

# **TECHNICAL MEMORANDUM**

To: Lake County Community Development Department

From: Annjanette Dodd, PhD, CA PE #77756 Exp. 6/30/2023

Date: August 19, 2021

Subject: Ordinance 3106 Hydrology Report – UP 19-36 Lake Vista Farms, LLC 2050 and 2122 Ogulin Canyon Road, Clearlake, (APNs 010-053-01 and 010-053-02)

## INTRODUCTION AND PURPOSE

On July 27, 2021, the Lake County Board of Supervisors passed an Urgency Ordinance (Ordinance 3106) requiring land use applicants to provide enhanced water analysis during a declared drought emergency. Ordinance 3106 requires that all projects that require a CEQA analysis of water use include the following items in a Hydrology Report prepared by a licensed professional experienced in water resources:

- Approximate amount of water available for the project's identified water source,
- Approximate recharge rate for the project's identified water source, and
- Cumulative impact of water use to surrounding areas due to the project.

The purpose of this Technical Memorandum (TM) is to provide the information required by Ordinance 3106 for UP 19-36, Lake Vista Farms, LLC. In addition to the Hydrology Report, Ordinance 3106 requires a Drought Management Plan (DMP) depicting how the applicant proposes to reduce water use during a declared drought emergency. The DMP for this project has been submitted as a separate document.

## **PROJECT LOCATION**

The project is located 2050 and 2122 Ogulin Canyon Road, Clearlake, Lake County, California (APNs 010-053-01 and 010-053-02). The project site is located northeast of the City of Clearlake, about 1- mile east of State Highway 53. The project site is part of a former hops farm, operated as Hops-Meister Farms, cultivating approximately 13.6-acres of hops beginning in about 2009.

## **PROPOSED PROJECT**

The project proposes 15-acres of outdoor cannabis cultivation without the use of light deprivation and/or artificial lighting. The proposed cultivation will be distributed across five (5) sites (Figure 1), labeled A through E.



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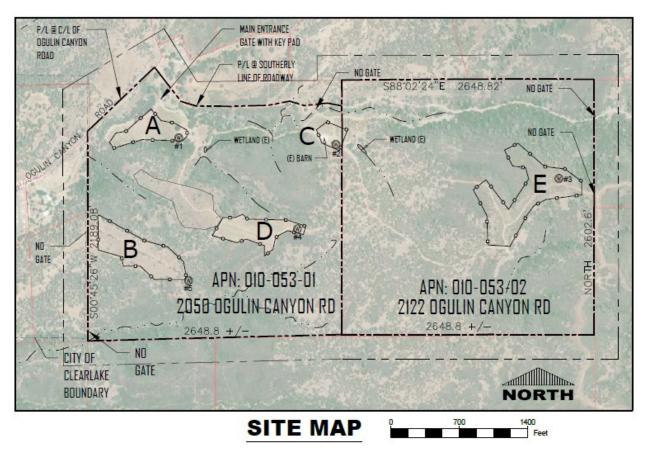


Figure 1. Proposed Site Map

#### **PROJECT WATER DEMAND**

The CalCannabis Environmental Impact Report (CDFA, 2017) uses 6.0 gallons per day per plant as an estimated water demand for cannabis cultivation. This is 1.0 gallons (gpd) per plant more than reported by Bauer et. el. (2015), who reported up to 5.0 (gpd) per plant (18.9 Liters/day/plant). Using the more conservative estimate of 6.0 gpd, and assuming there are approximately 500 plants per acre of canopy (CDFA, 2017), the demand is 3,000 gpd (2.1 gallons per minute [gpm]) per acre of canopy; this use rate is consistent with the Water Use Management Plan section (Section 15.2) of the project's Property Management Plan. The total water demand for 15-acres of canopy is approximately as follows:

- Daily 45,000 gpd (31.5 gpm)
- Yearly
  - 120 day cultivation season 16.6 acre-feet (AF)
  - $\circ$  180 day cultivation season 24.9 AF

## WATER SOURCE AND SUPPLY

There are five (5) existing, permitted groundwater wells that would be used for cultivation. The yield for each well is summarized in the Table 1 and shown on Figures 1 and 3. The well logs are attached to this TM (Attachment 1). The wells range in depth from 114 ft to 460 ft and have a combined yield of 720 gpm

(1,161 acre-feet per year). The potential daily demand of 31.5 gpm represents 4.4% of the combined well yield and between 1.4-2.1% of the combined annual production in acre-feet.

Site	Name (Well Latitude/Longitude)	Groundwater Basin <sup>1</sup>	Well #	Depth (ft)	Yield (gpm)
A	Northwestern Hops Field (38.982011, -122.599900)		1	240	60
В	Southwest Clearing (38.978344, -122.599803)	Burns Valley	5	340	300
С	Northeast Hops Field (38.982033, -122.594181)		2	114	60
D	Central Hops Field (38.979569, -122.595764)	Clearlake	4	358	200
E	Chaparral Clearing (38.980981, -122.586219)	Cache Formation	3	460	100

Table 1. Summary of cannabis cultivation canopy areas for each cultivation site.

<sup>1</sup>California Department of Water Resources, California Groundwater (Bulletin 18)

#### IRRIGATION AND WATER STORAGE

Irrigation for the cultivation operation will use water supplied by the existing wells. The irrigation water would be pumped from each well, via PVC piping, to a 2,500-gallon water storage tank, adjacent to each well, and then delivered to a drip irrigation system. The drip lines will be sized to irrigate the cultivation areas at a rate slow enough to maximize absorption and prevent runoff. Drip irrigation systems, when done properly, conserve water compared to other irrigation techniques.

#### **GROUNDWATER BASIN INFORMATION AND HYDROGEOLOGY**

The project's water sources are located within the eastern portion of the Burns Valley (Basin #5-17) Groundwater Basin and the western portion of the Clear Lake Cache Formation (Basin #5-66) Groundwater Basin (Table 1, Figure 2 and Figure 3).

The Burns Valley Basin is within the Burns Valley Watershed. The Franciscan Formation borders the Burns Valley Basin on the north, Clear Lake borders the basin on the west, and the Cache Formation borders the basin on the south and east. The valley is drained by Burns Valley Creek, flowing southwest, and eventually into Clearlake. There are three water bearing formations in the Burns Valley Basin, The Quaternary Alluvium, Quaternary Terrace Deposits, and Lower Lake Formation. *Quaternary Alluvium* located in the valley lowlands in the southern end of the valley are composed of silt, sand, and gravel with a thickness up to 50 feet. Groundwater in this formation is unconfined and typically provides water for domestic use. *Quaternary Terrace Deposits* have been deposited on the sides of the alluvial plain in the Burns Valley Basin. The terrace deposits are approximately 15 feet above the valley floor and slope up the valley to a similar elevation as the foothill exposures of the Cache Formation. Groundwater in this formation is not well understood. The *Lower Lake Formation*, consisting of lake deposits, underlies the alluvial and terrace deposits in the basin. The formation consists of fine sands, silts, and thick interbeds of marl and limestone, and has a maximum thickness of 200 feet. The formation has low permeability and provides water to wells at up to a few hundred gallons per minute. The California Department of Water Resources (DWR) estimated a storage capacity of the Burns Valley Basin as 4,000 AF with a usable storage

capacity of 1,400 AF. According to DWR, almost all the groundwater in the Burns Valley Basin is derived from rain that falls within the 12.5 square mile Burns Valley Watershed drainage area. According to the Lake County Groundwater Management Plan, dated 2006, agricultural demand during an average year is 105 AF per year; of this, 14 AF is supplied from groundwater. Wells in the valley range in depth between 25-feet and 525-feet. (CDM 2006 and California DWR 2003, 2021)

The Clear Lake Cache Formation Basin shares a boundary with the Burns Valley Groundwater Basin in the southwest. Lower Cretaceous marine and Mesozoic ultrabasic intrusive rocks bound the south of the basin. Lower Cretaceous marine deposits border the east portion of the basin, and the Franciscan Formation borders the north and west portions of the basin. The basin is drained by the North Fork Cache Creek and Cache Creek to the south and east. The primary water-bearing formation is the Cache Formation. The Cache Formation is largely made up of lake deposits. The formation consists of tuffaceous and diatomaceous sands and silts, limestone, gravel, and intercalated volcanic rocks. In some areas the general lithology includes up to 400 feet of blue clay and shale with alternating strata of shale and limestone below 400-feet. The permeability of the formation is generally low. According to the Lake County Groundwater Management Plan, dated 2006, agricultural demand during an average year is 100 AF; of this, 85 AF is supplied from groundwater. Wells in the valley range in depth between 5-feet and 500-feet. (CDM 2006 and California DWR 2003, 2021)

Neither of these basins have been identified by the California Department of Water Resources (DWR) as critically overdrafted basins. Critically overdrafted is defined by DWR as, "A basin subject to critical overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts." In addition, as part of the California Statewide Groundwater Elevation Monitoring (CASGEM) Program, DWR created the CASGEM Groundwater Basin Prioritization statewide ranking system to prioritize California groundwater basins in order to help identify, evaluate, and determine the need for additional groundwater level monitoring. California's groundwater basins were classified into one of four categories high-, medium-, low-, or very low-priority. Both the Burns Valley and Clear Lake Cache Formation Basins were ranked as very low-priority basins by the CASGEM ranking system. (DWR, 2021)

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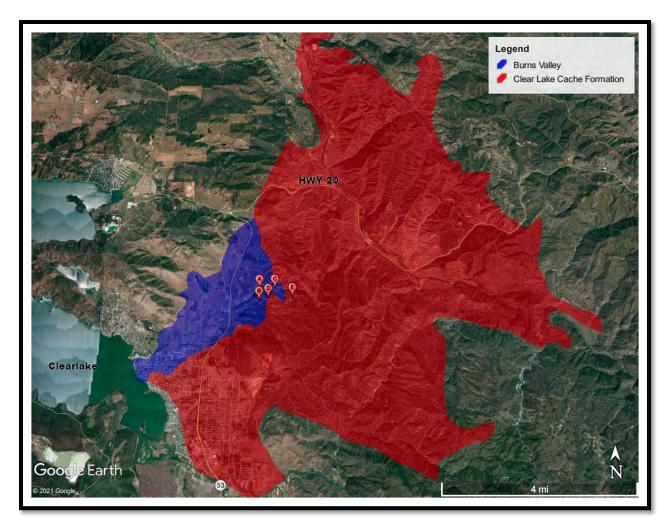


Figure 2. Field Locations (labeled A through E) and Mapped Groundwater Basins



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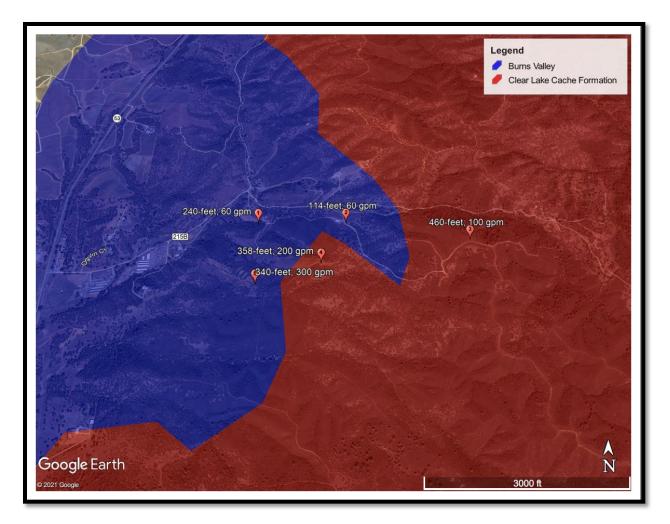


Figure 3. Well Locations (numbered 1 through 5) and Mapped Groundwater Basins

#### **RECHARGE RATE**

The annual recharge can be estimated using a water balance equation, where recharge is equal to precipitation (P) less runoff (Q) and abstractions that do not contribute to infiltration (e.g., evapotranspiration). A simple tool that can be used to estimate runoff and abstractions, that uses readily available data, is the Natural Resources Conservation Service (NRCS) Curve Number (CN) Method (NRCS, 1986). Determination of the CN depends on the watershed's soil and cover conditions, cover type, treatment, and hydrologic condition. The CN Method runoff equation is

$$Q = \frac{(P - I_a)^2}{(P - I_a) + S}$$

where

Q = runoff (inches) P = rainfall (inches) S = potential maximum retention after runoff begins (inches) and  $I_a$  = initial abstraction (inches) The initial abstraction ( $I_a$ ) represents all losses before runoff begins, including initial infiltration, surface depression storage, evapotranspiration, and other factors. The initial abstraction is estimated as  $I_a = 0.2S$ . *S* is related to soil and cover conditions of the watershed through the CN, determined as S = 1000/CN - 10. Using these relations, the runoff equation becomes:

$$Q = \frac{(P - 0.2S)^2}{(P + 0.8S)}$$

The CN is estimated based on hydrologic soil group (HSG), cover type, condition, and land use over the area of recharge, which is estimated as the area of the watershed contributing to the wells. Although well numbers 3 and 4 are located in the Clear Lake Cache Formation, they are on the western boundary and within the Burns Valley Watershed. The approximate area of recharge, 954 acres, was delineated using USGS StreamStats (https://streamstats.usgs.gov/ss/) and is shown in Figure 4.

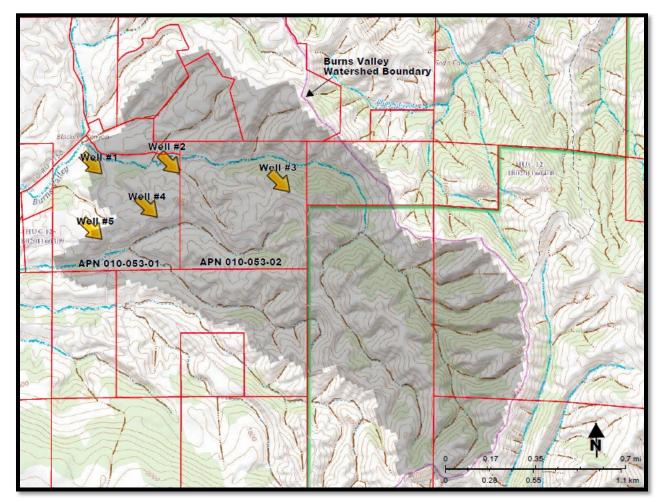


Figure 4. Recharge Area (Shaded Area)

Soils are classified into four HSGs (A, B, C, and D) according to the soils ability to infiltrate water; where HSG A has the highest infiltration potential and HSG D has the lowest infiltration potential. HSGs are based on soil type and are determined from the NRCS Web Soil Survey



#### (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm).

The recharge area is comprised of two HSGs: 942 acres (99%) HSG C and 12 acres (1%) HSG D (Attachment 2). The area is dominated by HSG C. The land use is undeveloped with a cover type of brush in fair (50% to 75% ground cover) condition and has CNs of 70 and 77 for HSGs C and D, respectively. The weighted CN for the recharge area is 70.

The PRISM Climate Group gathers climate observations from a wide range of monitoring networks and provides time series values of precipitation for individual locations (https://prism.oregonstate.edu/explorer/). Using the annual precipitation from 1895 to 2020, as predicted by PRISM, the annual average precipitation over this period is 27.5 inches and the minimum precipitation over this period is 6.5 inches (Attachment 3).

Using the above information, and assuming that 50% of the initial abstraction infiltrates and the remainder is evapotranspiration (0.43 inches or 34.2 AF), the estimated annual recharge over the recharge area of 954 acres is 328 AF during an average year and 228 AF during a dry year (Table 1).

Recharge Area (acres)	P (inches)	CN	S (inches)	I <sub>a</sub> (inches)	Q (inches)	Recharge = P - Q - 0.5*Ia (inches)	Recharge (AF)
954	6.5	70	4.29	0.86	3.2	2.9	228
954	27.5	70	4.29	0.86	23.0	4.1	328

Table 2. Estimated annual recharge over the recharge area of the project's well.

### **CUMULATIVE IMPACT TO SURROUNDING AREAS**

The Burns Valley Groundwater Basin has a storage capacity of 4,000 AF with a usable storage capacity of 1,400 AF (CDM 2006 and California DWR 2003, 2021). The proposed project's demand, 24.9 AF, is 1.8% of the usable storage capacity. In addition, the proposed 15-acres cannabis cultivation is replacing approximately 13.6 acres of hops cultivation. Hops have large leaf area and require a significant amount of water, approximately 1.5-inches of water equivalent per week (Bamka and Dager, 2002). This equates to 40,700 gallons per acre per week or 5,800 gallons per day (gpd) per acre (note: 1 US gallon equates to 231 cubic inches); which is almost double the amount of water used to cultivate cannabis (43.6 AF per year for hops). The proposed cannabis cultivation would use less water compared to farming hops and would have less of an impact on the surrounding area.

Since all five project wells are within the Burns Valley Watershed, it is likely that they would have the most impact on the Burns Valley Groundwater Basin. Annual water demand of the proposed project could be up to 24.9 AF per year, depending on the length of the cultivation season, which is approximately 8% and 11% of the annual recharge during an average and dry year, respectively. The project recharge area of 954 acres would need just under 1-inch of rain per year to meet the project's demand. Thus, there is sufficient rainfall recharge, on an annual basis, to meet the project's demand, even during low precipitation years.

According to the Lake County Groundwater Management Plan, there are 86 domestic wells and 9 irrigation wells in the Burns Valley Basin and agricultural demand during an average year is 105 AF per year; of this, 14 AF is supplied from groundwater. The Groundwater Management Plan is dated 2006, and does not include the demand from the hops farm. With the 13.6-acre hops farm included, the average

annual groundwater demand for irrigation is 57.6 AF. Replacing the 13.6-acres of hops with 15.0-acres of cannabis reduces the average annual demand from 57.6 AF to 38.9 AF or only 2.8% of the usable storage capacity in the Burns Valley Basin.

The Burns Valley Groundwater Basin appears to have sufficient storage and recharge to meet the proposed projects' water demand, during both a dry and average rainfall year. In addition, the proposed cannabis cultivation uses less water than the previous hops farm. Therefore, the proposed project water use would not likely have a cumulative impact on the surrounding area.

## **QUALIFICATIONS OF AUTHOR**

I am a registered Professional Engineer with the State of California with 30-years of experience practicing and teaching Water Resources Engineering.

### REFERENCES

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### Attachments:

- 1. Well Logs
- 2. NRCS Soil Survey Results
- 3. PRISM Climate Precipitation 1895 to 2020

ATTACHMENT 1 WELL LOGS LAKE VISTA FARMS, LLC

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Well #4, Field D TRIPLICATE STATE OF CALIFORNIA DWR USE ONLY - DO NOT FILL IN **Owner's Copy** WELL COMPLETION REPORT STATE WELL NO. STATION NO. Refer to Instruction Pamphlet Page \_\_\_\_ of. No. 0963040 **Owner's Well No.** Date Work Began LATITUDE LONGITUDE S. Ended Local Permit Agency OUN APN/TRS/OTHER Permit No. Permit Date EOLOGIC LOG WELL OWNER VERTICAL ORIENTATION ( 2) HORIZONTAL ANGLE (SPECIFY) Name, FAR DRILLING Mailing Address METHOD FLUID . DEPTH FROM DESCRIPTION Corta SURFACE ALTA Describe material, grain size, color, etc. E F WELL LOCATION 201 Address Dulia City County APN Book 010 Page 053 Parcel Holen Township : \_ Range Section Lat. N Long\_ DEG. SEC DEG. MIN MIN. SEC LOCATION SKETCH ACTIVITY (1) NORTH NEW WELL MODIFICATION/REPAIR --- Deepen WPPER Cither (Specify) 010,111 well DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG") USES (∠) WATER SUPPLY Domestic \_\_\_\_ Public Irrigation \_\_\_\_ Industrial WEST EAST MONITORING TEST WELL \_ CATHODIC PROTECTION HEAT EXCHANGE DIRECT PUSH IN JECTION VAPOR EXTRACTION SPARGING SOUTH -REMEDIATION . Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE. OTHER (SPECIFY) . WATER LEVEL & YIELD OF COMPLETED WELL DEPTH TO FIRST WATER 280FL) BELOW SURFACE DEPTH OF STATIC WATER LEVEL (FL) & DATE MEASURED 200 T (GPM) & TEST TYPE A ESTIMATED YIELD . 10 (Feet) TOTAL DEPTH OF BORING \_\_ TEST LENGTH \_\_\_\_ \_ (Hrs.) TOTAL DRAWDOWN\_ (Ft) TOTAL DEPTH OF COMPLETED WELL S(Feet) \* May not be representative of a well's long-term yield. DEPTH FROM SURFACE CASING (S) ANNULAR MATERIAL BORE-DEPTH TYPE (≤) FROM SURFACE TYPE DIA. SCREEN CON-DUCTOR FILL PIPE MATERIAL / INTERNAL GAUGE SLOT SIZE BLANK BEN-CF-(Inches) DIAMETER OR WALL MENT TONITE FILTER PACK Ft. Ft. FILL to (Inches) THICKNESS (Inchas) Ft Ft. (TYPE/SIZE) (=) (1) (2 V K Ø V 032 1 arkue 11 ATTACHMENTS ( ) CERTIFICATION STATEMENT I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief. Geologic Log Well Construction Diagram NALIE PRINTER Geophysical Log(s) \_ Soil/Water Chemical Analyses Other ATTACH ADDITIONAL INFORMATION, IF IT EXISTS. Signed C-57 EIGENBED WATER WELL CONTRAC DWR 188 REV. 05-03

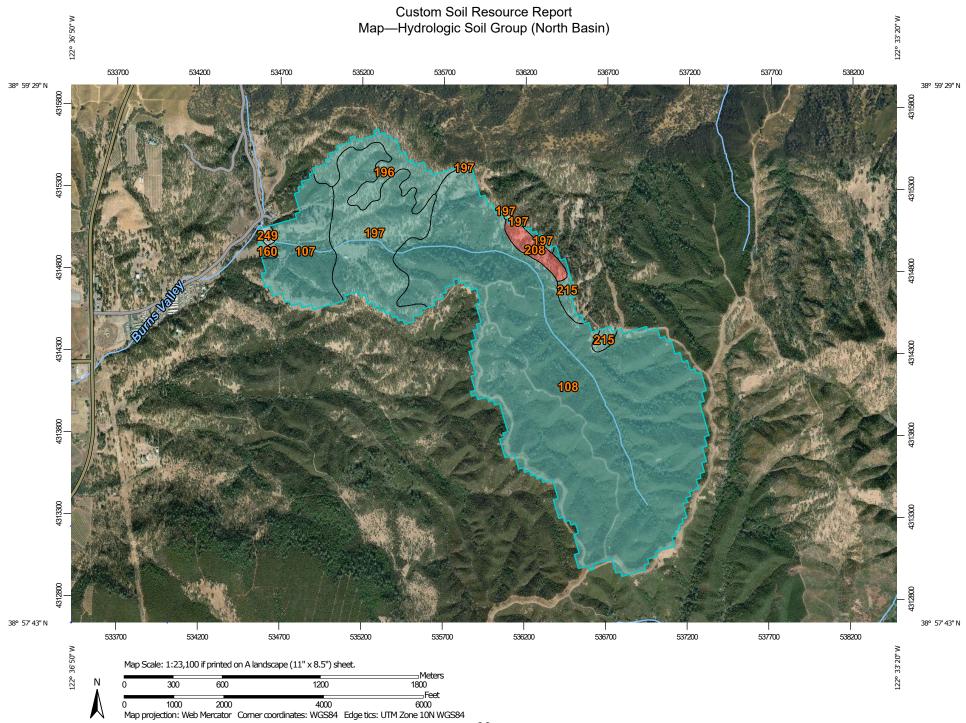
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

*The free /	Adobe Rei	ader may b	e used to view a	and complete	this form. However, s	oftware mus	st be purchas	ed to comp	lete, save,	and reuse	a saved f	Well	#5, Field B
File Origin	nal with C	DWR				te of Califo		1		DW	R Use On	nly – Do	Not Fill In
Page	1	of /			Well Cor	npletic	on Repo	ort		1	1 1	1	
Owner's \	Vell Nurr					o instruction P				State		mber/Sit	le Number
Date Wor	k Began	4-8-2	20	Date	Work Ended 4-10	0-20				Latitude	N		Longitude
Local Per	mit Agen	CY LAK	e County	Envire	mental He	alth				Lauibue	1	1 1	
Permit Nu	mber 4	1E-5	331 <u>46</u>	Permit Da	te 3-17-2	0					APN	TRS/Oth	er
			Geolog	gic Log			1	al a succession of the succession		Well	Owner		an a
Orie	ntation	<ul> <li>Vertic</li> </ul>			OAngle Specify		Name	AKEL	ista 1				
Drilling 1	Method	41 - Ra	Harry		Drilling Fluid -	-			105 Cl			10,0	•
	from Su				cription		Can De	ta lea	h 6	Str UI	cn I	190	zip 94952
Feet	to Fe		rown C/		grain size, color, etc		City _						
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60	100		rown 5		r cray	Address	2030	Dogy	lin C	anya	1 10.	ALAT	
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24	28	and the second	reen 5		CAY S	1910	Latitude	Dea	Min.	Sec.	V Longitu	ude	Neg. Min. Sec.
280	30				avels CAM	alel	Datum		Dec. Lat.				Long.
300	34				Green S)				Page			Parce	<u> </u>
150	151	- 3	, cen y	me	- censi	MIC	Townshi		Range			Secti	Contraction of the American States and the second second
								A Design of the local diversion of the local	tion Ske		1	0008	Activity
							(Sketch r		n by hand aft		rinted )	N	ew Well
							1		North			0 M	odification/Repair
							11			~			Deepen
									4.	120	-		Other estroy
												D	escribe procedures and materials rider "GEOLOGIC LOG"
							11	1				Concession in the owner of	Planned Uses
							11	1			1		ater Supply
							11	1					Domestic Public
							West	1			East		Irrigation Industria
									1.			00	athodic Protection
						- Andread and a state of the st	11	mf	Bulin	Canyon			ewatering
			non understand der anderstander soller	anal analy a polytical grade of the days	Sector and an experimental sector and a sector of the sect		11	i I		X	-11		eat Exchange
			and an and a second second second second				11	NI			$\langle \rangle$		jection
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							41	H=			14		parging
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						dation of the second	l liuritaria co da	L distance	South of well from row	when the Latin and			apor Extraction
							rivers, siz. and Plases be an	d atach a map	Use additional mplete	paper il nece	акачу.	00	ther
				million and the serve and the	1		and the second s	No. of Concession, Name	d Yield o	the second s		Voll	
					and a construction of the second s				200'		icted i		t below surface)
ļ							Depth to	Static					
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Total D	epth of B	oring	34		Feet				3004	(GPN	1) Test	Туре	4.1-1.Ft
Total D	epth of C	ompleted	Well 34	0	Feet			ngth <u>21</u>	sentative				lown(Feet)
<u> </u>				Cas	inge			t oo repie		or a well			
Depth	from	Borehole	Ŧ	Cas	14/-11	Outside	Screen	Slot Size	Denti	from	Annul	ar Ma	terial
Sur	face	Diameter	Туре	Mater	Thickness	Diameter	Туре	if Any	Sur	face	Fi	11	Description
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240		10,50	F-480	PVC	340	6"	Perfs.	.032	11	21	Bent		JELAT
			1 10-			-		-use	21		510		Gravel Park
									1	-1-	-151		
		5											
		2		·									
		Attachn	nents				0	Certificat	tion Stat	ement			
	Geologic	and the second statement of th			I, the undersigned,	certify that					the bes	t of my	knowledge and belief
	Well Con	struction I			Name Will Ye	tersan h	Rel Dr.	)					
		ical Log(s			P.O. Box	695	2001	K	else y	1.116	20	A	95451
-		er Chemic	al Analyses		Signed With	XA	•		City	4-10	-20 51	late	90520
	Other	nation, if it ex	sts.			nsed Water W	fell Contractor			Date Sig	and a state of the	sector of the sector where the sector	ense Number
DWR 188					IF ADDITIONAL SPACE			NSECUTIVE	LY NUMBER	Accession of the second			

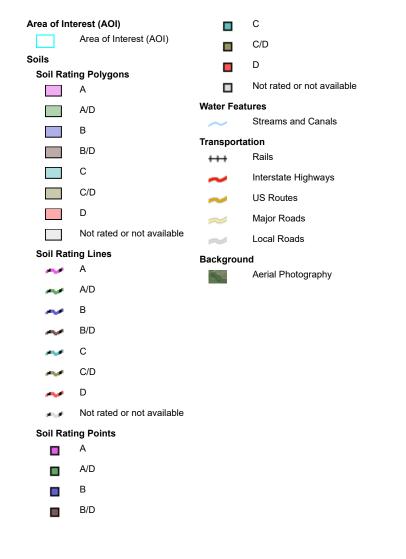


1

ATTACHMENT 2 NRCS SOIL SURVEY RESULTS HYDROLOGIC SOIL GROUPS LAKE VISTA FARMS, LLC



### MAP LEGEND



#### **MAP INFORMATION**

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service Web Soil Survey URL: Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lake County, California Survey Area Data: Version 17, Jun 1, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 18, 2016—May 10, 2019

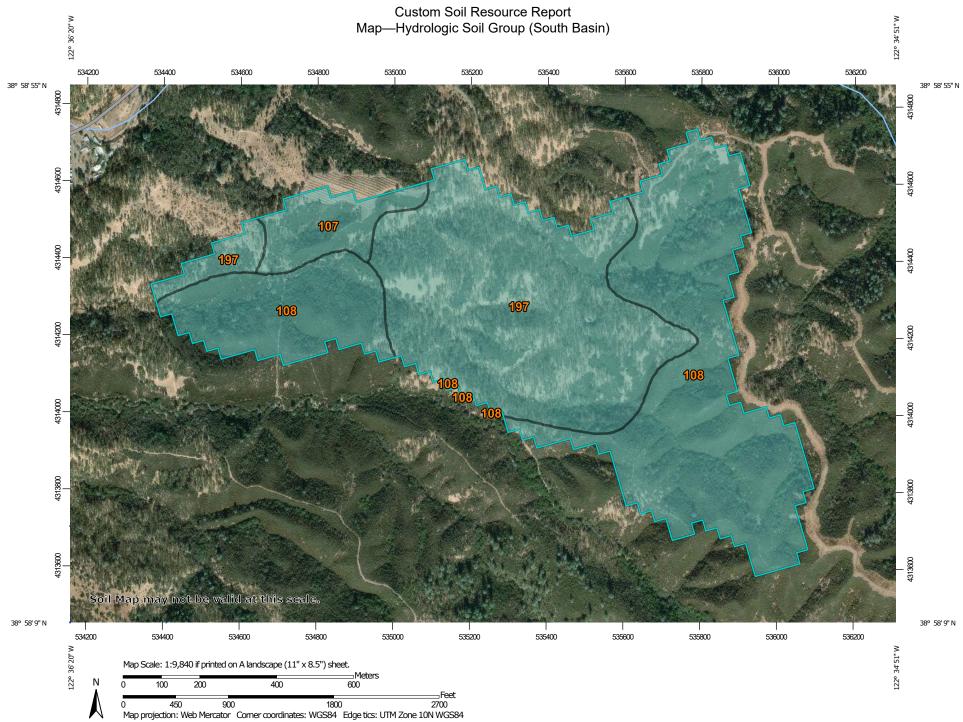
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

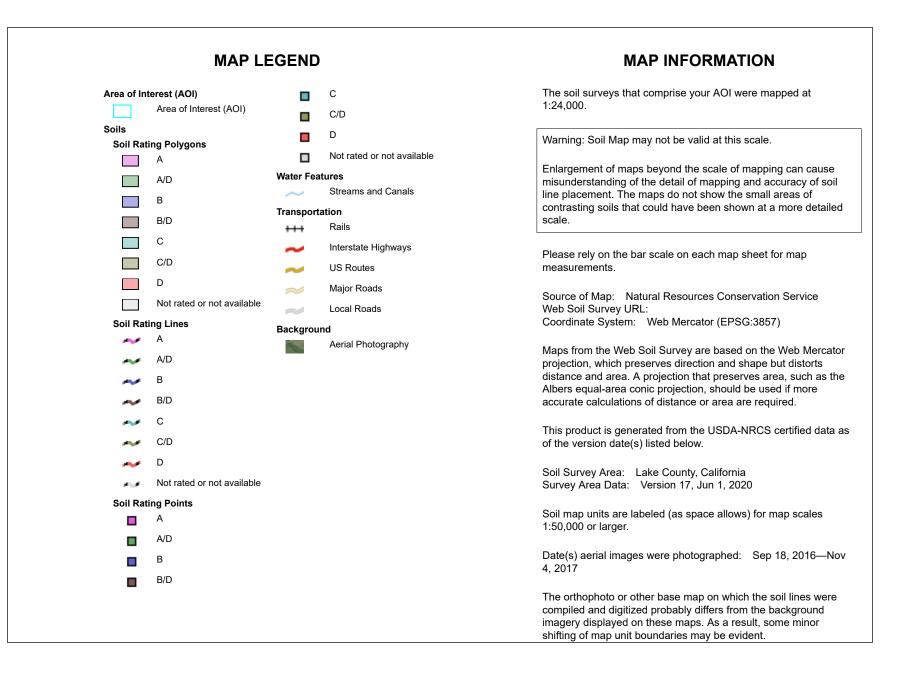
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
107	Bally-Phipps complex, 15 to 30 percent slopes	С	61.8	8.5%
108	Bally-Phipps- Haploxeralfs association, 30 to 75 percent slopes	C	507.5	69.4%
160	Manzanita loam, 5 to 15 percent slopes	С	1.9	0.3%
196	Phipps complex, 15 to 30 percent slopes	С	34.0	4.6%
197	Phipps complex, 30 to 50 percent slopes	С	102.3	14.0%
208	Skyhigh-Asbill complex, 15 to 50 percent slopes	D	11.5	1.6%
215	Sleeper variant-Sleeper loams, 30 to 50 percent slopes	С	10.0	1.4%
249	Xerofluvents-Riverwash complex		2.0	0.3%
Totals for Area of Inter	est		731.0	100.0%

## Table—Hydrologic Soil Group (North Basin)

## Rating Options—Hydrologic Soil Group (North Basin)

Aggregation Method: Dominant Condition Component Percent Cutoff: None Specified Tie-break Rule: Higher





## Table—Hydrologic Soil Group (South Basin)

			1	
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
107	Bally-Phipps complex, 15 to 30 percent slopes	С	13.8	6.2%
108	Bally-Phipps- Haploxeralfs association, 30 to 75 percent slopes	С	112.3	50.6%
197	Phipps complex, 30 to 50 percent slopes	С	95.8	43.2%
Totals for Area of Inter	est	222.0	100.0%	

# Rating Options—Hydrologic Soil Group (South Basin)

Aggregation Method: Dominant Condition Component Percent Cutoff: None Specified Tie-break Rule: Higher ATTACHMENT 3 PRISM PRECIPITATION 1895-2020 LAKE VISTA FARMS, LLC

## **PRISM Time Series Data**

	Time Series Da			
		Lon: -122.5945	Elev: 1634ft	
Climate v	variable: ppt			
Spatial re	esolution: 4km			
Period: 1	895 - 2020			
Dataset:	AN81m			
PRISM d	lay definition: 2	4 hours ending at	1200 UTC on th	e day shown
Grid Cell	Interpolation:	On		
Time ser	ies generated:	2021-Aug-16		
Details:	http://www.pri	ism.oregonstate.	edu/documents/	PRISM_datasets.pdf
Date	ppt (inches)			
189	33.45			
189	6 39.39			
189	26.36			
189	14.99			
189	9 35.97		p	pt (inches)
190	0 24.78		Average	27.5
190	26.17		Minimum	6.5
190	34.35			
190	3 26.73			
190	4 42.74			
190	5 23.09			
190	6 43.07			
190	35.61			
190	18.71			
190	9 45.28			
191	0 17.39			
191	1 33.86			
191	2 20.46			
191	3 26.18			
191	4 31.14			
191	5 35.54			
191	6 29.98			
191	7 13			
191	8 20.62			
191	9 22.96			
192	29.78			
192	24.1			
192	27.53			
192	14.67			
192	4 21.03			
192	26.1			
192	.6 34.49			
192	28.45			
192	20.62			
192	.9 15.29			
193	0 17.41			

1001	05.01
1931	25.01
1022	12 77
1932	12.77
1933	20.87
1934	18.91
1025	
1935	25.48
1936	25.52
1950	
1937	34.4
1938	31.82
1020	12 (2
1939	12.63
1940	46.02
1941	45.09
1942	32.28
1943	21.27
1943	
1944	26.49
1945	29.24
1046	
1946	14.2
1947	16.79
194/	
1948	23.39
1949	16.78
1050	
1950	34.38
1951	29.78
1952	34.45
1953	21.19
1054	20.20
1954	29.38
1955	24.98
1956	21.1
1957	30.79
1958	35.6
	55.0
1959	20.63
1960	27.07
1961	20.06
1901	20.06
1962	27.04
1963	28.52
1064	22
1964	23
1965	25.92
1966	22.66
1967	27.6
1968	30.44
1900	
1969	34.03
1970	35.32
	17.7
1971	1/./
1972	19.37
1973	41.58
1974	23.99
1975	24.29
1976	
	8.63
	8.63
1977	8.63 19.17

1978	30.24
1979	34.99
1980	24.62
1981	31.16
1982	33.5
1983	62.26
1984	21.22
1985	16.61
1986	38.61
1987	27.83
1988	17.57
1989	20.95
1990	16.75
1991	24.08
1992	29.87
1993	36.33
1994	21.27
1995	55.42
1996	36.89
1997	30.2
1998	52.5
1999	23.46
2000	27.45
2001	36.14
2002	28.7
2003	32.85
2004	33.62
2005	39.04
2006	34.76 13.57
2007 2008	19.35
2008	19.55
2009	33.89
2010	23.12
2011	30.45
2012	6.46
2013	31.29
2015	18.08
2016	35.65
2017	43.57
2018	23.61
2019	43.17
2020	9.92