Limited	FACU
Bromus madritensis	Foxtail chess, foxtail brome	non-native	annual grass	-	-	UPL
Calandrinia menziesii	Red maids	native	annual herb	-	-	FACU
Capsella bursa-pastoris	Shepherd's purse	non-native	annual herb	-	-	FACU
Cardamine hirsuta	Hairy bitter cress	non-native	annual herb	-	-	FACU
Castilleja exserta ssp. *exserta*	Purple owl's clover	native	annual herb	-	-	-
Centaurea solstitialis	Yellow starthistle	non-native (invasive)	annual herb	-	High	-
Clarkia purpurea ssp. *quadrivulnera*	Purple clarkia	native	annual herb	-	-	-
Claytonia parviflora ssp. *parviflora*	Miner'slettuce	native	annual herb	-	-	FACU
Claytonia perfoliata	Miner's lettuce	native	annual herb	-	-	FAC
Croton setiger	Turkey-mullein	native	perennial herb	-	-	-
Cynosurus echinatus	Dogtail grass	non-native (invasive)	annual grass	-	Moderate	-
Cyperus eragrostis	Tall cyperus	native	perennial grasslike herb	-	-	FACW

Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Daucus pusillus	Wild carrot	native	annual herb	-	-	-
Elymus caput-medusae	Medusa head	non-native (invasive)	annual grass	-	High	-
Elymus multisetus	Big squirreltail grass	native	perennial grass	-	-	-
Epilobium canum	California fuchsia	native	perennial herb	-	-	-
Epilobium ciliatum	Slender willow herb	native	perennial herb	-	-	FACW
Epilobium minutum	Minute willowherb	native	annual herb	-	-	FACU
Erigeron canadensis	Canada horseweed	native	annual herb	-	-	FACU
Eriodictyon californicum	Yerba santa	native	shrub	-	-	-
Eriogonum sp.	buckwheat	native	perennial herb	-	-	-
Erodium botrys	Big heron bill	non-native	annual herb	-	-	FACU
Erodium cicutarium	Red stemmed filaree	non-native (invasive)	annual herb	-	Limited	-
Erodium moschatum	White-stem filaree	non-native	annual herb	-	-	-
Eschscholzia californica	California poppy	native	annual, perennial herb	-	-	-
Euthamia occidentalis	Western goldenrod	native	perennial herb	-	-	FACW
Festuca arundinacea	Reed fescue	non-native (invasive)	perennial grass	-	Moderate	FACU
Festuca microstachys	Small fescue	native	annual grass	-	-	-

Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Festuca myuros	Rattail sixweeks grass	non-native (invasive)	annual grass	-	Moderate	FACU
Fraxinus latifolia	Oregon ash	native	tree	-	-	FACW
Galium aparine	Cleavers	native	annual herb	-	-	FACU
Gastridium phleoides	Nit grass	non-native	annual grass	-	-	FACU
Githopsis diffusa ssp. *diffusa*	Southern blue cup	native	annual herb	-	-	FAC
Hemizonia congesta ssp. *clevelandii*	Cleveland's tarweed	native	annual herb	-	-	-
Hirschfeldia incana	Short-podded mustard	non-native (invasive)	perennial herb	-	Moderate	-
Hypericum perforatum ssp. *perforatum*	Klamath weed	non-native	perennial herb	-	Moderate	FACU
Hypochaeris radicata	Hairy cats ear	non-native (invasive)	perennial herb	-	Moderate	FACU
Juglans hindsii	Northern California black walnut	native	tree	Rank 1B.1[1]	-	FAC
Juncus xiphioides	Iris leaved rush	native	perennial grasslike herb	-	-	OBL
Lactuca serriola	Prickly lettuce	non-native	annual herb	-	-	FACU
Lagophylla ramosissima	Common hareleaf	native	annual herb	-	-	-
Lamium amplexicaule	Henbit	non-native	annual herb	-	-	-

[1] While Northern California black walnut is considered rare, that designation is only for individuals occurring within the native range of the species, in the vicinity of the Sacramento Delta. Therefore, it is not considered rare within the Study Area.

Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Leontodon saxatilis	Hawkbit	non-native	annual herb	-	-	FACU
Lepidium latifolium	Perennial pepperweed	non-native (invasive)	perennial herb	-	High	FAC
Lepidium nitidum	Shining pepper grass	native	annual herb	-	-	FAC
Logfia gallica	Narrowleaf cottonrose	non-native	annual herb	-	-	-
Lupinus affinis	Fleshy lupine	native	annual herb	-	-	-
Lupinus bicolor	Lupine	native	annual, perennial herb	-	-	-
Lupinus nanus	Valley sky lupine	native	annual herb	-	-	-
Lythrum hyssopifolia	Hyssop loosestrife	non-native (invasive)	annual, perennial herb	-	Limited	OBL
Marah fabacea	California man-root	native	perennial herb, vine	-	-	-
Marrubium vulgare	White horehound	non-native (invasive)	perennial herb	-	Limited	FACU
Medicago polymorpha	California burclover	non-native (invasive)	annual herb	-	Limited	FACU
Melilotus indicus	Annual yellow sweetclover	non-native	annual herb	-	-	FACU
Micropus californicus	Q tips	native	annual herb	-	-	FACU
Microsteris gracilis	Slender phlox	native	annual herb	-	-	FACU
Navarretia pubescens	Purple navarretia	native	annual herb	-	-	-
Nemophila menziesii var. *menziesii*	Baby blue eyes	native	annual herb	-	-	-

Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Nemophila parviflora	Small flowered nemophila	native	annual herb	-	-	-
Nemophila pedunculata	Meadow nemophila	native	annual herb	-	-	FAC
Plagiobothrys nothofulvus	Rusty haired popcorn flower	native	annual herb	-	-	FAC
Plantago erecta	California plantain	native	annual herb	-	-	-
Plectritis sp.	Plectritis	native	annual herb	-	-	-
Poa bulbosa	Bulbous blue grass	non-native	perennial grass	-	-	FACU
Polypogon monspeliensis	Annual beard grass	non-native (invasive)	annual grass	-	Limited	FACW
Quercus lobata	Valley oak	native	tree	-	-	FACU
Rumex crispus	Curly dock	non-native (invasive)	perennial herb	-	Limited	FAC
Rumex pulcher	Fiddleleaf dock	non-native	perennial herb	-	-	FAC
Rumex salicifolius	Willow leaved dock	native	perennial herb	-	-	FACW
Salix exigua	Narrowleaf willow	native	tree, shrub	-	-	FACW
Salix lasiolepis	Arroyo willow	native	tree, shrub	-	-	FACW
Sambucus nigra ssp. *caerulea*	Blue elderberry	native	shrub	-	-	FAC
Scleranthus annuus ssp. annuus	German knotgrass	non-native	annual herb	-	-	FACU
Secale cereale	Rye	non-native	annual grass	-	-	-

Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Senecio vulgaris	Common groundsel	non-native	annual herb	-	-	FACU
Sidalcea diploscypha	Fringed checker mallow	native	annual herb	-	-	-
Silene gallica	Common catchfly	non-native	annual herb	-	-	-
Stellaria nitens	Shining chickweed	native	annual herb	-	-	-
Thysanocarpus curvipes	Common fringe pod	native	annual herb	-	-	-
Toxicodendron diversilobum	Poison oak	native	vine, shrub	-	-	FACU
Trichostema laxum	Turpentine weed	native	annual herb	-	-	-
Trifolium ciliolatum	Tree clover	native	annual herb	-	-	-
Trifolium dubium	Shamrock	non-native	annual herb	-	-	UPL
Trifolium hirtum	Rose clover	non-native (invasive)	annual herb	-	Limited	-
Trifolium microcephalum	Small head clover	native	annual herb	-	-	FAC
Trifolium microdon	Valparaiso clover	native	annual herb	-	-	-
Trifolium willdenovii	Tomcat clover	native	annual herb	-	-	FACW
Triphysaria pusilla	Little owl's clover	native	annual herb	-	-	-
Umbellularia californica	California bay	native	tree	-	-	FAC
Verbascum blattaria	Moth mullein	non-native	perennial herb	-	-	UPL

Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Verbascum thapsus	Woolly mullein	non-native (invasive)	perennial herb	-	Limited	FACU
Veronica anagallis-aquatica	Water speedwell	non-native	perennial herb	-	-	OBL
Vicia benghalensis	Purple vetch	non-native	annual herb, vine	-	-	-
Vicia sativa	Spring vetch	non-native	annual herb, vine	-	-	FACU
Vitis californica	California wild grape	native	vine, shrub	-	-	FACU
Xanthium strumarium	Cocklebur	native	annual herb	-	-	FAC

[1]Rare Status: The CNPS Inventory of Rare and Endangered Plants (CNPS 2019a)

FE: Federal Endangered
FT: Federal Threatened
SE: State Endangered
ST: State Threatened
SR: State Rare
Rank 1A: Plants presumed extirpated in California and either rare or extinct elsewhere
Rank 1B: Plants rare, threatened, or endangered in California and elsewhere
Rank 2A: Plants presumed extirpated in California, but more common elsewhere
Rank 2B: Plants rare, threatened, or endangered in California, but more common elsewhere
Rank 3: Plants about which we need more information – a review list
Rank 4: Plants of limited distribution – a watch list

[2]Invasive Status: California Invasive Plant Inventory (Cal-IPC 2019)

High: Severe ecological impacts; high rates of dispersal and establishment; most are widely distributed ecologically.
Moderate: Substantial and apparent ecological impacts; moderate-high rates of dispersal, establishment dependent on disturbance; limited-moderate distribution ecologically
Limited: Minor or not well documented ecological impacts; low-moderate rate of invasiveness; limited distribution ecologically
Assessed: Assessed by Cal-IPC and determined to not be an existing current threat

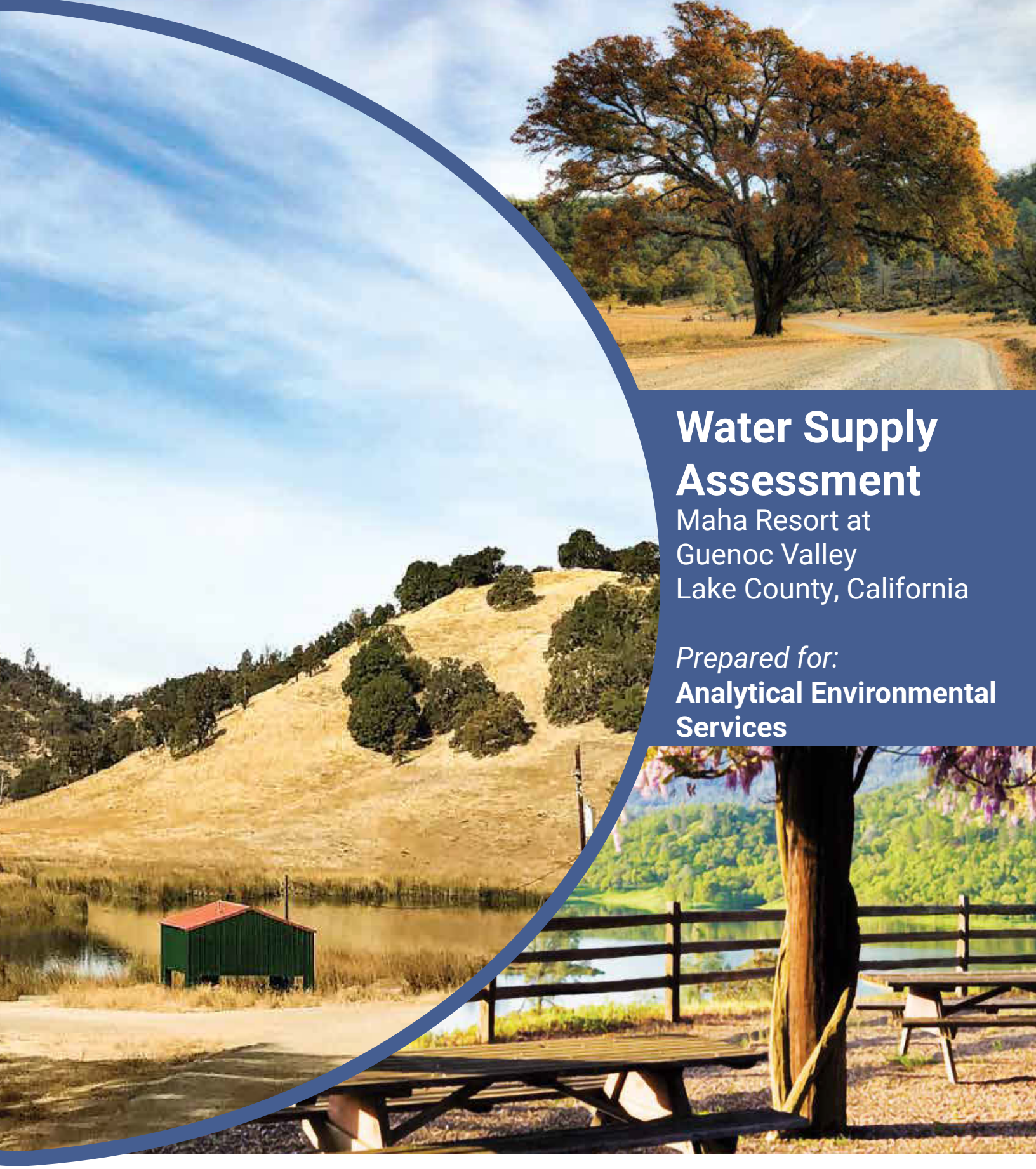
[3]Wetland Status: National List of Plant Species that Occur in Wetlands, Arid West Region (Lichvar et al. 2016)

OBL: Almost always a hydrophyte, rarely in uplands

FACW:	Usually a hydrophyte, but occasionally found in uplands
FAC:	Commonly either a hydrophyte or non-hydrophyte
FACU:	Occasionally a hydrophyte, but usually found in uplands
UPL:	Rarely a hydrophyte, almost always in uplands

APPENDIX WSA

WATER SUPPLY ASSESSMENT



Water Supply Assessment

Maha Resort at
Guenoc Valley
Lake County, California

Prepared for:
Analytical Environmental Services

February 2020

Luhdorff & Scalmanini
Consulting Engineers

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LIST OF ABBREVIATIONS & ACRONYMS

AF	Acre-feet
AFD	Acre-feet per day
AFY	Acre-feet per year
AOI	Area(s) of Interest
AWC	Available Water Capacity
BCM	U.S. Geological Survey California Basin Characterization Model
CASGEM	California Statewide Groundwater Elevation Monitoring
CDPH	California Department of Public Health
CEQA	California Environmental Quality Act
CFS	Cubic feet per second
CFWS	California Fish and Wildlife Service (formerly California Department of Fish and Game)
CGPS	Continuous Global Positioning System
CGS	California Geological Survey
DWR	California Department of Water Resources
DFW	California Department of Fish and Wildlife
EC	Electrical conductivity
EIR	Environmental Impact Report
ET	Evapotranspiration
eWRIMS	State Water Resources Control Board Electronic Water Rights Information Management System
ft	Feet
ft/d	Feet per day
ft^3/d	Cubic feet per day
GAMA	Groundwater Ambient Monitoring Assessment Program
GCM	Global Climate Model
GDE	Groundwater Dependent Ecosystems
GPD	Gallons per day
GPM	Gallons per minute

GPY	Gallons per year
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
GVD	Guenoc Valley District
GWE	Groundwater Elevation
GWL	Groundwater Level
GWQ	Groundwater Quality
MCL	Maximum Contaminant Level
mg/L	Milligrams per liter
m.y.	Million years
NOAA	National Oceanic and Atmospheric Administration
POD	Points of Diversion
S	Storativity
SB 610	California Senate Bill 610
SGMA	Sustainable Groundwater Management Act
SPOD	Specific Plan of Development
SWN	State Well Number
SWP	State Water Project
SWRCB	California State Water Resources Control Board
SWRCB - DDW	California State Water Resources Control Board – Division of Drinking Water
T	Transmissivity
TDS	total dissolved solids
µg/L	Micrograms Per Liter
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
WSA	Water Supply Assessment
WDL	Water Data Library
WQ	Water Quality
WY	Water Year

GEOLOGIC NOTATIONS

Jv	Volcanic Rocks, mainly basalt
KJf	Franciscan Formation (ss-sandstone, shale, conglomerate, ch-chert, gs-greenstone, mg-metagraywacke)
KJu	Lower Cretaceous and Upper Jurassic Rocks (undifferentiated marine mudstone, sandstone, and conglomerate (includes "Knoxville Formation")
Ku	Upper Cretaceous (undifferentiated marine rocks)
Q\Qa\Qb	Alluvium (Quaternary period, poorly sorted stream and basin deposits, clay to boulder size)
Qt	Terrace deposits
QTc	Cache Formation (Includes Pleistocene Kelsyville and Lower Lake Formations of Rymer, 1980. Pebbly sandstone, conglomerate, siltstone, and tuff; nonmarine)
QTcv	Clear Lake Volcanics (d-dacite, a-andesite to basaltic rock, b-basalt, r-rhyolite, t-tuff and other pyroclastic rocks)
um	Ultramafic Rocks (Peridotite) (partly to complete serpentinized)

Note: geologic notations and descriptions from California Geological Survey, Regional Geologic Map, Santa Rosa Quadrangle (1982)

EXECUTIVE SUMMARY

This Water Supply Assessment (WSA) analyzes the existing and planned future water demands and available water supplies for the proposed Maha Resort at Guenoc Valley (Project), including Phase One and a future phase of development. The report demonstrates that the Project has existing available water supplies from two sources, local surface water and groundwater, and a planned future supply of recycled (non-potable) water. In both normal and dry year conditions, for the year 2020 the Project site is expected to have a range of 9,163 to 16,223 acre-feet of water available annually. Projecting out to the year 2040 (and full build-out of the first phase and future phase), in both normal and dry year conditions the Project site will have a range of approximately 9,266 to 13,886 acre-feet of water available annually. For both potable and non-potable water needs, this available water supply significantly exceeds projected water demands, as analyzed from 2020 through 2040. More specifically, even with full build-out of the first phase and the Future Phase in 2040, an annual water surplus of at least 3,380 acre-feet of water is projected. Based on the analysis presented in this WSA, available sources of supply are anticipated to exceed Project and non-Project water demands in normal and dry years through 2040, consistent with the requirements of California Senate Bill 610.

1 INTRODUCTION

The proposed Maha Resort at Guenoc Valley (Project) would occur on a 16,000 acres site in southeastern Lake County (Project Area). The Project Area is located approximately three miles southeast of Middletown and currently supports agricultural land uses along with tourism-focused uses, including a hunting lodge and camp. The Project has applied to the County of Lake to rezone the Project Site to a new zoning designation the "Guenoc Valley District (GVD)". Pursuant to the California Environmental Quality Act (CEQA) the application will include an Environmental Impact Report (EIR). The EIR will include a programmatic analysis of the impacts to rezone the Project Site, the EIR will include a detailed, project level analysis of the impacts at a project level review of the first phase of development, submitted as the Specific Plan of Development (SPOD). The Project Level review EIR will analyze the environmental changes caused by a development including the construction and operation, whereas the programmatic EIR will evaluate impacts resulting from the rezone classification rather than a project specific analysis. Future phases of the project will require additional CEQA review. This Water Supply Assessment (WSA) analyzes both the first phase (Phase One) project level impacts and the potential future phase development within the new GVD zoning classification.

1.1 Purpose

California Senate Bill 610 (SB 610), which amended Part 2.10, Division 6 of the California Water Code in 2001, requires an evaluation of the sufficiency of water supplies to meet existing and planned future demands for water when proposed development projects meet certain minimum criteria (see Section 1.5). This Water Supply Assessment (WSA), provides an SB 610 evaluation, including existing and proposed water demands, for the Project Area. Water demands evaluated by this WSA include those planned to occur as part of the Project and other planned future uses in the Project Area and Adjacent Non-Project Areas with shared sources of supply (**Figure 1-1**). This WSA evaluates existing and planned

water supplies for the Project Area including surface water, groundwater, and recycled water. This WSA addresses the sufficiency of available water supplies to meet projected demands during normal, single-dry, and multiple-dry years over a twenty-year planning horizon, through 2040. Lake County is the Lead Agency for the Project.

1.2 Proposed Maha Resort at Guenoc Valley Project

The Maha Resort at Guenoc Valley is a proposed rezoning and development project located in southern Lake County. The Project includes luxury resorts and master planned residential community to be sited in clusters across the approximately 16,000-acre Project Area. The Project incorporates low impact designs that prioritize low density and clustered development, preserving surrounding open space and agricultural cultivation.

Phase One includes the construction of the roads and the utility infrastructure, approximately 225 hotel rooms, 144 resort residential units, 411 Residential villas, workforce and staff housing, and resort accessory commercial structures. The allowable uses within Future Phases evaluated as part of this WSA, include similar resort, resort accessory, and residential land uses, consistent with the development density presented in the Middletown Area Plan.

Each resort community or cluster will include a mixture of hotel units, resort residential and residential villas. The Project commercial elements will include small boutique hotels, commercial shops, and small artisanal food and winery production facilities, small farm and integrative animal husbandry elements and spa and restaurants. The key recreational facilities will include an equestrian center, an 18-hole golf course, rural recreation, and camping facilities.

The Project will also include essential operational facilities including workforce housing, central back-of-the-house operations, and emergency response center. Workforce housing is planned to be developed in Middletown, at a currently undeveloped parcel within the Collayomi County Water District Service Area.

The Project will likely form a privately held public utility company that will operate and maintain the water and sewer facilities at the property. Regulated water utilities are considered to be professional water service providers that own water and wastewater utilities, partner with municipalities to form public-private partnerships, or operate and maintain water and wastewater systems as contracted services providers. The new water system will likely be a Class B system that will serve between 2,000 to 10,000 service connections. New water supply infrastructure is being planned for the Project that will include both a potable and non-potable water systems.

1.2.1 Potable Water System

The potable water system will include three water systems serving separate parts of the Project Area: the Guenoc Valley area, the Upper Bohn Lake area, and the Camping area. The Guenoc Valley system will be designed to serve the Central Back of House area, the Equestrian Center and the Bohn Ridge

Resort. The Upper Bohn Lake system will serve the Maha Farm/Sales Center area, the Spa, Emergency Center and Support Services, the Red Hill Estates and Renaissance Golf Course, and the Resort at Trout Flat. A small water system will serve the remotely located Camping area.

Each water system will likely include a series of deep, water supply wells that will pump water to strategically placed water storage tanks.[1] Each tank will have a multi-pump booster station to maintain system pressures throughout the water distribution system. Each water system will include a water distribution system that will consist of a series of branched and looped water lines, where required to serve all commercial and residential parcels.

A series of potable water storage tanks will be installed at each water system. The domestic water storage tanks will be sized to satisfy the maximum day demand requirements for each area.

For the Guenoc Valley water system the total amount of water storage is estimated to be approximately 170,000 gallons. This will serve the Central Back of House area, the Equestrian Center and the Bohn Ridge Resort.

For the Upper Bohn Lake water system, a total of approximately 260,000 gallons of potable water storage capacity will be needed. For this system approximately 125,000 gallons of storage capacity will be needed at Maha Farms area and 135,000 gallons of storage capacity to serve the Red Hill Estate, the golf course, the Resort at Trout Flat, the Emergency Center and short-term staff accommodations and the Spa area.

The water storage tanks will likely be placed in elevated locations to provide gravity flow to the parcels served in the event of a power outage. The tanks will likely be placed on graded pads that will also be bermed with the cut material so that the grading cut and fill volume are closely balanced to avoid the transport of soils from these sites. In some locations, underground cisterns may be used to avoid impacts associated with aboveground tanks. The location of the tank and cistern sites can be selected and planned so that their installation and operation does not impact sensitive cultural, historic, and biotic resources at the site.

A system of booster pump systems located at the water storage tanks and possibly within the distribution system will be used to maintain a uniform operating pressure in each water system. It is anticipated that each booster pump system will include at least three (3) booster pumps plumbed in parallel that will be operated by a variable frequency drive controller to determine how many pumps are in operation at a given time to maintain the pressure requirements for the system. Under low or normal flow conditions it is likely that a single booster pump will be operating and, as the water demand increases, the additional standby pumps will turn on to maintain a constant flow and pressure throughout the distribution system.

[1] Water storage tanks may include both aboveground and underground facilities.

The booster pump systems will typically be installed in close proximity to the water storage tanks and will be placed in areas that are graded as a result of the storage tanks. The booster pump systems will be installed in small enclosures.

The water systems will consist of both branched in in some locations looped water distribution systems. The water distribution systems will consist primarily of 4-inch diameter water mains and 3- and 2-inch water laterals to supply the commercial building and residential parcels. The majority of the water mains and laterals will be installed in the planned roadways and driveways and will not be installed in undisturbed areas on the site, unless requested as part of the permitting process, and therefore should not result in any additional impacts to cultural, historic or biotic resources related to the installation of the new roads.

1.2.2 Non-Potable Water System

Two non-potable water system are also planned to be installed: one to serve development in the Guenoc Valley and a second system to serve the development in the Upper Bohn Lake area.

In general, both non-potable systems will include a new non-potable water distribution network, new surface water pumping systems, and wastewater recycling systems.

The non-potable water distribution will be constructed to supply fire and irrigation water demands for the site. The non-potable water distribution system will be a “purple pipe” system so that it can convey recycled water, as well as other sources of non-potable through the distribution system. The non-potable water distribution system will serve fire hydrants and external and internal fire sprinkler systems for commercial and residential buildings. The non-potable water distribution system will consist primarily of 8-inch and 6-inch water mains and 3-inch and 2-inch diameter laterals to serve fire sprinkler systems and residential properties to provide the required pressure. The majority of the non-potable water distribution system will be installed in planned roadways and driveways and should not result additional land disturbance and impacts to cultural, historic and biotic resources beyond impacts resulting from the construction of the new roads.

Both non-potable water systems will include new pumping systems located in the vicinity of the existing pumping systems at Detert, McCreary and Upper Bohn Lake. A new pump station will be installed in the vicinity of the flashboard dam installed across Bucksnort Creek downstream of McCreary Reservoir and this pump station will house two pumping systems: one pump station will convey water to Lower Bohn Lake and the second will pump water up to the new Renaissance Golf Course in the Red Hill area.

The new surface water pump stations on Detert and McCreary Reservoirs will be connected to the Guenoc Valley non-potable water system and will be used to supply irrigation, fire protection and make up water for water features and ponds in this area. The surface water pump stations placed on Bucksnort Lake and Upper Bohn Lake will be used to pump water to the non-potable water system in the Upper Bohn Lake Region for irrigation, fire protection and make up water for evaporative losses in water features and ponds.

The new surface water pump stations at the reservoirs will be installed adjacent to the existing pumping plants and will be placed in areas that have been graded and should not result in substantial ground disturbance during their construction and installation. The new pumping plant at Bucksnort Creek will be placed in a small area above the normal highwater mark and outside of the immediate riparian zone of the creek. It will likely be within 50 feet of the creek and with the riparian zone; however, it will be constructed in a location that will minimize impacts to sensitive cultural, historic and biotic resources in this area.

1.2.3 Recycled Water Facilities

Based on the remote locations of the clustered development plan, several small package type water recycling plants will be installed to treat wastewater from the development areas. Seven small package plants are currently planned to serve the Phase I project and will include small treatment works at the Maha Farm, Redhill/Renaissance Golf Course, Resort at Trout Flat, Central Back of the House, Equestrian Center and a small system at the Camping area.

The treatment systems will be designed to meet California Title 22 recycled water regulations for tertiary level disinfected recycled water that can be used for unrestricted irrigation and recreational use of the water.

At each water reclamation facility there will be a 100,000-gallon recycled water tank and booster pump system that will pump recycled water into the non-potable water distribution system for landscape irrigation, fire protection and make up water to ornamental water features and ponds.

Each water reclamation plant will cover a relatively small area ranging from less than 1,000 square feet at the Camping area to the largest area of 12,500 square feet for the largest system that will serve the Maha Farms area. The installation of all the water reclamation plants will require approximately two (2) acres of land.

The water reclamation plants will be placed in areas that are set back from the cluster developments to avoid potential odor and noise issues. The plants will be located close to planned roads to provide easy access to them and to avoid the need to construct long driveways or access roads to serve them. The plants will also be placed in areas that will minimize grading and ground disturbance to the extent practical and to avoid impacts to sensitive flora and fauna.

1.3 Report Organization

This report is structured to facilitate the presentation of information required by the Water Code including the analyses necessary to evaluate the sufficiency of the water supply to meet projected future demands. The WSA includes the following sections:

Section 1 provides an overview of the legal requirements for the WSA and describes the Project. Definitions of key terms are provided, and water resource management plans relevant to the Project are described.

Section 2 describes the Project Area and includes a summary of projected population growth, local climate, and existing and planned sources of water supply for the Project Area.

Section 3 describes the hydrogeology of the Project Area, including the geology, well, and aquifer characteristics for groundwater basins and non-basin areas.

Section 4 describes regional and local groundwater conditions including groundwater levels and groundwater quality. The section also presents data on historical and current water use and information on the availability of groundwater, surface water, and recycled water in the Project Area.

Section 5 describes future water demands based for both Phase One and a future phase of the Maha Resort at Guenoc Valley.

Section 6 addresses water supply sufficiency by comparing projected water demands in the Project Area to available supplies for normal, dry, and multiple-dry water year[2] conditions. This section includes a discussion of the permits and financing necessary to make the water supply available to the Project.

1.4 Scope of Analysis

This WSA includes a review of water resources and water supplies as well as existing and future planned water demands the Project Area to the year 2040, consistent with the requirements of SB 610.

Although not within the Project Area, areas covering approximately 505 acres along Bucksnort Creek and approximately 720 acres in Napa County are included in the WSA analysis, due to the inter-related nature of the existing water supply for those areas with the rest of the Project Area. These areas are referenced in this WSA as Adjacent Non-Project Areas; existing and planned land uses in these areas include vineyards, the Lillie Langtry House, and the Langtry Estate Winery. The WSA is intended to fulfill the requirements of SB 610, as described below.

1.5 SB 610 Requirements for Groundwater Sources

SB 610 became effective on January 1, 2002 with the intent to strengthen the process by which local agencies determine the adequacy and sufficiency of current and future water supplies to meet current and future demands. SB 610 amended the California Public Resources Code to incorporate Water Code findings within the CEQA process for certain types of projects. SB 610 amended the Water Code to expand the types of information included in Urban Water Management Plans (UWMP) from Water Code Section 10620 *et seq.* and to amend Water Code Part 2.10 Water Supply Planning to Support Existing and Planned Future Uses (Section 10910 *et seq*.). The latter Part 2.10 describes the roles and

[2] Water year is the period from October 1 to September 30, named for the calendar year on September 30.

responsibilities of the Lead Agency under CEQA and the public water system (water supplier) with respect to comparing current and future water supplies with current and projected future water demands. A project requiring a WSA, as defined in SB 610, includes 1) a proposed residential development having more than 500 dwelling units; 2) a proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space; 3) a proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space; 4) a proposed hotel or motel, or both, having more than 500 rooms; 5) a proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area; 6) a mixed-use development that includes one or more of the uses described above; 7) a development that would demand an amount of water equivalent to or greater than the amount of water required by a 500-dwelling-unit project; and 8) for Lead Agencies with under 5,000 water service connections, any new development that will increase the number of water service connections in the service area by ten percent or more.

If the water supplier has already completed an UWMP, it must identify whether the new demands are included in the UWMP. If the UWMP includes the demands, it may be incorporated by reference. In this case, there is no UWMP covering the Project Area; therefore, Water Code Section 10910 requires the preparation of a WSA. To comply with the SB 610 requirements, this WSA includes the following information:

- A description of the water service area including climate and population. Population information include current and projected population reflecting existing and planned future populations.
- A description and quantification of the existing and planned water sources (surface water, groundwater, and recycled water).
- A description of the water source availability during normal, single-dry, and multiple-dry water year types.
- A description of current and projected water demands among all user classes in the future public water system service area in five-year increments.
- A discussion of the total projected water supplies determined to be available to the Maha Resort water system during normal, single-dry, and multiple-dry water years for a 20-year horizon that will meet the projected water demand associated with the proposed project, in addition to continuation of existing uses and planned future uses.

WSA requirements are specified when groundwater is identified as a source. For the Project Area, groundwater is planned to serve as the sole source of potable drinking water and delivered surface water will provide agricultural and landscaping water demands. Due to the inclusion of groundwater as a source of water, the WSA must include the following additional information:

- A review of any information contained in an UWMP relevant to the identified water supply for the proposed project. Where an area does not have an UWMP, a guidance document prepared

by the California Department of Water Resources (DWR) suggests that the WSA include discussion of any existing groundwater management plan and how it would affect the water supplier's use of the basin (DWR, 2003).

- A description of any groundwater basin from which the proposed project would be supplied with groundwater, including information obtained from the most current DWR bulletin that characterizes the condition of the groundwater basin (i.e., whether DWR has identified the basin as overdrafted, or projected that the basin will become overdrafted if present management conditions continue, and what measures are being taken to prevent overdraft conditions from occurring). As suggested in the DWR guidance document relating to the implementation of SB 610, if the basin has not been (or recently been) evaluated by DWR, data that indicate historical and recent groundwater level trends should be evaluated.
- A detailed description and analysis of the amount and location of groundwater pumped by the public water system for the past five years from any groundwater basin from which the proposed project will be supplied.
- A detailed description and analysis of the amount and location of groundwater that is projected to be pumped (for at least a twenty-year horizon) by the public water system from any basin from which the proposed project will be supplied.
- An analysis of the sufficiency of the groundwater that will be supplied from the basin or basins to meet the projected water demand of the proposed project.

1.6 Definition of Terms

1.6.1 Project Area

The Project Area covers approximately 16,000 acres of unincorporated land in southern Lake County and includes the lands to be rezoned and developed as part of the Project (**Figure 1-1**).

1.6.2 Adjacent Non-Project Areas

Adjacent Non-Project Areas are lands that rely on surface water and groundwater water supplies available to meet Project demands. Due to the shared sources of supply these areas are included in the analysis presented in this WSA. These areas include approximately 505 acres along Bucksnort Creek in Guenoc Valley, including an existing commercial winery, and approximately 720 acres in Napa County (**Figure 1-1**).

1.6.3 Sufficiency

Water Code Section 10910(f)(5) requires inclusion of "an analysis of the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project."

Water Code Section 10910(c)(3) states:

> "If … the public water system has no urban water management plan, the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses."

The Water Code Sections (Water Code 10910 *et seq*.) above are understood to mean that the analysis of the sufficiency of groundwater from the basin applies to the availability of water supplies to meet the projected water demands during normal, dry, and multiple-dry years within a 20-year projection.

1.6.4 Overdraft

SB 610 requirements discussed above include evaluation of the condition of the groundwater basin, including whether DWR has identified the basin to be in overdraft or projected to become overdrafted. The word "overdraft" is defined by DWR as follows (DWR, 2003a):

> "[T]he condition of a groundwater basin or subbasin in which the amount of water withdrawn by pumping exceeds the amount of water that recharges the basin over a period of years, during which the water supply conditions approximate average conditions (DWR, 1998)."

Bulletin 118 also reports that "overdraft can be characterized by groundwater levels that decline over a period of years and never fully recover, even in wet years. If overdraft is determined and continues for a number of years, "significant adverse impacts may occur, including increased extraction costs, costs of well deepening or replacement, land subsidence, water quality degradation, and environmental impacts" (DWR, 2003a).

1.7 Water Management Plans

This section includes a review of existing Water Management Plans that are in the vicinity of the Maha Resort Project area and how they pertain to groundwater resources in the area. This includes the Lake County Groundwater Management Plan (CDM, 2006).

There are no Urban Water Management Plans or Agricultural Water Management Plans for areas intersection of overlapping with the Project area.

Lake County manages groundwater resources through the Lake County Watershed Protection District (District). In 2006, the District finalized the Lake County Groundwater Management Plan (GMP) (CDM, 2006). The GMP was developed to "(support) the long-term maintenance of high quality groundwater resources within the 13 groundwater basins of the county" (p. 1-3), including the Coyote Valley Basin and Collayomi Valley Basin. The GMP includes the following management objectives:

- Improve the understanding of groundwater hydrology and quality in Lake County;

- Maintain a sustainable, high quality water supply for agricultural, environmental, and urban uses;
- Minimize the long-term drawdown of groundwater levels;
- Protect groundwater quality;
- Minimize changes to surface water flows and quality that directly affect groundwater levels or quality;
- Minimize the effect of groundwater pumping on surface water flows and quality;
- Facilitate groundwater replenishment and cooperative management projects; and
- Prevent inelastic land surface subsidence from occurring as a result of groundwater pumping.

The GMP presents information summarizing groundwater conditions in each basin including hydrographs of depth to groundwater in the northern portion of the Coyote Valley which established historical groundwater levels. The GMP also includes the following "Best Management Objectives" (BMOs), developed with stakeholder input, to guide groundwater management in the Coyote Valley Basin and Collayomi Valley Groundwater Basin:

- Prevent long-term declines in groundwater levels
- Maintain groundwater levels to assure an adequate and affordable irrigation and domestic water supply
- Develop an understanding of groundwater within the basin
- Maintain a sustainable water supply now and into the future
- Understand geothermal water occurrence
- Reduce nitrate concentrations
- Increase groundwater quality monitoring
- Increase monitoring and understanding of groundwater levels, groundwater quality, land subsidence, and connections between these elements
- Monitor and understand iron, manganese, boron and chromium water quality issues Understand well depths consistent with basin pumping or available yield
- Increase subsidence monitoring
- Prevent inelastic land subsidence

Both the Coyote Valley Groundwater Basin and the Collayomi Valley Groundwater Basin are designated as very low priority basins by the California Department of Water Resources as of 2019. Based on their priority designation, the basins are not required to be managed by a Groundwater Sustainability Plans (GSPs), under the Sustainable Groundwater Management Act. No Groundwater Sustainability Agencies (GSAs) have formed within either basin.

1.8 Water System Permits, Regulatory Requirements, and Approvals

The Project will be required to obtain permits and regulatory approvals from design to construction and including ongoing operations. Permits and regulatory approvals related to the Project water system are listed below, along with the corresponding regulatory agency:

- Water Wells Permits – Issued by Lake County or State Water Resources Control Board – Division of Drinking Water(SWRCB-DDW)
- Water System Plan and Technical Reports - Approved by Lake County and SWRCB-DDW
- Operation and Maintenance Plan - Approved by Lake County and SWRCB-DDW
- Water System Permit - Issued by SWRCB-DDW
- Public Water Utility Formation - Approved by the CPUC, Lake County Local Agency Formation Commission, and SWRCB-DDW
- Water Recycling Permit -Issued by the Central Valley Regional Water Quality Control Board (with review by the SWRCB-DDW)

2 MAHA RESORT AT GUENOC VALLEY SETTING

Guenoc Valley is a small inland valley set on an alluvial fan, isolated from surrounding areas by rocky ridges and volcanic outcroppings and rock. As part of the inner coastal range of Northern California, the site is characterized by varied topography, with rolling hills, native vegetation including chaparral and oak woodlands, irrigated vineyards, grazing corridors, open meadows and lakes. Ground elevations across the Project Area range from 600 to over 1,200 feet above sea level.

The Project Area is approximately 95 miles northeast of San Francisco, 85 miles southwest of Sacramento, 40 miles east of Santa Rosa, and 25 miles southeast of Clearlake.

2.1 Project Area Characteristics

The Project Area covers approximately 16,000 acres of unincorporated land in southern Lake County. Adjacent Non-Project Areas include an additional 1,225 acres in unincorporated Lake and Napa Counties that share existing water supplies with the Project Area, including surface water diversions and groundwater, described in more detail in the following sections. The Project Area and Adjacent Non-Project Areas support agricultural land uses along with a winery and tourism-focused uses, including a hunting lodge and camp. A golf course was also in use on the Project Area until approximately 2016.

The surrounding area is predominately rural and characterized by some agricultural uses and scattered small communities, with native vegetation predominating. Two communities located near the Project Area include Middletown, located approximately three miles west via Butts Canyon Road and Highway 29 (**Figure 1-1**).

2.2 Climate and Precipitation

The Project Area experiences a Mediterranean climate, characterized by a wet season occurring during cool winters and dry season during the warm to hot summers (**Figure 2-1**). Monthly average high temperatures range from 58 °F in December to 88 °F in July. Monthly average low temperatures range from 35 °F in December to 64 °F in July. Precipitation measured at a long-term station in Middletown has averaged 41 inches annually for the most recent 30-year period, from 1989. The distribution of annual precipitation, evaluated by a frequency analysis, includes a range of normal year precipitation from 35 inches to almost 54 inches (**Table 2-1**).

Table 2-1: Middletown Precipitation Frequency Analysis

Class	Lower Bound (inches)	Upper Bound (inches)	Number of Years	Exceedance Probability	Likelihood
Very Dry		<=29.37	5	89.80%	10.4%
Dry	29.38	34.98	11	67.35%	22.9%
Normal	34.99	53.61	17	32.7%	35.4%
Wet	53.62	75.45	11	10.2%	22.9%
Very Wet		>75.45	4	*<10.2%*	8.3%

Station ID: USC00045598, 1941 to 2017, n=48, excludes years with incomplete data

2.3 Current and Projected Population

There are currently no permanent residences in the Project Area and no residences at the Off-site Workforce Housing site location in Middletown, as a result the population of both areas is zero. The estimated project area population is expected to reach 1,059, including resort residential and hotel units and workforce housing. Future Phases are expected to add a population of 2,790. Off-site workforce housing, planned to be located in Middletown, is projected to reach a population of 221. In total, after full build-out the Project is estimated to account for a population of 4,070 (**Table 2-2**).

Table 2-2: Estimated Project Population

Location	Residential Units	Workforce Bedroom Units	Population Generated
Project Area Phase One	401	100	1,059
Project Area Future Phases	1,000	400	2,790
Off-site Workforce Housing	-	221	221
Total	**1,401**	**721**	**4,070**

Adapted from AES (2019). Population estimated based on proposed residential units.

2.4 Existing and Planned Water Sources

2.4.1 Groundwater

Fourteen springs and production wells are currently in use in the Project Area and Adjacent Non-Project Areas (**Table 2-3**). Wells supply irrigation water outside of approved Places of Use and domestic water for existing uses. At least eight springs, not shown in **Table 2-3**, were formerly used for stock watering. Two springs are currently used to supply domestic uses, though none are proposed to supply Project water demands. Two wells shown in **Table 2-3** (McCreary Production Well 1 and Red Hills Production Well 1) are proposed wells planned to be constructed, under and existing contract for drilling services.

In the Project Area, three wells are currently used to meet existing uses and are not planned to supply Project demands. These include the Lodge Well, Tephra Ridge #1 Well, and Tephra Ridge #2 Well (**Table 2-3**). The Lodge Well supplies domestic uses at the Gebhard Lodge with production rate of about 10 gallons per minute (GPM) (AES, 2006). The two Tephra Ridge wells supply groundwater to meet irrigation demands at the Tephra Ridge vineyards located approximately 2 miles southeast of Detert Reservoir and outside of surface water Places of Use. The Tephra Ridge irrigation wells have approximate production rates of 50 GPM and 25 GPM, respectively (**Table 2-3)** (AES, 2006).

In preparation for the Project, new water supply wells have been constructed in the Project Area to eventually supply groundwater to the two planned potable water systems. Work related to the installation of the water supply wells began in August of 2019. A total of four potable water supply wells are currently planned to be installed (**Figure 2-3**). As of November 2019, two wells (Camping Area Production Well 1 and Farmstead Production Well 1) have been installed and a third well is under construction. New wells have been constructed and tested to municipal standards and will be able to be permitted domestic supply wells. Initially, the wells will be used to supply water for construction activities.

Camping Area Production Well 1 (CA PW-1)[3]

Construction and testing of CA PW-1 began in September 2019 and was completed in October 2019. A conductor consisting of 24-inch diameter by 5/16-inch wall mild steel was installed from 50 feet below ground surface (bgs) to ground surface within a 30-inch diameter borehole. A sanitary seal consisting of a 10.3 sack sand/cement grout was placed in the annulus between the borehole and the casing. The 17-inch diameter borehole was drilled from 50 feet bgs to 290 feet bgs. The materials encountered during the drilling of CA PW-1 included sand and gravel and fractured volcanic rock. The well structure consists of 8-inch diameter by ¼-inch wall mild steel blank and triple mill slotted steel casing. The width of slots is 0.080-inch. Slotted intervals were installed from 110-170, 180-240, and 250-270 feet bgs. A well sump was installed from 270-280 feet bgs. A gravel pack consisting of pea gravel was installed from 290 to 100

[3] Camping Area Production Well 1 (CA PW-1) was previously designated Wilderness Area Production Well 1 (WA PW-1). The well has been renamed to more closely align with the proposed Project elements. The latter name still appears in some earlier Project documents including water quality sampling documentation.

feet bgs. An annular seal consisting of 10.3 sack sand/cement grout was installed from 100 feet bgs to ground surface.

Testing of WA PA-1 consisted of three, 2-hour constant rate tests, followed by a 10-day constant rate test. The short-term constant rate tests (i.e., step tests) were used to select a pumping rate for the 10-day constant rate test. During short-term testing the well was pumped at 160 GPM, 240, GPM, and 377 GPM, respectively (**Figure 2-4**). Afterwards, the well was pumped at an average rate 346 gallons per minute (GPM) for 10-days (**Figure 2-5**). Total drawdown during the constant rate test was approximately 28 feet at the maximum pumping rate allowed by the test pump. At the end of the test, the well's specific capacity was 12.7 gallons per minute/foot of drawdown (GPM/foot). Water level measurements were collected for 10 days after pumping ceased. The water level within the well recovered to within 95% of the static water level within 8 days. Based on the pumping rate and rate of water level recovery, per DDW regulations (CCR Section 64554), the permitted yield of the well is anticipated to be 178 GPM. The pumping rate used during the test was limited by the size of the installed pump. A higher well yield could be demonstrated with additional testing with a larger pump. Water quality samples were collected during the constant rate test for Title 22 drinking water analysis. For the constituents analyzed, the water meets all current Title 22 water quality standards (**Table 2-4).**

Farmstead Production Well 1 (FS PW-1)

Construction and testing of FS PW-1 began in October 2019. A conductor consisting of 24-inch diameter by 5/16-inch wall mild steel was installed from 50 feet bgs to ground surface within a 30-inch diameter borehole. A sanitary seal consisting of a 10.3 sack sand/cement grout was placed in the annulus between the borehole and the casing. The 17-inch diameter borehole was drilled from 50 feet bgs to 430 feet bgs. The material encountered during the drilling of FS PW-1 was fractured volcanic rock. The completed well depth is 430 feet below ground surface bgs, with screened intervals of 200-300 and 330-420 feet bgs. The well casing consists of 8-inch diameter by ¼-inch wall mild steel installed within a 17-inch diameter borehole. The well screen is triple mill slot with 0.080-inch slot size. The gravel pack consisting of pea gravel is installed from 430 to 100 feet bgs. An annular seal consisting of 10.3 sack sand/cement grout is installed from 100 feet to ground surface.

Testing of FS PW-1 began in November 2019. The initial phase of yield testing consisted of three, 2-hour constant rate tests, followed by a 10-day constant rate test. The short constant rate tests were used to select a pumping rate for the 10-day constant rate test. The well was pumped at an average rate of 305 GPM during the 10-day test. Water quality samples were collected during the constant rate test for Title 22 drinking water analysis. For the constituents analyzed, the water meets all current Title 22 water quality standards (**Table 2-4**). Water level and pumping rate data are being evaluated to quantify the anticipated permitted well yield for FS PW-1.

Four production wells and springs are located in Adjacent Non-Project Areas and are not proposed to supply the Project; they include the Headquarters West #1 and #2 springs, Langtry Estates Well, and the Upper Bohn Well (**Table 2-3**). The Headquarters West #1 and #2 springs supply domestic uses at the

Lillie Langtry House and nearby buildings. The Langtry Estates Well supplies the existing winery and tasting room located near the intersection of Guenoc Road and Butts Canyon Road. The Upper Bohn Well is located outside of the Project Area, in Napa County, and supplies existing agricultural water demands in the Project Area and adjacent non-project areas. The Upper Bohn Well is located approximately one-half mile southeast of Upper Bohn Lake. Constructed in 2002, the Upper Bohn Well is pumped into Upper Bohn Lake to augment the primary supply of surface water to the lake, as needed to supply irrigation demands for vineyards located outside of Places of Use in the Upper Bohn Lake service area. The Upper Bohn Well is not proposed to supply the Project and no changes to the use or volume of pumpage are anticipated as a result of the Project.

Crossroads Well (W-1)

The Crossroads Well was constructed in 2002 and tested soon afterwards at a rate of 295 GPM for 24-hours (GSi/water, 2002). In their report describing that testing, GSi/water described that an average pumping rate of 300 GPM could be used, but that a long-term production rate may need to be set lower to allow for more complete water level recovery between pumping cycles. As shown in **Table 2-3**, the long-term pumping rate is estimated to be 200 GPM.

Table 2-3: Well and Spring Inventory

Well or Spring Name	Approximate Production Rate (Gallons per Minute)[1]	Purpose/Use	Planned to Supply Project
Crossroads Well (W-1)[2]	200	Upper Bohn Area Non-Potable Supply	Yes
Camping Area Production Well 1 (CA PW-1)	178	Guenoc Valley and Camping Area Potable Supply	Yes
Farmstead Production Well 1 (FS PW-1)	Analysis pending	Upper Bohn Area Potable Supply	Yes
McCreary Production Well 1 (McCreary PW-1)	Well construction and testing pending	Guenoc Valley Area Potable Supply, not yet constructed	Yes
Red Hills Production Well 1 (RH PW-1)	Well construction and testing pending	Upper Bohn Area Potable Supply, not yet constructed	Yes
Lodge Well	10	Gebhard Lodge domestic use	No
Tephra Ridge #1 Well	50	Tephra Ridge vineyard irrigation	No
Tephra Ridge #2 Well	25	Tephra Ridge vineyard irrigation	No
Langtry Estates Well	unknown	Langtry Estates Winery	No
Headquarters West #1 Spring	15	Langtry House and nearby buildings domestic use	No
Headquarters East #1 Spring	5	Langtry House and nearby buildings domestic use	No
Upper Bohn Well (W-2)[2]	540	Upper Bohn Area Non-Potable Supply	No
Langtry Vineyard #1 Spring	5	Langtry Vineyard irrigation use	No
Lodge Well	10	Gebhard Lodge domestic uses	No
Black Oak Villa Spring	1	Domestic uses	No
Ink Ranch Spring	2	Existing hunting camp supply	No

[1] Table adapted from (AES, 2006, p.4.5-5). Spring and well production rates may vary seasonally and annually. Production rates are estimates unless stated otherwise.
[2] Alternate names as designated by GSi/water (2002).

Table 2-4: Maha Resort Production Well Water Quality Results

ANALYTE	UNITS	REPORTING LIMIT	ANALYTICAL METHOD	MCL	Camping Area Production Well 1 Sample Date: 10/8/2019	Farmstead Production Well 1 Sample Date: 11/25/2019
CATIONS						
Calcium	mg/L	1.0	200.7		17	6.3
Magnesium	mg/L	1.0	200.7		25	90
Potassium	mg/L	1.0	200.7		2.3	ND
Sodium	mg/L	1.0	200.7		18	5.5
Total Hardness	mg/L	1.0	200.7		150	390
ANIONS						
Bicarbonate Alkalinity	mg/L	5.0	SM 2320B		150	460
Carbonate Alkalinity	mg/L	5.0	SM 2320B		ND	ND
Chloride (Cl)	mg/L	0.50	300.0	250/500[2]	26	5.1
Cyanide	mg/L	0.1	SM20-4500-CN	0.15	ND	ND
Fluoride	mg/L	0.10	300.0	2	0.11	ND
Hydroxide Alkalinity	mg/L	5.0	SM 2320B		ND	ND
Nitrate (as N)	mg/L	0.40	300.0	10	ND	ND
Nitrate/Nitrite (as N)	mg/L	0.40	300.0	10	ND	ND
Nitrite (as N)	mg/L	0.40	300.0	0.4	ND	ND
Sulfate (as SO4)	mg/L	0.50	300.0	250/500[2]	3.1	4.7
Sulfide	mg/L	1.0	SM4500-S F		ND	ND
Total Alkalinity	mg/L	5.0	SM 2320B		150	460
Perchlorate	mg/L	0.0040	314.0	0.006	ND	ND

Table 2-4: Maha Resort Production Well Water Quality Results

ANALYTE	UNITS	REPORTING LIMIT	ANALYTICAL METHOD	MCL	Camping Area Production Well 1 Sample Date: 10/8/2019	Farmstead Production Well 1 Sample Date: 11/25/2019
PHYSICAL PARAMETERS						
Color (A.P.H.A)	Color Units	1	SM 2120B	15[2]	ND	ND
pH	pH units	0.01	SM 4500-H B	6.5/8.5[4]	8.01	7.74
Methylene Blue Active Substance	mg/L	0.10	SM 5540C	0.5[2]	ND	ND
Specific Conductivity	µmhos/cm	1.0	120.1	900/1,600[2]	360	740
Total Dissolved Solids (TDS)	mg/L	10	SM 2540C	500/1,000[2]	240	480
Odor	TON	1	140.1		ND	1
Turbidity	NTU	0.10	180.1	5[2]	0.22	0.18
INORGANICS						
Aluminum	mg/L	0.05	200.7	1[1]/0.2[3]	ND	ND
Antimony	mg/L	0.0040	200.8	0.006	ND	ND
Arsenic	mg/L	0.0020	200.8	0.010	0.0034	0.0021
Barium	mg/L	0.1	200.7	1	ND	ND
Beryllium	mg/L	0.001	200.7	0.004	ND	ND
Boron	mg/L	0.1	200.7	1[3]	ND	ND
Cadmium	mg/L	0.0010	200.8	0.005	ND	ND
Chromium (Total)	mg/L	0.01	200.7	0.05	ND	ND
Hexavalent Chromium	mg/L	0.001	218.6		ND	ND
Copper	mg/L	0.050	200.7	1.3[2]	ND	ND
Iron	mg/L	0.10	200.7	0.3[2]	ND	0.110
Lead	mg/L	0.0050	200.8	0.015[3]	ND	ND

Table 2-4: Maha Resort Production Well Water Quality Results

ANALYTE	UNITS	REPORTING LIMIT	ANALYTICAL METHOD	MCL	Camping Area Production Well 1 Sample Date: 10/8/2019	Farmstead Production Well 1 Sample Date: 11/25/2019
Manganese	mg/L	0.02	200.7	0.05[2]	0.037	ND
Mercury	mg/L	0.0010	245.1	0.002	ND	ND
Nickel	mg/L	0.01	200.8	0.1	ND	ND
Selenium	mg/L	0.0050	200.8	0.05	ND	ND
Silver	mg/L	0.01	200.7	0.1[2]	ND	ND
Thallium	mg/L	0.001	200.8	0.002	ND	ND
Vanadium	mg/L	0.003	200.8	0.05[3]	ND	ND
Zinc	mg/L	0.05	200.7	5[2]	ND	ND
RADIO CHEMISTRY						
Gross Alpha	pCi/L	0.971	900	15/5[3]	7.77 ± 1.26	1.42 ± 1.58
Gross Beta	pCi/L	0.702	900	50	9.16 ± 1.43	12.8 ± 2.24
Total Alpha Radium (226)	pCi/L	0.304	903	3	0.084 ± 0.116	0.038 ± 0.130
Ra 228	pCi/L	0.400	Ra-05	2	0.405 ± 0.826	1.69 ± 1.19
Uranium	pCi/L	0.342	908	20	0.00 ± 0.400	0.101 ± 0.521
OTHER ANALYSES						
Purgeable Organic Compounds (VOCs)	µg/L	*	524.2		ND	ND
Benzo(a)pyrene	µg/L	0.10	550		ND	ND
Nitrogen/Phosphorus Pesticides	µg/L	*	507		ND	ND
Semi-Volatile Organic Compounds (SVOCs)	mg/L	*	525.2		ND	ND
Trihalomethanes	µg/L	0.50	524.2		ND	ND

Table 2-4: Maha Resort Production Well Water Quality Results

ANALYTE	UNITS	REPORTING LIMIT	ANALYTICAL METHOD	MCL	Camping Area Production Well 1 Sample Date: 10/8/2019	Farmstead Production Well 1 Sample Date: 11/25/2019
EDB and DBCP	µg/L	*	504.1		ND	ND
Haloacetic Acids	µg/L	*	552.2		ND	ND
Chlorinated Herbicides	µg/L	*	515.3		ND	ND
Chlorinated Pesticides and PCB's	µg/L	*	508		ND	ND
Asbestos	MFL	0.21	600/R-94/134	7	ND	ND
Endothall	µg/L	20	548.1		ND	ND
2,3,7,8-TCDD Dioxin	pg/L	10.8	1613B		ND	ND
1,2,3-Trichloropropane	µg/L	0.0050	SRL524M-TCP		ND	ND
Glyphosate	µg/L	5.0	547		ND	ND
Carbamates	µg/L	2.0	531.2		ND	ND
Diquat	µg/L	4.0	549.2		ND	ND

[1] - Primary MCL
[2] - Secondary MCL (recommended/upper range)
[3] - Notification Level
[4] - Suggested lower/upper acceptable range
* - Various Reporting Limits
ND = Non-Detect

2.4.2 Surface Water

A number of intermittent streams run through the Project Area and one perennial stream, Putah Creek, crosses the northeast part of the Project Area. Bucksnort Creek enters the property near the southwest corner of the property and lows in a southeast to northwest direction approximately 7 miles through the property before discharging into Putah Creek. Bucksnort Creek is an important stream on the property and is used to convey water from one reservoir to another on a periodic basis. Putah Creek runs approximately 6.7 miles through the property and drains into Lake Berryessa, southeast of the Project Area. Several of the intermittent streams have been dammed to create reservoirs for water storage used pursuant to existing surface water rights.

The Project has existing riparian and appropriate water rights that allow for the diversion and use of surface water resources. Riparian water rights permit the landowner to use water on riparian land for domestic, stock watering, irrigation, power and other beneficial purposes. The riparian right is not based on the amount of use and is not lost by non-use. Riparian rights only allow for the direct diversion of water and do not allow for storage of water typically greater than 30-days. The long-term irrigation and frost protection of lands on the property require the reliability of seasonal water storage allowed by appropriative rights.

Appropriative rights allow a specific amount of water to be diverted and used for reasonable, beneficial use in a specific place (defined as a "place of use" (POU). Appropriative rights allow for direct diversion and/or storage of water for use on lands regardless of their proximity to streams. The appropriative right relates to the particular amount of water, and failure to make use of the right over five consecutive years can results in the forfeit of the right. It is also important to note that appropriative water can be applied to non-POU lands within a water year, as long as the water used is replenished from an alternative water supply, such as from a groundwater source.

The appropriative water rights for the Project Area and Adjacent Non-Project Areas allow for the diversion to storage of 10,394.5 acre-feet per year (AFY) and withdrawals from storage of up to 8,599.5 AFY (**Table 2-5**). The current storage capacity of reservoirs is 9,390 acre-feet (**Table 2-6**). The Project has the capacity, using existing infrastructure, to transfer water from storage in reservoirs in the Bucksnort Creek watershed (i.e., Langtry, Detert, Bordeaux, Burgundy, and McCreary) to Upper Bohn Reservoir outside of the Bucksnort Creek watershed. These transfers allow greater flexibility in the use of available surface water, consistent with appropriative rights. Previously permitted modifications to Upper Bohn Lake, scheduled for completion in 2020, are planned to increase the net storage capacity of that reservoir by 1,000 acre-feet and facilitate increased diversions to storage in Upper Bohn Lake from Putah Creek by up to 1,600 acre-feet per year. As a result of these modifications, the planned future storage capacity of Project Area reservoirs will be 10,390 acre-feet.

Table 2-5: Langtry Farms/Maha Resort at Guenoc Valley Appropriative Water Rights Summary

Water Right	Reservoir	Authorized Diversion to Storage Amount (AFY)	Authorized Withdrawal from Storage Amount (AFY)
Reservoirs Serving the Project Area			
License 2141 (Application 3069)[1]	Detert, McCreary, Lake Bordeaux (Foley No. 1), Lake Burgundy (Foley No, 2) & Bucksnort Creek Diversion Dam	6,074.5	5,089.5
License 2142 (Application 4889)			
License 6334 (Application 15706)			
License 10421 (Application 19890)			
License 10422 (Application 20877)			
Pending License under Permit 16861 (Application 24297)[2]			
Pending License under Permit 16861 (Application 24297)[3]	Langtry Lake	560	480
License 9939 (Application 20876)	Upper Bohn Lake	3,760	3,030
Pending License under Permit 16860A (Application 24296A)[4]			
Permit 16860C (Application 24296C)			
	Totals	**10,394.5**	**8,599.5**
Storage Reservoirs Supplying Other Areas			
License 13414 (Application 24296B)	Big Basin Reservoir (Napa Valley Lake)	200	192

Adapted from Wagner & Bonsignore (2019)
[1] Water right License 2141 (Application 3069) also authorizes direct diversion of 5.35 cfs from Bucksnort Creek.
[2] Diversion and storage of 985 ac-ft of water was perfected prior to the end of the beneficial use period of Permit 16861 and was inspected for license by the SWRCB. No withdrawal from storage was made prior to the end of the beneficial use period of Permit 16861 therefore no withdrawal from storage of this 985 ac-ft of water will be authorized by the pending license.
[3] The storage and withdrawal amounts stated for Permits 16861 are amounts which were perfected prior to the end of the beneficial use period of the Permit and were inspected for license by the SWRCB. (*Continued)*

[4] The diversion to storage and withdrawal amounts stated for Permits 16860A are amounts which were perfected prior to the end of the beneficial use period of Permit 16860A and were inspected for license by the SWRCB.

Riparian rights allow for the direct diversion of 5.35 cubic feet per second (cfs) for use on lands along Bucksnort Creek in Guenoc Valley. Between 1999 and 2018 the average annual estimate of riparian water use by existing Project Area and Adjacent Non-Project Areas has been 560 AFY (Wagner & Bonsignore, 2019).

Table 2-6: Langtry Farms/Maha Ranch at Guenoc Valley Storage Reservoirs

Reservoir Name	Stream	Storage Capacity (Acre-feet)
Storage Reservoirs Serving the Project Area		
Detert Lake (Guenoc Lake)	Bucksnort Creek	3,220
McCreary Lake	Bucksnort Creek	1,725/2,098[1]
Lake Bordeaux (Foley No. 1)	Unnamed	540
Lake Burgundy (Foley No. 2)	Unnamed	212
Cassidy Lake (Langtry Lake)	Unnamed	560
Upper Bohn Lake	Routan Creek and Unnamed	2,760[2]
	Total Storage Capacity	9,017/9,390
Storage Reservoirs Supplying Other Areas		
Big Basin Reservoir (Napa Valley Lake)	Unnamed	200

Adapted from Hanson (1999)
[1] The capacity of McCreary Lake is increased to 2,098 acre-feet with flashboards installed.
[2] Previously permitted modifications to Upper Bohn Lake, scheduled for completion in 2020, are planned to increase the net storage capacity by 1,000 acre-feet.

2.4.3 Recycled Water (Non-potable)

Recycled water is a planned source of supply to the Project. The Project proposes that new development clusters will be connected to new sanitary sewer systems and conveyed to new wastewater treatment facilities designed to produce non-potable recycled water suitable for reuse as landscaping irrigation and make up water for ornamental ponds and water features (Sherwood Design Engineers, 2019b).

2.5 Current Land Use

The Project Area and Adjacent Non-Project Areas support agricultural land uses along with a winery and tourism-focused uses, including a hunting lodge and camp. Agricultural and hunting uses have been a feature of the Project Area for over a hundred years and represent the most extensive of currently developed land uses in the Project Area. Since 2016 agricultural acreage consists of approximately 1,660 acres of vineyards, though prior to 2015 several hundred acres of pasture were also irrigated. Agricultural acreage currently includes minor areas within and outside of Places of Use associated with existing surface water rights (**Table 2-7).** Most of the existing agricultural uses rely on a combination of groundwater and surface water (through appropriative and riparian rights) described in Section 4 of this WSA.

Although a few rural residential properties are present in the Project Area and Adjacent Non-Project Areas, current domestic uses are limited. Residences are present in the main ranch center, located along Guenoc Road near Bucksknort Creek, includes the 19th century home of Lillie Langtry, and a guest house, both of which are in the Adjacent Non-Project Areas. An older ranch home located of the northeast of the ranch center, and within the Project Area, is used infrequently as a guesthouse and hunting lodge. The Adjacent Non-Project Areas also include the Langtry Estates Winery and tasting room facility.

Table 2-7: Current Agricultural Land Use

Use	In Places of Use (Acres)	Outside Places of Use (Acres)
Project Area - Vineyard	860	105
Adjacent Non-Project Areas -Vineyard	745	-
Total	1,605	105

3 HYDROGEOLOGIC SETTING

3.1 Geologic Setting

Lake and County is located within the California Coast Range geomorphic province. This province is a geologically complex and seismically active region characterized by sub-parallel northwest-trending faults, mountain ranges and valleys. The oldest bedrock units are the Jurassic- Cretaceous Franciscan Complex and Great Valley sequence sediments originally deposited in a marine environment. Subsequently, younger rocks such as the Tertiary-age Sonoma Volcanics group, the Plio-Pleistocene-age Clear Lake Volcanics and sedimentary rocks such as the Guinda, Domengine, Petaluma, Wilson Grove, Cache, Huichica and Glen Ellen formations were deposited throughout the province. Extensive folding and thrust faulting during late Cretaceous through the early Tertiary period created complex geologic conditions that underlie the modern topography (**Figure 3-1**). In valleys, the bedrock is covered by alluvial soil of variable thickness.

The Project Area is underlain by Quaternary terrace deposits and olivine basalt, as well as older units such as Cretaceous-Jurassic Franciscan sandstone, shale, mélange, serpentinite, and greenstone. There are also localized outcrops of Cretaceous-Jurassic Great Valley Sequence and Jurassic Knoxville Formation.

Alluvial deposits occur along Bucksnort Creek, Putah Creek and in some smaller drainages in the Project Area. Alluvial deposits, including sands and gravels, occur at thicknesses of 5-15 feet along Bucksnort Creek and in other larger drainages in the Project Area. Groundwater Basin Description

While 91% of the Project Area acreage is outside of groundwater basins designated by the California Department of Water Resources (DWR), the Project Area does include approximately 1,340 acres within the Coyote Valley Groundwater Basin (8% of the total Project Area) and approximately 90 acres within the Collayomi Valley Groundwater Basin (less than 1% of the total Project Area) (**Figure 1-1**).

DWR identifies the alluvial plain of the Coyote Valley Basin as bounded on the west and northwest by Franciscan and undifferentiated rocks (DWR, 2004). The south and southwest part of the valley is bounded by low hills of basalt outcrops. North of the Basin there are outcrops of Cache Formation, to the northeast there is more basalt. The Basin's primary water bearing formation are alluvial deposits comprised of floodplain and channel deposits from Putah Creek and alluvial fan deposits. DWR reports that water bearing alluvium ranges in thickness from 100 to 300 feet. Volcanics, including the Cache Formation on the north, may be water bearing. Major recharge to the Coyote Valley Groundwater Basin is from Putah Creek, with lesser recharge from direct precipitation onto the alluvium and from smaller streams.

3.2 Well Yields and Aquifer Characteristics

DWR reports that well yields for municipal and irrigation wells in the Coyote Valley Basin range from 75 to 800 gallons per minute (GPM), with an average of 446 GPM recorded on six well completion reports.

Well yield information available from the Project Area indicates somewhat more permeable formations, including the Clear Lake Volcanics Formation are present in the northern and eastern Project Area, including areas adjacent to Upper Bohn Lake extending northward to Amel Lake (**Figure 3-1**). These areas include existing wells planned to be among the wells suppling the Project including the Crossroads well, Camping Area Production Well 1, and Farmstead Production Well 1. Additional supply wells planned to be constructed to supply the Project, including Red Hills Production Well 1 and McCreary Production Well1, are also proposed to be located within the Clear Lake Volcanics Formation. As described in Section 2.4.1, yields at the two presently constructed and tested wells planned to supply the Project are between 178 GPM and 200 GPM.

4 CURRENT AND HISTORICAL WATER DEMANDS AND PROJECTED AVAILABILITY

This section summarizes available data and to describe current and historical water demands and availability by source of supply. This section also describes anticipated availability of water supplies by source using a variety of data including historical records of surface water availability, mathematical modeling of groundwater availability, and planned recycled water availability.

4.1 Groundwater Use and Availability

4.1.1 Groundwater Levels

Long-term groundwater level data in the Project Area is limited, at present. The nearest well with notable water level history is located at the border of the Project Area, where it overlaps the Collayomi Valley Basin. Additional information on groundwater trends within the area can be inferred from the surrounding groundwater basins which have long monitoring histories. These basins are the Coyote Valley Basin and the Collayomi Valley Basin (which extends into the study area) along Bucksnort Creek (**Figure 1-1**).

Groundwater levels in the Coyote Valley Basin are shallow in the spring, decrease over the summer, and recover during the winter. Water levels in the basin are generally between 10 to 15 feet below ground surface in the spring. Spring to summer drawdown in the western areas ranges from 20 to 25 feet, and drawdown on the eastern side of the valley ranges from 5 to 10 feet. Groundwater levels have been generally stable throughout the Basin.

Groundwater levels in the Collayomi Valley Basin follow similar trends as the Coyote Valley Basin. Water levels in the basin are shallow in the spring ranging from 3 to 15 feet below the ground surface and fluctuate in the growing season, drawing down 5 to 20 feet.

The groundwater levels monitored by a well on the southwest border of the study area are largely consistent over the period of record. Water levels remain around 5 to 10 feet below ground surface in the spring and dip to 20 to 25 feet in the summer.

4.1.2 Groundwater Quality

The groundwater quality data are also somewhat limited in the Project Area, although samples collected in 2019 during test well drilling and production well construction activities have shown generally good water quality in the areas under consideration for production wells to supply the Project. Samples from a few test well, drilled to inform siting of production wells, have contained elevated levels of barium, boron, iron and zinc, which can be easily treated for potable water. Four of the six test wells had good quality water, which met the drinking water criteria for inorganics and physical parameters. One well had high concentrations of iron and zinc, which will require treatment prior to domestic use. One well had high barium and boron, which will require treatment prior to domestic use. As noted in Section 2.4.1, water quality tested at the newly constructed Camping Area Production Well 1 and Farmstead Production Well 1 met all current Title 22 water quality standards (see **Section 2.4.1**).

4.1.3 Historical Pumpage

Groundwater has been in use in the Project Area and Adjacent Non-Project Areas for many decades. Records of pumping volumes were not made in the past, but the production capacities of wells supplying vineyards in the Tephra Ridge area and the Upper Bohn Lake service area, described in Section 2.4.1, have been tested in the past. The Tephra Ridge irrigation wells have approximate production rates of 50 GPM and 25 GPM, respectively (**Table 2-3)** (AES, 2006). The Crossroads Well was tested in 2002 at a rate of 295 GPM for 24-hours (GSi/water, 2002). In their report describing that testing, GSi/water described that an average pumping rate of 300 GPM could be used, but that a long-term production rate may need to be set lower to allow for more complete water level recovery between pumping cycles. As shown in Table 2-3, the long-term pumping rate is estimated to be 200 GPM.

DWR previously estimated the groundwater storage capacity of the entire 3,000-acre Coyote Valley Basin to be 29,000 acre-feet (AF), with usable storage capacity of 7,000 AF. DWR estimated groundwater extraction for agriculture and municipal/industrial uses in about 1995 at 1,400 AF and 290 AF, respectively, for a total use of 1,690 AF. DWR also estimated that deep percolation from applied water to be 1,100 acre-feet. In 2019, DWR finalized a groundwater use estimate as part of a statewide groundwater basin prioritization review. That 2018 basin prioritization estimate of groundwater use was 3,250 acre-feet and did not include an estimate of deep percolation of applied water (DWR, 2019).

4.1.4 Current Pumpage

Current use of groundwater in the Project Area supports domestic uses at an older ranch home used as a guest house and hunting lodge and agricultural production in areas outside of Places of Use. Use of groundwater in Adjacent Non-Project Areas supports an existing winery and domestic uses at the Langtry House (**Table 4-1**). Domestic uses, including landscape irrigation, are estimated to be 1 acre-foot per year for the existing ranch home in the Project Area and 2 acre-feet per year at the Langtry House. Winery uses are reported to range from 3,000 to 5,000 gallons per day during nine non-harvest months and 5,000 to 7,000 gallons per day during three harvest months (R. Sternberg, pers. comm.), resulting in an estimate of 6 acre-feet per year. Agricultural irrigation includes approximately 42 acres of vineyard in the Tephra Ridge area southeast of Detert Reservoir and approximately 63 of vineyard west and north of Upper Bohn Reservoir located adjacent to but outside of Places of Use. Average annual vineyard irrigation and frost protection amounts are 1 acre-foot per acre based on surface water uses for irrigation and frost protection recorded for existing uses in the Project Area (**Appendix A**).

Table 4-1: Existing Average Annual Groundwater Use

Use Type	Average Annual Use by Year (Acre-feet)	
	2009 - 2013	2014- 2019
Potable		
Project Area – Guest house/hunting lodge (occasional domestic use and landscape irrigation)	1	1
Adjacent Non-Project Areas – Langtry House (domestic uses and landscaping)	2	2
Adjacent Non-Project Areas - Langtry Estates Winery	6	6
Potable Groundwater Use Subtotal	9	9
Non-Potable		
Project Area: Tephra Ridge Vineyard Irrigation and frost protection (42 acres)	42	42
Adjacent Non-Project Areas – Upper Bohn area vineyard outside Places of Use (63 acres)	-	63
Non-Potable Groundwater Use Subtotal	**42**	**105**
Existing Groundwater Use	**50**	**113**

Domestic uses include landscaping demands.

Winery use is as reported by Randy Sternberg, Lotusland Investment Holdings VP, personal communication 10/3/2019.

Vineyard irrigation uses are 1 AF/acre consistent with reported deliveries of surface water metered in Project reservoirs.

Groundwater use for vineyard irrigation in the Adjacent Non-Project Areas is due to new vineyard acreage planted in those areas that are also outside of approved Places of Use for surface water.

4.1.5 Current and Projected Groundwater Availability

Current and projected future groundwater availability were evaluated for this WSA using the Basin Characterization Model (BCM) of California developed by the U.S. Geological Survey (USGS) (Flint et al., 2013). The BCM simulates watershed hydrologic processes from 1900 to 2016 for monthly time steps based on observed precipitation, potential evapotranspiration, soil survey data, and geologic conditions. The BCM is parameterized and run for a continuous state-wide model grid with cell sizes of 270 m by 270 m, or approximately five acres. The hydrologic processes simulated by the BCM are described by

Flint et al. (2013) and summarized in **Figure 4-1**. BCM outputs include surface water runoff and groundwater recharge[4] for each month for each model grid cell.

BCM model grid cell outputs for long-term average annual results are presented in **Figure 4-2** and **Figure 4-3** to depict how the outputs vary across the Project Area.

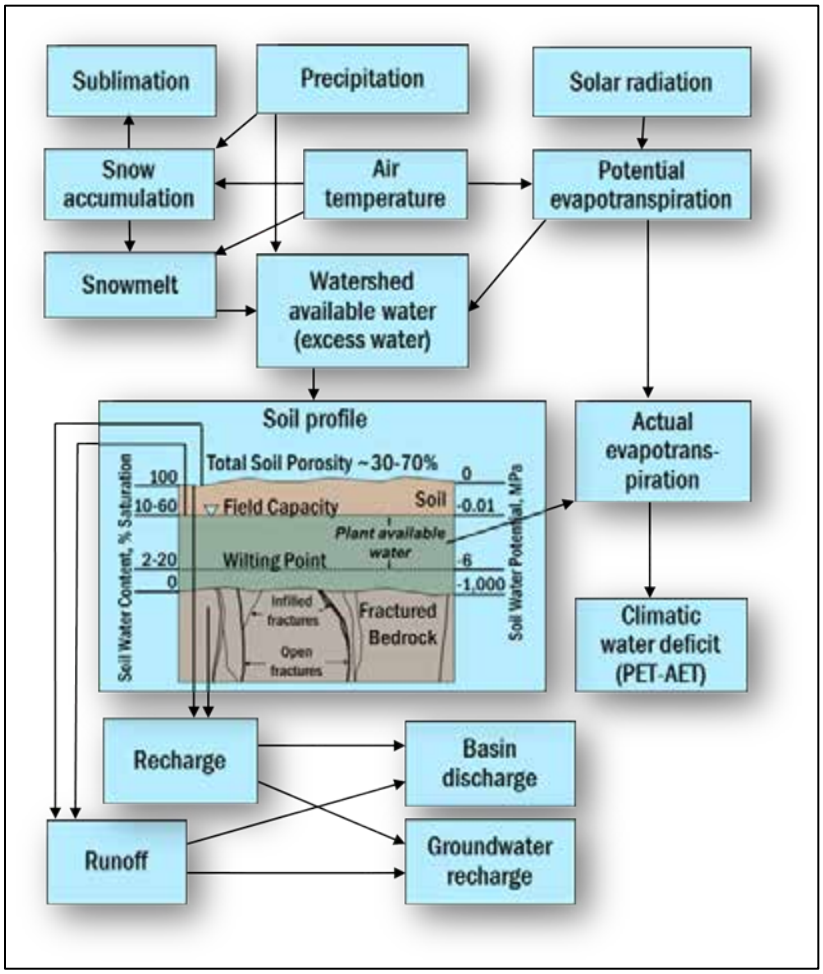
BCM results for groundwater recharge and runoff were post-processed to calculate the availability of groundwater across the Project Area for both observed current conditions and projected future conditions. The post-processing routine requires aggregating both BCM output datasets, for model cell groundwater recharge and surface runoff, and applying a series of equations that account for hydrologic processes occurring across the landscape scale that influence how streamflow is generated and how groundwater is retained in the subsurface. The conceptual model for those landscape scale process is depicted in **Figure 4-4**.

The BCM conceptual model includes three zones[5], depicted in **Figure 4-4 (**Flint et al., 2013):

1. Surface zone – "surface and near surface processes that hold and direct water toward the stream and that are event driven"
2. Shallow zone – "the shallow transient saturated zone that rises and falls seasonally providing much of the baseflow, but can sometimes also be event driven, and provides some recession flow"
3. Deep zone – "the regional aquifer but can also provide some flow to the shallow groundwater (zone) over long time frames

[4] The BCM output for groundwater recharge is consistent with the concept of deep percolation below the root zone and at a depth where evapotranspiration would not occur.
[5] The text by Flint et al. (2013) uses the term "reservoirs" to describe the three conceptual partitions of the surface water and groundwater system. This report refers instead to "zones" or "groundwater zones" to avoid confusion with discussion about surface reservoirs elsewhere in the report.

Figure 4-1: Schematic of hydrologic processes simulated by the Basin Characterization Model (adapted from Flint et al. 2013)



Post-processing BCM outputs occurs by applying a series of equations developed by the BCM authors. These equations use the model cell outputs for runoff and recharge to account for how water that becomes runoff or recharge at the model cell level eventually contribute to streamflow generated at the watershed scale, both by direct surface runoff and by contributions to streamflow by groundwater. The BCM is calibrated through this procedure to match observed streamflow at gauging stations and subsequently compared to observed streamflow at other gauging stations to validate the BCM performance. In the Project vicinity, the BCM authors utilized long-term stream gauge data from the USGS gauge Putah Creek near Guenoc, CA (USGS Station ID: 11453500) as one such validation gauge, where BCM model outputs were post-processed and compared to observed streamflow to evaluate the ability of the model and post-processing procedure to reflect observed streamflow.

The BCM post-processing equation are shown below (see Equations 1 – 7). They include quantification of monthly flows into each of the three groundwater zones (Surface, GWshallow, and GWdeep) by way of flowpaths defined as Surfaceflow, Shallowflow, and Deepflow.

1. $$GW_{surface(i)} = GW_{surface(i-1)} + BCM_{run(i)} - Surfaceflow_{(i-1)}$$

2. $$Surfaceflow_{(i)} = (SurfaceScaler * GW_{surface(i)})^{SurfaceExp}$$

3. $$GW_{shallow(i)} = GW_{shallow(i-1)} + BCM_{rch(i)} - shallowflow_{(i)} - deepflow_{(i)}$$

4. $$Shallowflow_{(i)} = (ShallowScaler * GW_{shallow(i-1)})^{ShallowExp}$$

5. $$Deepflow_{(i)} = (DeepScaler * GW_{shallow(i-1)})^{DeepExp}$$

6. $$Stream_{(i)} = Surfaceflow_{(i)} + Shallowflow_{(i)}$$

7. $$Discharge_{(i)} = WatBal * Stream_{(i)}$$

The equations also include seven parameters to influence the rate of flow between groundwater zones and ultimately simulate the total watershed scale of discharge observed at a gauging station. The values for each of the seven parameters are published by the USGS (Flint et al., 2013) for individual stream gauging stations selected by the USGS for evaluation. The parameter values vary from between gauging sites to reflect different watershed processes that vary with geologic settings, climatic patterns, and other watershed-scale processes that influence the movement of runoff of recharge. The analysis performed for this WSA applied the parameter values developed by the USGS for the nearest stream gauging station, Putah Creek near Guenoc, CA (USGS Station ID: 11453500) (see **Table 4-2**).

Table 4-2: Basin Characterization Model Post-Processing Parameters, Putah Creek near Guenoc, CA (USGS Station ID: 11453500) (source: Flint et al., 2013)

Parameter	Value
SurfaceScaler	1.00
SurfaceExp	0.97
ShallowScaler	1.00
ShallowExp	0.45
DeepScaler	1.00
DeepExp	0.60
WatBal	1.93

Figure 4-4: Schematic of watershed scale streamflow and groundwater process evaluated by the Basin Characterization Model (adapted from Flint et al. 2013)

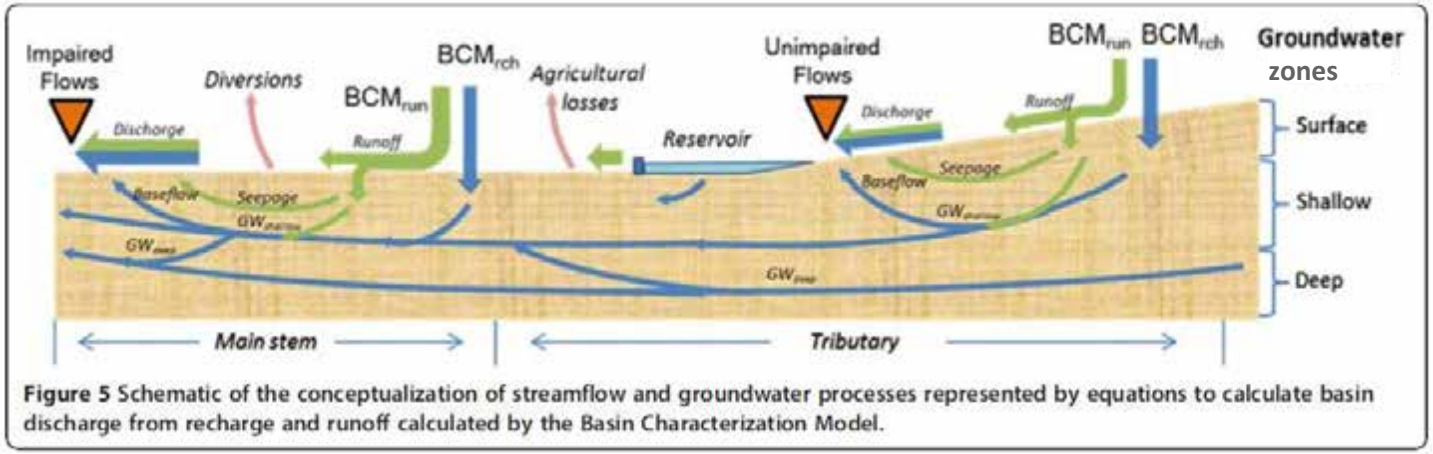


Figure 5 Schematic of the conceptualization of streamflow and groundwater processes represented by equations to calculate basin discharge from recharge and runoff calculated by the Basin Characterization Model.

Groundwater availability for the Project is represented in the post-processed BCM output for the Deepflow variable. The Deepflow reflects "water subtracted from the shallow (zone) to simulate deep groundwater recharge" (Flint et al, 2013 p. 9). This represents groundwater that moves over time through the Surface and Shallow groundwater zones simulated by the BCM and into the deep groundwater zone after accounting for flows of groundwater that contribute to streamflow as hillslope seepage (leaving the surface zone) and baseflow (leaving the shallow zone). The accumulation of water in the deep zone is therefore a subset of the overall recharge output calculated at the model grid scale and reflects an amount which is not subject to discharge through natural processes (including evapotranspiration, contributions to streamflow, and subsurface groundwater flow).

Recognizing that climate change presents the potential to alter water availability in the future, the analysis performed for this WSA incorporates a range of possible groundwater availabilities reflecting the potential for variation due to climate change. The BCM outputs provided by the USGS include projected future runoff and recharge at the model cell level developed by running the BCM with inputs for future meteorological conditions, including precipitation and air temperature, provided by global climate models (GCMs). The future conditions represented by the GCMs incorporate "global socio-economic scenarios… developed by the (United Nation's) Intergovernmental Panel on Climate Change to provide climate scenarios that take into account estimates of possible magnitudes of greenhouse gas emissions that are responsible for much of the climate change" (Flint and Flint, 2012, p 1).

The future water availability analysis performed for this WSA uses BCM outputs for a "hot and low rainfall" scenario (MIROC_esm_rcp85) developed in a recent study of climate change vulnerability in northern San Francisco Bay Area counties (Micheli et al., 2016). BCM outputs resulting from the "hot and low rainfall" scenario represents the largest departure from recent, observed climate conditions out of six future scenarios evaluated for the northern Bay Area counties. For the "hot and low rainfall" scenario mid-century averages (i.e., 2040 to 2069) include a 21% reduction in average annual precipitation, an 11% increase in minimum monthly winter temperatures, and an 8% increase in the maximum monthly summer temperatures. The monthly time scale climate scenario data and corresponding BCM outputs for runoff and recharge that the BCM simulates do not constitute "predictions of precisely when climatic events will occur" instead they represent simulated future conditions considered "physically possible given the state of the science" (Micheli et al. 2016). For this reason, the evaluation of future groundwater availability incorporates long-term average annual conditions simulated by the BCM for the Project Area.

Results of the groundwater availability analysis for current and projected future conditions in the Project Area are presented in **Table 4-3**. The results reflect the variability in groundwater flowing into the deep groundwater zone described by the BCM on an annual basis based on post-processed BCM outputs for current conditions (water years 1988 to 2016[6]) and projected future conditions (water years 2020 to

[6] The period considered to reflect current conditions reflects a recent period of balanced wet and dry water year types. BCM outputs through 2016 are the most current provided by the U.S. Geological Survey based on observed meteorological data used as inputs to the BCM. It is common for large hydrologic models, such as the BCM, to

2040) by the BCM. Current availability shown in **Table 4-3** is based on recent, observed conditions; future availability reflects projected changes resulting from the modeled climate change scenario. For the purposes of this WSA, the future groundwater supply availability is accounted for beginning in 2030, the midpoint in the 20-year period of analysis.

The amount of groundwater varies with water year conditions. Although the flow is reduced in years with reduced rainfall, one benefit of using groundwater as a source of supply is the ability to manage the use of groundwater in conjunction with other available supplies. For the proposed Project, the availability of existing surface water and future recycled water supplies provides for some flexibility in the use of groundwater for non-potable uses.

Table 4-3: Current and Projected Groundwater Supply Availability

Year Type	Normal Year	Dry Year	Very Dry Year
Current Availability (2020 – 2029)	8,700	6,570	4,800
Projected Future Availability (2030 – 2040)	6,200	4,950	3,740
Values reflect average annual inflows to the deep groundwater zone calculated by post-processing BCM model outputs for current conditions and for future conditions.			

4.2 Surface Water Use and Availability

As described in Section 2.4.2, the Project has both riparian and appropriative rights to use surface water for beneficial uses along with a series of interconnected storage reservoirs and related facilities to convey water from points of diversion to the reservoirs and then on to Places of Use. Riparian and appropriative water have been used on the property for decades and will continue to be used for beneficial uses including irrigation, frost protection, agricultural production related activities (dust control, limited construction activities), fire protection, and other acceptable uses.

Agricultural acreage includes areas within and outside of Places of Use (see Section 2.4.2). Acreage within Places of Use account for the majority of current water use and all current surface water use in the Project Area and Adjacent Non-Project Areas. Current irrigated acreage within Places of Use is approximately 1,605 acres (**Table 2-6**).[7] Total irrigated acreage outside of Places of Use is approximately

experience delays on the order of years between the time that input data become available and the time when model outputs are published.

[7] Includes areas in Adjacent Non-Project Areas of approximately 415 vineyard acres in Guenoc Valley and approximately 330 acres of existing vineyards in the Napa County in the Upper Bohn Lake service area.

105 acres in the Project Area and Adjacent Non-Project Areas (**Table 2-6**). Currently, the total irrigated acreage includes only vineyard acreage.

Prior to 2016, surface water was also used as a source of supply to irrigate a golf course, covering approximately 90 acres, and pastures covering approximately 340 acres.

Average annual surface water use in the Project Area and Adjacent Non-Project Areas was 1,400 acre-feet between water years 2009 and 2013 when the uses included irrigation for vineyard, pasture, and golf course (**Table 4-4**). Average annual surface water use was 1,060 acre-feet between water years 2014 and 2018 as the uses of irrigation transitioned to vineyard only.

Table 4-4: Existing Project Area Average Annual Surface Water Use

Use Type	Average Annual Use by Year (Acre-feet)	
	2009 - 2013	2014- 2018
Non-Potable		
Irrigation Use (Agriculture and Golf Course)	1,400	1,060
Reservoir Losses (evaporation and seepage)	2,320	2,770
Average Annual Surface Water Use and Losses	3,720	3,830
Irrigation uses and reservoir losses reported through 2018 by Wagner and Bonsignore Consulting Civil Engineers and include reservoir losses to evapotranspiration and seepage.		

In dry years, including dry and very dry years, the Project can experience reduced surface water availability, although carryover of water stored in Project reservoirs in prior years can allow the project to beneficially use more water than is diverted in a given dry or very dry year. Water use and reservoir storage records, as available, for the recent period from water year 2011 through water year 2018 were reviewed to understand how the availability of water changes under dry and very dry year conditions (**Table 4-5**). The volume of carryover storage is represented by the sum of water stored in reservoirs proposed to supply the Project as of October 1. Metered use and October 1 storage volumes are used here to represent how surface water availability changes in dry and very dry years.

In 2013, a Very Dry year according to the precipitation frequency analysis presented in Section 2.2, metered use from the project reservoirs was 879 acre-feet and the amount of water remaining in storage at the end of the water year was 3,380 acre-feet. The sum of these two volumes, 4,260 acre-feet, represents the total surface water availability under Very Dry year conditions (**Table 4-6**). Dry year surface water availability is represented by the average of the sum of metered use and end of year reservoir storage for water years 2013 to 2016. The Dry year surface water availability, indicated by data

collected during recent drought conditions, is 4,600 acre-feet (**Table 4-6**).[8] The Dry year and Very Dry year surface water availability considered here assumes that no water is available for diversion under the riparian rights, due to more limited timing and duration of flow during the growing season in Dry and Very Dry years.

Table 4-5: Project Area Water Use from Reservoirs and Carryover Storage

Water Year[1]	Middletown Precipitation[2] (inches)	Reservoir Depletions[3] (Acre-feet)	End of Water Year Reservoir Storage[4] (Acre-feet)	Metered Use from Reservoirs[5] (Acre-feet)	Sum of End of Water Year Storage and Metered Use (Acre-feet)
2011	49.59	3,275	4,249	1,156	**5,405**
2012	34.24	4,527	4,654	1,171	**5,825**
2013	22.64	3,699	3,380	879	**4,260**
2014	19.69	3,277	3,814	1,215	**5,030**
2015	30.93	3,828	2,998	1,463	**4,461**
2016	40.6	3,345	3,816	916	**4,732**
2017	84.53	3,346	4,784	1,061	**5,845**
2018	18.02[6]	6,043	5,764	861	**6,625**

[1] Water year is the period from October 1 to September 30, named for the calendar year on September 30.
[2] Middletown precipitation as reported at NOAA Station ID: USC00045598.
[3] Reservoir depletions reflect total changes in reservoir storage over the year and include evaporation and seepage losses and all uses.
[4] End of Water Year Reservoir Storage is the sum of water remaining in the reservoirs that would serve the proposed Project as measured on October 1, excepting 2011 when November 1 data were used because October 1 data are unavailable.
[5] Metered use reflects water applied to developed areas based on meter recordings.
[6] Water year 2018 precipitation data from NOAA Station ID: USC0004559 are incomplete, missing records from February and March.

[8] Although the precipitation record reflects an increase in precipitation received in water year 2016, the combined volume of metered use and end of year storage in 2016 was more comparable to the Dry years from 2013 to 2015 than 2012.

Records of surface use in recent years demonstrate the capacity of existing facilities to meet demands that occurred in those years but do necessarily reflect the total supply that could have been diverted and used to meet different demands. Wagner & Bonsignore (2019) estimated the amount of surface water available for use by existing and proposed uses, include the Project and other proposed vineyard expansions (see Section 5). Their analysis accounts for the total amount permitted to be withdrawn from storage in a given year and reductions due to annual evaporative losses from storage. Those results, when excluding the Big Basin Reservoir (Napa Valley Lake), indicate that permitted withdrawals from storage of about 8,600 AFY may be reduced by 1,770 AFY due to evaporative losses. The net amount of 6,800 AFY available to withdraw from storage would be augmented by direct diversion under riparian rights. Riparian right diversions have averaged 560 AFY between 1999 and 2018. Combing the net amount available for withdrawal from storage and the average annual riparian diversions results in an estimated total available supply of approximately (6,800 AFY + 560 AFY) 7,360 AFY. This amount reflects the anticipated availability of surface water under normal year conditions (**Table 4-6**).

Table 4-6: Current and Future Surface Water Supply Availability

Year Type	Normal Year	Dry Year	Very Dry Year
Current Availability (2020 – 2029)	7,360	4,600	4,200
Projected Future Availability (2030 – 2040)	7,360	5,600	5,200

Normal year availability is represented by the amount that the Project could generate under approved water rights, including appropriative and riparian, accounting for reservoir evaporation losses.

Dry and very dry year availability is represented by amounts of metered use during recent drought conditions (water years 2013 – 2016) and the amount of water remaining in storage at the end of those same water years.

Projected future availability is increased by 1,000 acre-feet in dry and very dry years consistent with the net increase in storage capacity at Upper Bohn Lake planned as a result of work planned to be completed in 2020.

4.3 Anticipated Recycled Water Availability

The Project proposes that new development clusters will be connected to new sanitary sewer systems and conveyed to new wastewater treatment facilities designed to produce recycled water suitable for reuse as landscaping irrigation and make up water for ornamental ponds and water features (Sherwood Design Engineers, 2019b). The estimates for recycled water availability show that 163 acre-feet of water would be available annually with the completion of Phase One of the Project (**Table 4-7**). The Future Phase of development is projected to include similar resort, resort accessory, and residential land uses, consistent with the proposed Guenoc Valley District zoning classification, that will generate additional wastewater for treatment by sanitary sewer systems. Based similarities in land uses between Phase One

and the Future Phase, it is assumed that the Future Phase of development will result in an additional recycled water supply increment of at least 163 acre-feet at full build-out.

Table 4-7: Current and Future Recycled Water Supply Availability

Year Type	Normal Year	Dry Year	Very Dry Year
Current Availability	0	0	0
Projected Future Availability: Phase One (2020 – 2029)	163	163	163
Projected Future Availability: Phase One and Future Phase (2030 – 2040)	326	326	326
Recycled water availability will vary based on system build-out, which will coincide with build-out of Project amenities that will generate wastewater flows for treatment. For the purposes of this WSA, it is assumed that the Project will achieve full build-out conditions of Phase One within the first five years and that Future Phase build-out will occur by 2030. The projected timing to build-out of the Future Phase used for this WSA is intended to provide a conservative estimate of future demands, within the required 20-year period of analysis.			

4.4 Summary of Existing Water Use

Existing potable and non-potable uses are summarized in **Table 4-8**. Amounts reflect average annual uses of surface water and groundwater in recent years, as described above. Reductions in surface water use in the period from 2014 to 2018 reflect the transition from irrigated pasture and golf course irrigation to irrigation of vineyards only.

Table 4-8: Existing Water Use Summary

Use Type	Average Annual Use by Year (Acre-feet)	
	2009 - 2013	2014- 2019
Potable Uses		
Project Area – Guest house/hunting lodge (occasional domestic use and landscape irrigation)	1	1
Adjacent Non-Project Areas – Langtry House (domestic uses and landscaping)	2	2
Adjacent Non-Project Areas - Langtry Estates Winery	6	6
Potable Water Use Subtotal	9	9
Non-Potable Uses		
Project Area: Tephra Ridge Vineyard Irrigation and frost protection outside Places of Use	42	42
Project Area: Irrigation, within Places of Use	1,400	1,060
Adjacent Non-Project Areas – Upper Bohn area vineyard outside Places of Use	-	63
Adjacent Non-Project Areas – Irrigation, within Places of Use	330	330
Non-Potable Water Use Subtotal	1,772	1,495
Total Existing Use	**1,781**	**1,504**

Domestic uses include landscaping demands.

Winery use is as reported by Randy Sternberg, Lotusland Investment Holdings VP, personal communication 10/3/2019.

Vineyard irrigation uses are 1 AF/acre consistent with reported deliveries of surface water metered in Project reservoirs.

Irrigation uses are as reported through 2018 by Wagner and Bonsignore Consulting Civil Engineers and include reservoir losses to evapotranspiration and seepage. Project Area irrigation within Places of Use included pasture and golf course irrigation prior to 2016.

5 PLANNED FUTURE WATER DEMANDS

This section summarizes the projected future demands for both phases of the Project and other changes to water demands anticipated to occur in the Project Area and Adjacent Non-Project Areas. Planned future water demands for the Project Area include both potable and non-potable components. Future Project demands are based on information developed for the Project. Additional non-potable demands expected to occur due to new vineyard acreage planned to be developed as part of existing leases and separate land use approvals.

5.1 Project Area Potable Water Demands

Projected potable water demands include new uses to be developed as part of the Maha Resort. The demands include resort facilities (temporary lodging), residential development (including workforce co-housing), resort amenities, agricultural production facilities, and essential accessory uses (Sherwood Design Engineers, 2019a). Total new average annual potable water demands anticipated for Phase One are 249 acre-feet per year (AFY), of which 18 AFY would occur in Middletown within the service area of the Collayomi County Water District (**Table 5-1**). Allowable uses within future phases result in additional potential demands of 436 acre-feet per year at full build-out, of which 12 AFY would occur in Middletown within the service area of the Collayomi County Water District (**Table 5-2**).

Table 5-1: Maha Resort Phase One Average Annual Potable Water Demand

Use	Unit	Quantity	Water Demand (gallons)	Average Occupancy Rate (percent)	Average Annual Water Demand (GPY)	Average Annual Water Demand (AFY)
1. Resort Facilities						
1.1. Hotel Rooms	EA	225	277.5	60%	13,673,813	41.96
1.2. Resort Residential units	EA	144	427.5	60%	13,481,640	41.37
2. Residential Development						
2.1. Residential Estate Villas	EA	411	674.4	40%	40,468,046	124.17
2.2. Workforce Co-Housing	EA	300	75	70%	5,748,750	17.64
3. Resort Amenities						
3.1. Outdoor Entertainment	Seats	500	5.5	60%	39600	0.122
3.2. Spa and Wellness Area	Visitors	70	25	60%	383,250	1.18
3.3. Sports and Recreation	Visitors	0				
3.4. Equestrian Area	Visitors	105	18	60%	413,910	1.27
3.5. Golf	Visitors	85	21	60%	390,915	1.20
3.6. Camping Area	EA	42	64	60%	588,672	1.81
3.7. Commercial & Retail	Visitors	120	23	60%	604,440	1.85
4. Agricultural Production Facilities						
4.1. Wineries	Cases	62,500	16	60%	600000	1.841
4.2. Diversified Agricultural Production	Visitors	8	35	60%	61,320	0.188
4.3. Livestock and Farm Management	Visitors	8	35	60%	61,320	0.188
5. Essential Accessory Uses						
5.1. Back of House Facilities	EA	1	17100	60%	3744900	11.491
5.2. Emergency Response Center	EA	1	4140	60%	906660	2.782
5.3. Alternative Energy Production	EA	1	280	100%	102200	0.314
5.4. Float Plane Dock	EA	1	60	25%	5475	0.017
5.5. Helipads	EA	1	30	25%	2737.5	0.008
Total Estimated Phase One Potable Water Demand					**81,277,648**	**249**

Source: Sherwood Design Engineers, 2019a

Table 5-2: Maha Resort Future Phase Estimated Average Annual Potable Water Demand

Use	Unit	Quantity	Water Demand (gallons)	Average Occupancy Rate (percent)	Average Annual Water Demand (GPY)	Average Annual Water Demand (AFY)
1. Resort Facilities						
1.1. Hotel Rooms	EA	155	277.5	60%	9,419,738	28.90
1.2. Resort Residential units	EA	260	427.5	60%	24,341,850	74.69
2. Residential Development						
2.1. Residential Estate Villas*	EA	986	674.4	40%	97,083,926	297.89
2.2. Workforce Co-Housing	EA	200	75.0	70%	3,832,500	11.76
3. Resort Amenities						
3.1. Outdoor Entertainment	Seats	200	5.5	60%	15840	0.05
3.2. Spa and Wellness Area	Visitors	70	25.0	60%	383250	1.18
3.3. Sports and Recreation	Visitors	100	30.0	60%	657000	2.02
3.4. Equestrian Area	Visitors	105	18.0	60%	413910	1.27
3.5. Golf	Visitors	44	21.0	60%	202356	0.62
3.6. Camping Area						
3.7. Commercial & Retail	Visitors	60	23.0	60%	302220	0.93
4. Agricultural Production Facilities						
4.1. Wineries	Cases	292,000	16.0	60%	2803200	8.60
4.2. Diversified Agricultural Production	Visitors	8	35.0	60%	61320	0.19
4.3. Livestock and Farm Management	Visitors	8	35.0	60%	61320	0.19
5. Essential Accessory Uses						
5.1. Back of House Facilities	EA	1	8550.0	60%	1872450	5.75
5.2. Emergency Response Center	EA	1	2070.0	60%	453330	1.39
5.3. Alternative Energy Production	EA	1	168.0	100%	61320	0.19
5.4. Float Plane Dock	EA	1	20.0	25%	1825	0.01
5.5. Helipads	EA	1	20.0	25%	1825	0.01
Total Estimated Future Phase Potable Water Demand					**141,969,180**	**436**

Estimated Future Phase potable demands reflect maximum build-out of proposed zoning.
Source: Sherwood Design Engineers, 2019a

Table 5-3: Summary of Daily and Annual Maha Resort Potable Water Demands

Use	Average Daily Water Demand (GDP)	Average Daily Water Demand (AFD)	Maximum Day Water Demand (GPD)	Maximum Annual Water Demand (AFD)	Average Annual Water Demand (GPY)	Average Annual Water Demand (AFY)
Phase One	224,436	0.7	462,425	1.4	81,277,648	249
Future Phase	211,894	0.7	406,669	1.2	141,969,180	436
Total Estimated Potable Water Demand	**436,330**	**1.3**	**869,093**	**2.7**	**223,246,828**	**685**

5.2 Project Area Non-Potable Water Demands

Projected non-potable water demands include new uses to be developed as part of the Maha Resort and new uses associated with additional vineyard lands not yet planted. Non-potable demands associated with the Maha Resort are planned to occur in two phases, consistent with the potable water demands(**Table 5-4** and **Table 5-5**). Resort-related non-potable demands include "landscape irrigation demands for the commercial and residential properties, new vineyard and farm areas, recreational areas including the Renaissance Golf Course and the Equestrian Center, roadway landscaping and greenroofs" (Sherwood Design Engineers, 2019a).Non-potable water demands will also include "make up water for non-recreational water features (fountains and reflection pools)" (Sherwood Design Engineers, 2019a). Non-potable water is planned to be supplied by three sources: recycled water, existing entitled surface water rights and groundwater. As described in Section 2, approved Places of Use are part of the surface water rights and limit the areas where surface water may be used. Tables in this section report the planned demands for water within and outside Places of Use in order to help understand what source or sources of supply may be used to meet the planned demands.

Table 5-4: Maha Resort Phase One Annual Non-Potable Water Demand Estimates

Use	Unit	Total Acres	POU Acres	Non-POU Acres	Water Demand (AF/ac)	POU Water Demand (AFY)	Non-POU Water Demand (AFY)
1. Resort Facilities							
1.1. Hotel Rooms	Acres	88.5	36.9	51.6	2	73.8	103.2
1.2. Resort Residential units	Acres	16.5	1.8	14.7	2	3.6	29.4
2. Residential Development							
2.1. Residential Estate Villas	Acres	87.7	40.3	47.4	2	80.6	94.8
2.2. Workforce Co-Housing	Acres	3.8	3.8	0	2	7.6	0
3. Resort Amenities							
3.1. Outdoor Entertainment	Acres	2	0	2	2	0.0	4
3.2. Spa and Wellness Area	Acres	6.2	0	6.2	2	0.0	12.4
3.3. Sports and Recreation	Acres	0					
3.4. Equestrian Area	Acres	46	46	0	2	92.0	0
3.5. Golf	Acres	83.8	48.2	35.6	4	192.8	142.4
3.6. Camping Area	Acres	2	0	2	1	0.0	2
3.7. Commercial & Retail	Acres	2	0	2	2	0.0	4
4. Agricultural Production Facilities							
4.1. Wineries (landscape)	Acres	5.7	5.7	0	2	11.4	0
4.2. Diversified Agricultural Production	Acres	6	0	6	3	0.0	18
5. Essential Accessory Uses							
5.1. Back of House Facilities	Acres	6.2	6.2	0	1	6.2	0
5.2. Emergency Response Center	Acres	1.3	1.3	0	2	2.6	0
5.3. Float Plane Dock	Acres	0.3	0	0.3	1	0.0	0.3
5.4. Hellipads	Acres	0.3	0	0.3	1	0.0	0.3
6. Other Non-Potable Demands							
6.1. Greenroofs	Acres	22.4	5.2	17.2	2	10.4	34.4
6.2. Entry Roads	Acres	61	23.8	37.2	1	23.8	37.2
6.3. Equestrian Lake	Acres	8	8	0	5	40.0	0
Total Estimated Phase One Non-Potable Water Demand (AFY)						**544.8**	**482.4**
Source: Sherwood Design Engineers, 2019a							

Table 5-4: Maha Resort Future Phase Estimated Annual Non-Potable Water Demand

Use	Unit	Quantity	POU Acres	Non-POU Acres	Water Demand (ac-ft/ac)	POU Water Demand (AFY)	Non-POU Water Demand (AFY)
1. Resort Facilities							
1.1. Hotel Rooms	Acres	36	7.2	28.8	2	14.4	57.6
1.2. Resort Residential units	Acres	30	6	24	2	12.0	48.0
2. Residential Development							
2.1. Residential Estate Villas	Acres	227	113.5	113.5	2	227.0	227.0
2.2. Workforce Co-Housing	Acres	1.5	1.5	0	2	3.0	0.0
3. Resort Amenities							
3.1. Outdoor Entertainment	Acres	2	0	2	2	0.0	4.0
3.2. Spa and Wellness Area	Acres	6.2	0	6.2	2	0.0	12.4
3.3. Sports and Recreation	Acres	300	300	0	1.5	450.0	0.0
3.4. Equestrian Area	Acres	46	46	0	2	92.0	0.0
3.5. Golf	Acres	175	87.5	87.5	4	350.0	350.0
3.6. Camping Area	Acres	0		0	1	0.0	0.0
3.7. Commercial & Retail	Acres	1.5	0	1.5	2	0.0	3.0
4. Agricultural Production Facilities							
4.1. Wineries (landscaping)	Acres	11	0	11	2	0.0	22.0
4.2. Diversified Agricultural Production	Acres	3	1.5	1.5	3	4.5	4.5
4.3. Livestock and Farm Management	Acres	3	1.5	1.5	3	4.5	4.5
5. Essential Accessory Uses							
5.1. Back of House Facilities	Acres	3.2	3.2	0	1	3.2	0.0
5.2. Emergency Response Center	Acres	0.25	0.25	0	2	0.5	0.0
6. Other Non-Potable Demands							
6.1. Greenroofs	Acres	11.2	5.6	5.6	2	11.2	11.2
6.2. Entry Roads	Acres	30	15	15	1	15.0	15.0
Total Estimated Future Phase Non-Potable Water Demand (AFY)						**1187.3**	**759.2**

Source: Sherwood Design Engineers, 2019a

In addition to the planned landscaping and other non-potable water uses associated with the Maha Resort, the Project Area includes approximately 1,132 acres of land previously leased for vineyard installation (**Table 5-6**). The additional leased acreage, not currently planted, includes approximately 1,115 acres within Places of Use, which will rely on existing surface water right entitlements, and approximately 18 acres outside of Places of Use, to be supplied by groundwater. Sources of supply for these planned demands include existing entitled surface water and groundwater.

Table 5-6: Previously Approved Project Area Vineyard Lease Water Demand Estimates

	Within Places of Use		Outside Places of Use			
	Acres	Annual Water Use Estimate (AFY)	Acres	Annual Water Use Estimate (AFY)	Total Acres	Total Avg. Annual Non-Potable Demand (AF)
Amended Lease Lands (Future Project Area Vineyards not part of Project)	1,115	1,1115	18	18	1,132	1,132

5.3 Adjacent Non-Project Area Water Demands

Adjacent Non-Project Areas (ANPA) include approximately 505 acres near Bucksnort Creek in Guenoc Valley and approximately 720 acres in Napa County. Existing water demands are planned to continue in both areas, with additional vineyard expansion likely in the Napa County portion of the ANPA. As described in Section 2.4, the Napa County ANPA includes approximately 330 acres currently planted with vineyards. Napa County has previously approved an approximately 390 acres of additional vineyard plantings in the areas (**Table 5-7**). While not a part of the Project, for the purposes of this WSA, it is assumed that all 390 acres will be established, consistent with Napa County approvals. Sources of supply for these planned demands include existing entitled surface water and groundwater.

Table 5-7: Previously Approved Adjacent Non-Project Area Vineyard Water Demand Estimates

	Within Places of Use (POU)		Outside POU			
	Acres	Annual Water Use Estimate (AFY)	Acres	Annual Water Use Estimate (AFY)	Total Acres	Total Avg. Annual Non-Potable Demand (AF)
Previously Approved Additional Vineyards in Napa County (not part of Project)	390	390	0	0	390	390

5.4 Summary of Planned Future Water Demands

Planned future potable water demands are summarized in **Table 5-8** and represent uses planned to occur in addition to existing potable uses described in Section 4. Future potable water demands are anticipated to occur as a result the Project during both Phase One and through Future Phase developments. As noted in Section 5.1, Workforce co-housing demands of 18 AFY in Phase One and 12 AFY in the Future Phase would occur in Middletown within the service area of the Collayomi County Water District and are not considered a demand to be met by Project Area sources of supply.

Table 5-8: Planned Future Potable Water Demand Summary

Planned Future Use	Project Area (AFY)	Colloyami County Water District (AFY)	Average Annual Demand (AFY)
Potable Demands			
Maha Resort Phase One[1]	231	18	249
Maha Resort Future Phase[1]	424	12	436
Planned Potable Demand Total	**655**	**30**	**685**

[1] Potable Demands for the Maha Resort Project, Phase One and Future Phase include 18 AFY and 12 AFY, respectively (see Section 5.1). Those demands are planned to occur in Middletown within the service area of the Collayomi County Water District. They area reported separately here and are not considered a demand to be met by Project Area sources of supply.

Planned future non-potable water demands are summarized in **Table 5-9** and represent uses planned to occur in addition to existing non-potable uses described in Section 4. Future non-potable water demands are anticipated to occur as a result the Project during both Phase One and through Future Phase developments.

Table 5-9: Planned Future Non-Potable Water Demand Summary

Planned Future Use	Non-Potable Demands In Places of Use (AFY)	Non-Potable Demands Outside Places of Use (AFY)	Average Annual Demand (AFY)
Non-Potable Demands			
Maha Resort Phase One	545	482	1,027
Maha Resort Future Phase	1,187	759	1,946
Project Area Vineyard Lease	1,115	18	1,133
Adjacent Non-Project Area Vineyard	390	-	390
Planned Non-Potable Demand Subtotal	**3,237**	**1,259**	**4,496**

6 WATER SUPPLY SUFFICIENCY

SB 610 requires that a WSA report findings regarding water supply sufficiency to meet projected water demands, including existing demands planned to continue, under the normal, single-dry, and multiple-dry year planning scenarios. Sufficiency is addressed in this section by comparing the projected water demands presented in Section 5 with the available supply and current water uses presented in Section 4. For the purposes of this analysis, it is assumed that the Project will achieve full build-out conditions of Phase One within the first five years and that Future Phase build-out will occur by 2030. The projected timing to build-out of the Future Phase used for this WSA is intended to provide a conservative estimate of future demands, within the required 20-year period of analysis.

6.1 Summary of Water Supply Availability to 2040 (Normal, Dry, and Multiple-Dry Years)

The Project Area includes existing supplies of surface water and groundwater and a planned future supply of recycled water to meet potable and non-potable demands, both existing and proposed. Current and future water rights, entitlements, and contracts, are summarized in **Table 6-1**, as presented in Section 4. Supply types are designated here for consistency with Water Code Section 10910. As described in Section 2.4.3 and Section 4.3 the recycled water supply for the project is planned to be developed as part of the Project itself and used to meet Project demands.

Table 6-1: Sources of Supply

Source	Annual Amount (acre-feet)	Type[1]	Used Previously
Local Surface Water[2]	10,394.5	Entitlement	Yes
Groundwater[3]	8,700 – 4,950	Right	Yes
Recycled Water[4]	163- 326	Contract	No

[1] Supply types are designated here for consistency with Water Code Section 10910, the planned future recycled water supply is referenced here a "contract" though the supplier would be the Project's own planned water system.
[2] See Section 2.4.2, permitted total appropriative surface water authorized diversion to storage (excluding Big Basin Reservoir outside of the Project Area, plus 560 acre-feet of estimated riparian water use, 1999 – 2018.
[3] See Section 4.1.5
[4] See Section 4.3

Projected availability of groundwater in future years, through 2040, reflects the range of groundwater availability determined through the analysis of current and projected future hydrologic conditions processes, including hydrologic impacts due to climate change (see Section 4.3.3) (**Tables 6-2 and 6-3**). Specifically, the availability of groundwater projected for years from 2020 through 2040 account for the volume of groundwater recharge not subject to discharge through natural processes (including evapotranspiration, contributions to streamflow, and subsurface groundwater flow).

Projected surface water availability in future years, through 2040, reflects the range of surface water availability determined through review of the variability of diversions and use of surface water occurring in the Project Area since 2011 and the permitted capacity for the project to divert and use surface water with consideration for reservoir evaporation losses and the limited availability of riparian right diversion in Dry and Very Dry years (see Section 4.2). The projected surface water availability also reflects the net increase of 1,000 acre-feet available from Upper Bohn Reservoir as a result of dam reconstruction and diversion upgrades previously approved by the 2006 Water Right Modification and scheduled for completion in 2020.

Recycled water is shown as a source of supply beginning in 2020 to coincide with the initiation of Project Phase One demands, also shown to begin in 2020 for the purpose of this sufficiency assessment. The actual timing of both recycled water supply availability and Project Phase One demands will likely be somewhat different and subject to the progress of Project construction.

The amounts represented as single dry year supplies in **Table 6-2** and **Table 6-3** correspond to the supplies described under Very Dry year conditions presented in Sections 4.1.5 (groundwater), 4.2 (surface water), and 4.3 (recycled water).

Projected recycled water availability in future years, through 2040, is consistent with projections of project build-out, including build-out of recycled water facilities (Sherwood Design Engineers, 2019b).

Table 6-2: Water Supply Availability for 2020 (Normal, Dry, and Multiple-Dry Years)

Source of Supply	Annual Water Supply (acre-feet)				
	Normal Year	Single Dry Year[1]	Multiple Dry Years[2]		
			2	3	4
Groundwater	8,700	4,800	6,570	6,570	6,570
Local Surface Water	7,360	4,200	4,600	4,600	4,600
Recycled Water	**163**	**163**	**163**	**163**	**163**
Total Supply	**16,223**	**9,163**	**11,333**	**11,333**	**11,333**

[1] Single dry year supplies correspond to the Very Dry year supply availability described in Section 4.
[2] Multiple dry year supplies correspond to the multiple Dry year supply availability described in Section 4.

Table 6-3: Projected Water Supply Availability for 2040(Normal, Dry, and Multiple-Dry Years)

Source of Supply	Annual Water Supply (acre-feet)				
	Normal Year	Single Dry Year[1]	Multiple Dry Years[2]		
			2	3	4
Groundwater	6,200	3,740	4,950	4,950	4,950
Local Surface Water	7,360	5,200	5,600	5,600	5,600
Recycled Water	**326**	**326**	**326**	**326**	**326**
Total Supply	**13,886**	**9,266**	**10,876**	**10,876**	**10,876**

[1] Single dry year supplies correspond to the Very Dry year supply availability described in Section 4.
[2] Multiple dry year supplies correspond to the multiple Dry year supply availability described in Section 4.

6.2 Summary of Water Supply Sufficiency to 2040 (Normal, Dry, and Multiple-Dry Years)

For the purposes of this analysis, it is assumed that the Project will achieve full build-out conditions of Phase One within the first five years and that Future Phase build-out will occur by 2030 (**Table 6-4** and **Table 6-5**). The projected timing to build-out of the Future Phase used for this WSA is intended to provide a conservative estimate of future demands, within the required 20-year period of analysis. Demands associated with all planned future uses of water in the Project Area are reported here as average annual demands, which reflect a level of demand expected to occur over a period of years. Demands may fluctuate from year to year according to resort occupancy and staffing levels or due to water year type and meteorological conditions but are expected to remain consistent with the average annual demand projections over periods of five years or more.

Table 6-4: Normal Water Year Potable Water Supplies and Demands Through 2040

	2020	2025	2030	2035	2040
Potable Supply[1]					
Groundwater[1]	800	800	800	800	800
Total Supply	**800**	**800**	**800**	**800**	**800**
Potable Demand[2]					
Existing Uses	9	9	9	9	9
Maha Resort Phase One	249	249	249	249	249
Maha Resort Future Phase	0	0	436	436	436
Total Demand	**258**	**258**	**694**	**694**	**694**
Potable Surplus or Deficiency	**542**	**542**	**106**	**106**	**106**

[1] Groundwater will be supplied by wells in the Project Area (see Section 2.4.1).
[2] Existing uses are described in Section 4. Proposed future demands are described in Section 5.

Table 6-5: Normal Water Year Non-Potable Water Supplies and Demands Through 2040

	2020	2025	2030	2035	2040
Non-Potable Supply[1]					
Local Surface Water	7,360	7,360	7,360	7,360	7,360
Groundwater	7,900	7,900	5,400	5,400	5,400
Recycled Water	163	163	326	326	326
Total Supply	**15,423**	**15,423**	**13,086**	**13,086**	**13,086**
Non-Potable Demand in Places of Use (POU)[2]					
Existing Uses	1,390	1,390	1,390	1,390	1,390
Expanded Vineyard Lease	1,115	1,115	1,115	1,115	1,115
Adjacent Non-Project Area Vineyard	390	390	390	390	390
Maha Resort Phase One	545	545	545	545	545
Maha Resort Future Phase	0	0	1,187	1,187	1,187
Total Demand	**3,440**	**3,440**	**4,627**	**4,627**	**4,627**
Non-Potable Surplus or Deficiency in POU	**3,920**	**3,920**	**2,733**	**2,733**	**2,733**
Non-Potable Demand outside POU					
Existing Uses	105	105	105	105	105
Expanded Vineyard Lease	9	18	18	18	18
Maha Resort Phase One	482	482	482	482	482
Maha Resort Future Phase	0	0	759	759	759
Total Demand	**596**	**605**	**1,364**	**1,364**	**1,364**
Non-Potable Surplus or Deficiency outside POU	**7,467**	**7,458**	**4,362**	**4,362**	**4,362**

[1] Groundwater demands generated by the Project will be supplied by wells in the Project Area (see Section 2.4.1). The groundwater supply shown for non-potable uses is equal to the total available supply described in Section 4.1.5 less the supply shown for potable uses in Table 6-4.
[2] Existing uses are described in Section 4. Proposed future demands are described in Section 5.

Water supply sufficiency is considered for normal, single dry, and multiple dry year types in 2020 (**Table 6-6)** and 2040 (**Table 6-7**) to reflect the anticipated changes in demand anticipated to occur over time. Surface water supplies are projected to remain stable during sequential dry years based on the ability of Project reservoirs to receive diverted water in dry years (see Section 4.2). Groundwater supplies are projected to remain stable during sequential dry years based on the analysis of groundwater recharge showing that groundwater recharge continues to occur in dry year. Recycled water supplies are projected to remain stable in sequential dry years because the supply is linked to the generation of wastewater by the Project's potable water system, which will continue in dry years.

The availability of water supplies is projected to exceed projected water demands, including both Phase One and the Future Phase of development as well as other planned future demands and continuation of existing demands. The supply sufficiency is projected to result in surpluses through 2040 without causing overdraft of groundwater supplies and without exceeding the surface water supplies available to the Project (**Table 6-6** and **Table 6-7**).

Table 6-6: Comparison of Water Supply Sufficiency for 2020 (Normal, Dry, and Multiple-Dry Years)

	Annual Water Supply and Demand (acre-feet)				
	Normal Year	Single Dry Year	Multiple Dry Years		
			2	3	4
Potable Supply Total[1]	800	800	800	800	800
Potable Demand Total[2]	258	258	258	258	258
Potable Surplus or Deficiency	**542**	**542**	**542**	**542**	**542**
Non-Potable Supply in Places of Use (POU)[1]	7,360	4,200	4,600	4,600	4,600
Non-Potable Demand Total, in POU[2]	3,440	3,440	3,440	3,440	3,440
Non-Potable Surplus or Deficiency in POU	**3,920**	**760**	**1,160**	**1,160**	**1,160**
Non-Potable Supply outside POU[1]	7,900	4,000	5,770	5,770	5,770
Non-Potable Demand Total outside POU[2]	596	596	596	596	596
Non-Potable Surplus or Deficiency outside POU	**7,304**	**3,404**	**5,174**	**5,174**	**5,174**

[1] Reflects groundwater, surface water, and recycled water supplies, as applicable, and water year supply variability (see Sections 4.1.5, 4.2, 4.3).
[2] Includes existing demands planned to continue and all planned future demands, expecting the Future Phase Maha Resort development assumed to reach build-out by 2030 (see Section 4.4 and Section 5).
[3] Places of Use (POU).

Table 6-7: Comparison of Projected Water Supply Sufficiency for 2040 (Normal, Dry, and Multiple-Dry Years)

	Annual Water Supply and Demand (acre-feet)				
	Normal Year	Single Dry Year	Multiple Dry Years		
			2	3	4
Potable Supply Total[1]	800	800	800	800	800
Potable Demand Total[2]	694	694	694	694	694
Potable Surplus or Deficiency	**106**	**106**	**106**	**106**	**106**
Non-Potable Supply in Places of Use (POU)[1]	7,360	5,200	5,600	5,600	5,600
Non-Potable Demand Total, in POU[2]	4,627	4,627	4,627	4,627	4,627
Non-Potable Surplus or Deficiency - POU	**2,733**	**573**	**973**	**973**	**973**
Non-Potable Supply outside POU[1]	6,526	4,066	5,276	5,276	5,276
Non-Potable Demand Total outside POU[2]	1,364	1,364	1,364	1,364	1,364
Non-Potable Surplus or Deficiency - outside POU	**5,162**	**2,702**	**3,912**	**3,912**	**3,912**

[1] Includes projected supplies of groundwater, surface water, and recycled water, as applicable (see Sections 4.1.5, 4.2, and 4.3).
[2] Includes existing demands planned to continue, all planned future demands (Section 4.4 and Section 5).

7 RECOMMENDATIONS

7.1 Groundwater Monitoring Program

While the information presented in this WSA reflect considerable groundwater resources available to the Project, it is recommended that the Project implement a groundwater monitoring program to routinely collect groundwater level and quality data in the vicinity of Project water supply wells and wells supplying Adjacent Non-Project Areas. The monitoring program should be developed consistent with the Lake County Groundwater Management Plan (CDM, 2006). Objectives of the monitoring program should include ensuring that groundwater supplies remain sustainable for the Project and Adjacent Non-Project Areas.

7.2 Continued Groundwater Exploration to Verify New Well Capacity

It is recommended that new supply wells for planned Project water system continue to be constructed and tested in order to demonstrate, consistent with State and County codes and regulations, that hydrogeologic conditions will support the planned production rates from Project wells. This recommendation is consistent with the activities already underway to permit, construct, and test new production wells including Camping Area Production Well 1 and Farmstead Production Well 1, constructed and tested in 2019. Although the Project production wells constructed and tested have, as of this report, shown a capacity for sustained production at rates consistent with levels likely to be needed for water system operations, it is recommended that the Project move forward with future well construction and testing to fully demonstrate the capacity to produce groundwater at rates that will be required for Phase One water system operations.

8 REFERENCES

AES. 2006. *Guenoc Water Rights Modification Project Draft Environmental Impact Report*. Analytical Environmental Services. Lead Agency: State Water Resources Control Board. July 2006. 558 pp.

AES. 2019. Draft Environmental Impact Report – Maha Resort at Guenoc Valley. Analytical Environmental Services. Lead Agency: Lake County.

CDM. 2006. *Lake County Groundwater Management Plan*. Prepared by CDM in cooperation with the California Department of Water Resources, Northern District. Prepared for the Lake County Watershed Protection District. March 31, 2006.

DWR. 2003. *Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001* (http://www.water.ca.gov/pubs/use/sb_610_sb_221_guidebook/guidebook.pdf). California Department of Water Resources. October 8, 2003. 81 pp.

DWR. 2004. Bulletin 118 – California's Groundwater, Coyote Valley Basin Description. Updated February 27, 2004. 4pp.

DWR. 2019. Sustainable Groundwater Management Act, Basin Prioritizations, 2019 Release (Phase 1). https://water.ca.gov/Programs/Groundwater-Management/Basin-Prioritization

Flint, L.E and A.L. Flint. 2012. *Downscaling future climate scenarios to fine scales for hydrologic and ecological modeling and analysis*. Ecological Processes, 1(1). 15 pp.

Flint, L.E., A.L. Flint, J.H. Thorne, R. Boynton, 2013. *Fine-scale hydrologic modeling for regional landscape applications: the California Basin Characterization Model development and performance*. Ecological Processes, 2(25). 21 pp.

GSi/water. 2002. *Results of Testhole Drilling, Well Construction and Testing Guenoc Ranch Magoon Estate, Limited, Middletown, California*. Prepared for James C. Hanson Consulting Civil Engineer and Magoon Estate, Limited. July 24, 2002. 28 pp.

Hanson. 1999. *Magoon Estate Limited – Guenoc Ranch Development, Report on Water Resources*. James Hanson Consulting Civil Engineer. March 1999.

Langtry Farms. 2019. www.langtryfarms.com. accessed December 1, 2019.

Micheli E., L. Flint, S. Veloz, K. Johnson (Higgason), and N. Heller. 2016. *Climate Ready North Bay Vulnerability Assessment Data Products: 3. Napa County User Group (*technical memorandum). Dwight Center for Conservation Science at Pepperwood, Santa Rosa, CA. prepared for the California Coastal Conservancy and Regional Climate Protection Authority, 46 pp.

Sherwood Design Engineers. 2019a. *Water Demand Analysis for Maha Resort at Guenoc*. Technical Memorandum. Revised October 4, 2019. 13 pp.

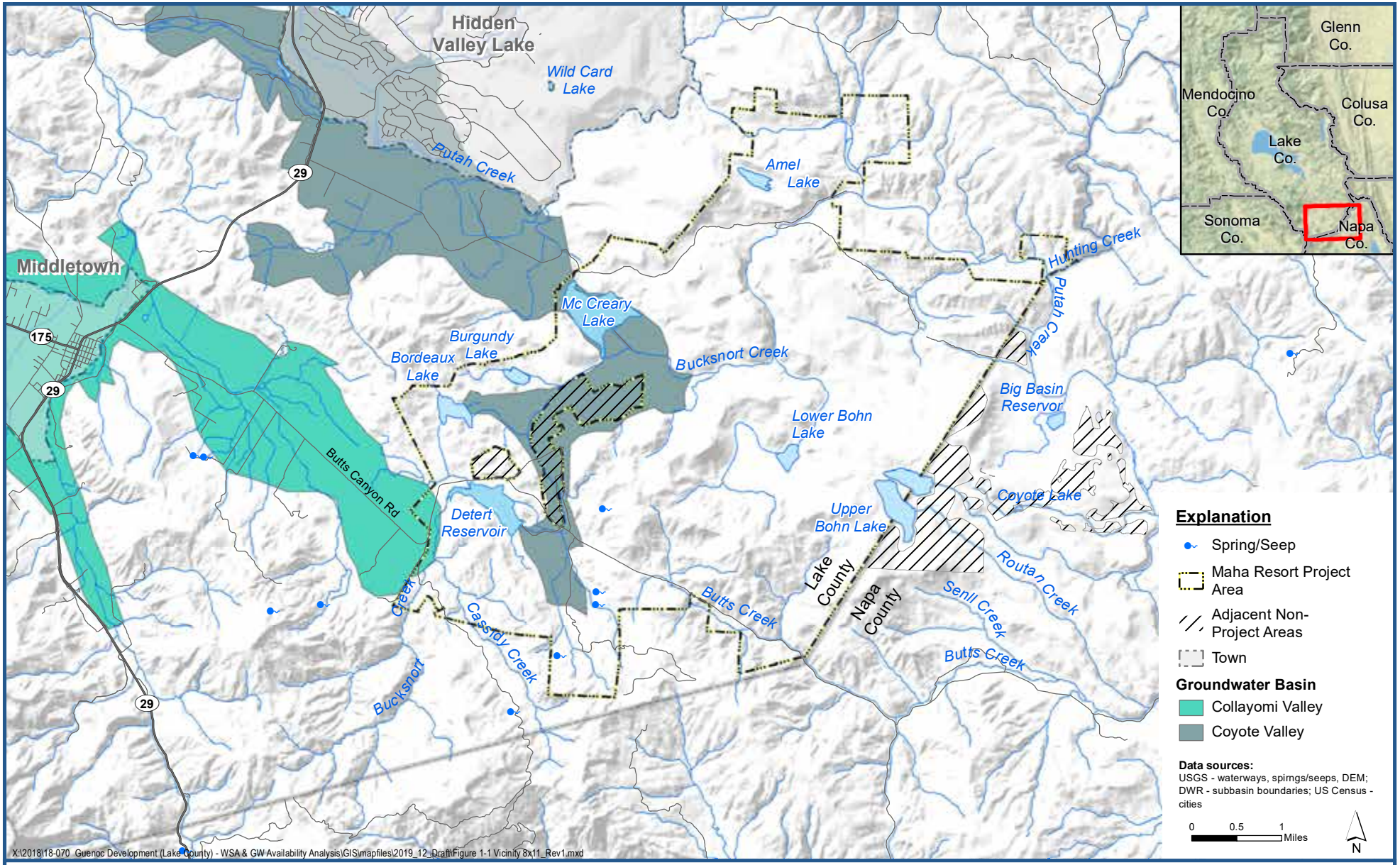
Sherwood Design Engineers. 2019b. *Wastewater Feasibility Study for Maha Resort at Guenoc Valley*. Prepared for Lotusland Investment Holdings. October 15, 2019. 25 pp.

Randy Sternberg, Lotusland Investment Holdings VP. personal communication. October 3, 2019.

Wagner, D.L and E.J. Bortugno. 1982. Geologic map of the Santa Rosa Quadrangle: California Division of Mines and Geology Regional Geologic Map Series, Map 2A, scale 1:250,000.

Wagner & Bonsignore . 2019. Estimate of Water Availability for Proposed Vineyard and Maha Resort Developments on the Langtry Farms Property in Guenoc Valley. Wagner & Bonsignore Consulting Civil Engineers. Draft Memorandum. July 18, 2019.5 pp.

FIGURES



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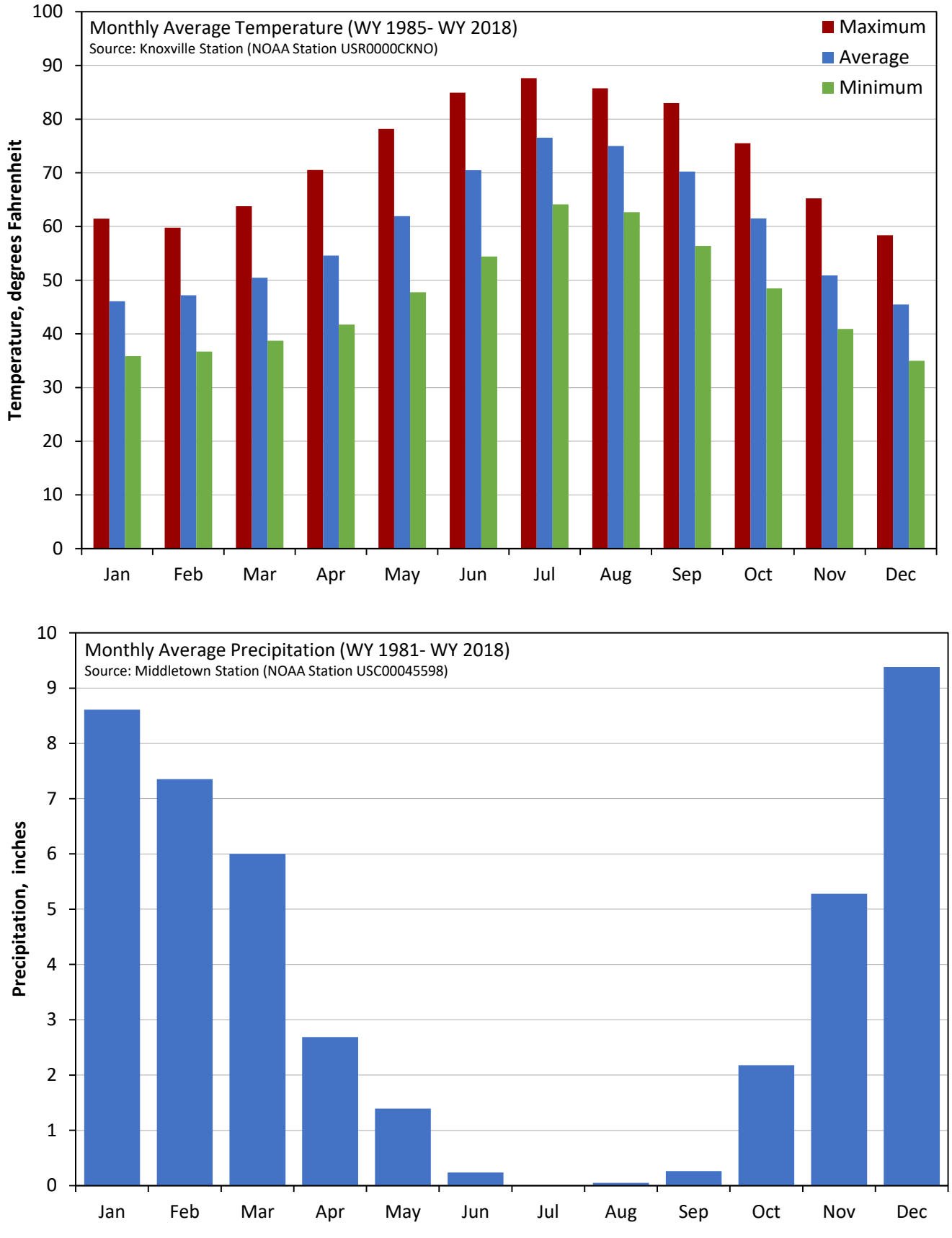
Consulting Engineers

Maha Resort at Guenoc Valley Project Area and Vicinity

Figure 1-1

Maha Resort at Guenoc Valley Water Supply Assessment
Lake County, California



FILE: X:\2018\18-070 Guenoc Development (Lake County) - WSA & GW Availability Analysis\DATA\Meteorological\Middletown_Knoxville_Temp_Precip_summary.xlsx

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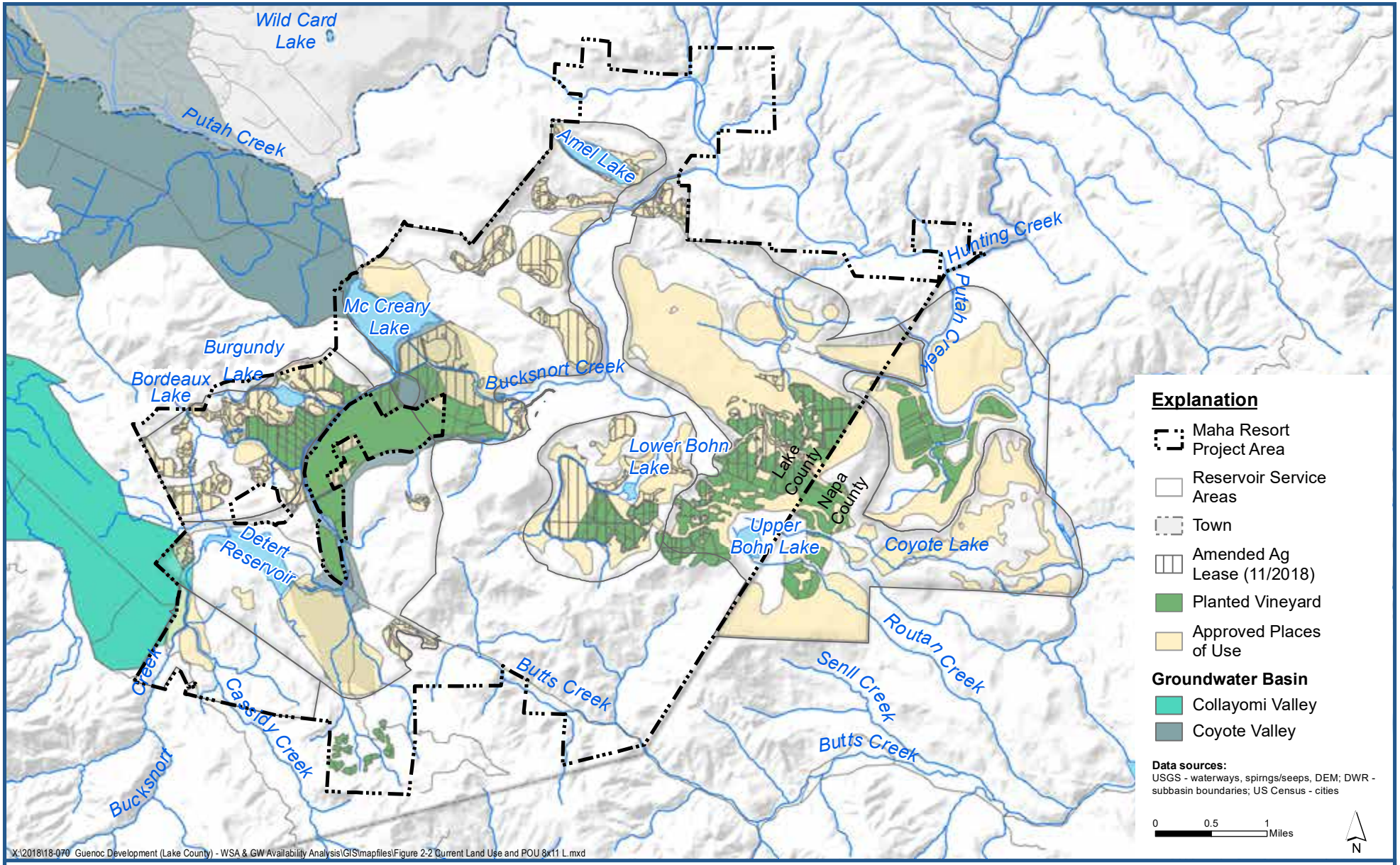
Average Monthly Temperature and Precipitation, Middletown and Knoxville Stations

Maha Resort at Guenoc Valley Water Supply Assessment
Lake County, California

Figure 2-1



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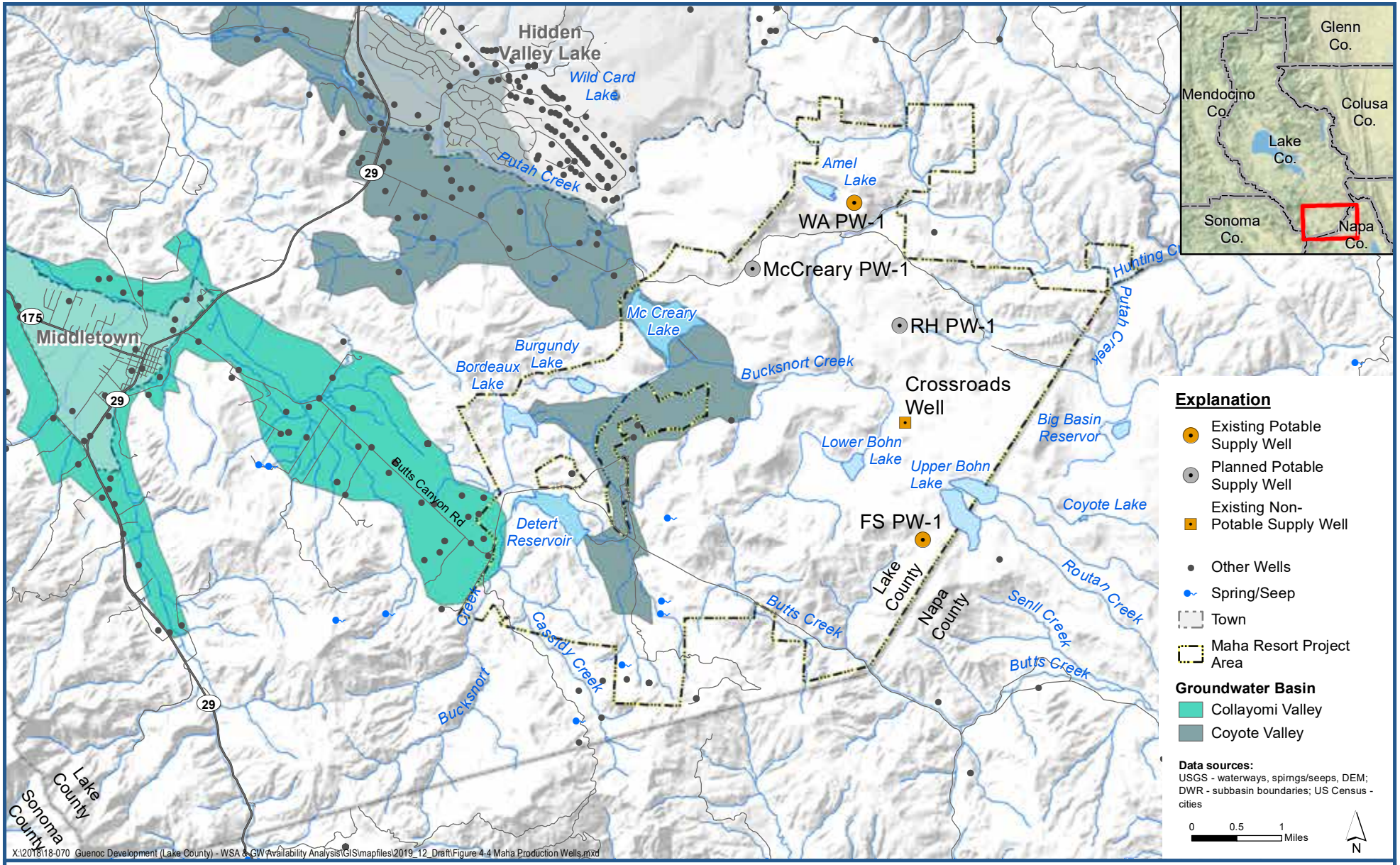
Current Land Use and Approved Places of Use

Maha Resort at Guenoc Valley Water Supply Assessment
Lake County, California

Figure 2-2



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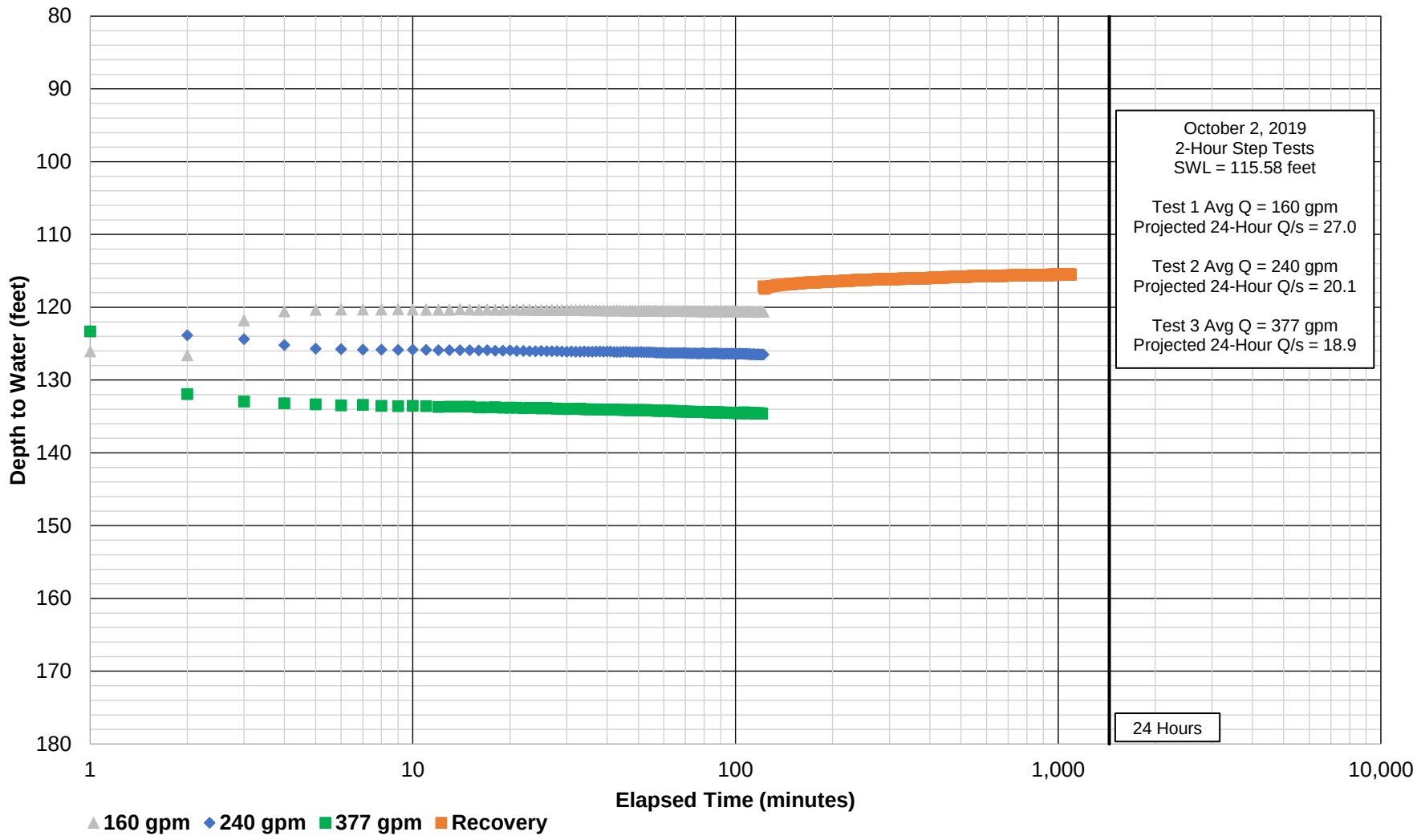
Existing and Planned Maha Resort at Guenoc Valley Production Wells

Maha Resort at Guenoc Valley Water Supply Assessment
Lake County, California

Figure 2-3



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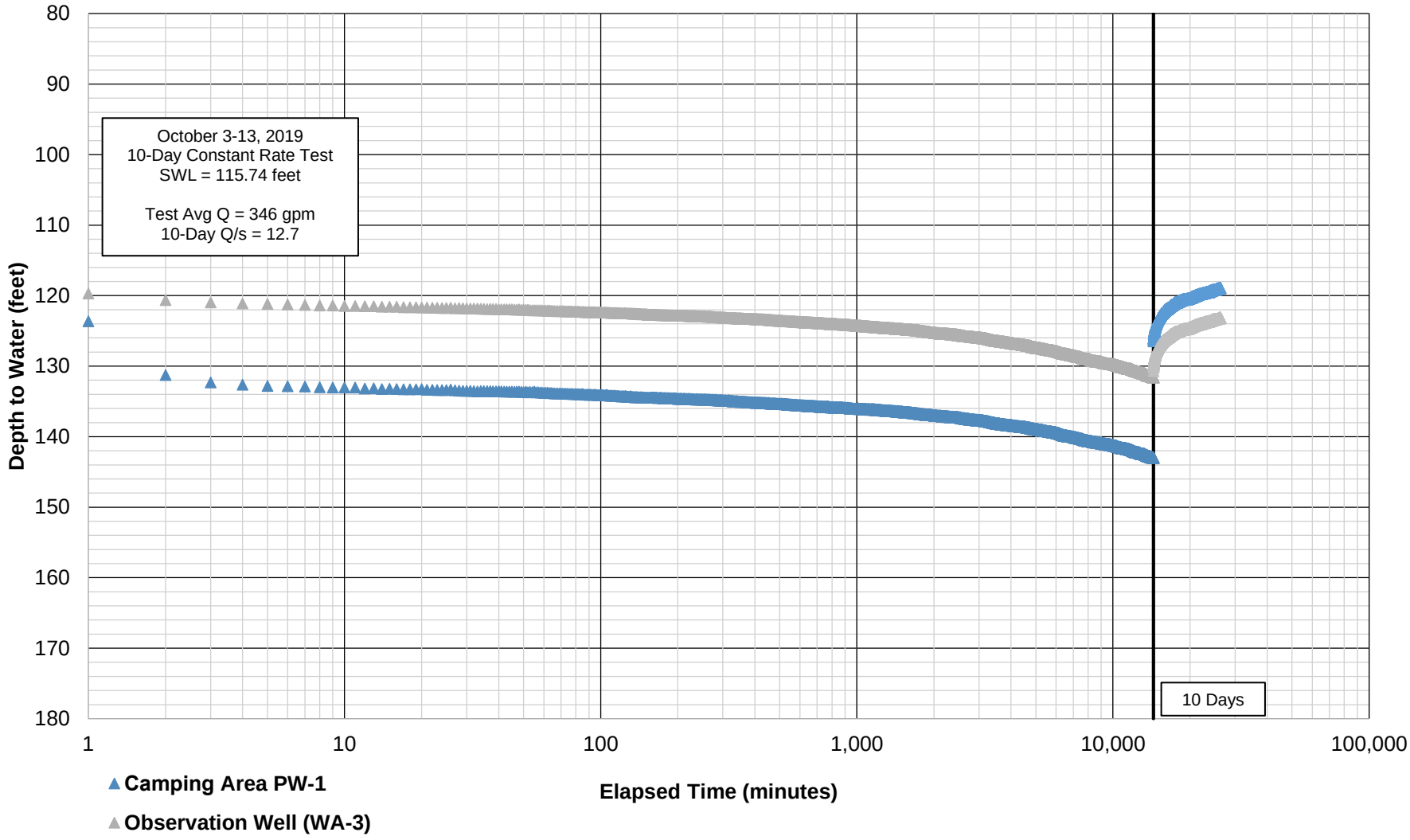
Camping Area Production Well-1 (PW-1)
Step Test

Maha Resort at Guenoc Valley Water Supply Assessment
Lake County, California

Figure 2-4



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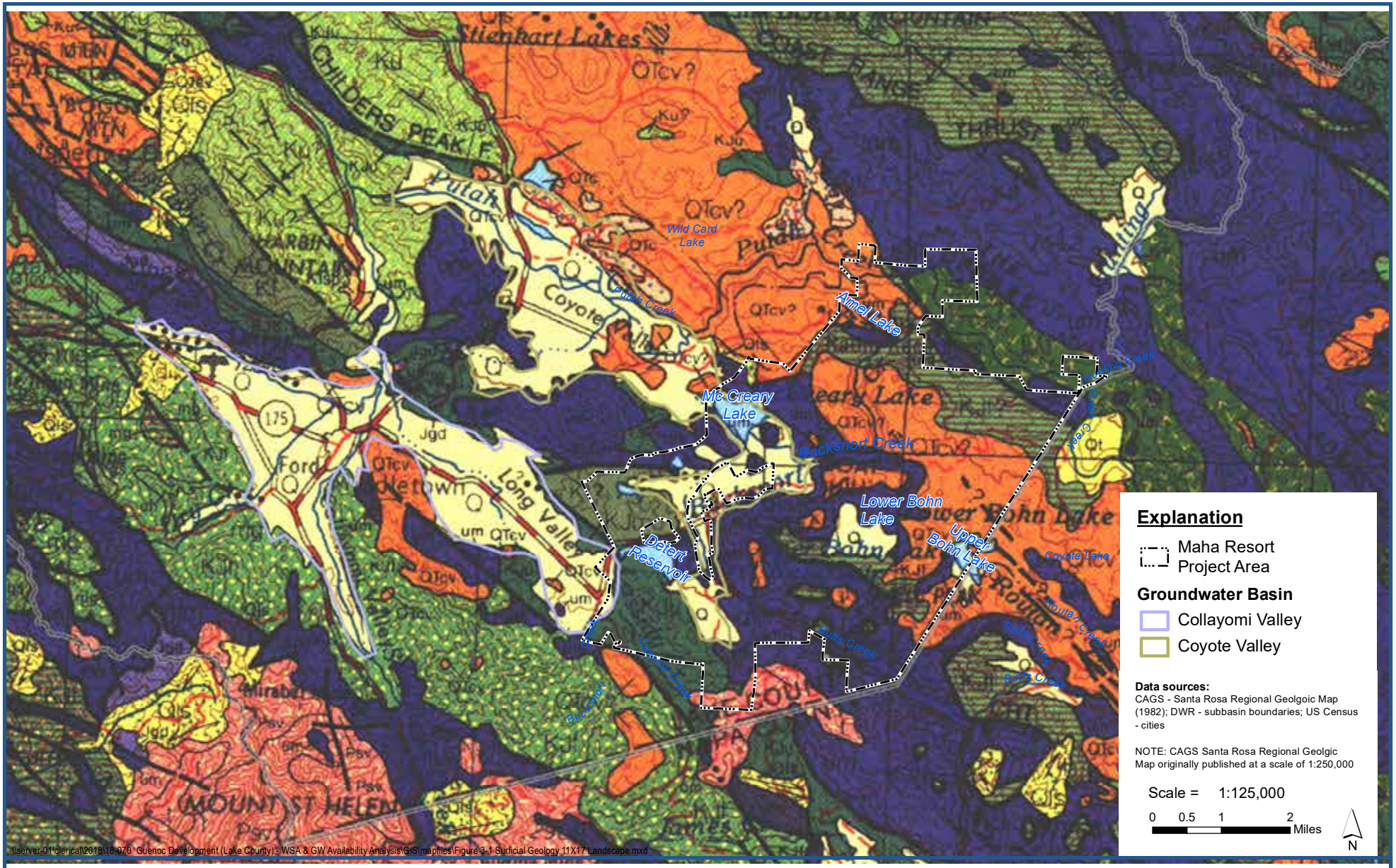
Camping Area Production Well-1 (PW-1)
Constant Rate Test

Maha Resort at Guenoc Valley Water Supply Assessment
Lake County, California

Figure 2-5



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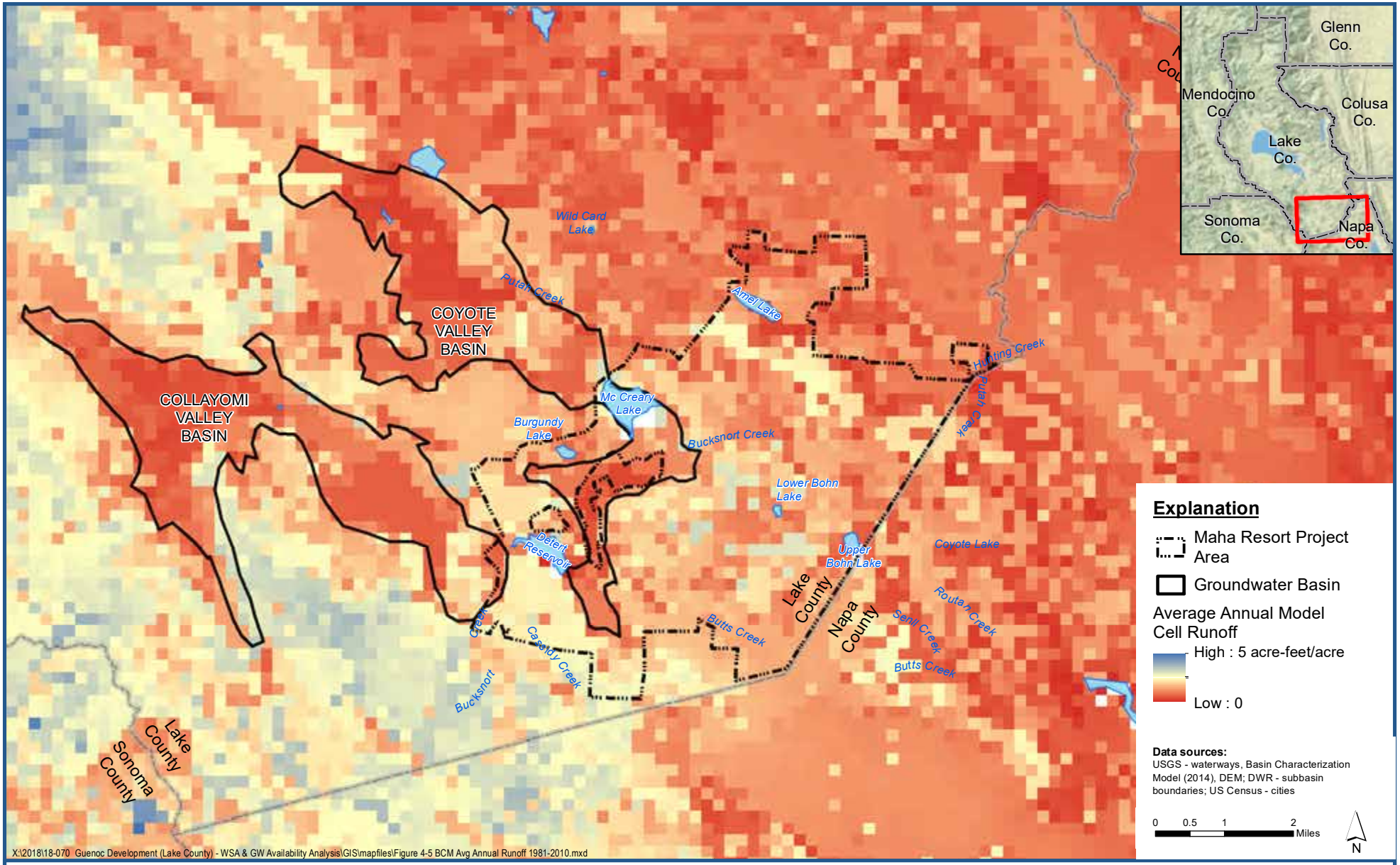
Surficial Geology

Maha Resort at Guenoc Valley Water Supply Assessment
Lake County, California

Figure 3-1



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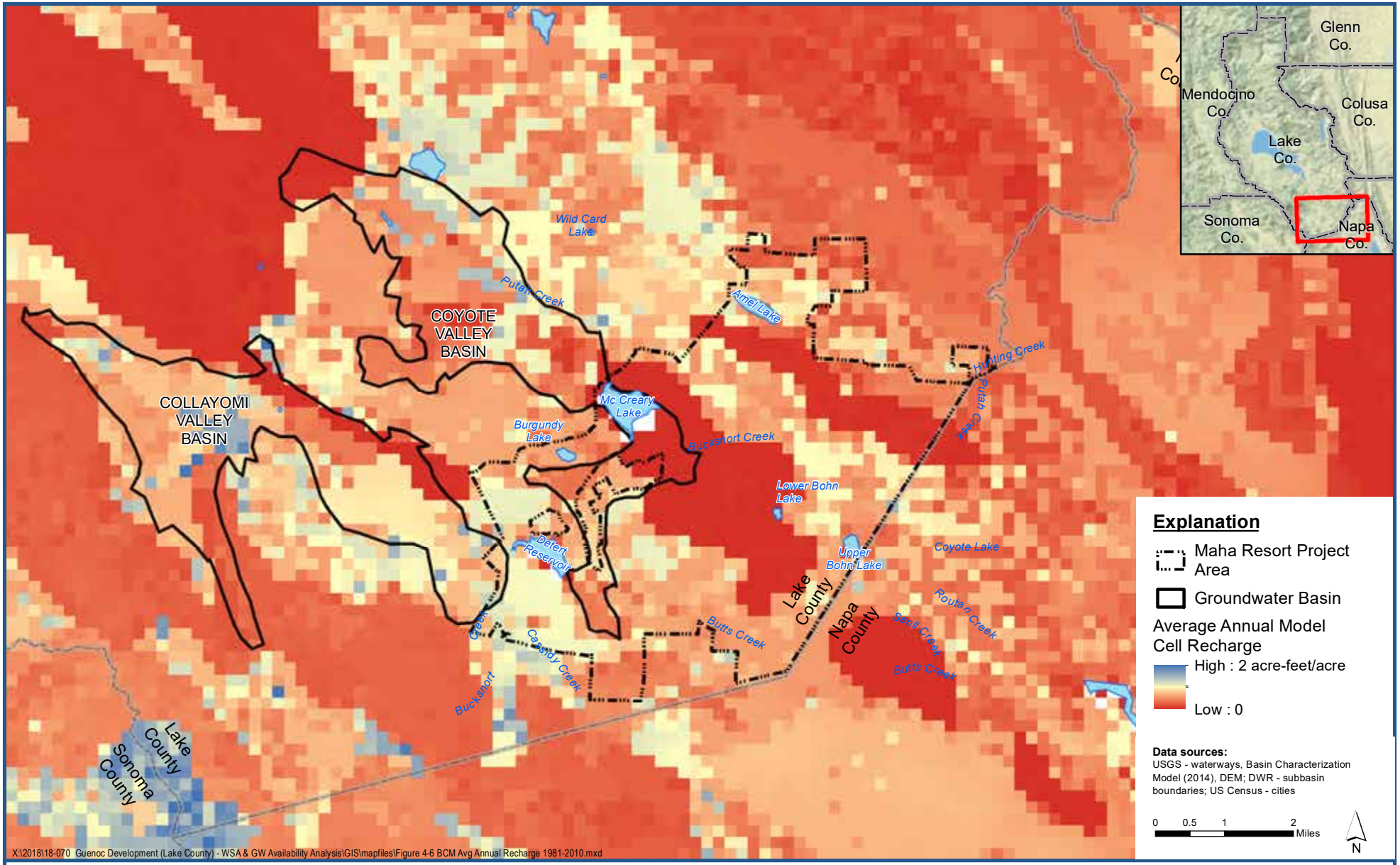
Basin Characterization Model Average Annual Runoff, 1981 – 2010

Figure 4-2

Maha Resort at Guenoc Valley Water Supply Assessment
Lake County, California



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Basin Characterization Model Average Annual Recharge, 1981 – 2010

Figure 4-3

Maha Resort at Guenoc Valley Water Supply Assessment
Lake County, California

APPENDIX A

LANGTRY FARMS
SUMMARY OF 5 YEAR AVERAGE WATER DIVERSION
WATER YEAR 2009 TO 2013

Reservoir	Storage Capacity (af)	2009 to 2013 Average Water Year Reservoir Diversions to Storage (ac/ft) [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	85	291	728	136	133	205	30	35	0	--	--	--	1,642
McCreary	2098	41	129	405	147	98	117	70	22	0	--	--	--	1,029
Foley #1	540	3	20	95	7	60	110	30	8	0	--	--	--	333
Foley #2	212	2	8	37	6	18	43	12	2	0	--	--	--	128
Langtry (Cassidy)	560	6	28	80	12	66	23	6	--	--	--	--	--	220
Upper Bohn (Natural Inflow) [3]	2760	6	42	144	41	48	148	16	0	0	--	--	--	446
Lower Bohn Diversion to Upper Bohn Storage		4	7	114	27	66	76	13	--	--	--	--	--	307
Napa Valley Lake (Big Basin)	200	2	4	20	35	86	34	24	--	--	--	--	--	204
Pump #2 to Napa Valley Lake		0	0	0	0	2	19	1	--	--	--	--	--	23
Total	**9,590**	**150**	**530**	**1,622**	**411**	**577**	**774**	**202**	**66**	**1**	**0**	**0**	**0**	**4,333**

Region	2009 to 2013 Average Direct Diversions to Use (ac/ft) [2]												
Guenoc Valley	1	15	55	45	27	30							173
Upper Bohn													0
Napa Valley Lake	0	0	34	26	20	18							97
Total Average Direct Water Diversions	**1**	**15**	**89**	**71**	**46**								**222**
Total Average Water Diversions	**150**	**530**	**1622**	**412**	**592**	**863**	**273**	**113**	**48**	**0**	**0**	**0**	**4,603**

(1) Water diversion to storage amounts based on reservoir elevation measurements.
(2) Direct diversion amounts determined by meter recordings and reservoir elevation measurements.
(3) Includes groundwater pumped into Upper Bohn

LANGTRY FARMS
SUMMARY OF 5 YEAR AVERAGE WATER USE BY REGION
WATER YEAR 2009 TO 2013

Reservoir	Storage Capacity (af)	2009 to 2013 Average Water Year Reservoir Depletions [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	87	11	42	0	1	22	141	247	226	276	259	173	1,484
McCreary	2098	33	0	6	0	7	3	57	87	126	270	217	130	937
Foley #1	540	55	0	0	0	0	8	4	22	40	53	87	107	376
Foley #2	212	56	0	0	0	0	0	3	14	20	22	19	17	152
Langtry (Cassidy)	560	6	0	1	0	0	0	8	14	23	24	21	14	111
Upper Bohn	2760	52	4	9	2	18	7	54	82	126	114	102	90	660
Napa Valley Lake (Big Basin)	200	14	2	2	0	0	0	5	15	24	39	42	29	173
Pump #2 to Napa Valley Lake		0	0	0	18	12	6	9	0	0	0	0	0	45
Total	**9,590**	**304**	**17**	**60**	**20**	**38**	**46**	**281**	**482**	**585**	**798**	**747**	**559**	**3,936**

Region	2009 to 2013 Average Metered Applied Water (af) [2] Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	115	10	2	1	15	45	117	198	219	245	240	196	1,404
Upper Bohn [4]	0	0	0	0	0	0	0	0	0	0	0	0	0
Napa Valley Lake	1	0	0	0	0	2	4	5	9	16	15	7	61
Total Applied Water	**116**	**10**	**2**	**1**	**15**	**47**	**121**	**204**	**228**	**261**	**255**	**204**	**1,465**
Evaporation and Seepage (af) [3]	187	6	58	1	11	-7	151	279	356	537	492	355	2,426

(1) Reservoir depletions based on reservoir elevation measurements includes evaporation, seepage and all uses.
(2) Water applied to developed areas based on meter recordings and does not include evaporation and seepage.
(3) Water lost to evaporation or seepage based on reservoir elevation measurements and corresponding metered use. Negative values are the results of inflows coinciding with metered use or transfer of water to satellite reservoirs.
(4) Meter data incomplete, Some outlet and irrigation meters were installed in 2014 and 2015

LANGTRY FARMS
SUMMARY OF 5 YEAR AVERAGE WATER USE BY REGION
WATER YEAR 2009 TO 2013

Region	Developed Acreages	2009 to 2013 Average Reservoir Depletion Water Duty (af/ac) [1]												
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley [3]	986	0.24	0.01	0.05	0.00	0.01	0.03	0.22	0.39	0.44	0.65	0.61	0.45	3.10
Upper Bohn [4] [6]	281	0.18	0.01	0.03	0.01	0.06	0.02	0.19	0.29	0.45	0.40	0.36	0.32	2.35
Napa Valley Lake [5]	314	0.05	0.01	0.00	0.00	0.00	0.00	0.02	0.05	0.08	0.12	0.13	0.09	0.55

Region	Developed Acreages	2009 to 2013 Average Metered Applied Water Duty (af/ac) [2]												
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	986	0.12	0.01	0.00	0.00	0.02	0.05	0.12	0.20	0.22	0.25	0.24	0.20	1.42
Upper Bohn [4] [6]	281	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Napa Valley Lake [5]	314	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.03	0.05	0.05	0.02	0.19

Frost Protection	2009 to 2013 Average Metered Applied Frost Protection (af)			
Guenoc Valley [3]	0	36	91	16
Upper Bohn [4] [6]	0	0	0	
Napa Valley Lake [5]	0	12	51	

(1) Reservoir depletion per developed acre based on reservoir elevation measurements and includes evaporation, seepage and all uses.
(2) Applied water per developed acre based on meter recordings and does not include evaporation and seepage.
(3) 663 Acres of Vineyard, 222 acres of Pasture, 90 Acres of Golf Course
(4) 246 Acres of Vineyard, 281 Acres of Pasture
(5) All Vineyard
(6) Meter data incomplete, Some outlet and irrigation meters were installed in 2014 and 2015

LANGTRY FARMS
SUMMARY OF WATER USE by RESERVOIR
for WATER YEAR 2013

Reservoir	Storage Capacity (af)	Water Year Reservoir Depletions [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	142	0	0	0	4	0	215	254	222	306	278	42	1,463
McCreary	2098	10	0	0	0	33	16	44	85	122	151	103	88	652
Foley #1	540	56	0	0	0	0	39	13	89	53	83	45	90	468
Foley #2	212	17	0	0	0	2	0	0	15	40	31	18	21	143
Langtry (Cassidy)	560	9	0	0	0	2	0	13	22	21	33	24	10	134
Upper Bohn	2760	62	0	0	11	54	34	87	95	126	162	103	105	838
Napa Valley Lake (Big Basin)	200	16	3	0	0	0	0	3	0	46	62	47	23	200
Pump #2 to Napa Valley Lake [5]		0	0	0	88	60	31	44						224
Total	**9,590**	**312**	**3**	**0**	**99**	**154**	**120**	**419**	**559**	**630**	**829**	**618**	**379**	**4,123**

Region	Metered Applied Water (af) [2] Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	99	2	0	0	0	19	79	131	117	184	162	86	879
Upper Bohn [3]													
Napa Valley Lake	7	2	0	0	0	9	16	11	23	45	38	16	167
Total Applied Water	**106**	**3**	**0**	**0**	**0**	**29**	**94**	**142**	**140**	**229**	**200**	**102**	**1,046**
Evaporation and Seepage (af) [4]	144	-1	0	0	40	26	194	322	364	438	315	172	2,014

(1) Reservoir depletions based on reservoir elevation measurements includes evaporation, seepage and all uses.
(2) Water applied to developed areas based on meter recordings and does not include evaporation and seepage.
(3) No meters installed.
(4) Water lost to evaporation or seepage based on reservoir elevation measurements and corresponding metered use. Negative values are the results of inflows coinciding with metered use or transfer of water to satellite reservoirs.
(5) Water released from Guenoc Valley and picked up at Pump #2 for irrigation is measured at Napa Valley Lake Metered Applied Water.

LANGTRY FARMS
SUMMARY OF WATER USE by RESERVOIR
for WATER YEAR 2013

Region	Developed Acreages	Reservoir Depletion Water Duty (af/ac) [1]												
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley [3]	986	0.24	0.00	0.00	0.00	0.04	0.06	0.29	0.47	0.46	0.61	0.47	0.25	2.90
Upper Bohn [4]	281	0.22	0.00	0.00	0.04	0.19	0.12	0.31	0.34	0.45	0.58	0.37	0.37	2.98
Napa Valley Lake [5]	314	0.05	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.15	0.20	0.15	0.07	0.64

Region	Developed Acreages	Metered Applied Water Duty (af/ac) [2]												
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	986	0.10	0.00	0.00	0.00	0.00	0.02	0.08	0.13	0.12	0.19	0.16	0.09	0.89
Upper Bohn [6]	281	--	--	--	--	--	--	--	--	--	--	--	--	--
Napa Valley Lake	314	0.02	0.00	0.00	0.00	0.00	0.03	0.05	0.03	0.07	0.14	0.12	0.05	0.53

Frost Protection	Metered Applied Frost Protection (af)	
Guenoc Valley	54	13
Upper Bohn		
Napa Valley Lake	9	16

(1) Reservoir depletion per developed acre based on reservoir elevation measurements and includes evaporation, seepage and all uses.
(2) Applied water per developed acre based on meter recordings and does not include evapoaration and seepage.
(3) 302 acres vineyard, 596 acres pasture, 88 acre golf course.
(4) All pasture
(5) 122 acre vineyard, 192 acre pasture
(6) No meters installed

LANGTRY FARMS
SUMMARY OF WATER DIVERSION by RESERVOIR
for WATER YEAR 2013

Reservoir	Storage Capacity (af)	Water Year Reservoir Diversions to Storage (ac/ft) [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	0	849	877	0	0	4	0	0	0	--	--	--	1,730
McCreary	2098	0	418	757	0	0	0	0	0	0	--	--	--	1,175
Foley #1	540	0	70	242	4	9	0	0	0	0	--	--	--	325
Foley #2	212	0	25	88	7	0	22	9	0	0	--	--	--	151
Langtry (Cassidy)	560	0	90	33	0	0	0	0	--	--	--	--	--	123
Upper Bohn (Natural Inflow)	2760	0	148	298	18	0	0	0	0	0	--	--	--	463
Lower Bohn Diversion to Upper Bohn Storage		0	0	275	78	0	3	0	--	--	--	--	--	356
Napa Valley Lake (Big Basin)	200	0	0	35	88	60	17	0	--	--	--	--	--	200
Pump #2 to Napa Valley Lake		0	0	0	0	0	14	0	--	--	--	--	--	14
Total	**9,590**	**0**	**1,599**	**2,604**	**194**	**69**	**61**	**9**	**0**	**0**	**0**	**0**	**0**	**4,536**

Region	Direct Diversions to Use (ac/ft) [2]												
Guenoc Valley						19							19
Upper Bohn													0
Napa Valley Lake						9	16	45					70
Total Direct Water Diversions					**0**	**29**	**16**	**45**					**89**
Total Water Diversions	**0**	**1599**	**2604**	**194**	**69**	**90**	**25**	**45**	**0**	**0**	**0**	**0**	**4,625**

(1) Water diversion to storage amounts based on reservoir elevation measurements.
(2) Direct diversion amounts determined by meter recordings and reservoir elevation measurements.

LANGTRY FARMS
SUMMARY OF WATER USE by RESERVOIR
for WATER YEAR 2012

Reservoir	Storage Capacity (af)	Water Year Reservoir Depletions [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	102	15	209	0	0	0	29	300	313	356	306	281	1,909
McCreary	2098	47	0	31	0	0	0	171	145	121	301	272	194	1,282
Foley #1	540	19	0	2	0	0	0	0	0	34	64	88	70	276
Foley #2	212	8	0	0	0	0	0	0	30	32	22	34	25	150
Langtry (Cassidy)	560	3	0	3	0	0	0	4	18	32	17	26	16	120
Upper Bohn	2760	36	20	46	0	36	0	54	103	170	114	119	93	790
Napa Valley Lake (Big Basin)	200	10	8	8	0	0	0	19	0	0	47	55	31	178
Pump #2 to Napa Valley Lake [6]		0	0	0	0	0	0	0						0
Total	**9,590**	**224**	**43**	**299**	**0**	**36**	**0**	**276**	**596**	**702**	**921**	**899**	**709**	**4,705**

Region	Metered Applied Water (af) [2] Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	50	11	11	0	0	31	80	178	184	203	210	214	1,171
Upper Bohn [3]													
Napa Valley Lake [4]	0	0	0	0	0	0	5	15	22	36	39	21	138
Total Applied Water	**50**	**11**	**11**	**0**	**0**	**31**	**85**	**193**	**206**	**239**	**249**	**234**	**1,310**
Evaporation and Seepage (af) [5]	139	12	242	0	0	-31	137	300	327	568	531	382	2,605

(1) Reservoir depletions based on reservoir elevation measurements includes evaporation, seepage and all uses.
(2) Water applied to developed areas based on meter recordings and does not include evaporation and seepage.
(3) No meters installed.
(4) Outlet meter installed in March.
(5) Water lost to evaporation or seepage based on reservoir elevation measurements and corresponding metered use. Negative values are the results of inflows coinciding with metered use or transfer of water to satellite reservoirs.
(6) 'Water released from Guenoc Valley and picked up at Pump #2 for irrigation is measured at Napa Valley Lake Metered Applied Water.

LANGTRY FARMS
SUMMARY OF WATER USE by RESERVOIR
for WATER YEAR 2012

Region	Developed Acreages	Reservoir Depletion Water Duty (af/ac) [1]												
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley [3]	986	0.18	0.01	0.25	0.00	0.00	0.00	0.21	0.50	0.54	0.77	0.74	0.59	3.79
Upper Bohn [4]	281	0.13	0.07	0.16	0.00	0.13	0.00	0.19	0.37	0.60	0.41	0.42	0.33	2.81
Napa Valley Lake [5]	314	0.03	0.03	0.02	0.00	0.00	0.00	0.06	0.00	0.00	0.15	0.17	0.10	0.57

Region	Developed Acreages	Metered Applied Water Duty (af/ac) [2]												
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	986	0.05	0.01	0.01	0.00	0.00	0.03	0.08	0.18	0.19	0.21	0.21	0.22	1.19
Upper Bohn [4] [6]	281													
Napa Valley Lake [7]	314	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.05	0.07	0.12	0.13	0.07	0.44

Frost Protection	Metered Applied Frost Protection (af)	
Guenoc Valley	0	74
Upper Bohn		
Napa Valley Lake [8]	0	31

(1) Reservoir depletion per developed acre based on reservoir elevation measurements and includes evaporation, seepage and all uses.
(2) Applied water per developed acre based on meter recordings and does not include evapoaration and seepage.
(3) 302 acres vineyard, 596 acres pasture, 88 acre golf course.
(4) All pasture.
(5) 122 acre vineyard, 192 acre pasture.
(6) No meters installed.
(7) Outlet meter installed in March.
(8) Frost protection amounts estimated based on ((1475 min x 55 gpm x 122 acres)/325/851 gal/acre).

LANGTRY FARMS
SUMMARY OF WATER DIVERSION by RESERVOIR
for WATER YEAR 2012

Reservoir	Storage Capacity (af)	Water Year Reservoir Diversions to Storage (ac/ft) [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	0	0	0	649	55	708	0	0	0	--	--	--	1,412
McCreary	2098	0	0	0	279	17	351	0	0	0	--	--	--	647
Foley #1	540	0	2	0	26	2	190	109	14	0	--	--	--	342
Foley #2	212	0	0	0	8	0	86	41	0	0	--	--	--	135
Langtry (Cassidy)	560	0	0	0	50	0	50	0	--	--	--	--	--	100
Upper Bohn (Natural Inflow)	2760	0	0	0	77	0	112	80	0	0	--	--	--	269
Lower Bohn Diversion to Upper Bohn Storage		0	0	0	0	0	310	38	--	--	--	--	--	348
Napa Valley Lake (Big Basin)	200	0	0	0	0	108	56	27	--	--	--	--	--	191
Pump #2 to Napa Valley Lake		0	0	0	0	0	0	0	--	--	--	--	--	0
Total	**9,590**	**0**	**2**	**0**	**1,088**	**183**	**1,863**	**295**	**14**	**0**	**0**	**0**	**0**	**3,444**

Region	Direct Diversions to Use (ac/ft) [2]													
Guenoc Valley							31	51						82
Upper Bohn														0
Napa Valley Lake								19	53	89				161
Total Direct Water Diversions							**31**	**70**	**53**	**89**				**243**
Total Water Diversions	**0**	**2**	**0**	**1088**	**183**	**1894**	**364**	**67**	**89**	**0**	**0**	**0**	**3,688**	

(1) Water diversion to storage amounts based on reservoir elevation measurements.
(2) Direct diversion amounts determined by meter recordings and reservoir elevation measurements.

LANGTRY FARMS
SUMMARY OF WATER USE by RESERVOIR
for WATER YEAR 2011

Reservoir	Storage Capacity (af)	Water Year Reservoir Depletions [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	56	10	0	0	0	0	72	53	17	318	356	271	1,153
McCreary	2098	40	0	0	0	0	0	0	100	59	208	229	132	767
Foley #1	540	18	0	0	0	0	0	0	8	93	92	113	86	409
Foley #2	212	74	0	0	0	0	0	11	14	13	42	25	25	203
Langtry (Cassidy)	560	7	0	0	0	0	0	9	7	11	28	24	16	102
Upper Bohn	2760	44	0	0	0	0	0	80	80	157	86	97	97	641
Napa Valley Lake (Big Basin)	200	16	0	0	0	0	0	0	21	7	10	41	40	134
Pump #2 to Napa Valley Lake [6]		0	0	0	0	0	0	0						0
Total	**9,590**	**254**	**10**	**0**	**0**	**0**	**0**	**171**	**283**	**357**	**783**	**885**	**666**	**3,409**

Region	Metered Applied Water (af) [2] Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	21	10	0	6	76	67	109	156	177	130	196	207	1,156
Upper Bohn [3]													
Napa Valley Lake [4]													
Total Applied Water	**21**	**10**	**0**	**6**	**76**	**67**	**109**	**156**	**177**	**130**	**196**	**207**	**1,156**
Evaporation and Seepage (af) [5]	173	0	0	-6	-76	-67	-18	27	16	558	549	322	1,478

(1) Reservoir depletions based on reservoir elevation measurements includes evaporation, seepage and all uses. October and November values are estimated based on end of 2010 irrigation season reservoir elevation measurements.
(2) Water applied to developed areas based on meter recordings and does not include evaporation and seepage.
(3) No meters installed
(4) No Meters installed
(5) Water lost to evaporation or seepage based on reservoir elevation measurements and corresponding metered use. Negative values are the results of inflows coinciding with metered use or transfer of water to satellite reservoirs.
(6) Water released from Guenoc Valley and picked up at Pump #2 for irrigation is counted within Guenoc Valley reservoir depletions.

LANGTRY FARMS
SUMMARY OF WATER USE by RESERVOIR
for WATER YEAR 2011

Region	Developed Acreages	Reservoir Depletion Water Duty (af/ac) [1]												
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley [3]	986	0.20	0.01	0.00	0.00	0.00	0.00	0.09	0.19	0.20	0.70	0.76	0.54	2.67
Upper Bohn [4]	281	0.16	0.00	0.00	0.00	0.00	0.00	0.28	0.28	0.56	0.30	0.35	0.35	2.28
Napa Valley Lake [5]	314	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.02	0.03	0.13	0.13	0.43

Region	Developed Acreages	Metered Applied Water Duty (af/ac) [2]												
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	986	0.02	0.01	0.00	0.01	0.08	0.07	0.11	0.16	0.18	0.13	0.20	0.21	1.17
Upper Bohn [6]	281	--	--	--	--	--	--	--	--	--	--	--	--	--
Napa Valley Lake [7]	314	--	--	--	--	--	--	--	--	--	--	--	--	--

Frost Protection	Metered and Estimated Applied Frost Protection (af)	
Guenoc Valley	123	30
Upper Bohn		
Napa Valley Lake [8]	44	

(1) Reservoir depletion per developed acre based on reservoir elevation measurements and includes evaporation, seepage and all uses.
(2) Applied water per developed acre based on meter recordings and does not include evapoaration and seepage.
(3) 302 acres vineyard, 596 acres pasture, 88 acre golf course.
(4) All pasture
(5) 122 acre vineyard, 192 acre pasture.
(6) No meters installed.
(7) No meters installed.
(8) Estimate based on ((2145 min. x 55gpm x 122 acres)/325,851 gal/af).

LANGTRY FARMS
SUMMARY OF WATER DIVERSION by RESERVOIR
for WATER YEAR 2011

Reservoir	Storage Capacity (af)	Water Year Reservoir Diversions to Storage (ac/ft) [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	325	217	724	0	0	0	0	0	0	--	--	--	1,266
McCreary	2098	121	81	270	439	74	38	256	0	0	--	--	--	1,277
Foley #1	540	3	2	7	3	92	318	19	0	0	--	--	--	444
Foley #2	212	3	2	6	12	10	88	0	0	0	--	--	--	121
Langtry (Cassidy)	560	8	6	19	3	65	0	0	--	--	--	--	--	102
Upper Bohn (Natural Inflow)	2760	32	22	72	26	134	428	0	0	0	--	--	--	714
Lower Bohn Diversion to Upper Bohn Storage		0	0	0	26	57	0	0	--	--	--	--	--	84
Napa Valley Lake (Big Basin)	200	0	0	0	28	101	65	64	--	--	--	--	--	258
Pump #2 to Napa Valley Lake		0	0	0	0	0	0	0	--	--	--	--	--	0
Total	**9,590**	**492**	**329**	**1,099**	**537**	**533**	**937**	**339**	**0**	**0**	**0**	**0**	**0**	**4,265**

Region	Direct Diversions to Use (ac/ft) [2]												
Guenoc Valley				6	76	67	37	94	149				429
Upper Bohn													0
Napa Valley Lake [3]							44						44
Total Direct Water Diversions				**6**	**76**	**67**	**81**	**94**	**149**				**473**
Total Water Diversions	**492**	**329**	**1099**	**544**	**609**	**1004**	**420**	**94**	**149**	**0**	**0**	**0**	**4,738**

(1) Water diversion to storage amounts based on reservoir elevation measurements. October, November and December values are estimated based on end of 2010 irrigation season reservoir elevation measurements and precipitation ratio to measured reservoir elevations in January 2011.
(2) Direct diversion amounts determined by meter recordings and reservoir elevation measurements.
(3) Direct diversion estimate based on frost use ((2145 min. x 55gpm x 122 acres)/325,851 gal/af).

LANGTRY FARMS
SUMMARY OF ESTIMATED WATER USE by RESERVOIR
for WATER YEAR 2010

Reservoir	Storage Capacity (af)	Estimated Water Year Reservoir Depletions [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	53	29	0	0	0	83	177	279	153	178	180	139	1,271
McCreary	2098	29	0	0	0	0	0	32	56	265	314	121	80	898
Foley #1	540	91	0	0	0	0	0	4	7	11	13	179	153	458
Foley #2	212	50	0	0	0	0	0	3	5	8	9	9	7	90
Langtry (Cassidy)	560	6	0	0	0	0	0	5	14	38	17	16	13	109
Upper Bohn	2760	35	0	0	0	0	0	25	69	101	113	108	85	536
Napa Valley Lake (Big Basin)	200	14	0	0	0	0	0	2	29	37	40	36	27	184
Pump #2 to Napa Valley Lake [6]		0	0	0	0	0	0	0						0
Total	**9,590**	**278**	**29**	**0**	**0**	**0**	**83**	**249**	**459**	**613**	**684**	**648**	**504**	**3,546**

Region	Metered Applied Water (af) [2] Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	152	28	0	0	0	82	148	237	276	302	280	211	1,715
Upper Bohn [3]													
Napa Valley Lake [4]													
Total Applied Water	**152**	**28**	**0**	**0**	**0**	**82**	**148**	**237**	**276**	**302**	**280**	**211**	**1,715**
Evaporation and Seepage (af) [5]	77	1	0	0	0	1	74	124	199	229	226	181	1,112

(1) Reservoir estimated depletions based on beginning and ending of irrigation season reservoir elevation measurements and includes evaporation, seepage and all uses. Monthly values are estimated based on seasonal reservoir elevation measurements and rationed monthly based on published evaporation data from Markly Cove.
(2) Water applied to developed areas based on meter recordings and does not include evaporation and seepage.
(3) No meters installed
(4) No Meters installed
(5) Water lost to evaporation or seepage based on reservoir elevation measurements and corresponding metered use. Negative values are the results of inflows coinciding with metered use or transfer of water to satellite reservoirs.
(6) Water released from Guenoc Valley and picked up at Pump #2 for irrigation is counted within Guenoc Valley reservoir depletions.

LANGTRY FARMS
SUMMARY OF ESTIMATED WATER USE by RESERVOIR
for WATER YEAR 2010

Region	Developed Acreages	Reservoir Depletion Water Duty (af/ac) [1]												
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley [3]	986	0.23	0.03	0.00	0.00	0.00	0.08	0.22	0.37	0.48	0.54	0.51	0.40	2.87
Upper Bohn [4]	281	0.12	0.00	0.00	0.00	0.00	0.00	0.09	0.25	0.36	0.40	0.38	0.30	1.91
Napa Valley Lake [5]	314	0.05	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.12	0.13	0.11	0.09	0.59

Region	Developed Acreages	Metered Applied Water Duty (af/ac) [2]												
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	986	0.15	0.03	0.00	0.00	0.00	0.08	0.15	0.24	0.28	0.31	0.28	0.21	1.74
Upper Bohn [6]	281	--	--	--	--	--	--	--	--	--	--	--	--	--
Napa Valley Lake [7]	314	--	--	--	--	--	--	--	--	--	--	--	--	--

Frost Protection	Metered Applied Frost Protection (af)		
Guenoc Valley	76	137	40
Upper Bohn			
Napa Valley Lake [8]	50	51	

(1) Reservoir depletion per developed acre based on reservoir elevation measurements and includes evaporation, seepage and all uses.
(2) Applied water per developed acre based on meter recordings and does not include evapoaration and seepage.
(3) 302 acres vineyard, 596 acres pasture, 88 acre golf course.
(4) All pasture
(5) 122 acre vineyard, 192 acre pasture.
(6) No meters installed.
(7) No meter installed.
(8) Based on Napa Valley Lake frost pond report.

LANGTRY FARMS
SUMMARY OF ESTIMATED WATER DIVERSION by RESERVOIR
for WATER YEAR 2010

Reservoir	Storage Capacity (af)	Water Year Reservoir Diversions to Storage (ac/ft) [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	0	193	1,810	0	0	0	0	0	0	--	--	--	2,003
McCreary	2098	23	23	856	0	14	0	0	0	0	--	--	--	916
Foley #1	540	0	2	193	0	115	0	0	0	0	--	--	--	309
Foley #2	212	0	0	74	0	41	0	0	0	0	--	--	--	116
Langtry (Cassidy)	560	0	8	302	0	143	0	0	--	--	--	--	--	453
Upper Bohn (Natural Inflow)	2760	0	42	351	0	32	0	0	0	0	--	--	--	425
Lower Bohn Diversion to Upper Bohn Storage		0	0	254	26	163	7	0	--	--	--	--	--	451
Napa Valley Lake (Big Basin)	200	0	0	45	55	81	0	13	--	--	--	--	--	194
Pump #2 to Napa Valley Lake		0	0	0	0	12	11	7	--	--	--	--	--	30
Total	**9,590**	**23**	**268**	**3,885**	**81**	**602**	**18**	**21**	**0**	**0**	**0**	**0**	**0**	**4,897**

Region	Direct Diversions to Use (ac/ft) [2]												
Guenoc Valley						76	137	40					253
Upper Bohn													0
Napa Valley Lake						50	51						101
Total Direct Water Diversions						**126**	**188**	**40**					**354**
Total Water Diversions	**23**	**268**	**3885**	**81**	**602**	**144**	**209**	**40**	**0**	**0**	**0**	**0**	**5,251**

(1) Water diversion to storage amounts based on ending and beginning of irrigation season reservoir elevation measurements. Monthly values are estimated based on seasonal reservoir elevation measurements and rationed monthly based on published precipitation data from Middletown.
(2) Direct diversion amounts determined by meter recordings and reservoir elevation measurements.

LANGTRY FARMS
SUMMARY OF ESTIMATED WATER USE by RESERVOIR
for WATER YEAR 2009

Reservoir	Storage Capacity (af)	Estimated Water Year Reservoir Depletions [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	81	0	0	0	0	25	211	349	424	222	177	133	1,623
McCreary	2098	39	0	0	0	0	0	37	51	65	378	359	153	1,084
Foley #1	540	93	0	0	0	0	0	4	6	8	10	10	137	268
Foley #2	212	132	0	0	0	0	0	4	5	6	9	8	7	171
Langtry (Cassidy)	560	7	0	0	0	0	0	8	10	13	24	17	14	93
Upper Bohn	2760	83	0	0	0	0	0	22	65	75	93	85	68	492
Napa Valley Lake (Big Basin)	200	15	0	0	0	0	0	3	28	30	35	31	24	167
Pump #2 to Napa Valley Lake [6]		0	0	0	0	0	0	0						0
Total	**9,590**	**451**	**0**	**0**	**0**	**0**	**25**	**289**	**515**	**622**	**772**	**687**	**537**	**3,899**

Region	Metered Applied Water (af) [2] Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	253	0	0	0	0	25	168	290	342	406	352	265	2,101
Upper Bohn [3]													
Napa Valley Lake [4]													
Total Applied Water	**253**	**0**	**0**	**0**	**0**	**25**	**168**	**290**	**342**	**406**	**352**	**265**	**2,101**
Evaporation and Seepage (af) [5]	199	0	0	0	0	0	121	225	280	366	335	272	1,798

(1) Reservoir estimated depletions based on beginning and ending of irrigation season reservoir elevation measurements and includes evaporation, seepage and all uses. Monthly values are estimated based on seasonal reservoir elevation measurements and rationed monthly based on published evaporation data from Markly Cove.
(2) Water applied to developed areas based on meter recordings and does not include evaporation and seepage.
(3) No meters installed
(4) No Meters installed
(5) Water lost to evaporation or seepage based on reservoir elevation measurements and corresponding metered use. Negative values are the results of inflows coinciding with metered use or transfer of water to satellite reservoirs.
(6) Water released from Guenoc Valley and picked up at Pump #2 for irrigation is counted within Guenoc Valley reservoir depletions.

LANGTRY FARMS
SUMMARY OF ESTIMATED WATER USE by RESERVOIR
for WATER YEAR 2009

Region	Developed Acreages	Reservoir Depletion Water Duty (af/ac) [1]												
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley [3]	986	0.36	0.00	0.00	0.00	0.00	0.03	0.27	0.43	0.52	0.65	0.58	0.45	3.28
Upper Bohn [4]	281	0.30	0.00	0.00	0.00	0.00	0.00	0.08	0.23	0.27	0.33	0.30	0.24	1.75
Napa Valley Lake [5]	314	0.05	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.10	0.11	0.10	0.08	0.53

Region	Developed Acreages	Metered Applied Water Duty (af/ac) [2]												
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	986	0.26	0.00	0.00	0.00	0.00	0.03	0.17	0.29	0.35	0.41	0.36	0.27	2.13
Upper Bohn [6]	281	--	--	--	--	--	--	--	--	--	--	--	--	--
Napa Valley Lake [7]	314	--	--	--	--	--	--	--	--	--	--	--	--	--

Frost Protection	Metered Applied Frost Protection (af)	
Guenoc Valley [8]	106	65
Upper Bohn		
Napa Valley Lake [8]		114

(1) Reservoir depletion per developed acre based on reservoir elevation measurements and includes evaporation, seepage and all uses.
(2) Applied water per developed acre based on meter recordings and does not include evapoaration and seepage.
(3) 302 acres vineyard, 596 acres pasture, 88 acre golf course.
(4) All pasture
(5) 122 acre vineyard, 192 acre pasture.
(6) No meters installed.
(7) No meter installed.
(8) Based on Guenoc Valley and Napa Valley Lake frost pond report.

LANGTRY FARMS
SUMMARY OF ESTIMATED WATER DIVERSION by RESERVOIR
for WATER YEAR 2009

Reservoir	Storage Capacity (af)	Water Year Reservoir Diversions to Storage (ac/ft) [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	101	195	227	29	609	313	150	174	2	--	--	--	1,800
McCreary	2098	63	123	143	18	383	196	94	109	1	--	--	--	1,130
Foley #1	540	14	27	31	4	83	42	20	24	0	--	--	--	244
Foley #2	212	7	13	15	2	41	21	10	12	0	--	--	--	120
Langtry (Cassidy)	560	20	39	45	6	121	62	30	--	--	--	--	--	322
Upper Bohn (Natural Inflow)	2760	0	0	0	86	74	201	0	0	0	--	--	--	360
Lower Bohn Diversion to Upper Bohn Storage		18	36	41	5	111	57	27	32	0	--	--	--	328
Napa Valley Lake (Big Basin)	200	10	19	22	3	79	31	15	--	--	--	--	--	178
Pump #2 to Napa Valley Lake		0	0	0	0	0	70	0	--	--	--	--	--	70
Total	**9,590**	**233**	**451**	**524**	**153**	**1,499**	**992**	**346**	**350**	**3**	**0**	**0**	**0**	**4,552**

Region	Direct Diversions to Use (ac/ft) [2]	
Guenoc Valley	81	81
Upper Bohn		0
Napa Valley Lake	109	109
Total Direct Water Diversions	**190**	**190**

Total Water Diversions	**233**	**451**	**524**	**153**	**1499**	**1182**	**346**	**350**	**3**	**0**	**0**	**0**	**4,742**

(1) Water diversion to storage amounts based on ending and beginning of irrigation season reservoir elevation measurements. Monthly values are estimated based on seasonal reservoir elevation measurements and rationed monthly based on published precipitation data from Middletown.
(2) Direct diversion amounts determined by meter recordings and reservoir elevation measurements.

LANGTRY FARMS
SUMMARY OF 5 YEAR AVERAGE WATER DIVERSION
WATER YEAR 2014 TO 2018

Reservoir	Storage Capacity (af)	2014 to 2018 Average Water Year Reservoir Diversions to Storage (ac/ft) [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	32	107	490	364	125	90	99	0	0	--	--	--	1,306
McCreary	2098	10	17	279	222	53	96	101	0	0	--	--	--	778
Foley #1	540	3	3	61	43	31	54	25	5	0	--	--	--	226
Foley #2	212	1	0	22	21	11	22	0	5	0	--	--	--	82
Langtry (Cassidy)	560	4	2	85	33	40	34	6	--	--	--	--	--	204
Upper Bohn (Natural Inflow) [3]	2760	7	11	126	267	80	114	0	0	0	--	--	--	604
Lower Bohn Diversion to Upper Bohn Storage		0	8	93	153	39	95	16	--	--	--	--	--	403
Napa Valley Lake (Big Basin)	200	0	1	22	54	71	0	21	--	--	--	--	--	170
Pump #2 to Napa Valley Lake		0	0	0	10	27	17	33	--	--	--	--	--	87
Total	**9,590**	**57**	**150**	**1,177**	**1,165**	**477**	**523**	**301**	**10**	**0**	**0**	**0**	**0**	**3,861**

Region	2014 to 2018 Average Direct Diversions to Use (ac/ft) [2]												
Guenoc Valley	5	6	0	0	2	24	28	4					69
Upper Bohn						1	4	0					5
Napa Valley Lake						25	45	0					71
Total Average Direct Water Diversions	**5**	**6**	**0**	**0**	**2**	**51**	**77**	**4**					**145**
Total Average Water Diversions	**62**	**156**	**1177**	**1165**	**479**	**574**	**378**	**14**	**0**	**0**	**0**	**0**	**4,006**

(1) Water diversion to storage amounts based on reservoir elevation measurements.
(2) Direct diversion amounts determined by meter recordings and reservoir elevation measurements.
(3) Includes groundwater pumped into Upper Bohn

LANGTRY FARMS
SUMMARY OF 5 YEAR AVERAGE WATER USE
WATER YEAR 2014 TO 2018

Reservoir	Storage Capacity (af)	2014 to 2018 Average Water Year Reservoir Depletions [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	112	22	10	4	22	22	41	170	349	437	306	189	1,683
McCreary	2098	20	14	9	12	10	8	63	73	111	130	209	155	815
Foley #1	540	11	3	6	2	1	2	11	19	23	53	39	31	199
Foley #2	212	8	5	2	0	1	3	13	7	9	10	13	10	80
Langtry (Cassidy)	560	75	5	1	1	0	2	4	20	24	29	23	17	202
Upper Bohn	2760	67	19	11	10	31	28	48	116	164	196	194	104	988
Napa Valley Lake (Big Basin)	200	6	0	0	0	0	8	1	3	13	33	28	34	128
Pump #2 to Napa Valley Lake [5]		0	0	0	5	27	0	0	0	0	0	0	0	32
Total	**9,590**	**299**	**68**	**38**	**35**	**91**	**73**	**180**	**408**	**695**	**889**	**812**	**541**	**4,127**

Region	2014 to 2018 Average Metered Applied Water (af) [2] Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	76	11	2	3	2	51	68	68	90	106	118	135	731
Upper Bohn [4]	25	3	0	0	1	5	8	28	54	80	92	78	372
Napa Valley Lake	16	0	0	0	0	22	41	14	28	56	41	25	242
Total Applied Water	**117**	**14**	**2**	**3**	**4**	**77**	**117**	**109**	**173**	**242**	**251**	**238**	**1,345**
Evaporation and Seepage (af) [3]	182	54	36	27	60	-5	64	298	522	647	561	303	2,750

(1) Reservoir depletions based on reservoir elevation measurements includes evaporation, seepage and all uses.
(2) Water applied to developed areas based on meter recordings and does not include evaporation and seepage.
(3) Water lost to evaporation or seepage based on reservoir elevation measurements. Negative values are the results of inflows coinciding with metered use or transfer of water to satellite reservoirs.
(4) Meter data incomplete, Some outlet and irrigation meters were installed in 2014 and 2015
(5) 'Water released from Guenoc Valley and picked up at Pump #2 for irrigation is measured at Napa Valley Lake Metered

LANGTRY FARMS
SUMMARY OF 5 YEAR AVERAGE WATER USE
WATER YEAR 2014 TO 2018

Region	Developed Acreages	2014 to 2018 Average Reservoir Depletion Water Duty (af/ac) [1] Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley [3]	941	0.24	0.05	0.03	0.02	0.04	0.04	0.14	0.31	0.55	0.70	0.63	0.43	3.17
Upper Bohn [4] [6]	714	0.09	0.03	0.02	0.01	0.04	0.04	0.07	0.16	0.23	0.27	0.27	0.15	1.38
Napa Valley Lake [5]	204	0.03	0.00	0.00	0.00	0.00	0.04	0.01	0.02	0.07	0.16	0.14	0.17	0.63

Region	Developed Acreages	2014 to 2018 Average Metered Applied Water Duty (af/ac) [2] Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	941	0.08	0.01	0.00	0.00	0.00	0.05	0.07	0.07	0.10	0.11	0.13	0.14	0.78
Upper Bohn [4] [6]	714	0.04	0.00	0.00	0.00	0.00	0.01	0.01	0.04	0.08	0.11	0.13	0.11	0.52
Napa Valley Lake [5]	204	0.08	0.00	0.00	0.00	0.00	0.11	0.20	0.07	0.14	0.27	0.20	0.12	1.19

Frost Protection	2014 to 2018 Average Metered Applied Frost Protection (af)		
Guenoc Valley [3]	0	38	48
Upper Bohn [4] [6]	0	5	7
Napa Valley Lake [5]	0	20	40

(1) Reservoir depletion per developed acre based on reservoir elevation measurements and includes evaporation, seepage and all uses.
(2) Applied water per developed acre based on meter recordings and does not include evaporation and seepage.
(3) 663 Acres of Vineyard, 222 acres of Pasture, 90 Acres of Golf Course. Golf course irrigation ended 9/2015, pastures converted to vineyard in 2016
(4) 246 Acres of Vineyard, 281 Acres of Pasture. Pastures converted to vineyard in 2016
(5) All Vineyard
(6) Meter data incomplete, Some outlet and irrigation meters were installed in 2014 and 2015

LANGTRY FARMS
SUMMARY OF WATER USE by RESERVOIR
for WATER YEAR 2018

Reservoir	Storage Capacity (af)	Water Year Reservoir Depletions [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	72	0	16	0	108	0	0	276	957	1,343	636	0	3,408 [2]
McCreary	2098	0	6	19	0	10	0	253	0	0	0	308	353	949
Foley #1	540	16	5	28	0	4	0	13	0	0	57	36	28	186
Foley #2	212	8	16	6	0	3	0	16	6	10	1	23	6	95
Langtry (Cassidy)	560	3	18	0	0	2	0	6	20	21	31	23	17	140
Upper Bohn	2760	152	12	21	0	94	6	19	173	231	203	165	186	1,264
Napa Valley Lake (Big Basin)	200	0	0	0	0	0	0	0	9	0	24	26	59	118
Pump #2 to Napa Valley Lake [5]		0	0	0	26	133								159
Total	**9,590**	**251**	**57**	**90**	**26**	**354**	**6**	**307**	**485**	**1,219**	**1,659**	**1,216**	**650**	**6,321**

Region	Metered Applied Water (af) [3] Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	22	0	0	2	0	13	53	31	62	77	50	52	363
Upper Bohn [6]	44	10	0	0	0	6	19	29	73	106	99	111	498
Napa Valley Lake	13	0	1	0	0	9	67	14	19	43	49	39	253
Total Applied Water	**80**	**11**	**1**	**2**	**0**	**29**	**139**	**74**	**154**	**225**	**198**	**202**	**1,114**
Evaporation and Seepage (af) [4]	171	47	89	-2	221	-22	168	412	1,065	1,433	1,018	448	5,047

(1) Reservoir depletions based on reservoir elevation measurements includes evaporation, seepage and all uses.
(2) Detert Reservoir was drained in 2018 to facilitate outlet repairs.
(3) Water applied to developed areas based on meter recordings and does not include evaporation and seepage.
(4) Water lost to evaporation or seepage based on reservoir elevation measurements. Negative values are the results of inflows coinciding with metered use or transfer of water to satellite reservoirs.
(5) Water released from Guenoc Valley and picked up at Pump #2 for irrigation is measured at Napa Valley Lake Metered
(6) Includes water transferred from Guenoc Valley to Upper Bohn. Includes groundwater pumped into Upper Bohn.

LANGTRY FARMS
SUMMARY OF WATER USE by RESERVOIR
for WATER YEAR 2018

Region	Developed Acreages [3]	Reservoir Depletion Water Duty (af/ac) [1]												
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	919	0.11	0.05	0.08	0.00	0.14	0.00	0.31	0.33	1.08	1.56	1.12	0.44	5.20
Upper Bohn	744	0.20	0.02	0.03	0.00	0.13	0.01	0.03	0.23	0.31	0.27	0.22	0.25	1.70
Napa Valley Lake	204	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.12	0.13	0.29	0.58

Region	Developed Acreages [3]	Metered Applied Water Duty (af/ac) [2]												
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	919	0.02	0.00	0.00	0.00	0.00	0.01	0.06	0.03	0.07	0.08	0.05	0.06	0.39
Upper Bohn [4] [5]	744	0.06	0.01	0.00	0.00	0.00	0.01	0.03	0.04	0.10	0.14	0.13	0.15	0.67

(1) Reservoir depletion per developed acre based on reservoir elevation measurements and includes evaporation, seepage and all uses.
(2) Applied water per developed acre based on meter recordings and does not include evaporation and seepage.
(3) Unless Stated, all irrigated acreages developed as vineyard.
(4) Includes groundwater pumped into Upper Bohn.
(5) Includes water transferred from Guenoc Valley to Upper Bohn

LANGTRY FARMS
SUMMARY OF WATER DIVERSION by RESERVOIR
for WATER YEAR 2018

Reservoir	Storage Capacity (af)	Water Year Reservoir Diversions to Storage (ac/ft) [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	0	64	0	616	0	0	198	0	0	--	--	--	877
McCreary	2098	0	0	0	163	0	338	0	0	0	--	--	--	501
Foley #1	540	0	0	0	26	0	69	0	0	0	--	--	--	96
Foley #2	212	0	0	0	9	0	18	0	0	0	--	--	--	28
Langtry (Cassidy)	560	0	0	0	27	0	118	0	--	--	--	--	--	145
Upper Bohn (Natural Inflow) [3]	2760	0	0	0	89	0	89	0	0	0	--	--	--	178
Lower Bohn Diversion to Upper Bohn Storage		0	1	0	88	0	99	68	--	--	--	--	--	255
Napa Valley Lake (Big Basin)	200	0	0	2	63	70	2	5	--	--	--	--	--	142
Pump #2 to Napa Valley Lake		0	0	0	26	133	7	82	--	--	--	--	--	248
Total	**9,590**	**0**	**64**	**2**	**1,107**	**203**	**740**	**352**	**0**	**0**	**0**	**0**	**0**	**2,469**

Region	Direct Diversions to Use (ac/ft) [2]		
Guenoc Valley	13	53	66
Upper Bohn	6	19	25
Napa Valley Lake	9	67	76
Total Direct Water Diversions	**29**	**139**	**167**
Total Water Diversions	**769**	**491**	**2,637**

(1) Water diversion to storage amounts based on reservoir elevation measurements.
(2) Direct diversion amounts determined by meter recordings and reservoir elevation measurements.
(3) Includes groundwater pumped into Upper Bohn.

LANGTRY FARMS
SUMMARY OF WATER USE by RESERVOIR
for WATER YEAR 2017

Reservoir	Storage Capacity (af)	Water Year Reservoir Depletions [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	0	0	0	0	0	0	0	35	143	205	186	115	683
McCreary	2098	0	0	0	0	0	13	0	85	161	179	150	212	800
Foley #1	540	0	0	0	0	0	0	0	38	47	63	49	50	247
Foley #2	212	0	0	0	0	0	2	1	10	12	14	12	11	62
Langtry (Cassidy)	560	0	0	0	0	0	0	0	18	28	31	20	25	122
Upper Bohn	2760	0	0	0	0	0	0	31	226	262	336	368	208	1,432
Napa Valley Lake (Big Basin)	200	25	0	0	0	0	1	3	2	0	21	35	43	128
Pump #2 to Napa Valley Lake [4]		0	0	0	0	0	0							0
Total	**9,590**	**25**	**0**	**0**	**0**	**0**	**16**	**35**	**414**	**653**	**849**	**820**	**664**	**3,475**

Region	Metered Applied Water (af) [2] Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	27	29	0	0	0	4	56	55	62	106	95	44	479
Upper Bohn	30	1	0	0	4	1	7	59	100	137	139	104	582
Napa Valley Lake	6	0	0	0	0	14	41	14	17	58	41	27	218
Total Applied Water	**63**	**30**	**0**	**0**	**4**	**18**	**104**	**129**	**179**	**302**	**276**	**175**	**1,279**
Evaporation and Seepage (af) [3]	-39	-30	0	0	-4	-3	-68	285	474	547	544	489	2,196

(1) Reservoir depletions based on reservoir elevation measurements includes evaporation, seepage and all uses.
(2) Water applied to developed areas based on meter recordings and does not include evaporation and seepage.
(3) Water lost to evaporation or seepage based on reservoir elevation measurements. Negative values are the results of inflows coinciding with metered use or transfer of water to satellite reservoirs.
(4) Water released from Guenoc Valley and picked up at Pump #2 for irrigation is measured at Napa Valley Lake Metered Applied Water.

LANGTRY FARMS
SUMMARY OF WATER USE by RESERVOIR
for WATER YEAR 2017

Region	Developed Acreages [3]	Reservoir Depletion Water Duty (af/ac) [1]												
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	919	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.20	0.43	0.53	0.45	0.45	2.08
Upper Bohn	744	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.30	0.35	0.45	0.49	0.28	1.92
Napa Valley Lake	204	0.12	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.10	0.17	0.21	0.63

Region	Developed Acreages [3]	Metered Applied Water Duty (af/ac) [2]												
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	919	0.03	0.03	0.00	0.00	0.00	0.00	0.06	0.06	0.07	0.12	0.10	0.05	0.52
Upper Bohn [4]	744	0.04	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.13	0.18	0.19	0.14	0.78
Napa Valley Lake	204	0.03	0.00	0.00	0.00	0.00	0.07	0.20	0.07	0.08	0.29	0.20	0.13	1.07

Frost Protection — **Metered Applied Frost Protection (af)**

(3) Unless stated, all irrigated acreages developed as vineyard.
(4) Includes groundwater pumped into Upper Bohn.

LANGTRY FARMS
SUMMARY OF WATER DIVERSION by RESERVOIR
for WATER YEAR 2017

Reservoir	Storage Capacity (af)	Water Year Reservoir Diversions to Storage (ac/ft) [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	159	277	365	0	0	0	0	0	0	--	--	--	801
McCreary	2098	26	63	507	66	11	0	278	0	0	--	--	--	952
Foley #1	540	16	13	104	81	0	0	0	0	0	--	--	--	214
Foley #2	212	6	1	32	52	0	0	0	0	0	--	--	--	91
Langtry (Cassidy)	560	22	3	97	0	0	0	0	--	--	--	--	--	122
Upper Bohn (Natural Inflow) [3]	2760	36	15	242	835	289	0	0	0	0	--	--	--	1,416
Lower Bohn Diversion to Upper Bohn Storage		0	40	209	460	20	0	0	--	--	--	--	--	729
Napa Valley Lake (Big Basin)	200	0	6	21	83	11	0	37	--	--	--	--	--	158
Pump #2 to Napa Valley Lake		0	0	0	0	0	0	78	--	--	--	--	--	78
Total	**9,590**	**264**	**419**	**1,576**	**1,577**	**332**	**0**	**393**	**0**	**0**	**0**	**0**	**0**	**4,561**

Region	Direct Diversions to Use (ac/ft) [2]												
Guenoc Valley	23	29	0	0	1	3	64	20					142
Upper Bohn													0
Napa Valley Lake						14	41						54
Total Direct Water Diversions	**23**	**29**	**0**	**0**	**1**	**17**	**105**	**20**					**196**
Total Water Diversions	**287**	**448**	**1577**	**1577**	**333**	**17**	**498**	**20**	**0**	**0**	**0**	**0**	**4,758**

(1) Water diversion to storage amounts based on reservoir elevation measurements.
(2) Direct diversion amounts determined by meter recordings and reservoir elevation measurements.
(3) Includes groundwater pumped into Upper Bohn.

LANGTRY FARMS
SUMMARY OF WATER USE by RESERVOIR
for WATER YEAR 2016

Reservoir	Storage Capacity (af)	Water Year Reservoir Depletions [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	65	28	0	0	0	0	20	85	172	199	181	142	894
McCreary	2098	40	19	0	0	40	0	0	96	140	194	147	120	798
Foley #1	540	21	5	0	0	0	0	2	26	28	50	42	33	207
Foley #2	212	26	2	0	0	0	0	10	6	11	14	11	9	90
Langtry (Cassidy)	560	7	1	0	0	0	0	7	18	25	30	26	16	131
Upper Bohn	2760	108	36	0	0	0	0	87	117	227	317	271	62	1,224
Napa Valley Lake (Big Basin)	200	0	0	0	0	0	27	0	0	12	0	40	42	121
Pump #2 to Napa Valley Lake [4]		0	0	0	0	0	0	0						0
Total	**9,590**	**267**	**91**	**0**	**0**	**40**	**27**	**126**	**350**	**616**	**805**	**719**	**424**	**3,465**

Region	Metered Applied Water (af) [2] Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	19	2	1	0	10	46	11	42	68	97	113	68	478
Upper Bohn	39	3	0	0	0	5	3	39	69	95	92	93	438
Napa Valley Lake	29	0	0	0	2	46	3	22	36	67	39	28	272
Total Applied Water	**87**	**5**	**1**	**0**	**12**	**96**	**18**	**103**	**174**	**259**	**243**	**190**	**1,188**
Evaporation and Seepage (af) [3]	181	87	-1	0	28	-69	108	247	442	546	476	234	2,277

(1) Reservoir depletions based on reservoir elevation measurements includes evaporation, seepage and all uses.
(2) Water applied to developed areas based on meter recordings and does not include evaporation and seepage.
(3) Water lost to evaporation or seepage based on reservoir elevation measurements. Negative values are the results of inflows coinciding with metered use or transfer of water to satellite reservoirs.
(4) Water released from Guenoc Valley and picked up at Pump #2 for irrigation is measured at Napa Valley Lake Metered Applied Water.

LANGTRY FARMS
SUMMARY OF WATER USE by RESERVOIR
for WATER YEAR 2016

Region	Developed Acreages [3]	Reservoir Depletion Water Duty (af/ac) [1]												
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	919	0.17	0.06	0.00	0.00	0.04	0.00	0.04	0.25	0.41	0.53	0.44	0.35	2.31
Upper Bohn	744	0.14	0.05	0.00	0.00	0.00	0.00	0.12	0.16	0.30	0.43	0.36	0.08	1.65
Napa Valley Lake	204	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.06	0.00	0.20	0.20	0.59

Region	Developed Acreages [3]	Metered Applied Water Duty (af/ac) [2]												
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	919	0.02	0.00	0.00	0.00	0.01	0.05	0.01	0.05	0.07	0.11	0.12	0.07	0.52
Upper Bohn [4]	744	0.05	0.00	0.00	0.00	0.00	0.01	0.00	0.05	0.09	0.13	0.12	0.13	0.59
Napa Valley Lake	204	0.14	0.00	0.00	0.00	0.01	0.22	0.02	0.11	0.18	0.33	0.19	0.14	1.34

(2) Applied water per developed acre based on meter recordings and does not include evaporation and seepage.
(3) Unless Stated, all irrigated acreages developed as vineyard.
(4) Includes groundwater pumped into Upper Bohn.

LANGTRY FARMS
SUMMARY OF WATER DIVERSION by RESERVOIR
for WATER YEAR 2016

Reservoir	Storage Capacity (af)	Water Year Reservoir Diversions to Storage (ac/ft) [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	0	0	277	1,203	0	0	0	0	0	--	--	--	1,480
McCreary	2098	0	0	30	882	0	55	119	0	0	--	--	--	1,086
Foley #1	540	0	0	8	106	7	180	0	0	0	--	--	--	302
Foley #2	212	0	0	3	45	1	72	0	0	0	--	--	--	121
Langtry (Cassidy)	560	0	0	24	136	0	0	0	--	--	--	--	--	160
Upper Bohn (Natural Inflow) [3]	2760	0	0	35	323	4	279	0	0	0	--	--	--	641
Lower Bohn Diversion to Upper Bohn Storage		0	0	0	189	6	302	0	--	--	--	--	--	498
Napa Valley Lake (Big Basin)	200	0	0	0	13	114	0	34	--	--	--	--	--	161
Pump #2 to Napa Valley Lake		0	0	0	0	2	46	3	--	--	--	--	--	51
Total	**9,590**	**0**	**0**	**376**	**2,897**	**134**	**934**	**156**	**0**	**0**	**0**	**0**	**0**	**4,499**

Region	Direct Diversions to Use (ac/ft) [2]												
Guenoc Valley					7	29							36
Upper Bohn													0
Napa Valley Lake					2	46	3						51
Total Direct Water Diversions					**9**	**74**	**3**						**87**
Total Water Diversions	**0**	**0**	**376**	**2897**	**144**	**1009**	**160**	**0**	**0**	**0**	**0**	**0**	**4,586**

(1) Water diversion to storage amounts based on reservoir elevation measurements.
(2) Direct diversion amounts determined by meter recordings and reservoir elevation measurements.
(3) Includes groundwater pumped into Upper Bohn.

LANGTRY FARMS
SUMMARY OF WATER USE by RESERVOIR
for WATER YEAR 2015

Reservoir	Storage Capacity (af)	Water Year Reservoir Depletions [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	181	0	0	0	0	112	184	173	231	224	331	133	1,568
McCreary	2098	0	0	0	43	0	27	62	91	124	167	242	78	835
Foley #1	540	13	0	0	0	0	9	38	29	37	38	39	30	233
Foley #2	212	5	2	0	0	0	11	34	11	10	11	11	19	114
Langtry (Cassidy)	560	357	0	0	0	0	9	9	19	23	27	20	16	480
Upper Bohn	2760	0	0	0	0	0	36	42	64	100	124	167	65	598
Napa Valley Lake (Big Basin)	200	0	0	0	0	0	13	0	1	23	41	0	28	107
Pump #2 to Napa Valley Lake [5]		0	0	0	0	0	0	0						0
Total	**9,590**	**556**	**2**	**0**	**43**	**0**	**216**	**369**	**388**	**549**	**633**	**809**	**369**	**3,935**

Region	Metered Applied Water (af) [2] Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	264	2	0	0	0	116	198	74	128	135	196	52	1,165
Upper Bohn [4]	12	0	0	0	0	11	8	11	26	53	113	64	298
Napa Valley Lake	29	0	0	0	0	22	90	8	37	40	42	31	298
Total Applied Water	**305**	**2**	**0**	**0**	**0**	**149**	**296**	**93**	**191**	**228**	**350**	**146**	**1,761**
Evaporation and Seepage (af) [3]	251	0	0	43	0	68	73	295	358	405	459	223	2,174

(1) Reservoir depletions based on reservoir elevation measurements includes evaporation, seepage and all uses.
(2) Water applied to developed areas based on meter recordings and does not include evaporation and seepage.
(3) Water lost to evaporation or seepage based on reservoir elevation measurements. Negative values are the results of inflows coinciding with metered use or transfer of water to satellite reservoirs.
(4) Meter data incomplete, Some meters were installed August 2015. Includes groundwater pumped into Upper Bohn.
(5) Water released from Guenoc Valley and picked up at Pump #2 for irrigation is measured at Napa Valley Lake Metered Applied Water.

LANGTRY FARMS
SUMMARY OF WATER USE by RESERVOIR
for WATER YEAR 2015

Region	Developed Acreages	Reservoir Depletion Water Duty (af/ac) [1]												
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley [3]	975	0.57	0.00	0.00	0.04	0.00	0.17	0.34	0.33	0.44	0.48	0.66	0.28	0.00
Upper Bohn [4] [6]	811	0.00	0.00	0.00	0.00	0.00	0.04	0.05	0.08	0.12	0.15	0.21	0.08	3.31
Napa Valley Lake [5]	204	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.01	0.12	0.20	0.00	0.14	0.74

Region	Developed Acreages	Metered Applied Water Duty (af/ac) [2]												
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley [3]	975	0.27	0.00	0.00	0.00	0.00	0.12	0.20	0.08	0.13	0.14	0.20	0.05	0.00
Upper Bohn [4] [6]	811	0.02	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.03	0.07	0.14	0.08	1.19
Napa Valley Lake [5]	204	0.14	0.00	0.00	0.00	0.00	0.11	0.44	0.04	0.18	0.20	0.20	0.15	0.37

(1) Reservoir depletion per developed acre based on reservoir elevation measurements and includes evaporation, seepage and all uses.
(2) Applied water per developed acre based on meter recordings and does not include evaporation and seepage.
(3) 663 Acres of Vineyard, 222 acres of Pasture, 90 Acres of Golf Course
(4) Includes groundwater pumped into Upper Bohn. 692 Acres of Vineyard, 119 Acres of Pasture
(5) All Vineyard
(6) Meter data incomplete, Additional meters were installed August 2015

LANGTRY FARMS
SUMMARY OF WATER DIVERSION by RESERVOIR
for WATER YEAR 2015

Reservoir	Storage Capacity (af)	Water Year Reservoir Diversions to Storage (ac/ft) [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	0	193	1,810	0	0	0	0	0	0	--	--	--	2,003
McCreary	2098	23	23	856	0	14	0	0	0	0	--	--	--	916
Foley #1	540	0	2	193	0	115	0	0	0	0	--	--	--	309
Foley #2	212	0	0	74	0	41	0	0	0	0	--	--	--	116
Langtry (Cassidy)	560	0	8	302	0	143	0	0	--	--	--	--	--	453
Upper Bohn (Natural Inflow) [3]	2760	0	42	351	0	32	0	0	0	0	--	--	--	425
Lower Bohn Diversion to Upper Bohn Storage		0	0	254	26	163	7	0	--	--	--	--	--	451
Napa Valley Lake (Big Basin)	200	0	0	45	55	81	0	13	--	--	--	--	--	194
Pump #2 to Napa Valley Lake		0	0	0	11	0	17	2	--	--	--	--	--	30
Total	**9,590**	**23**	**268**	**3,885**	**92**	**590**	**24**	**15**	**0**	**0**	**0**	**0**	**0**	**4,897**

Region	Direct Diversions to Use (ac/ft) [2]	
Guenoc Valley		0
Upper Bohn		0
Napa Valley Lake	22	90	112
Total Direct Water Diversions	**22**	**90**	**112**
Total Water Diversions	**47**	**105**	**5,009**

(1) Water diversion to storage amounts based on reservoir elevation measurements.
(2) Direct diversion amounts determined by meter recordings and reservoir elevation measurements.
(3) Includes groundwater pumped into Upper Bohn.

LANGTRY FARMS
SUMMARY OF WATER USE by RESERVOIR
for WATER YEAR 2014

Reservoir	Storage Capacity (af)	Water Year Reservoir Depletions [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	240	79	33	21	0	0	0	279	245	217	197	554	1,864
McCreary	2098	59	45	25	19	0	0	0	93	132	110	197	11	691
Foley #1	540	5	3	2	10	0	0	0	0	3	58	29	15	123
Foley #2	212	3	3	1	2	0	0	1	0	3	11	10	6	41
Langtry (Cassidy)	560	9	8	3	3	0	0	0	25	25	27	26	12	137
Upper Bohn	2760	74	48	33	49	59	98	60	0	0	0	0	0	420
Napa Valley Lake (Big Basin)	200	7	2	1	0	0	0	3	5	32	77	38	0	165
Pump #2 to Napa Valley Lake [5]		0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**9,590**	**396**	**188**	**99**	**104**	**59**	**98**	**64**	**403**	**438**	**498**	**497**	**599**	**3,442**

Region	Metered Applied Water (af) [2] Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	48	22	6	11	2	76	24	138	132	116	137	459	1,171
Upper Bohn [4] [6]	0	0	0	0	0	0	0	0	0	10	17	17	44
Napa Valley Lake	3	0	0	0	0	18	3	11	33	69	33	0	170
Total Applied Water	**51**	**22**	**7**	**11**	**2**	**94**	**27**	**149**	**165**	**195**	**186**	**476**	**1,385**
Evaporation and Seepage (af) [3]	345	165	92	92	57	4	37	253	273	303	311	123	2,056

(1) Reservoir depletions based on reservoir elevation measurements includes evaporation, seepage and all uses.
(2) Water applied to developed areas based on meter recordings and does not include evaporation and seepage.
(3) Water lost to evaporation or seepage based on reservoir elevation measurements. Negative values are the results of inflows coinciding with metered use or transfer of water to satellite reservoirs.
(4) Meter data incomeplete, Some outlet and irrigation meters were installed June 2014
(5) Water released from Guenoc Valley and picked up at Pump #2 for irrigation is measured at Napa Valley Lake Metered
(6) Includes water transferred from Guenoc Valley to Upper Bohn. Includes groundwater pumped into Upper Bohn.

LANGTRY FARMS
SUMMARY OF WATER USE by RESERVOIR
for WATER YEAR 2014

Region	Developed Acreages	Reservoir Depletion Water Duty (af/ac) [1]												
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley [3]	975	0.32	0.14	0.07	0.06	0.00	0.00	0.00	0.41	0.42	0.43	0.47	0.61	2.93
Upper Bohn [4] [6] [7]	527	0.14	0.09	0.06	0.09	0.11	0.19	0.11	0.00	0.00	0.00	0.00	0.00	0.80
Napa Valley Lake [5]	204	0.03	0.01	0.01	0.00	0.00	0.00	0.02	0.03	0.16	0.38	0.19	0.00	0.81

Region	Developed Acreages	Metered Applied Water Duty (af/ac) [2]												
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Totals
Guenoc Valley	975	0.05	0.02	0.01	0.01	0.00	0.08	0.02	0.14	0.14	0.12	0.14	0.47	1.20
Upper Bohn [4] [6] [7]	527	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.03	0.08

(1) Reservoir depletion per developed acre based on reservoir elevation measurements and includes evaporation, seepage and all uses.
(2) Applied water per developed acre based on meter recordings and does not include evapoaration and seepage.
(3) 663 Acres of Vineyard, 222 acres of Pasture, 90 Acres of Golf Course
(4) 246 Acres of Vineyard, 281 Acres of Pasture
(5) All Vineyard
(6) Meter data incomeplete, Some outlet and irrigation meters were installed June 2014
(7) Includes water transferred from Guenoc Valley to Upper Bohn. Includes groundwater pumped into Upper Bohn.

LANGTRY FARMS
SUMMARY OF WATER DIVERSION by RESERVOIR
for WATER YEAR 2014

Reservoir	Storage Capacity (af)	Water Year Reservoir Diversions to Storage (ac/ft) [1] Oct (af)	Nov (af)	Dec (af)	Jan (af)	Feb (af)	Mar (af)	Apr (af)	May (af)	Jun (af)	Jul (af)	Aug (af)	Sept (af)	Totals (af)
Detert	3220	0	0	0	0	623	452	295	0	0	--	--	--	1,370
McCreary	2098	0	0	0	0	241	89	108	0	0	--	--	--	438
Foley #1	540	0	0	0	0	36	22	127	27	0	--	--	--	211
Foley #2	212	0	0	0	0	12	19	0	23	0	--	--	--	54
Langtry (Cassidy)	560	0	0	0	0	56	54	29	--	--	--	--	--	139
Upper Bohn (Natural Inflow) [3]	2760	0	0	0	86	74	201	0	0	0	--	--	--	360
Lower Bohn Diversion to Upper Bohn Storage		0	0	0	0	5	65	14	0	--	--	--	--	84
Napa Valley Lake (Big Basin)	200	0	0	45	55	81	0	13	--	--	--	--	--	194
Pump #2 to Napa Valley Lake		0	0	0	11	0	17	2	--	--	--	--	--	30
Total	**9,590**	**0**	**0**	**45**	**152**	**1,126**	**918**	**588**	**50**	**0**	**0**	**0**	**0**	**2,879**

Region	Direct Diversions to Use (ac/ft) [2]												
Guenoc Valley					2	76	24						101
Upper Bohn													0
Napa Valley Lake					0	35	27						62
Total Direct Water Diversions					**2**	**111**	**51**						**163**
Total Water Diversions	**0**	**0**	**45**	**152**	**1128**	**1029**	**639**	**50**	**0**	**0**	**0**	**0**	**3,043**

(1) Water diversion to storage amounts based on reservoir elevation measurements.
(2) Direct diversion amounts determined by meter recordings and reservoir elevation measurements.
(3) Includes groundwater pumped into Upper Bohn.

LANGTRY FARMS

12/11/2019

Monthly Reservoir Storage Levels by Water Year

(ALL AMOUNTS ARE ACRE-FEET)

2017-2018

Reservoir	Storage Capacity	October Storage	November Storage	December Storage	January Storage	February Storage	March Storage	April Storage	May Storage	June Storage	July Storage	August Storage	September Storage
Detert	**3,220**	2,537	2,465	2,529	2,512	3,128	3,020	3,020	3,218.0	2,941.9	1,985.1	642.2	6.4
Langtry	**560**	436.6	433.5	415.4	415.4	442.8	441.2	558.9	553.3	533.3	512.0	481.4	458.5
McCreary	**2,098**	1,017.1	1,036.1	1,029.8	1,010.8	1,173.4	1,163.3	1,501.3	1,248.4	1,419.6	1,795.7	1,824.4	1,516.4
Foley #1	**540**	293.9	277.8	272.9	245.2	271.7	267.8	337.0	324.1	324.1	331.8	275.2	239.7
Foley #2	**212**	151.2	143.6	127.7	121.4	130.8	127.7	145.9	129.8	123.3	113.3	112.0	89.4
Upper Bohn	**2,760**	1,328.2	1,175.8	1,163.7	1,142.9	1,319.6	1,225.1	1,412.6	1,400.9	1,235.2	1,016.6	838.2	848.6
Napa Valley Lake	**200**	101.5	72.7	56.3	58.4	121.0	191.5	193.7	198.6	189.6	196.5	172.7	146.4
Total	**9,590**	**5,865.3**	**5,604.5**	**5,594.4**	**5,506.5**	**6,587.3**	**6,436.7**	**7,169.5**	**7,073.2**	**6,767.0**	**5,951.0**	**4,346.0**	**3,305.4**
Storage as % of Total		**61.2%**	**58.4%**	**58.3%**	**57.4%**	**68.7%**	**67.1%**	**74.8%**	**73.8%**	**70.6%**	**62.1%**	**45.3%**	**34.5%**

2016-2017

Reservoir	Storage Capacity	October Storage	November Storage	December Storage	January Storage	February Storage	March Storage	April Storage	May Storage	June Storage	July Storage	August Storage	September Storage
Detert	**3,220**	2,419	2,578	2,855	3,220	3,220	3,220	3,220	3,220.0	3,185.1	3,042.2	2,837.7	2,651.4
Langtry	**560**	436.6	458.5	461.8	558.9	558.9	558.9	558.9	558.9	540.5	512.0	481.4	461.8
McCreary	**2,098**	865.4	891.9	955.1	1,462.0	1,527.8	1,539.2	1,525.9	1,803.9	1,718.9	1,558.3	1,379.5	1,229.5
Foley #1	**540**	327.0	342.9	355.6	460.0	540.0	540.0	540.0	540.0	503.1	456.5	393.3	344.3
Foley #2	**212**	122.1	127.7	129.1	161.2	212.0	212.0	211.3	210.4	200.6	188.5	174.1	162.1
Upper Bohn	**2,760**	614.3	650.0	704.9	1,155.0	2,450.9	2,760.0	2,760.0	2,728.6	2,502.4	2,240.3	1,904.3	1,536.1
Napa Valley Lake	**200**	103.6	79.1	85.4	106.2	188.7	200.0	199.5	196.5	194.8	200.0	178.6	144.0
Total	**9,590**	**4,888.1**	**5,128.0**	**5,546.9**	**7,123.4**	**8,698.3**	**9,030.1**	**9,015.6**	**9,258.4**	**8,845.4**	**8,197.8**	**7,348.8**	**6,529.2**
Storage as % of Total		**51.0%**	**53.5%**	**57.8%**	**74.3%**	**90.7%**	**94.2%**	**94.0%**	**96.5%**	**92.2%**	**85.5%**	**76.6%**	**68.1%**

2015-2016

Reservoir	Storage Capacity	October Storage	November Storage	December Storage	January Storage	February Storage	March Storage	April Storage	May Storage	June Storage	July Storage	August Storage	September Storage
Detert	**3,220**	1,833.6	1,768.5	1,740.3	2,017.1	3,220.0	3,220.0	3,220.0	3,199.6	3,114.3	2,941.9	2,742.6	2,561.5
Langtry	**560**	408.1	400.8	399.4	423.2	558.9	558.9	558.9	551.5	533.3	508.5	478.1	452.2
McCreary	**2,098**	577.1	536.7	518.1	548.4	1,430.6	1,390.3	1,445.3	1,564.0	1,467.6	1,327.4	1,133.4	985.9
Foley #1	**540**	232.4	211.8	206.8	215.1	321.3	328.4	508.6	506.8	480.5	452.4	402.2	359.8
Foley #2	**212**	91.2	64.8	62.8	65.3	110.0	111.3	183.4	173.4	166.9	155.8	141.8	131.2
Upper Bohn	**2,760**	673.5	566.0	529.9	590.4	1,103.1	1,113.5	1,695.1	1,608.5	1,491.0	1,264.2	947.2	675.8
Napa Valley Lake	**200**	135.7	94.5	85.0	85.0	98.0	199.0	172.0	187.9	189.6	177.5	185.5	145.4
Total	**9,590**	**3,951.6**	**3,643.0**	**3,542.2**	**3,944.5**	**6,841.8**	**6,921.4**	**7,783.4**	**7,791.7**	**7,443.3**	**6,827.7**	**6,030.8**	**5,311.7**
Storage as % of Total		**41.2%**	**38.0%**	**36.9%**	**41.1%**	**71.3%**	**72.2%**	**81.2%**	**81.2%**	**77.6%**	**71.2%**	**62.9%**	**55.4%**

LANGTRY FARMS

12/11/2019

Monthly Reservoir Storage Levels by Water Year

(ALL AMOUNTS ARE ACRE-FEET)

2014-2015

Reservoir	Storage Capacity	October Storage	November Storage	December Storage	January Storage	February Storage	March Storage	April Storage	May Storage	June Storage	July Storage	August Storage	September Storage
Detert	**3,220**	1,398.1	1,216.7	1,409.8	3,220.0	3,220.0	3,220.0	3,108.4	2,924.2	2,751.1	2,520.5	2,296.8	1,966.3
Langtry	**560**	436.6	79.6	87.8	389.4	388.0	531.5	522.6	513.8	494.8	471.5	444.3	424.4
McCreary	**2,098**	494.3	517.0	540.2	1,397.6	1,354.2	1,368.6	1,341.7	1,279.8	1,188.6	1,064.9	897.8	655.5
Foley #1	**540**	156.6	144.0	145.7	338.5	338.5	453.0	444.4	406.1	377.6	340.2	301.9	262.8
Foley #2	**212**	90.0	85.3	83.0	157.4	157.4	198.5	187.1	152.7	142.1	131.9	120.7	110.0
Upper Bohn	**2,760**	422.4	487.9	529.6	1,052.9	1,075.6	1,271.1	1,235.3	1,193.6	1,129.2	1,029.1	905.1	738.2
Napa Valley Lake	**200**	45.3	25.8	19.2	63.7	119.1	200.0	186.9	200.0	199.0	175.5	134.3	163.5
Total	**9,590**	**3,043.2**	**2,556.4**	**2,815.3**	**6,619.5**	**6,652.8**	**7,242.7**	**7,026.3**	**6,670.2**	**6,282.4**	**5,733.6**	**5,101.0**	**4,320.7**
Storage as % of Total		**31.7%**	**26.7%**	**29.4%**	**69.0%**	**69.4%**	**75.5%**	**73.3%**	**69.6%**	**65.5%**	**59.8%**	**53.2%**	**45.1%**

2013-2014

Reservoir	Storage Capacity	October Storage	November Storage	December Storage	January Storage	February Storage	March Storage	April Storage	May Storage	June Storage	July Storage	August Storage	September Storage
Detert	**3,220**	1,902.4	1,662.9	1,583.5	1,539.8	1,519.3	2,142.1	2,594.2	2,889.4	2,610.6	2,365.9	2,149.4	1,952.0
Langtry	**560**	434.7	426.2	418.4	415.4	412.5	468.2	522.6	551.5	526.1	501.6	474.8	449.0
McCreary	**2,098**	748.2	689.3	644.0	618.8	600.2	840.8	929.3	1,037.7	944.4	812.2	702.5	505.6
Foley #1	**540**	68.3	63.6	60.9	59.3	49.0	84.7	106.8	233.8	260.3	257.8	200.3	171.8
Foley #2	**212**	77.3	73.9	70.6	69.2	66.8	78.5	97.3	96.1	119.3	116.6	106.1	96.1
Upper Bohn	**2,760**	583.5	509.4	461.9	429.0	278.1	356.8	622.1	573.3	514.2	416.4	356.8	416.4
Napa Valley Lake	**200**	18.9	12.3	10.5	9.3	13.8	119.9	200.0	196.9	191.7	159.8	82.9	44.5
Total	**9,590**	**3,833.4**	**3,437.7**	**3,249.8**	**3,140.9**	**2,939.8**	**4,091.0**	**5,072.4**	**5,578.6**	**5,166.6**	**4,630.3**	**4,072.8**	**3,635.4**
Storage as % of Total		**40.0%**	**35.8%**	**33.9%**	**32.8%**	**30.7%**	**42.7%**	**52.9%**	**58.2%**	**53.9%**	**48.3%**	**42.5%**	**37.9%**

2012-2013

Reservoir	Storage Capacity	October Storage	November Storage	December Storage	January Storage	February Storage	March Storage	April Storage	May Storage	June Storage	July Storage	August Storage	September Storage
Detert	**3,220**	1,635.9	1,494.1	2,342.9	3220.0	3220.0	3,215.9	3,220.0	3,005.3	2,751.1	2,528.7	2,222.3	1,944.8
Langtry	**560**	445.9	436.6	526.1	558.9	558.9	556.7	557.0	544.1	522.6	501.6	468.2	444.3
McCreary	**2,098**	418.6	408.3	826.4	1,583.3	1,390.3	1,357.8	1,341.7	1,297.3	1,212.4	1,090.7	939.9	836.4
Foley #1	**540**	211.1	154.7	224.6	467.0	470.6	479.5	440.7	427.5	338.5	285.9	202.5	157.9
Foley #2	**212**	68.9	52.3	77.4	165.3	173.1	171.4	193.3	202.4	187.6	147.5	116.5	98.1
Upper Bohn	**2,760**	599.8	538.0	685.5	1,264.5	1,349.3	1,295.5	1,261.5	1,175.0	1,080.3	954.3	792.1	688.7
Napa Valley Lake	**200**	63.1	47.1	44.5	78.6	149.8	191.3	194.4	191.3	197.2	151.3	89.5	42.4
Total	**9,590**	**3,443.3**	**3,131.1**	**4,727.4**	**7,337.6**	**7,311.9**	**7,268.1**	**7,208.6**	**6,843.0**	**6,289.7**	**5,660.1**	**4,830.9**	**4,212.7**
Storage as % of Total		**35.9%**	**32.6%**	**49.3%**	**76.5%**	**76.2%**	**75.8%**	**75.2%**	**71.4%**	**65.6%**	**59.0%**	**50.4%**	**43.9%**

12/11/2019

LANGTRY FARMS

Monthly Reservoir Storage Levels by Water Year

(ALL AMOUNTS ARE ACRE-FEET)

2011-2012

Reservoir	Storage Capacity	October Storage	November Storage	December Storage	January Storage	February Storage	March Storage	April Storage	May Storage	June Storage	July Storage	August Storage	September Storage
Detert	**3,220**	2,133.3	2,031.8	2,017.1	1808.4	2457.2	2,512.4	3220.0	3,191.3	2,891.1	2,577.9	2,222.3	1,916.5
Langtry	**560**	465.0	461.8	461.8	458.5	508.5	508.5	558.9	555.2	536.9	505.1	488.1	461.8
McCreary	**2,098**	1,053.6	1,006.1	1,006.1	975.1	1,253.6	1271.0	1622.0	1,450.9	1,306.1	1,185.2	884.5	612.6
Foley #1	**540**	145.7	127.0	128.7	127.0	152.9	154.7	344.3	453.0	467.0	432.6	368.3	280.7
Foley #2	**212**	84.2	76.3	76.3	76.3	84.2	84.2	170.1	211.3	181.7	149.7	127.7	93.6
Upper Bohn	**2,760**	772.2	736.7	716.5	670.2	747.4	711.8	1,134.4	1,198.5	1,095.1	925.3	811.2	692.4
Napa Valley Lake	**200**	80.2	70.3	62.1	54.4	54.4	141.6	196.5	177.8	182.8	196.5	149.1	94.3
Total	**9,590**	**4,734.2**	**4,510.0**	**4,468.6**	**4,169.9**	**5,258.2**	**5,384.2**	**7,246.2**	**7,238.0**	**6,660.7**	**5,972.3**	**5,051.2**	**4,151.9**
Storage as % of Total		**49.4%**	**47.0%**	**46.6%**	**43.5%**	**54.8%**	**56.1%**	**75.6%**	**75.5%**	**69.5%**	**62.3%**	**52.7%**	**43.3%**

2010-2011

Reservoir	Storage Capacity	October Storage	November Storage	December Storage	January Storage	February Storage	March Storage	April Storage	May Storage	June Storage	July Storage	August Storage	September Storage
Detert	**3,220**		1,964.9		3220.0	3220.0	3,220.0	3220.0	3,148.2	3,094.9	3,077.7	2,759.6	2,403.9
Langtry	**560**		458.5		491.4	494.8	560.0	560.0	551.5	544.1	533.3	505.1	481.4
McCreary	**2,098**		1,158.3		975.1	1,414.1	1488.2	1525.9	1,781.4	1,681.0	1,622.0	1,414.1	1,185.2
Foley #1	**540**		92.2		105.3	108.3	200.3	518.0	537.0	529.3	435.9	344.3	231.5
Foley #2	**212**		92.1		103.5	115.3	124.9	212.0	202.4	188.5	175.1	133.4	108.7
Upper Bohn	**2,760**		483.0		697.8	750.4	941.4	1,369.4	1,289.4	1,209.4	1,052.7	967.0	869.6
Napa Valley Lake	**200**		15.3		15.3	42.8	134.3	198.3	198.3	177.8	171.2	161.6	120.2
Total	**9,590**	**0.0**	**4,264.3**	**0.0**	**5,608.4**	**6,145.7**	**6,669.1**	**7,603.6**	**7,708.2**	**7,425.0**	**7,067.9**	**6,285.1**	**5,400.5**
Storage as % of Total		**0.0%**	**44.5%**	**0.0%**	**58.5%**	**64.1%**	**69.5%**	**79.3%**	**80.4%**	**77.4%**	**73.7%**	**65.5%**	**56.3%**

Note: Storage amounts as recorded at the 1st of each month.

APPENDIX WW

WASTEWATER FEASIBILITY STUDY

SHERWOOD
DESIGN ENGINEERS

1525 SEABRIGHT AVENUE, SANTA CRUZ, CA 95062
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Revised October 15, 2019
Originally Submitted July 31, 2019

Chris Meredith
Kirsty Shelton
Maha Development

Transmittal: **Wastewater Feasibility Study for Maha Resort at Guenoc Valley**

Dear Chris and Kirsty:

Sherwood Design Engineers, Inc. (SDE) is pleased to present the revised Administrative Confidential Internal Draft Wastewater Feasibility Study ("Study") for Maha Resort at Guenoc Valley.

The primary purpose of this Study is to evaluate the available technical information to ascertain if there is a means to collect, treat, and dispose or reuse the wastewater generated for both the first and future phases of the Maha Resort at Guenoc Valley ("Project"). The study provides a compilation and review of critical information and data that will be needed to demonstrate the viability of the project to both local and state water regulators and to secure water related permits for the project.

The result of our analysis of the currently available data and information indicate that the proposed project is viable to manage and reuse treated wastewater at the site. The wastewater management plans will be permitted by the California Regional Water Quality Control Board and can be permitted within the State's permitting framework without any special requirements. The project is also consistent with the State's water recycling policies and regulations.

Thank you for the opportunity to assist you with this intriguing and complex project. Please contact me if you have any questions or require any additional information.

Sincerely,

Peter Haase

PETER HAASE, MS, PE
Principal Engineer

Enclosures

Wastewater Feasibility Study
For
Maha Resort at Guenoc Valley

October 15, 2019

Prepared for

Lotusland Investment
Holdings

SHERWOOD
DESIGN ENGINEERS

1525 SEABRIGHT AVENUE, SANTA CRUZ, CA 95062
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1. Introduction

The Maha Resort at Guenoc Valley has applied to the County of Lake for a development application. Pursuant to the California Environmental Quality Act (CEQA) the application will include an Environmental Impact Report (EIR). The EIR will include a programmatic analysis of the impacts to rezone the 16,000-acre Guenoc Ranch to "Guenoc Valley District (GVD)". In addition to the programmatic level EIR to allow the rezone, the EIR will include a detailed, project level analysis of the impacts at a Project level review of the first phase (Phase I) of development, submitted as the Specific Plan of Development (SPOD).

The Programmatic review of the overall project will occur in the EIR to assess the environmental impacts of the entire project proposal. Project level review will analyze the specific objectives and environmental impacts of the proposed first phase of development, as outlined in the SPOD. The Project Level review EIR will analyze the environmental changes caused by a development including the construction and operation, whereas the programmatic EIR will look at the impacts of the rezone classification rather than a project specific analysis. Future phases of the project will require additional CEQA review.

The SPOD identified Phase I as the construction of the roads and the utility infrastructure, approximately 255 hotel rooms, 144 resort residential units, and 411 Residential villas ("Total Units")[1], workforce and staff housing, and the accessory to resort commercial structures. This report looks at the wastewater feasibility of these operations relating to the phase one development. Future phases or future development will include additional hotel rooms, resort residential units, residential villas, new roads and utility infrastructure; however, the exact number and location of the anticipated improvements are unknown at this time.

This report presents the wastewater feasibility study in detail for the first phase and in concept for the future phases. The primary purpose of this study is to evaluate both phases of the Project on wastewater generation and the methods for collection, treatment, and disposal or reuse of the wastewater. The study evaluates the potential impacts the wastewater systems could have on adjacent properties and to sensitive cultural, historical and biotic resources on the property. The study provides a compilation and review of critical information and data that will be needed to demonstrate the viability of the project to both local and state water regulators and to secure water related permits for the project.[2]

[1] Since the publication of this study, the total units have been updated to be less than the number indicated here based on the tentative map lot analysis; therefore, the total analysis is conservative.
[2] General Plan of Development submitted December 2018. SPOD & Tentative Maps submitted May 2019.

2. Site and Project Description

The Maha Resort at Guenoc Valley (Project) is situated on a 16,000 acre property within the Guenoc Valley in Lake County, California. The project is located approximately three miles southeast of Middletown on the southeast border of Lake County, bordering Yolo and Napa Counties to the south and east. Figure 1 presents a site vicinity map. The Project site is approximately 95 miles northeast from San Francisco, 85 miles southwest from Sacramento, 40 miles east of Santa Rosa and 25 miles southeast from Clearlake.

The Guenoc Valley is a small inland valley set on an alluvial fan, isolated from surrounding areas by rocky ridges and volcanic outcroppings and rock. As part of the inner coastal range of Northern California, the site is characterized by varied topography, with rolling hills, oak woodlands, irrigated vineyards, grazing corridors, open spaced, meadows and lakes. Ground elevation ranges from 600 to over 1,600 feet above sea level. The average rainfall is 35 inches a year.

The Project proposal presented to Lake County is to transform the property into a state-of-the-art hospitality, rural residential and recreational facilities set into the rural landscape. The Project is organized into individual resort communities, defined by low impact designs that prioritize low density and clustered development, preserving surrounding open space and agricultural cultivation. The resort communities have been designed to be built with and into the landscape to minimize construction impacts to the natural landscape and habitats.

The Project preserves the long history of agricultural use by maintaining the vineyards and grazing lands while enhancing and diversifying agricultural production to include gardens, culinary education, farmers markets, agricultural retail sales, and resale opportunities for local artisans and business.

The Project commercial elements will include small boutique hotels, commercial shops, and small artisanal food and winery production facilities, small farm and integrative animal husbandry elements and spa and restaurants. The key recreational facilities will include an equestrian center, an 18-hole golf course, rural recreation and camping facilities.

Each resort community or cluster will include a mixture of hotel units, resort residential and residential villas. The clustering of development reduces the sprawl of the development and results in the consolidated hubs for critical utilities, while preserving the rural landscape and agricultural qualities of the property. The Project plans result in a very low-density development, an average of 0.1 unit per acre, with the average lot size of 5 acres for the residential villas with portions of each lot held in conservation.

The Project will also include essential operational facilities including workforce housing, central back-of-the-house operations, and emergency response center.

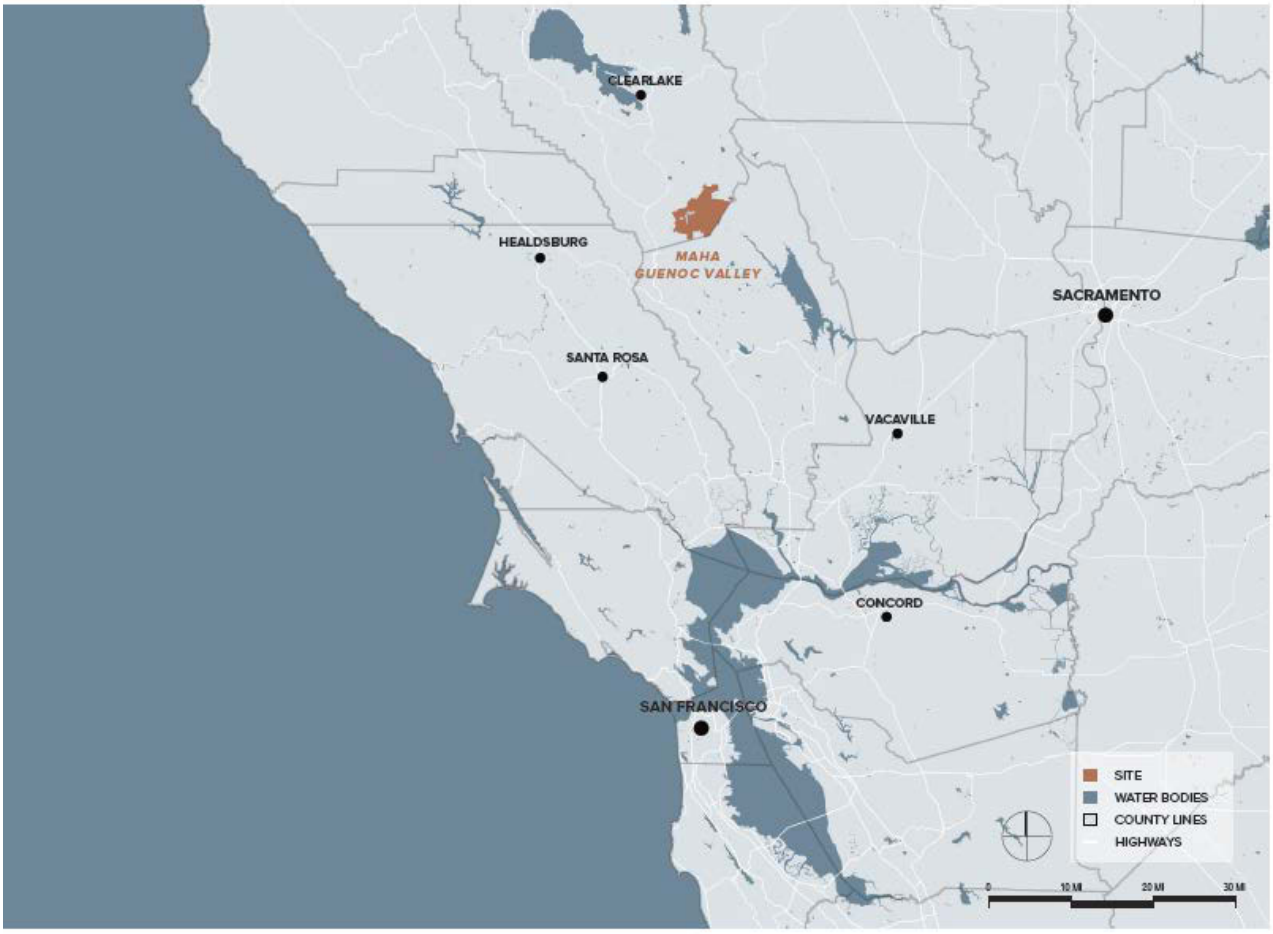

Figure 1. Site Vicinity Map

3. Land Use and Physical Setting

3.1. Existing Land Use

The Guenoc Valley is a small inland valley comprised of varying landscape and vegetation characteristics. The natural landscape includes grasslands, chaparral and oak woodlands. The property also includes vineyards, grazing lands and rural residential developments. A unique and rich feature of the property are the various lakes and creeks and associated wetlands and riparian habitat.

Historically, Guenoc Valley has been grazed by cattle and sheep for centuries. In 1925 William F. Detert constructed Deterted Reservoir and the valley floor irrigation project, which is still in use today. After irrigation was introduced into the Guenoc Valley it became possible to grow vegetables, vineyards and forage crops to support the existing grazing operations. The Guenoc Ranch has been farmed for more than a century. At present there is still a significant cattle and sheep operation in conjunction with the vineyards.

Vineyards. The property includes some of the oldest vineyards planted in Lake County, which were part planted by the famous actress Lili Langtry. Since this early period of time the vineyards have slowly expanded. Beginning in the later 1970's expansion of the vineyard began and in 1980 construction started on the Guenoc Winery, which is still in production today. Most of the valley floor is now vineyard and vineyards are being planted throughout the property, irrigated from numerous lakes on the site. There are approximately 909 acres of vineyards currently planted most of which are managed by an existing leasor.

Grazing. Animal husbandry will continue to be an important economic, management and aesthetic experience of the Project. Cattle will continue to be rotated throughout the site within larger open and pasture areas. Sheep and goats will be used close to development areas to aid in reducing vegetation cover and fire risk.

Ranch Center. The main ranch center includes the ranch manager's home and several other homes, as well as barns and shed which are proposed to be relocated as part of this project. An older ranch home, known as the Gebhard Lodge, located to the northeast of the ranch center is used as a guesthouse and hunting lodge as it has been used for the past 100 year.

3.2. Surface Features

The property extends over many square miles and extends over both moderately steep rolling hills and the nearly level valley floor. Rubbly outcrops and boulders are common throughout the property. In general, the ground surface is soft and spongy. This is a condition generally associated with weak, porous surface soil. In some places, the surface soil is disturbed by randomly arrayed shrinkage cracks generally associated with expansive soil. Locally, expansive soil shrinks and swells with the weather cycle. The cyclic shrinking and swelling tends to disturb the upper portion of the expansive clay. This zone is defined hereinafter as the active layer. Natural drainage consists of sheet flow over the ground surface and slopes that concentrates in manmade surface drainage elements such as roadside ditches, and natural drainage elements such as swales, ravines, and creeks. There are several springs throughout the property.

3.3. Topography

The valley floors within the Guenoc area are fairly level, while the surrounding ridge and hill slopes are moderately steep. Elevation with the project site ranges from approximately 600 feet to 1,600 feet above mean sea level (msl). The Guenoc Valley region in the western portion of the property consists of relatively flat irrigated lands comprised of alluvial deposits within the 1) Bucksnort Creek drainage basin, with hills along the perimeter with approximate elevations ranging from 1,000 to 1,200 feet above msl in this area. 2) The Tephra Ridge region, located in the hills upstream from Cassidy Reservoir in the southwestern portion of the property, contains existing vineyard with elevations up to 1,200 feet above msl. 3) The Lower Bohn Valley region located in the central portion of the property includes irrigated and irrigable lands on the valley floor and gentle hillsides, with moderately steep slope ridges encircling the valley with elevations ranging from 800 to 1,200 feet above msl. Irrigated and irrigable land in the 4) Big Basin region includes alluvial deposits adjacent to Putah Creek and the lower reaches of Bucksnort Creek with elevations ranging from 600 to 800 feet above msl, and the area is surrounded by moderately steep slopes. 5) The Northern Ranch region includes more rugged land, with high plateau and mountainous areas with elevations ranging from 800 to 1,200 feet.

3.4. Soils

The soils over the project site are variable and typically range from very thin less than 2 feet thick to 10 feet in thickness above bedrock. Soil types in the Maha Resort Property include over 30 different soil series including, but not limited to: Benridge Variant loam, Bressa-Millsholm loam, Cole clay loam, drained; Forward Variant-Kidd; Henneke-Montara-Rock outcrop complex; Jafa complex; Konocti-Hambright complex, and Konocti complex.

3.5. Geology

Lake County is located within the California Coast Range geomorphic province. This province is a geologically complex and seismically active region characterized by sub-parallel northwest-trending faults, mountain ranges and valleys. The oldest bedrock units are the Jurassic-Cretaceous Franciscan Complex and Great Valley sequence sediments originally deposited in a marine environment. Subsequently, younger rocks such as the Tertiary-age Sonoma Volcanics group, the Plio-Pleistocene-age Clear Lake Volcanics and sedimentary rocks such as the Guinda, Domengine, Petaluma, Wilson Grove, Cache, Huichica and Glen Ellen formations were deposited throughout the province. Extensive folding and thrust faulting during late Cretaceous through early Tertiary geologic time created complex geologic conditions that underlie the highly varied topography of today. In valleys, the bedrock is covered by thick alluvial soil. The project area is in Lake county and borders Napa county.

The property is underlain by Quaternary terrace deposits and olivine basalt, as well as older units such as Cretaceous-Jurassic Franciscan sandstone, shale, mélange, serpentinite, and greenstone. There are also localized outcrops of Cretaceous-Jurassic Great Valley Sequence and Jurassic Knoxville Formation.

A substantial thickness of sand and gravel alluvial deposits occurs along Putah Creek on the northeast side of the property. Similar deposits to a thickness of 5-15 feet occur along Bucksnort Creek and in other large drainages. Thinner alluvium, mixed with silt and clay is common along smaller drainages.

3.6. Existing Wastewater Infrastructure

Lake County has three utility areas focused mainly in providing water and wastewater services in more densely populated areas. To service these areas, the County has 5 regional wastewater facilities. The nearest wastewater facility to the Project has the capacity to serve almost 500 residential connections in the Middletown and the Harbin Hot Springs areas. The wastewater system is located in Utility Area 3 and consists of over 10 miles of gravity collection system, 3 lift stations, and over 3 miles of force main to the Middletown Wastewater Treatment Plant. The treatment facility was constructed in the 1990s and currently operating near capacity. The facility has a facultative pond with a dry/wet flow of 0.128/0.24 MGD.[3] Middletown is located 5 miles west from the Project property boundary.

Lake County also has a wastewater recycling system. The treated effluent is used for geothermal power production (injection/re-use). There is 50 miles of effluent pipeline with an average flow rate of 5,800 gpm recycling about 85% of the wastewater collected from the County wastewater systems. The recycling program uses solar powered treatment and pumping and creates geothermal power through injection wells just south of Cobb Mountain.

The developed areas within the Project area have existing onsite wastewater system that consists primarily of septic tanks with leachfield disposal. These wastewater systems would remain in place unless development is proposed in the vicinity or is necessary in which case they will be modified as part of this proposal.

[3]http://www.lakecountyca.gov/Government/Directory/Special_Districts/About_Us/Wastewater_Systems/Middletown_Wastewater_System.htm

4. Water Regulations and Agency Approvals

4.1. Overview of Local and State Regulations Related to Wastewater

This section provides a brief summary of the relevant regulations pertaining to wastewater management and reuse for the project. Additional information will be addressed in the Tentative Map, the development agreement and the SPOD.

4.2. Lake County Code, Chapter 9 – Health and Sanitation

The Lake County Code that pertains to wastewater is Chapter 9 – Health and Sanitation, Article 3 – Sanitary Disposal of Sewage.

Chapter 9. Article 3 – Sanitary Disposal of Sewage. These requirements specify that any construction, addition to, alteration of, or modification of a wastewater system for the disposal, treatment or discharge of sewage requires securing a sanitation permit from the County Health Officer. Costs incurred by the County shall be borne by the sub-divider and shall be paid to the Director of Public Works prior to final approval of any improvement work, and inspection fees deposits as determined by the Public Works Department and adopted by the Board of Supervisors.

Under this Article the sub-divider must obtain approval of a new wastewater system from the County health officer demonstrating that the new wastewater system will comply with the local permitting requirements.

4.3. Lake County Code, Chapter 17 – Subdivision Regulations

The Lake County Codes that pertain to sanitary sewer includes several sections of Chapter 17 – Subdivision Regulations and Article 5 – General Design.

Chapter 17. Article 5 – General Design and Improvement Standards. These requirements specify that all sanitary sewer improvement shall conform to the County's "Standard Improvement Specifications". These requirements also state that all sanitary sewer facilities shall not be installed until all plans for such work have been submitted to, approved and signed by the Director of Public Works and by local and state agency. All sanitary sewer improvements shall be installed under the inspection of the, and to the approval of, the Director of Public Works or his duly authorized representative. Costs incurred by the County shall be borne by the sub-divider and shall be paid to the Director of Public Works prior to final approval of any improvement work, and inspection fees deposits as determined by the Public Works Department and adopted by the Board of Supervisors.

Under this Article the sub-divider must obtain approval of a new sanitary sewer system from the County health officer demonstrating that the new wastewater system will comply with the local permitting requirements. When a new wastewater system is proposed the sub-divider shall demonstrate that the proposed design has been approved by the County Health Office and the Director of Public Works.

When connection to an existing sanitary sewer system is not feasible, the sub-divider shall provide evidence to the County Health Officer certifying that the site has ground slopes and soil conditions for satisfactory disposal by septic tanks or other approved method.

The Article further states that the SWRCB requirements for proposed waste discharge shall be complied with pursuant to Section 13260 of the State Water Code, where applicable, before the Planning Commission approves the tentative map for the project.

Wastewater system plans and related technical reports will be submitted to all required County and the State agencies for approval, prior to installing the wastewater system improvements. Maha Development Corporation will pursue approval from the SWRCB once the project has been approved under the requirements of the California Environmental Quality Act (CEQA).

Some portions of the project, such as the large parcels may pursue individual onsite septic systems, and in this circumstance the individual landowner would pursue a permit from Lake County. In other circumstances a landowner of a residential lot may connect to the sanitary sewer system if the soil conditions are not suitable for an individual onsite septic system.

4.4. Lake County Rules and Regulations (LCR) for On-site Sewage Disposal

The Lake County Rules and Regulations for On-site Sewage Disposal are rules adopted in 2010 per the County Code referenced above to prescribe the requirements for on-site sewage disposal systems. This document provides design criteria for standard on-site sewage disposal subsurface systems (LCR 1-130) as well as alternative systems that maybe used in the Project area including subsurface drip disposal systems (LCR 1-155), pressurized distribution systems (LCR 1-160), aerobic systems (LCR 1-195), sand filter systems (LCR 1-190 & LCR 1-200), other media filter (LCR 1-210-215) systems, steep slope systems (LCR 1-220), holding tanks (LCR 1-270), and experimental systems (LCR 1-290).

4.5. Applicable Public Utilities Code (PUC)

The Maha Resort in the Guenoc Valley is planning to form a privately held public utility company that will operate and maintain the water and sewer facilities at the property. Regulated water utilities are considered to be professional water service providers that own water and wastewater utilities, partner with municipalities to form public-private partnerships, or operate and maintain water and wastewater systems as contracted services providers.

In California, these professional water service providers who own and operate utilities are regulated by the California Public Utilities Commission (CPUC). The CPUC establishes rates and terms of service, as well as provides safety and security oversight and, with the State Water Resources Control Board, shares water quality and compliance responsibilities. In the course of regulating these public utilities, the CPUC reviews company costs, audits system needs, holds hearings on general rate cases, applications for capital projects and other formal proceedings, and render decisions that govern the utility's relationship with its customers. The new utility will be regulated by the California Public Utilities Commission. The new water and wastewater utility will initially be a Class C system serving less than 2,000 service connections, and eventually when the Future Phase of development occurs it will likely be a Class B system that will serve between 2000 to 10,000 service connections in the long-term.

Regulated water utilities have more than two centuries of experience providing drinking water to communities of all sizes and in all areas of the United States. Today, nearly 73 million Americans —one of every four people in this country—receive water service from a regulated water utility or a municipal utility operating under a public-private partnership. In California, the regulated water utilities, alone, serve nearly 6 million people, or about one in six Californians. When you add partnerships and contract operations to this total, the percentage grows substantially. There are 138 public utilities in California, including eight Class A utilities with more than 10,000 customers. Many of the larger public utilities own more than one water system, so that the 138 companies own a total of 255 separate systems. Together, public utilities serve almost 5.5 million people in California, 15 percent of the state's population. The largest public utility is California Water Service Company, which serves approximately 1.8 million people through 48 systems.

Public utilities are organized as private corporations, with their stock owned by shareholders for investment purposes. Of the 138 companies operating in California, four are publicly traded, two are owned by investment funds, and the remainder are closely-held businesses. Public utilities are subject to comprehensive regulation by the California Public Utilities Commission regarding water supplies, capital improvements, service quality and water rates.

The Maha Development Corporation will form a privately held water and wastewater public utility company to own, operate and maintain the systems. The Maha Development Corporation will prepare the necessary legal, technical and financial reports needed to form the new utility entity. The new utility company will be permitted and regulated by the CPUC, the SWRCB-DDW, and the CRWQCB.

4.6. State Water Reclamation Requirements for Recycled Water Use

In 2016 the State Water Resources Control Board adopted the State's first General Permit (Order WQ 2016-0068-DDW) for Water Reclamation Requirements for Recycled Water Use. The General Order provides the guidelines and instruction for both public and private parties permit water recycling projects under this streamlined permitting process. The General Permit includes general prohibitions, specifications, administrative requirements, general provisions and instructions for seeking coverage under the General Permit. The General Permit is promulgated under the California Regional Water Quality Control Board and the State Resources Water Control Board-Division of Drinking Water.

The Maha Developments will prepare the necessary plans and technical documents to permit all planned water recycling facilities under the General Water Recycling Permit.

4.7. California Water Code

Several sections of California Water Code, Division 7. Water Quality pertain to the project. Chapter 4, Article 4. Waste Discharge Requirements specify the general requirements for the project to obtain Wastewater Discharge Requirements for the proposed discharge of wastewater. Article 4. Regulation of Reclamation provides regulations pertaining to the use of recycled water. Article 7. Water Reuse specifies the use of recycled water in lieu of potable water for various water demands, such as, landscape irrigation, irrigation of golf courses and other uses.

The Maha Development will be required to prepare and submit a Report of Waste Discharge for the planned wastewater facilities on the property.

4.8. California Code of Regulations – Title 17

Article 2. Protection of Water System sets requirements for back flow preventers to prevent cross-connection or contamination of water systems. The regulations include the requirements for back flow preventer approval, construction of backflow preventers, location of backflow preventers, the type of protection required and the testing and maintenance of backflow preventers.

The Maha Development will need to employee backflow protection measures to prevent the cross-connection and/or contamination of surface water resources or non-domestic water wells. In most cases a reduced pressure principal backflow prevention (RP) type backflow prevention assembly can be used to isolate the recycled water from the other sources of non-potable.

4.9. California Code of Regulations – Title 22, Division 4. Environmental Health

Chapter 3. Water Recycling Criteria defines the type of recycled water and other related topics. Article 3 specifies the water quality requirements for the use of recycled water for irrigation. Article 4. Defines the use area requirements where recycled water can be applied and the setbacks from domestic supply wells for landscape irrigation and for storage of recycled water. Article 6 outlines sampling and analysis requirements. Article 7 outlines the requirement for an engineering report and operational requirements. Article 8 outlines general requirements of design and Article 10 specify requirements for reliability requirements for full treatment.

The Maha Development project will be required to prepare and submit an engineering report that describes the proposed recycled water system and what provisions for reliability and safety will be incorporated in the recycled water system.

The Maha Development project will need to install a water reclamation system that will need to be designed to provide disinfected tertiary recycled water that has filter effluent that does not exceed 2 NTU and influent turbidity does not exceed 5 NTU for more than 15 minutes and never exceeds 10 NTU, and there is a capability to automatically activate chemical addition or diver wastewater should the filter influent turbidity exceed 5 NTU for more than 15 minutes.

4.10. Required Governmental Agency Approvals

- Wastewater System Plan and Technical Reports approved by Lake County and California Regional Water Quality Control Board – Central Valley Region (CRWQCB), State Water Resource Control Board-Division of Drinking Water (SWRCB_DDW). These technical reports should be submitted once the CEQA documents have been approved and certified.
- Operation and Maintenance Plan Approved by CRWQCB and SWRCB-DDW. The O&M Plan should be completed and submitted prior to the startup and commissioning of the new systems.
- Public Water Utility Formation approved by the CPUC and LAFCO. The process to forma private water and wastewater utility should start as soon as the draft CEQA document has been published.
- Water Recycling Permit issued by the CRWQCB (with review by the SWRCB-DDW). Securing the permit should occur after the final CEQA document is certified and prior to occupying the property.

5. Wastewater Flow Analysis

Due to the location of the existing sanitary sewer districts in Lake County (the nearest about 5 miles from the property boundary), the steep slopes and the soil conditions of much of the Project development areas, and the need for reclaimed water for irrigation for the Project, most of the wastewater generated from Phase 1 and future phases will need to be treated in decentralized reclamation plants throughout the Project area. In order to quantify the impacts from the wastewater from the Project, SDE performed a wastewater flow analysis based on an estimate of the various potable water demands at the site. The Project will be designed with onsite collection and pump tanks that feed to both gravity and pressure wastewater lines to convey wastewater to decentralized wastewater reclamation facilities throughout the site.

The following sections include a description of the methodology used to calculate the wastewater flows for the project and results of the calculations.

5.1. Wastewater Flows Calculation Methodology and Results

SDE has completed wastewater flow calculations for both the Phase 1 and future phases projects. The results indicate the amount of recycled or reclaimed wastewater that could potentially be available for non-potable reuse for the project areas (primarily for irrigation). The following section describes the methods used to calculate the projected wastewater flows for the project.

5.2. Wastewater Flows

SDE calculated the projected wastewater flows for the project using the following water demand calculations[4,5] for:

- Domestic and commercial water needs for drinking, cooking, bathing, toilet flushing, and laundry.
- Clean–in-place (wash) water for wineries and other food related production facilities.

Hotel, Resort Villa and Residential Villa Potable Water Demands. SDE employed two methods to calculate the potable water demands for the project: the first method employed unit flow values for hotel rooms and villas based on similar flows obtained from other projects completed by the owner. The second method employed water use values published in technical references for similar types of uses and the expected occupancy rates.

Commercial Retail Space. Water demand values for commercial retail spaces has been calculated based on values published based on the area or square footage of retail and commercial space employed in different jurisdictions in California. [6]

Winery Process Water Demands. Water demand calculations for the winery production is based on the amount of water used per case of wine produced at the winery. SDE used 16 gallons of water required to produce a case or 2.4 gallons of wine.

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[4] USEPA. 1980. *Design Manual: Onsite Wastewater Treatment and Disposal Systems*
[5] R. Crites and G. Tchobanoglous. 1998. *Small & Decentralized Wastewater Management Systems*. WCB/McGraw-Hill
[6] San Francisco Public Utility Commission, *Water Use Calculator*

Table 1 present the potable unit water demands used to calculate the potable water demands and the equivalent wastewater flows for each use. Table 2 presents the estimated daily average and daily maximum wastewater flows for the Phase 1.

Table 1. Unit Water Demands

Description	Unit	Unit Demand	Reference Number
Restaurant			
Staff	gpd	15	3,4
Guest	gpd	10	3,4
Pool			
Staff	gpd	15	3,4
Guest	gpd	15	
Hotel			
Staff	gpd	15	3,4
Guest	god	75	3,4
Resort Villa Resident	gpd	75	3,4
Villa Resident	gpd	75	3,4
Pool Evaporative Loss	gpsf	0.1175	
Winery Production	gpc	16	4
Notes:			
gpd - gallons per day			
gpsf - gallons per square foot of water area			
gpc - gallons per case			

Table 2. Phase I Wastewater Flow Estimates

Description	**Daily Average Flows**	**Maximum Daily Flows**
Onsite Workforce Housing	8,064	11,520
Equestrian Center	29,805	65,535
Red Hill Estates	30,240	58,620
Bohn Ridge Resort	16,305	26,265
Resort at Trout Flat	14,280	23,060
Spa	4,785	7,355
Golf Course	3,360	6,780
Tented Camp	3,960	6,360
Central Back-of-House Facilities	17,100	17,100
Emergency Center & Short Term Staff Accomodations	4,140	6,540
Maha Farm	38,829	85,315
Total Wastewater Flow (Gallons per Day)	**170,868**	**314,450**
Total Wastewater Flow (Acre-Feet per Day)	**0.52**	**0.96**
Total Annual Wastewater Flow (Ac-Ft per Year)	**191.37**	NA

Future Phased Wastewater Flows

Future phased development will include additional hotel rooms, resort residential units, residential villas, expanded sport facilities and recreation opportunities. Based on preliminary programming for this future development the wastewater flows estimates have been calculated to be approximately 163 acre-feet of wastewater per year at full buildout and full occupancy as shown in Table 3. The future wastewater flow is estimated to increase the total amount of wastewater to approximately 354 acre-feet per year and will increase the overall wastewater generated by approximately 40 percent.

Table 3. Future Phased Wastewater Flows

Use	Unit	Quantity	Water Demand (gallons)	Average Occupancy Rate (percent)	Average Annual Water Demand (gallons/yr)	Average Annual Water Demand (ac-ft/yr)
1. Resort Facilities	EA	415	300	60%	27265500	83.66
2. Residential Estate Villas	EA	986	280	40%	40307680	123.68
3. Workforce Co-Housing	EA	200	75	70%	5748750	17.64
4. Resort Amenities						
4.1. Outdoor Entertainment	Seats	200	5.5	60%	25840	0.05
4.2. Spa and Wellness Area	Visitors	70	25	60%	383250	1.18
4.3. Sports and Recreation	Visitors	100	30	60%	657000	2.02
4.4. Equestrian Area	Visitors	105	18	100%	413910	1.27
4.5. Golf	Visitors	44	21	100%	202356	0.62
4.6. Camping Area						
4.7. Commercial and Retail	Visitors	60	23	60%	302220	0.93
5. Agricultural Production Facilities						
5.1. Wineries	CASES	250,000	16	100%	4000000	12.27
5.2. Agricultural Production Facilities	EA	16	35	60%	204400	0.63
6. Essential Accessory Use						
6.1. Back of House Facilities	EA	1	5000	60%	1825000	5.60
6.2. Emergency Response Center	EA	1	1500	60%	547500	1.68
6.3. Alternative Energy Production	EA	1	168	60%	61320	0.19
6.4. Float Plane Doce and Heli Pad	EA	2	20	60%	14600	0.04
Total Potable Water Demand						**251**
Total Wastewater Flows						**163**

5.2.1. Recycled Water

It is planned that wastewater from all clusters and related areas of development will be collected in sanitary sewer systems and conveyed to a series of small decentralized wastewater reclamation plants. Each plant will be designed to treat wastewater so it can be reused to supply all or a fraction of the landscape irrigation demand in the vicinity to the cluster. Some recycled water will also be reused as makeup water for ornamental ponds and water features. lakes, as 4 presents the amount of recycled that will be available after the Phase I project has been fully developed. The calculations indicate that approximately 162 acre-feet of water will be available to be used for non-potable water use at the property. This will represent between 17% to 18% of the total non-potable water supply for the Phase I project needs.

Table 4. Estimated Recycled Water Supply for Phase I Project

Area	Daily Average Demand (gallons/day)	Annual Demand (gallons/yr)	Annual Volume (ac-ft/yr)	Percent Reuse	Available Recycled Water (ac-ft/yr)
Onsite Workforce Housing	8,064	2,943,360	9.0	0.85	7.68
Equestrian Center	29,805	10,878,825	33.4	0.85	28.37
Red Hill Estates	30,240	11,037,600	33.9	0.85	28.79
Bohn Ridge Resort	16,305	5,951,325	18.3	0.85	15.52
Resort at Trout Flat	14,280	5,212,200	16.0	0.85	13.59
Spa	4,785	1,746,525	5.4	0.85	4.56
Golf Course	3,360	1,226,400	3.8	0.85	3.20
Tented Camp	3,960	1,445,400	4.4	0.85	3.77
Central Back-of-House Facilities	17,100	6,241,500	19.2	0.85	16.28
Emergency Center & Short Term Staff Accomodations	4,140	1,511,100	4.6	0.85	3.94
Maha Farm	38,829	14,172,635	43.5	0.85	36.96
Total Annual Volume of Recycled Water					**162.66**

6. Wastewater Management

New wastewater supply infrastructure is being planned for the Maha Resort that will include collecting wastewater from a mixed-use plan of both residential and commercial uses on the property. To accommodate the varied uses and parcel sizes on the project there will be different types of wastewater systems required to manage wastewater flows in the project area. In general, the commercial areas will use a combination of sanitary sewer, wastewater treatment and recycled water systems. The residential areas may include onsite wastewater systems.

6.1. Residential Wastewater Systems

Because of the requirements to conduct site assessment studies for each residential lot including percolation tests and determination of groundwater separation the current project accommodates for both an onsite wastewater solution and/or the option to connect the residential lots to the community wastewater systems. The following sections describe the type of onsite residential systems that are planned for the project.

There are three (3) types of wastewater systems that are acceptable to be implemented at the residential properties on the site. The type of system used will depend on the type of land use, site specific soil and groundwater conditions, and distance or adjacencies to other properties or land uses. The types of wastewater systems that are under consideration for the residential areas at this time include the following:

- Residential System Type 1A – Standard Septic System
- Residential System Type 1B – Onsite Enhance Treatment System
- Residential System Type 1C – Septic Tank Effluent Sewer System

The following provides a brief description of the different types of wastewater **residential** systems planned for the project.

6.1.1. Residential System Type 1A – Standard Septic System

A Type 1A system is a standard septic system that will be used on residential parcels that have suitable soil and groundwater conditions and meets setback requirements that would allow for the installation of a standard septic system (septic tank and subsurface disposal system) that conforms to Lake County Rules and Regulations (LCR) for on-site Sewage Disposal and the State of California's Onsite Wastewater Treatment Systems (OWTS) Policy.

6.1.2. Residential System Type 1B – Onsite Enhanced Treatment System.

A Type 1B system will include an onsite enhanced treatment system (such as an aerobic treatment, textile filter, sand filter or other alternative treatment system) that will provide pretreatment of the wastewater before it is disposed on site in a subsurface disposal system. The enhanced treatment system will be required to address site specific issues, such as marginal soil conditions, high groundwater or other site constraints that will not allow for a standard septic system to be utilized. The enhanced treatment system will designed and operated to comply with both the LCR and the State's OWTS policy.

6.1.3. Residential System Type 1C – Septic Tank Effluent Sewer Systems.

A Type 1C system will include an effluent sewer system to connect a residential parcel to a community wastewater treatment and recycled water system. The effluent sewer system is made up of an interceptor tank (septic tank) and a small-diameter collection pipeline that are designed to convey only the liquid portion of the household wastewater for off-site treatment and disposal or reuse. The septic tank is located close to the house and is used to remove solids from the wastewater and these tanks are periodically pumped by a vacuum truck and the solids are taken to a municipal treatment plant. The settled wastewater can either flow by gravity to the main collection system or a second pump tank with a pump system can be installed and the effluent can be pumped under pressure to the main collection system. The Septic Tank Effluent Gravity (STEP) and the Septic Tank Effluent pumping (STEP) systems would conform with Lake County and State of California's standards.

6.2. Sanitary Sewer, Wastewater Treatment and Recycled Water Systems.

The project is spread out over 16,000 acres and will include at least twelve (12) discrete areas that will require either individual and/or combined wastewater systems. These systems will collect wastewater from commercial and some residential areas.

Several areas will include mixed use developments including hotels, restaurants, commercial centers, pools and other related facilities. Wastewater management systems for these areas will include sanitary sewer collection system to collect the wastewater, small natural or package styled wastewater treatment and reuse systems, and recycled water distribution and reuse systems. The majority of recycled water will be used for landscape irrigation, make up water for water features, and potentially for indirect groundwater recharge via infiltration basins or trenches in selected areas on the property.

Some areas including the main back of the house area, the staff housing area, the fire center and the golf course areas will be smaller areas that are relatively remote from the larger development clusters. These areas will be served by small onsite wastewater systems that will include small sewer collection systems, a small enhanced treatment system and small reuse systems, such as, a subsurface drip dispersal irrigation system to reuse treated water to irrigate landscape around the buildings.

Table 5 presents a list of main project areas, the planned activities in each area, and the wastewater management approach for the area.

~~**Sanitary Sewer Systems.** Based on the variable topography and distances between facilities a combination of pressure and gravity sewer systems will be utilized. The pressurized sewer systems will include small lift stations located in strategic locations to pump wastewater to the main treatment system. Pressure sewers will be small diameter pressure lines that will likely be installed in the road right-of-way or in a utility easement. Gravity sewers will generally be larger diameter pipelines that will also be located in the road right-of-way or a utility easement.~~

~~**Wastewater Treatment and Recycling Systems.** The wastewater treatment and reuse system will include either a natural wastewater treatment system or a small biological package styled treatment system. The wastewater treatment systems will be energy efficient, easy to operate and maintain. The natural wastewater treatment that will be used will include a combined pond~~

~~and wetland treatment system or a small multi-stage trickling filter and wetland treatment system. The small biological package style treatment system will include either a multi-stage trickling filter with a membrane filtration system or packed-bed textile filter and membrane filtration system. All of the wastewater systems will also include advance filtration and disinfection system and inline water quality monitoring system to comply with the State of California's Recycled Water Laws.~~

Recycled Reuse Storage and Distribution Systems. Once the recycled water has been treated it will be stored in small water tanks or ponds. Small booster pumps will pump the recycled water into a purple pipe recycled water distribution system that will convey recycled water to the final point of use, such as a landscape irrigation system, the golf course or polo fields. Anywhere that water recycled water is reused will be posted to inform the visitors and staff that recycled water is being used.

There are several recycled water reuses at the site including but not limited to the following:

- Landscape irrigation;
- Vineyard and orchard irrigation and frost protection;
- Make up water for water features (fountains and reflecting pools);
- Dust control;
- Fire protection;
- Vehicle washing;
- Indoor reuse (toilet flushing, laundry washing, cooling system makeup water)

Table 5. Wastewater Management Approach for Each Cluster Area

Area	Planned Use	Wastewater Management Approach
Hill Hotel	Hotel, restaurant, conference center, sales center, back of house (BOH), central garden, water feature	Sanitary Sewer Collection System, Wastewater Treatment Recycling System and recycled water distribution and reuse
Maha Farm Village	Artisan workshop, restaurants, open air market, post office, bakery, hotel, reception, tasting rooms, public restrooms, winery, pools, gardens	Sanitary sewer collection system, wastewater treatment and recycling system and recycled water distribution and reuse
Spa & Recreational Center	Spa treatment building, male/female day spa, treatment rooms, Beauty and hair saloon, food services, water feature (pond), gardens Indoor & outdoor pools, public restrooms and showers, gym and yoga rooms	Sanitary sewer collection system, wastewater treatment and recycling system and recycled water distribution and reuse
Main Back of House (BOH)	Central laundry, maintenance and service areas, restrooms	• Laundry water graywater recycling system (closed loop) • Onsite wastewater treatment and reuse/disposal system
Staff Housing	Staff Apartments	Onsite wastewater treatment and reuse/disposal system
Fire Center	Staff housing, restrooms, kitchen	Onsite wastewater treatment and reuse/disposal system
Winery	Winery building, crush pad and restroom	Onsite wastewater treatment and reuse/disposal system
Golf Course and Club Houses	Club houses (three at different locations) and golf cart storage and service area, restrooms	Onsite wastewater treatment and reuse/disposal system
Red Hill Hotel	50 room hotel, reception and restroom, two restaurants, bar, winetasting room, pools, boutique, administrative offices, BOH and garden	Sanitary sewer collection system, wastewater treatment and recycling system and recycled water distribution and reuse
Polo Equestrian Center & Villas	Lodge, clubhouse, stables, and villas	Sanitary sewer collection system, wastewater treatment and recycling system and recycled water distribution and reuse
Bohn Ridge Resort	Reception and administration, hotel rooms, restaurant, yoga center, pool and changing room, gardens	Sanitary sewer collection system, wastewater treatment and recycling system and recycled water distribution
Camping Area	Reception, Dining Hall and Bath House	Sanitary sewer collection system, wastewater treatment and recycling system

Each wastewater system will include gravity and pressure collection mains and lift stations to convey the wastewater to a treatment system. Each lift station will include a pump system to convey water where gravity conveyance is not possible. Each treatment system will be a multi-stage treatment system that will treat the water for reuse on the Project site.

Collection System Lift Stations. A series of collection system lift stations will be installed at strategic locations throughout the wastewater systems. The lift stations will be below ground concrete or fiberglass tanks with access risers. The lift stations will be fitted with self-priming sewage pumps. The lift stations storage tanks will be sized to collect and convey the maximum day sewage flows for each area.

The lift stations will be placed in topographically low-lying areas to allow sewage to gravity flow to the tanks. The lift stations will be placed near roads to allow for good access and servicing as required. The location of the tank sites can be selected and planned so that their installation and operation does not impact sensitive cultural, historic, and biotic resources at the site.

Wastewater pump systems will be located at the lift stations and used to convey wastewater to the treatment plants. It is anticipated that each wastewater pump system will include at least two (2) duplex sewage pumps plumbed in parallel. Under low or normal flow conditions it is likely that a single wastewater pump is operating and as the wastewater flow increases the standby pumps will turn on to convey the wastewater to the treatment plant. The wastewater pump systems will be installed in small enclosures and in small areas that should not impact sensitive cultural, historical or biotic resources at the site. The wastewater pumping systems will be connected to the area-wide system control and data acquisition (SCADA) system to allow for both local and remote operation and continuous monitoring.

Wastewater Collection System. The wastewater systems will consist of both gravity and pressurized lines. The wastewater systems will consist primarily of 4-inch to 12-inch diameter sewer mains and 3- and 4-inch laterals to collect wastewater from the commercial building and residential parcels. The majority of the sewer mains and laterals will be installed in the planned roadways and driveways and will not be installed in undisturbed areas on the site. The installation of the wastewater collection system should not result in any additional impacts to cultural, historic or biotic resources related to the installation of the new roads.

Water Reclamation (Recycled) Plants. Based on the decentralized and clustered development plan several small package type water recycling plants will be installed to treat wastewater from the development areas. Seven (7) small package plants are current planned to serve the Phase I project and will include small treatment works at the Maha Farm, Redhill/Renaissance Golf Course, Resort at Trout Flat, Central Back of the House, Equestrian Center, staff housing, and a small system at the Wildlife Camp. Figure 2 shows the approximate location of the seven systems.

The treatment systems will be designed to meet State Title 22 recycled water regulations for tertiary level disinfected recycled water that can be used for unrestricted irrigation and recreational use of the water.

At each water reclamation facility there will be a recycled water tank and booster pump system that will pump recycled water into the non-potable water distribution system for landscape irrigation, fire protection and make up water to ornamental water features.

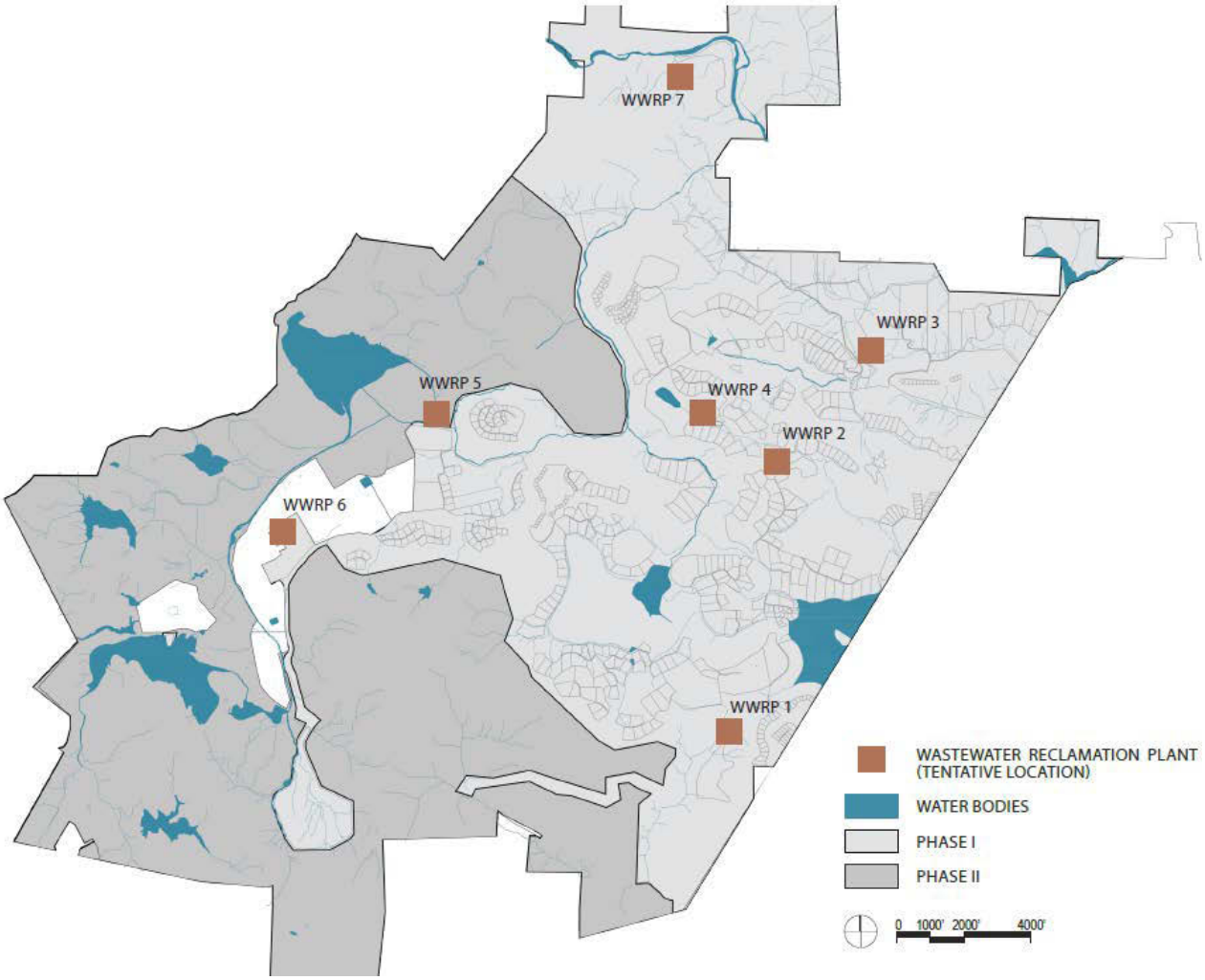

Figure 2. Proposed Approximate Location of Water Reclamation Facilities

Each water reclamation plant will cover a relatively small area ranging from less than 1,500 square feet at the Camping Area to the largest area of 12,500 square feet for the largest system that will serve the Maha Farms area. Figures 3 and 4 shows the typical layout of water reclamation plant facilities serving different flow requirements. Each facility will include a treatment plant, storage tank, booster pump system, and related parking area.

The water reclamation plants will be placed in areas that are set back from the cluster developments to avoid potential odor and noise issues. The plants will be located close to planned roads to provide easy access to them and to avoid the need to construct long driveways or access roads to serve them. The plants will also be placed in areas that will minimize grading and ground disturbance to the extent practical and to avoid impacts to sensitive cultural, historical and biotic resources.

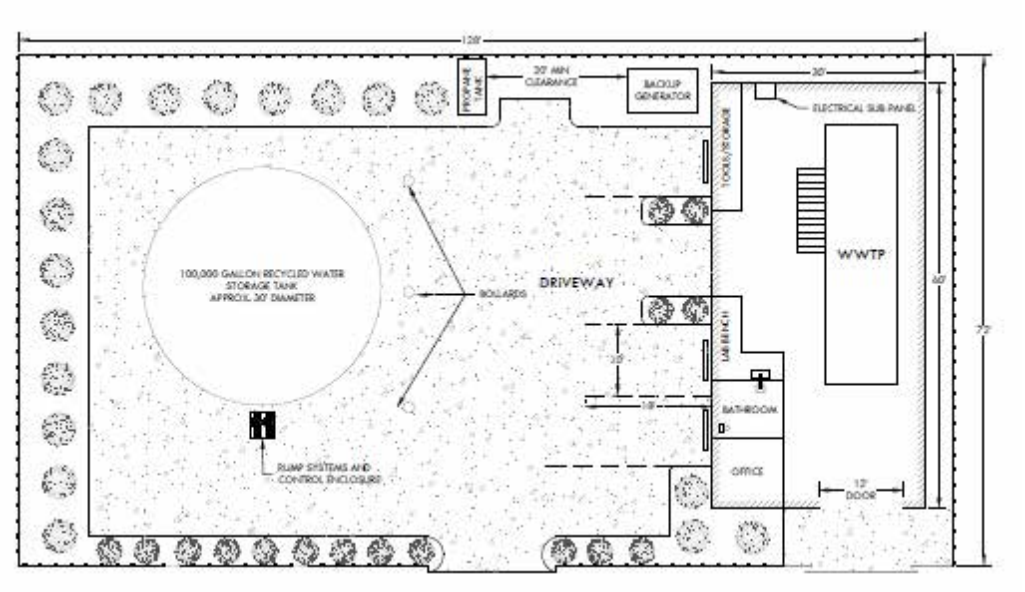

Figure 3. Typical Water Reclamation Facility Layout
- Capacity up to 85,000 Gallon Per Day

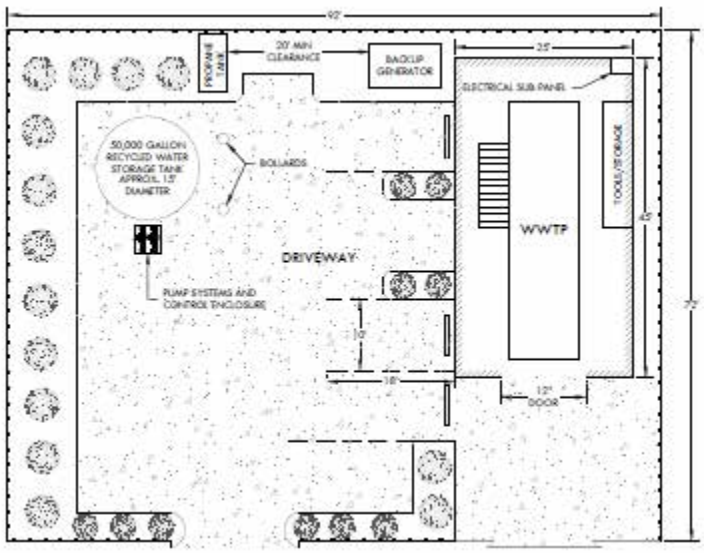

Figure 4. Typical Water Reclamation Facility Layout
- Capacity up to 30,000 Gallons Per Day

7. Analysis of Potential Impacts under the California Environmental Quality Act (CEQA)

This section presents an analysis of the potential impacts related to wastewater systems for the proposed project. In summary, the potential environmental impacts for new wastewater systems should to consider the following issues

1. Can the wastewater improvements be operated and maintain in a manner that does not impact the adjoining properties.

2. Will the propose wastewater facilities and discharge of wastewater be done in a manner that does not impact surface and groundwater at the site.

3. Will the wastewater management practices planned at the project site be consistent with the local and state wastewater management policies for the area? And can the wastewater infrastructure be constructed, operated and maintained to meet the local and state requirements without special conditions of approval?

4. Will the construction and operation of the wastewater systems result in significant environmental impacts to cultural, historical and/or biotic resources.

The following sections address each issue based on the information proved in the previous sections of this wastewater management feasibility study.

7.1. Potential Impacts to Adjoining Properties

All the proposed residential and commercial wastewater facilities are in areas that are remote for adjoining parcels and as planned will not have any potential impacts to the adjoining properties. The design and locations of these facilities will not result in any potential noise or odor nuisance conditions to adjoining property.

7.2. Consistency with Local and State Water Policies and Regulations

The proposed residential and commercial wastewater systems will be designed and operated in accordance with both local and state regulations and standards. The project will not seek any special conditions or variances to meet both local and state standards.

7.3. Recycled Water Policy and Rules

The State Water Resources Control Board supports and encourages the sustainable use of recycled water to promote conservation of water resources. The State's Water Quality Control Policy for Recycled Water was first adopted in 2009 and amended in 2013 and 2018. The project as planned will be consistent with the State's Water Recycling Policy.

The recycled water systems will also be permitted under the State's Water Reclamation Requirements for Recycled Water Use (Order WQ 2016-0068-DDW). The recycled water systems as planned will be consistent with the regulations and standard covered under the State's recycled regulations and associated standards contained in Title 22 Public health rules. The projects will be designed, constructed and operated in accordance with these requirements and as planned will not require any special consideration or variance for approval and permitting.

7.4. Avoidance of Potential Impacts to Cultural, Historical and Biotic Resources

As described in Section 7 the overall wastewater systems will result in decentralized and very localized and small improvements placed at strategic locations of the project site. The majority of improvements will be co-located in areas of other existing and planned improvements, such as installing the sewer collection and conveyance pipelines in the existing and proposed roads and driveways. In some instances, such as the small water reclamation plants and water storage tanks will be placed in small areas typically less than a quarter acre or 12,5000 square feet. These areas will require some site improvements including limited grading and drainage improvements, paving, utilities, and small buildings to house treatment and pumping equipment and related appurtenances.

Based on the amount of land available for these planned facilities, and the studies already conducted, these improvements will be planned to be set back from any significant cultural, historical and biotic resources to avoid any impacts to these resources, if required.

7.5. Avoidance of Potential Impacts to Surface Water and Groundwater Resources

The new commercial wastewater systems will be designed and operated to avoid any potential impacts to both surface and groundwater resources at the site. The majority of wastewater generated at the site will be treated to meet the State's recycled water requirements for tertiary treated wastewater that will produce an effluent with a total nitrogen concentration less than 10 mg/L and the effluent will be disinfected prior to reuse for primary for landscape irrigate purposes. The reuse of high-quality effluent at the site will not impact surface or groundwater resources.

Recycled wastewater will be distributed through a "non-potable" water distribution system. The "non-potable" water distribution system will also convey untreated surface water from the reservoirs on the site and groundwater. A permitted recycled water system will be required by the State to incorporate and maintain reliability features to ensure the safe performance of the recycled water system, such as State approved back flow to prevent cross-connection and contamination of the surface reservoirs and wells by recycled water.

Residential onsite wastewater systems will rely on shallow subsurface disposal systems that will be designed to meet local and state standards for setbacks to surface and separation to groundwater in order to protection these resource on the site.

These measures for both commercial and residential wastewater systems will protection surface and groundwater resources at the site.

8. Summary of Findings and Conclusions

The section provides a summary of the key findings and conclusions related to the project's water supply and feasibility.

1. The wastewater systems will be designed, constructed and operated to comply with local and state water rules for reclaimed water. A reclaimed water permit is required to reuse the wastewater for irrigation.

2. All wastewater systems will be installed and operated so they will not impact water resources on the project site, on the adjacent properties, and will not result in significant impacts as defined under CEQA.

3. All wastewater facilities can be installed and operated in a manner that will avoid any significant impacts to cultural, historical and biotic resources, and will not result in any significant impact as defined under CEQA.

4. The residential lots will have an onsite wastewater system if the results of the site-specific assessment study indicate that an onsite system is feasible. If an onsite system is not feasible the parcel will be connected to a community wastewater system.

5. Future phase of development will require project level CEQA review for final project approval and permitting.

9. References

AES. 2006. Guenoc: Water Rights Modification Project Draft Environmental Impact Report. Prepared for the State Water Resources Control Board

California Department of Water Resources. 2004. *Hydrologic Region Sacramento River, Coyote Valley Groundwater Basin*, California's Groundwater Bulletin 118

California State Water Resources Control Board. 2016. *Water Reclamation Requirement for Recycled Water Use* (Order WQ 2016-0068-DDW

California State Water Resources Control Board. 2018. *Water Quality Control Policy for Recycled Water*

Lake County Code of Ordinances. *1973 County of Lake, California Codified through Ordinance No. 3080, adopted December 18, 2018. (Supp. No.2).*

Maha Developments. 2019. *Specific Plan of Development for the Maha Resort at Guenoc Valley.* Prepared for the County of Lake Community Development Department

RGH Consultants. 2018. Draft Geotechnical Study Report: Maha resort at Guenoc Valley, Farmstead