NORTHPOINT
CONSULTING GROUP, INC.

TECHNICAL MEMORANDUM

To: Lake County Community Development Department

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

Date: March 7, 2022

Subject: Ordinance 3106 Hydrology Report
11450 and 11474 Spruce Grove Drive, Lower Lake, California (Cultivation APNs: 012-059-10, 012-059-11, 012-045-41, and 012-045-42; Non-cultivation APNs: 012-059-12, 012-059-13, 012-059-14, 012-045-39, 012-045-40, and 012-045-43)

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 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. Ordinance 3106 also 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 at 11450 and 11474 Spruce Grove Drive, Lower Lake, California (Cultivation APNs: 012-059-10, 012-059-11, 012-045-41, and 012-045-42; Non-cultivation APNs: 012-059-12, 012-059-13, 012-059-14, 012-045-39, 012-045-40, and 012-045-43). Total property area amounts to 502.4 acres. The cultivation area is located approximately 2.8 miles southeast of Lower Lake and is accessed from Spruce Grove Road.

PROPOSED PROJECT

The proposed project is to permit commercial cannabis cultivation in accordance with the Lake County Zoning Ordinance (Article 27). The proposed project has two phases. Phase 1 is proposing Type 3A Outdoor Cultivation for a total canopy area of up to 1,089,000 sq. ft. (25 acres). Phase II is proposing Type 3B Mixed Light Cultivation for a canopy area up to 550,000 sq. ft. (12.6 acres). The proposal includes the

development of facilities appurtenant to cultivation, including facilities for drying and curing of harvested cannabis, ancillary nursery, storage sheds, the appropriate irrigation infrastructure.

SITE DESCRIPTION

The site is accessed by a private gravel and dirt road off Spruce Grove Road. Prior to the establishment of the proposed cultivation operation, land use was livestock pasture, open space, and rural residential. Two existing residences are present on APN 012-059-11. The topography of the cultivation area is relatively flat with a gentle slope to the west, with elevations ranging from 1,368 feet to 1,410 feet.

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 16.2) of the project's Property Management Plan. The total estimated water demand is as follows:

Phase 1 (25.0 acres of outdoor canopy):

- Daily
  - 75,000 gpd (52.1 gpm)
- Yearly (180-day cultivation season)
  - 41.4 AF per year

Phase 2 (12.6 acres of mixed-light canopy):

- Daily
  - 37,800 gpd (26.3 gpm)
- Yearly (300-day cultivation season)
  - 34.8 AF per year

WATER SOURCE AND SUPPLY

The irrigation water source is an existing groundwater well (Lat/Long: 38.9003, -122.59729). The well is approximately 183 feet deep. A well production test was completed by JAK Drilling Pump on January 11, 2022 (Attachment 2). The static water level was reported at 27.3 feet below ground surface (bgs). The average pumping rate reported was 70 gpm over a 6-hour pump test. The water level dropped to 43.33 feet bgs during the first 5 minutes and down to 101.5 feet bgs after about 3 hours where it remained stable for the remainder of the pump test. The well water level began to recharge immediately upon cessation of pumping and recovered to 47 feet bgs within 40 minutes of cessation of pumping.

IRRIGATION METHOD AND WATER STORAGE

The project proposes to use the existing permitted groundwater well to fill fifteen (15) 5,000-gallon water tanks distributed across three locations within the proposed cultivation areas, amounting to a total of

75,000-gallons of storage (Attachment 1). Water from the storage tanks will be piped to drip irrigation systems in individual gardens. Drip lines will be sized to irrigate the cultivation areas at a slow rate to maximize absorption and prevent runoff. Drip irrigation systems, when implemented properly, conserve water compared to other irrigation techniques.

GROUNDWATER BASIN INFORMATION AND HYDROGEOLOGY

The project water source is approximately 0.75 miles south of the southern-most boundary of the Lower Lake Valley Groundwater Basin (LLVGB), identified as California Bulleting 118 Groundwater Basin #5-30 (Figure 1).

Lower Lake Valley Groundwater Basin (LLVGB)

The LLVGB is a long, narrow 2,400-acre basin located at the southeast end of Clear Lake. The aquifer system of the LLVGB consists of two water bearing formations primarily composed of deposits of the Quaternary alluvium, 50 to 75-feet thick, and Plio-Pleistocene Cache Formation, underlying the younger alluvial deposits over about two-thirds of the basin. Recharge in the LLVGB is derived from precipitation and seepage from Herndon, Copsey, and Seigler Canyon Creeks, and Clearlake as well as infiltration of rain over the Cache Formation. Storage capacity is estimated to range from 3,000 to 4,000 acre-feet. Additional capacity is available as part of the Cache Formation; however, thickness and specific yield of that formation is unknown. Well yields in the Cache Formation range between 150 and 240 gpm.

The LLVGB has not 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. LLVGB is ranked as very low-priority basins by the CASGEM ranking system (DWR, 2021).

Copsey Creek Groundwater Basin (CCGB)

The project water source and cultivation area are located at the northern boundary of an alluvial valley within the Copsey Creek Watershed (Figure 1 and Figure 2). Although not identified as a California Bulletin 118 Groundwater Basin, USGS topographic mapping and Well Completion Reports (WCRs) within the area indicate the presence of an alluvial basin associated with the lower Copsey Creek Watershed (Figure 2Figure 1). The Copsey Creek Watershed drains towards the north and is tributary to Cache Creek, which is tributary to the Sacramento River miles to the east. The estimated alluvial area extent of the Copsey Creek Groundwater Basin (CCGB) is approximately 1,630 acres or 2.54 square miles (sq. mi.). Groundwater in around Clear Lake primarily occurs in unconsolidated alluvium comprised of clay, silt, sand, and gravel deposits, where the primary sources of groundwater recharge are from infiltration of precipitation and percolation of streamflow. In CCGB, recharge is likely to occur over the Copsey Creek Watershed.

WCRs maintained by the California Department of Water Resources in the area overlying the CCGB were reviewed to garner an understanding of the characteristics of the CCGB. Sixty (60) WCRs were reviewed,

40 of which were drilled into the alluvium, with alluvium depths ranging between 15 and 66 feet bgs, associated with the CCGB (Attachment 3). Many of the WCR geologic logs reported wells drilled to depths beyond alluvium and into underlying volcanic deposits or marine sedimentary basement rock, generally comprised of shales and sandstones. Similar to the adjacent LLVGB, there are likely at least two water bearing formations associated with the CCGB, an upper alluvium and additional underlying geologic unit(s) within a mix of mostly well consolidated Upper and Lower Cretaceous, Jurassic, and Paleocene sandstones, shales, and conglomerates (Figure 3). The California Geologic Map also includes intermixed Quaternary volcanic flow rocks and minor pyroclastic deposits present on the eastern margin of the CCGB. Based on the depth of the project well, the well likely draws water from aquifers associated with both the alluvial and underlying sandstone and shale basement rock geologic units.

The storage capacity of the CCGB is estimated by multiplying the volume of the aquifer by the specific yield of unconsolidated alluvial sediments. The aquifer thickness is estimated as the difference between the average depth of alluvium and the average depth to static groundwater table (Attachment 3). A specific yield of 8% for unconsolidated alluvial sediments used in similar calculations for nearby alluvial groundwater basins is used (Upson 1955, CDWR, 2003). The storage capacity of the CCGB is approximately 2,600 AF.

- Aquifer Area: 1,630 acres
- Average Static Groundwater Depth: 17 ft BGS
- Average Depth of Alluvium: 37 ft BGS
- Average Aquifer Thickness: 20 ft
- Specific Yield: 8%
- Calculated Storage Capacity: 2,600 AF

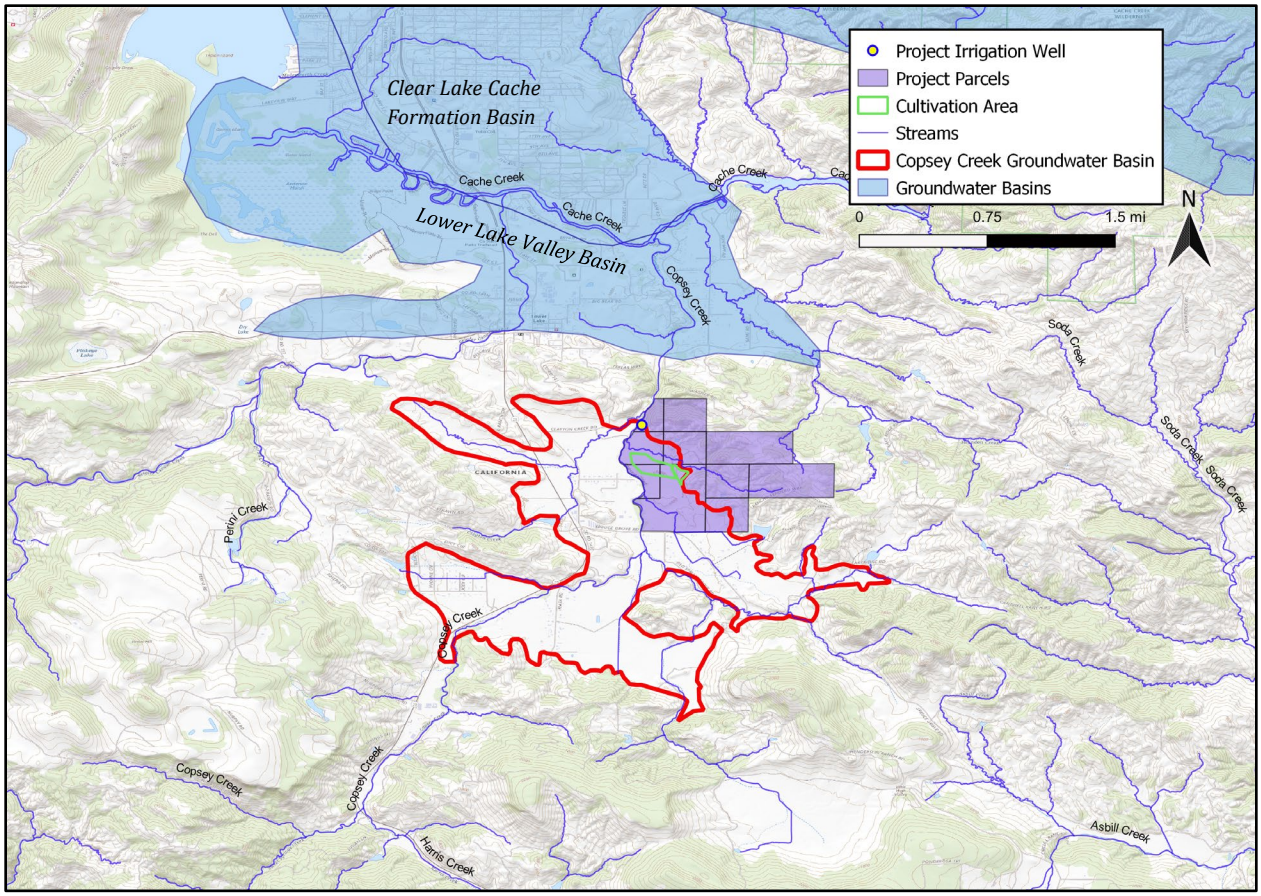

Figure 1: Copsey Creek Groundwater Basin and surrounding area

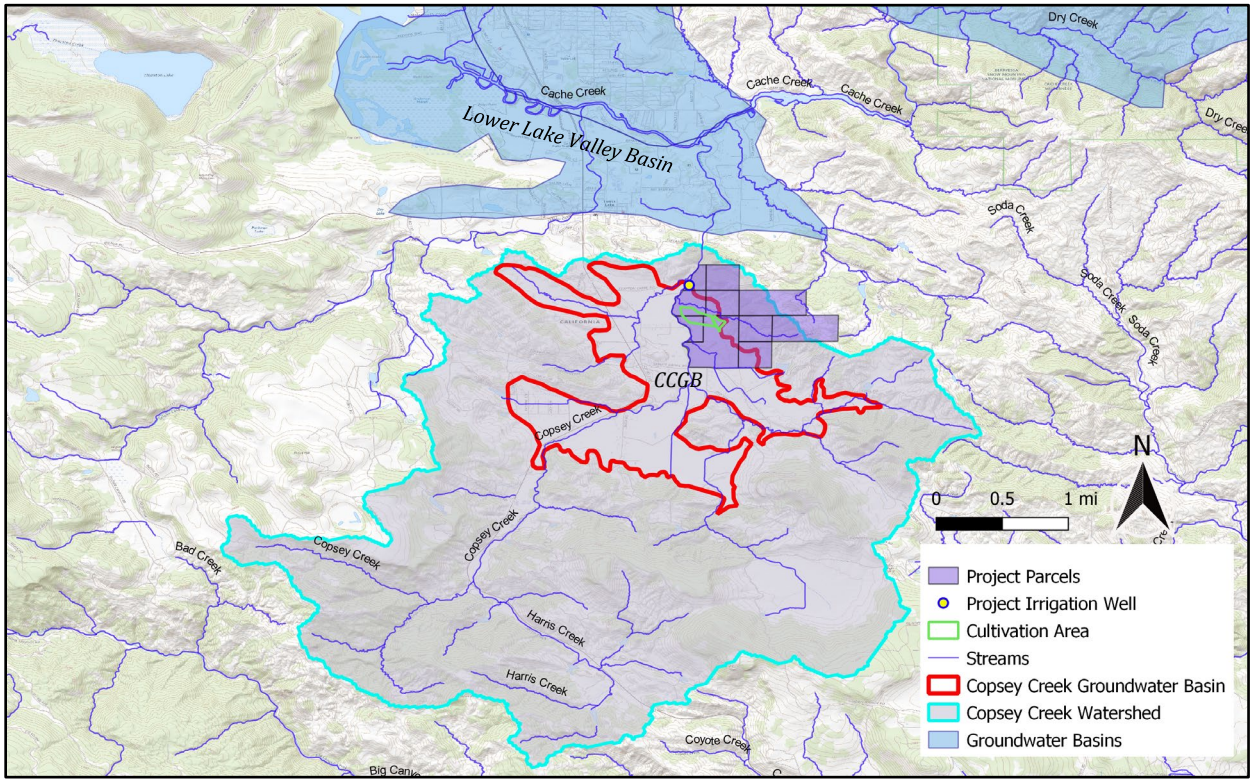

Figure 2: Copsey Creek Groundwater Basin, Copsey Creek Watershed, and surrounding area

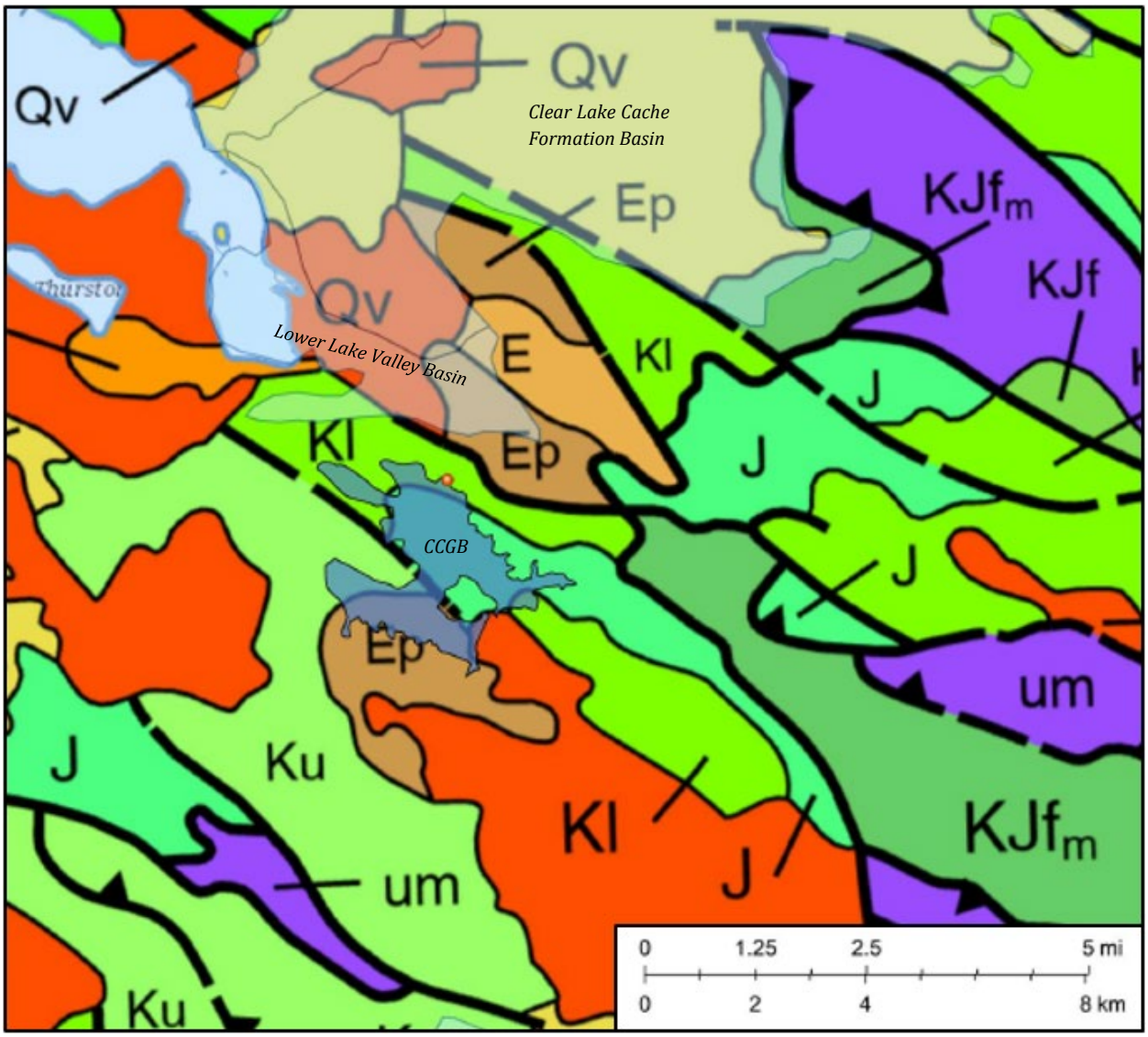

Figure 3: Geologic Map of California with the CCGB and location of the project irrigation well.S 'J' = Jurassic shale, sandstone, conglomerate, chert, and slate with minor pyroclastic rocks. For a complete list of all unit descriptions, visit Geologic Map of California.

Water Demand in the CCGB

The existing water demand in the CCGB was estimated herein based on the distinct County parcels intersecting with the CCGB area. Since there is no existing water service district in the CCGB, it is assumed that water in the basin is sourced by groundwater wells. There are 276 parcels intersecting the CCGB area.

Domestic – There are about 250 households that potentially rely on groundwater for domestic use in the CCGB. Domestic water use is approximately as 300 gallons per day (gpd) per household (How We Use Water | US EPA). The annual domestic groundwater demand is approximately 84 AF (3.2% of the total storage capacity of the CCGB)

Agriculture – Agricultural water demand was estimated using Lake County Crop type percentages and

irrigation demands provided by the Lake County Water Demand Forecast (CDM, 2006, Table 3-1) and assuming that 50% of the agricultural land (50% of 977 acres) is in crop production. The estimated annual agriculture demand is provided in Table 1. The approximate current annual agriculture demand is 1,025 AF, which is 39% of the storage capacity.

Table 1. Estimated agriculture demand in the CCGB.

Crop	% of Farmland	Area (acres)	Demand (AF/acre)	Total Demand (AF/year)
Wine Grapes	50	244	0.6	147
Pasture	20	98	4.4	430
Truck Crops	1	5	1.9	9
Pears	17	83	2.9	241
Rice	5	24	4.5	110
Walnuts	6	29	3.0	88
	99	484	Total	1,025

The potential annual water demand in the CCGB is 1,109 AF, which is 42.7% of the basin's storage capacity. These are likely conservative estimates that assume *maximum* water use due to the assumption of exclusive groundwater use to meet water demands.

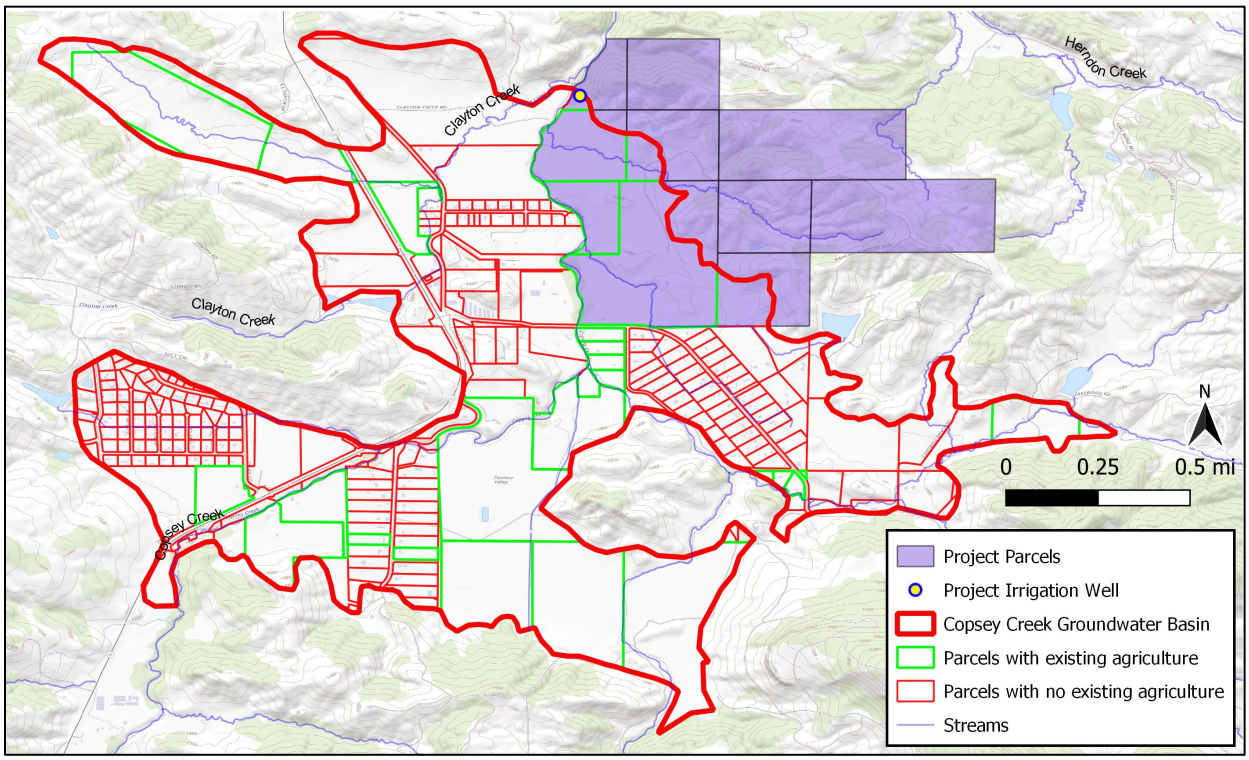

Figure 4: County parcels intersecting the Copsey Creek Groundwater Basin

GROUNDWATER SOURCE RECHARGE RATE

Annual groundwater 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). The CN is an empirical parameter used to predict runoff or infiltration from excess rainfall. 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. The wells are located within our delineation of the CCGB (Figure 2). To make a conservative estimate of groundwater availability, we estimated groundwater recharge for the portion of project parcels (415 acres) that drains via the Copsey Creek watershed and could contribute to groundwater recharge of the CCGB aquifer system (Figure 2). The approximate area of recharge, 414 acres, was within the delineated Copsey Creek Watershed (10,500 acres, Figure 4) according to USGS StreamStats (https://streamstats.usgs.gov/ss/).

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: 138 acres HSG C (33%), and 277 acres HSG D (66%) (Attachment 4). The cover types are a combination of oak woodland, oak savanna, chaparral, and pasture, range, or annual grassland. All land cover types were considered in 'fair condition' due to moderate to low land use intensity. The CNs and areas are summarized in Table 2. The weighted CN for the recharge area is 78.

Table 2. Land Use and Curve Numbers.

Land Cover Classification	Land Use Type	HSG	Condition	CN	Area (acres)	Weighted CN
Range/Annual grassland	Range/ Grassland	C	Fair	79	7	78
		D	Fair	84	39	
Blue Oak Woodland/Oak savanna	Woods-grass combination	D	Fair	82	185	
Chaparral/ brush	Brush	D	Fair	77	53	
Oak woodland	Woods	C	Fair	70	131	

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 29.7 inches and the minimum precipitation over this period is 6.0 inches (Attachment 5).

Using the above information, and assuming that 50% of the initial abstraction infiltrates and the remainder is evapotranspiration (0.28 inches or 9.7 AF), the estimated annual recharge over the recharge area of 415 acres is 99 AF during an average year and 74 AF during a dry year (Table 3).

Table 3. Estimated annual recharge over the recharge area of the project's well.

Recharge Area (acres)	P (inches)	CN	S (inches)	I_a (inches)	Q (inches)	Recharge = $P - Q - 0.5*I_a$ (inches)	Recharge (AF)
415	6.0	78	2.82	0.56	3.6	2.1	74
415	29.7	78	2.82	0.56	26.6	2.9	99

CUMULATIVE IMPACT TO SURROUNDING AREAS

The annual water demand of the proposed project would be 41.4 AF and 34.8 AF during Phase 1 and Phase 2, respectively. The maximum demand would occur during Phase 1, which is is approximately 44% and 58% of the annual recharge, over the project's parcels, during an average and dry year, respectively. Overall, the project would need 1.25 inches of rainfall to infiltrate into the project property area (415 acres) and recharge groundwater to meet the project's demand. To be conservative, the recharge area used to estimate the annual recharge for the project was only the area associated with the project's parcels. This area, 415 acres, is only 4% of the recharge area of the Copsey Creek Watershed, 10,500 acres. The estimated recharge over the project parcels is 99 AF and 74 AF during an average and dry year, respectively – thus, there is sufficient recharge on an annual basis to meet the project's demand, even during dry years.

The project and project's water source are within the CCGB. The estimated storage capacity of the basin is approximately 2,600 AF. The proposed project would utilize about 1.3-1.6% of the available storage capacity. Existing annual groundwater demand in the CCGB is approximately 1,109 AF. Cumulatively, the estimated demand plus the proposed project's demand represents approximately 44.2% of the usable storage capacity of the CCGB. Thus, there is sufficient storage capacity to meet the proposed project's

demand.

Because the groundwater basin is undefined, the recharge rate was determined using an estimate of the recharge area, and the in-situ characteristics of the water source (e.g., perched aquifer, localized confined aquifer, or confined/unconfined aquifer part of a larger system). It is recommended that the project applicant monitor water levels in the well. The purpose of the monitoring is to evaluate the functionality of the well to meet the long-term water demand of the proposed project. Water level monitoring is required by the Lake County Zoning Ordinance. Ordinance Article 27 Section 27.11(at) 3.v.e. requires the well to have a water level monitor. Recommendations for well water level monitoring are provided in the Drought Management Plan prepared for the proposed project.

QUALIFICATIONS OF AUTHOR

I have a PhD in Water Resources Engineering. In addition, I am a registered Professional Engineer with the State of California with 30-years of experience practicing and teaching Water Resources Engineering, including over 15 years of teaching, practicing, and modeling surface and groundwater hydrology.

LIMITATIONS

The study of groundwater hydrology is very complex and often relies on limited data, especially in rural areas. Recommendations and conclusions provided herein are based on professional judgment made using information of the groundwater systems and geology in Lake County, which is limited and allows only for a general assessment of groundwater aquifer conditions and recharge. NorthPoint Consulting Group, Inc. is making analyses, recommendations, and conclusions based on readily available data, including studies and reports conducted by other professionals, Lake County, the State of California, and other consultants hired by the project proponent to prepare technical studies for the proposed project. If additional information or data becomes available for the project area, the recommendations and conclusions presented herein may be subject to change.

ATTACHMENTS:

1. Site Plans and Map
2. Well Completion Report
3. WCR Review Data Summary
4. NRCS Soil Survey Results
5. PRISM Climate Precipitation 1895 to 2020

REFERENCES

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Attachment 1:
Site Plans and Map

THE JOEL MICHAELY GROW, LLC

MAJOR USE PERMIT

APN: 012-045-039, 012-045-40, 012-045-41, 012-045-42, 012-045-43, 012-059-10, 012-059-11, 012-059-12, 012-059-13, & 012-059-14

VICINITY MAP

NOT TO SCALE

DIRECTIONS TO SITE:

FROM LOWER LAKE, CA

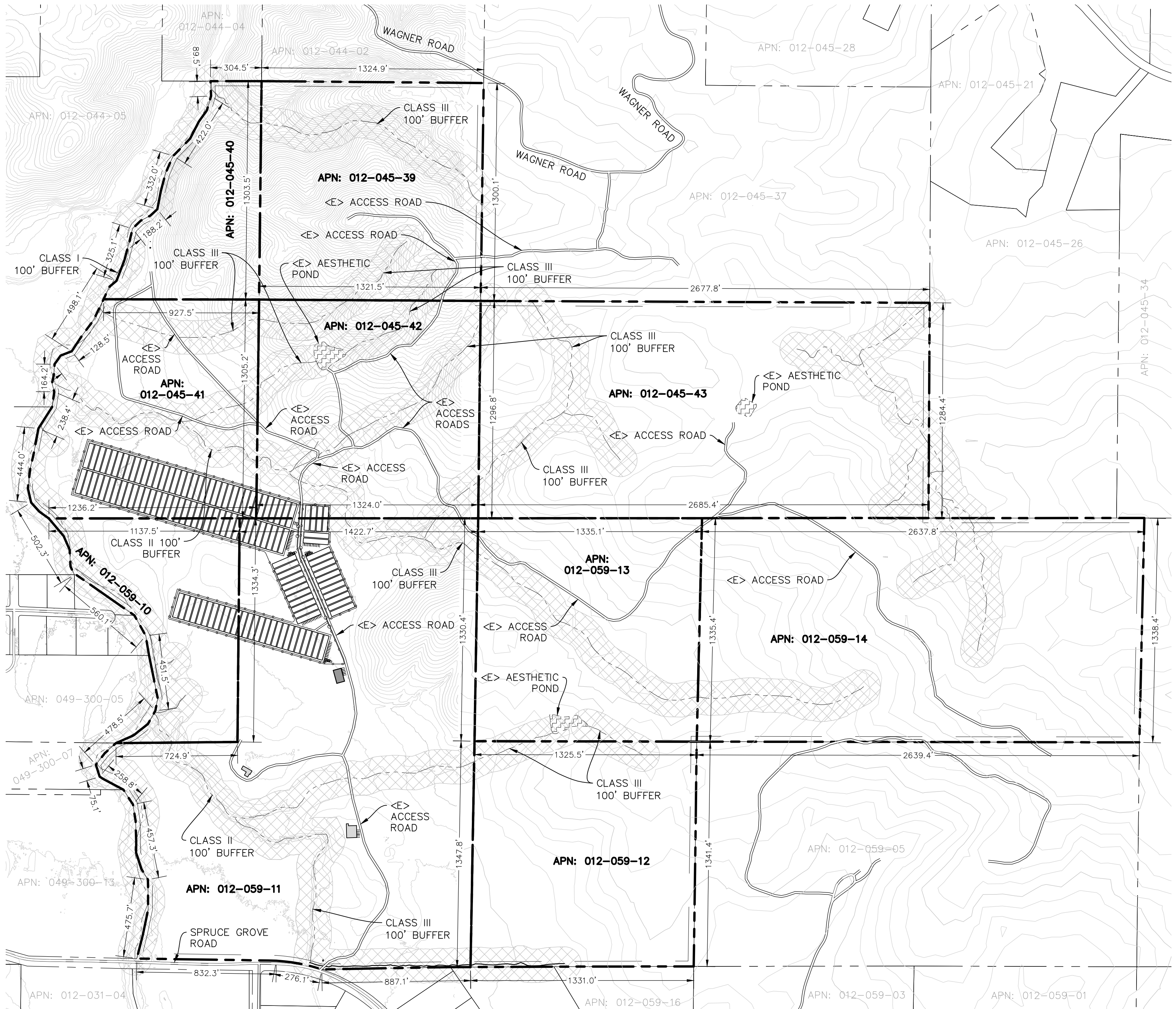
- AT THE INTERSECTION OF MAIN ST. AND LAKE ST. HEAD WEST ON MAIN ST TOWARD CA-29 SOUTH.
- STAY ON CA-29 SOUTH FOR 1.5 MILES BEFORE TURNING LEFT ON SPRUCE GROVE RD.
- STAY ON SPRUCE GROVE RD. FOR 0.6 MILES.
- DESTINATION WILL BE ON THE LEFT

PROJECT DESCRIPTION:

THE JOEL MICHAELY, LLC. IS PROPOSING TO PERMIT COMMERCIAL CANNABIS IN ACCORDANCE WITH THE LAKE COUNTY USE ORDINANCE (ARTICLE 27). THE PROPOSAL IS FOR TYPE 3B MIXED LIGHT CULTIVATION FOR 550,000 SQUARE FEET (SF) OF CANOPY AREA AND A TYPE 6 LICENSE FOR NON-VOLATILE MANUFACTURING. THE PROPOSAL ALSO INCLUDES THE DEVELOPMENT OF FACILITIES APPURTENANT TO CULTIVATION, INCLUDING HOOP HOUSES, FACILITIES FOR DRYING AND CURING OF HARVESTED CANNABIS, STORAGE SHEDS AND THE APPROPRIATE IRRIGATION INFRASTRUCTURE.

GENERAL NOTES:

1. DRAWING SCALE AS NOTED. WRITTEN DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALED DIMENSIONS.
2. THIS IS NOT A BOUNDARY SURVEY. BOUNDARY INFORMATION DEPICTED HAS BEEN OBTAINED FROM LAKE COUNTY 2015 GIS DATA. NORTHPOINT CONSULTING GROUP, INC. HAS NOT VERIFIED THIS PROPERTY BOUNDARY.
3. THERE ARE NO NEARBY SCHOOLS, SCHOOL BUS STOPS, PLACES OF WORSHIP, PUBLIC PARKS OR TRIBAL RESOURCES WITHIN 1,000 FEET OF THE PROPOSED CULTIVATION AREA.
4. THERE ARE NO RESIDENCES ON ADJOINING PARCELS WITHIN 200 FEET OF THE PROPOSED CULTIVATION AREAS.
5. ANY EXISTING DEVELOPMENT CONSTRUCTED WITHOUT THE BENEFIT OF COUNTY REVIEW WILL BE SUBJECT TO THE LAKE COUNTY BUILDING DEPARTMENT UPON APPROVAL OF THE USE PERMIT.
6. CLASSIFICATION OF WATERCOURSES AS IDENTIFIED IN THE BIOLOGICAL ASSESSMENT.
7. POWER SOURCE SUMMARY: THE APPLICANT IS PROPOSING TO TRANSITION TO PG&E TO (ON-GRID POWER) POWER TO OPERATE THE MIXED LIGHT CULTIVATION ACTIVITIES. UNTIL TRANSITIONED TO PG&E, POWER TO EACH GREENHOUSE NEEDED TO OPERATE THE LOW WATTAGE LIGHTS, FANS, AND MOTORS TO OPEN AND CLOSE THE BLACKOUT COVERS, WOULD BE POWERED USING SOLAR POWER ON EACH GREENHOUSE WITH BATTERY BACKUP STORAGE. EACH GREENHOUSE WOULD BE EQUIPPED WITH ITS OWN SOLAR PANELS SUFFICIENT TO POWER THE LIGHTS, FANS, AND MOTORS (SMALL MOTORS, 0.25 HORSEPOWER) WITHIN THE GREENHOUSE. NO GENERATORS ARE PROPOSED TO OPERATE THE GREENHOUSES AT ANY TIME.



PLOT PLAN

22x34 SHEET: 1"=400'
11x17 SHEET: 1"=800'

0 200 400 800

N

PROJECT INFORMATION:

APPLICANT:
THE JOEL MICHAELY GROW, LLC
114450 & 11474 SPRUCE GROVE RD.
LOWER LAKE, CA 95457

PROPERTY OWNER:
11450 SPRUCE GROVE, INC
6672 CORONADO PALMS AVE
LAS VEGAS, NV 89139

APPLICANTS AGENT:
NORTHPOINT CONSULTING GROUP, INC
1117 SAMOA BLVD.
ARCATA, CA 95521
(707) 798-6438

SITE ADDRESS:
APN: 012-045-39
APN: 012-045-40
APN: 012-045-41
APN: 012-045-42
APN: 012-045-43
APN: 012-059-10
APN: 012-059-11
APN: 012-059-12
APN: 012-059-13
APN: 012-059-14

11450 & 11474 SPRUCE GROVE RD.
LOWER LAKE, CA 95457

PHASE I – OUTDOOR CANOPY AREA = 1,089,000 SF = 25 ACRES

PHASE II – MIXED LIGHT CANOPY AREA = 550,000 SF = 12.6 ACRES

WATER = PRIVATE
SEWER = PRIVATE

PROPERTY SIZE:

APN: 012-045-39	= ±39.54 ACRES
APN: 012-045-40	= ±17.86 ACRES
APN: 012-045-41	= ±31.59 ACRES
APN: 012-045-42	= ±39.50 ACRES
APN: 012-045-43	= ±79.44 ACRES
APN: 012-059-10	= ±21.83 ACRES
APN: 012-059-11	= ±105.06 ACRES
APN: 012-059-12	= ±40.98 ACRES
APN: 012-059-13	= ±40.67 ACRES
APN: 012-059-14	= ±80.93 ACRES

TOTAL: = ±502.4 ACRES

ZONING = A (AGRICULTURAL) RL (RURAL LAND)

SHEET INDEX:

DRAWN BY | REVISIONS | DATE

NORTHPOINT CONSULTING GROUP, INC.
1117 Samoa Blvd., Arcata, CA 95521

THE JOEL MICHAELY GROW, LLC
11450 & 11474 SPRUCE GROVE RD. LOWER LAKE, CA 95457
PLOT PLAN, VICINITY MAP, & PROJECT NOTES

PROJ. MGR.: AD
DRAWN BY: CC
DATE: 03/03/22
SCALE: AS SHOWN

SHEET
C0

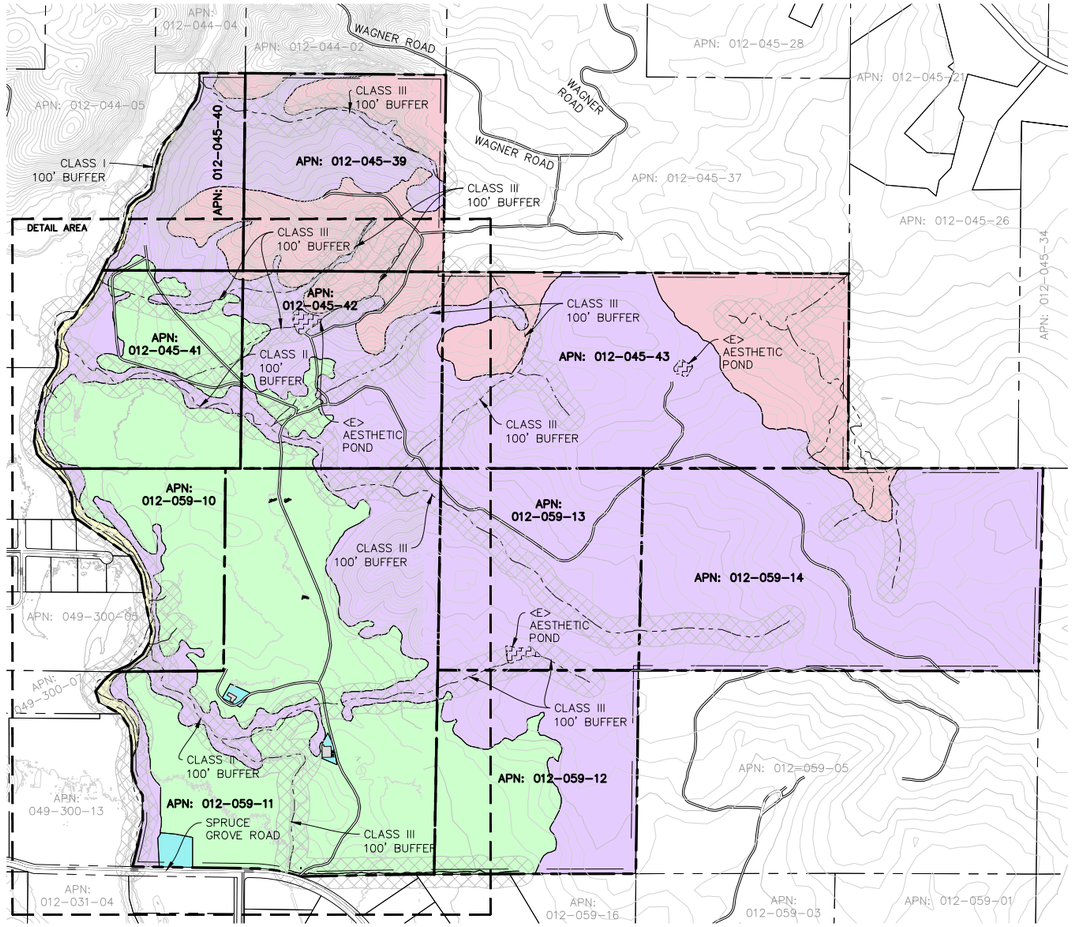
21-118

THE JOEL MICHAELY GROW, LLC

MAJOR USE PERMIT

EXISTING SITE CONDITIONS

APN: 012-045-40, 012-045-41, 012-059-10, 012-059-11, 012-059-12, 012-059-13, 012-059-14, 012-059-14, 012-045-43, 012-045-42, & 012-045-039



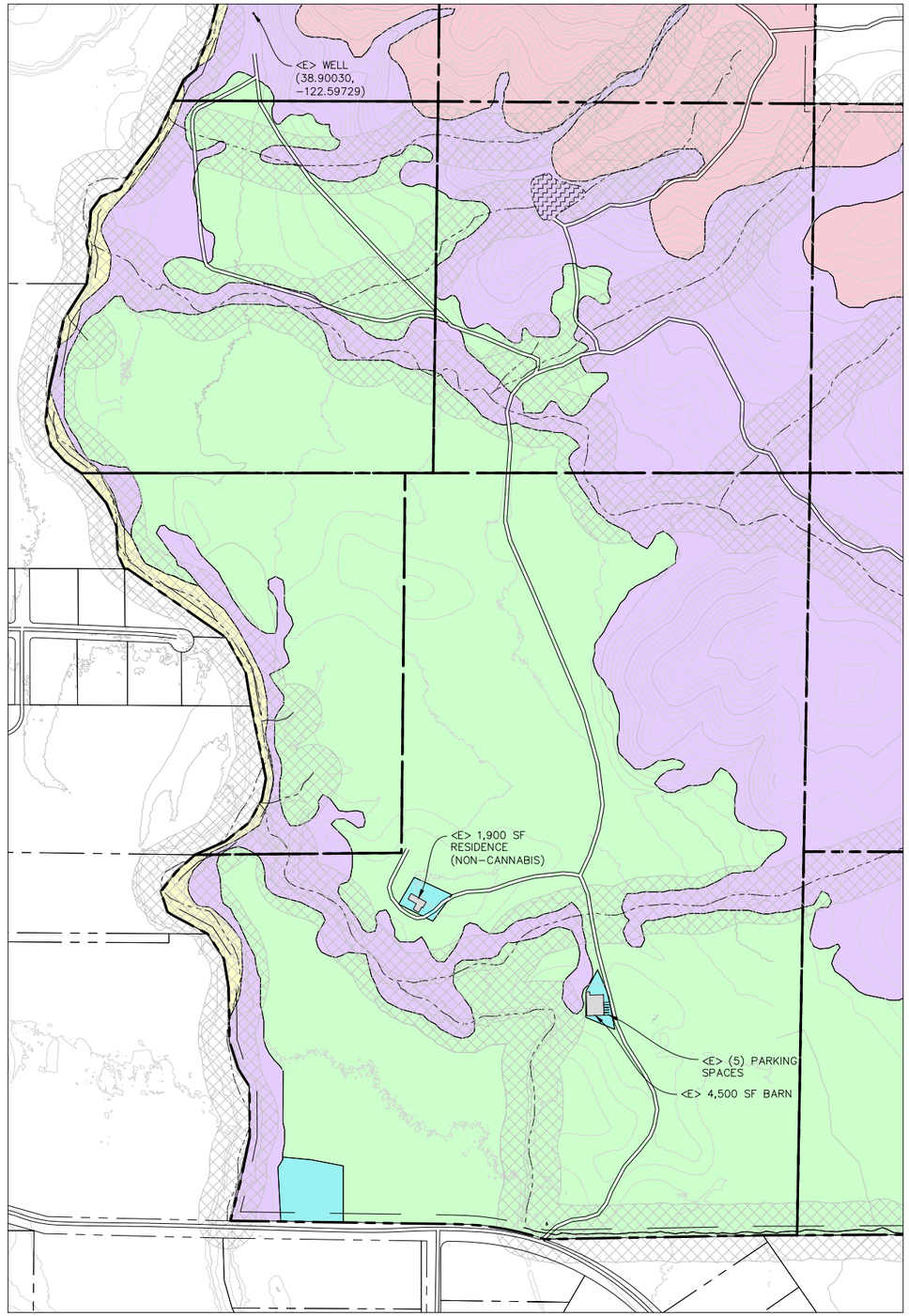
PLOT PLAN

22x34 SHEET: 1"=500'
11x17 SHEET: 1"=1000'

0 250 500 1000

LEGEND:

- – DEVELOPED AREA
- – ANNUAL GRASSLAND
- – CHAPARREL
- – WOODLAND
- – RIPARIAN



DETAIL AREA

22x34 SHEET: 1"=250'
11x17 SHEET: 1"=500'

0 125 250 500

NORTHPOINT CONSULTING GROUP, INC.
1117 Samoa Blvd., Arcata, CA 95521

DRAWN BY:
REVISIONS
DATE

THE JOEL MICHAELY GROW, LLC
11450 & 11474 SPRUCE GROVE RD. LOWER LAKE, CA 95457
EXISTING SITE CONDITIONS

PROJ. MGR.: AD
DRAWN BY: CC
DATE: 03/03/22
SCALE: AS SHOWN

SHEET
C1
21-118

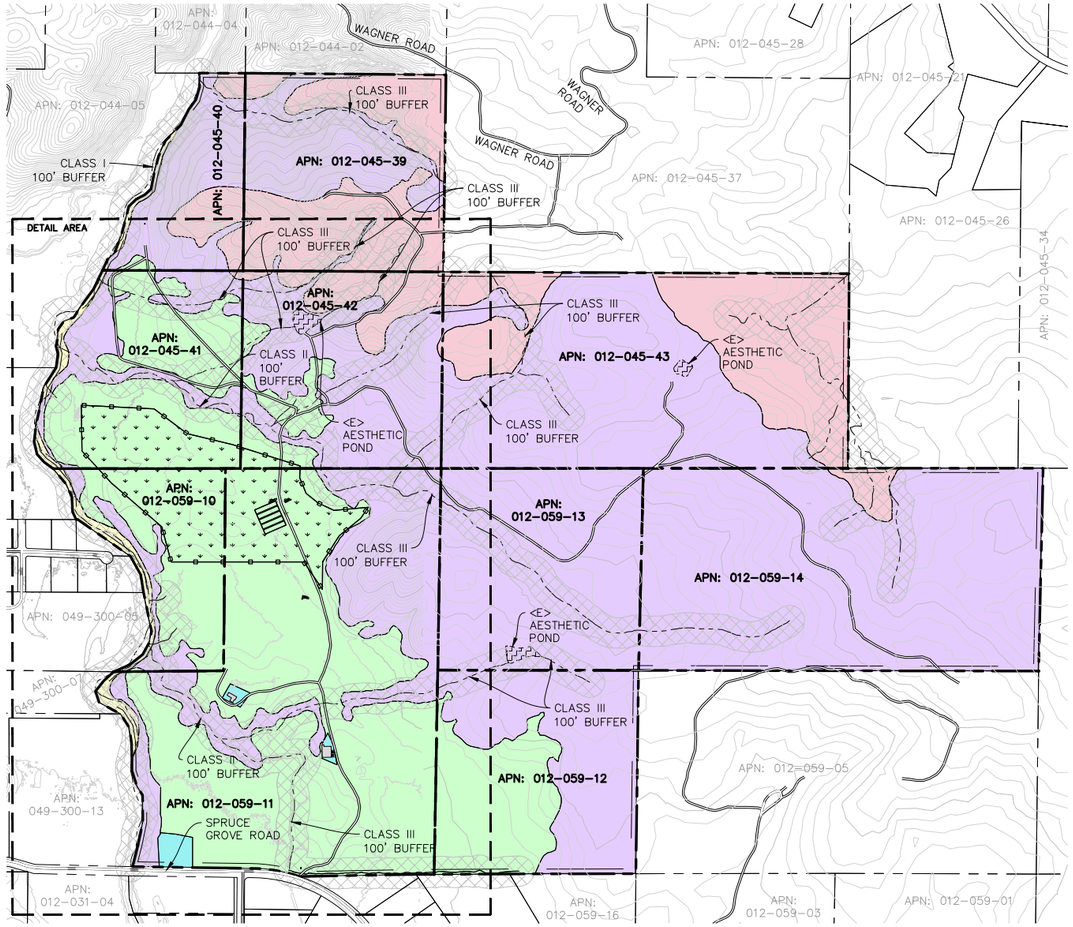
March 4, 2022 - 14:05 Dwg Name: p:\michaely, joshua - rest\dv - 21-118\CAD\Rest\dv - CUP.dwg Updated By: ChangCheng

THE JOEL MICHAELY GROW, LLC

MAJOR USE PERMIT

PROPOSED SITE CONDITIONS - PHASE I

APN: 012-045-40, 012-045-41, 012-059-10, 012-059-11, 012-059-12, 012-059-13, 012-059-14, 012-059-14, 012-045-43, 012-045-42, & 012-045-039



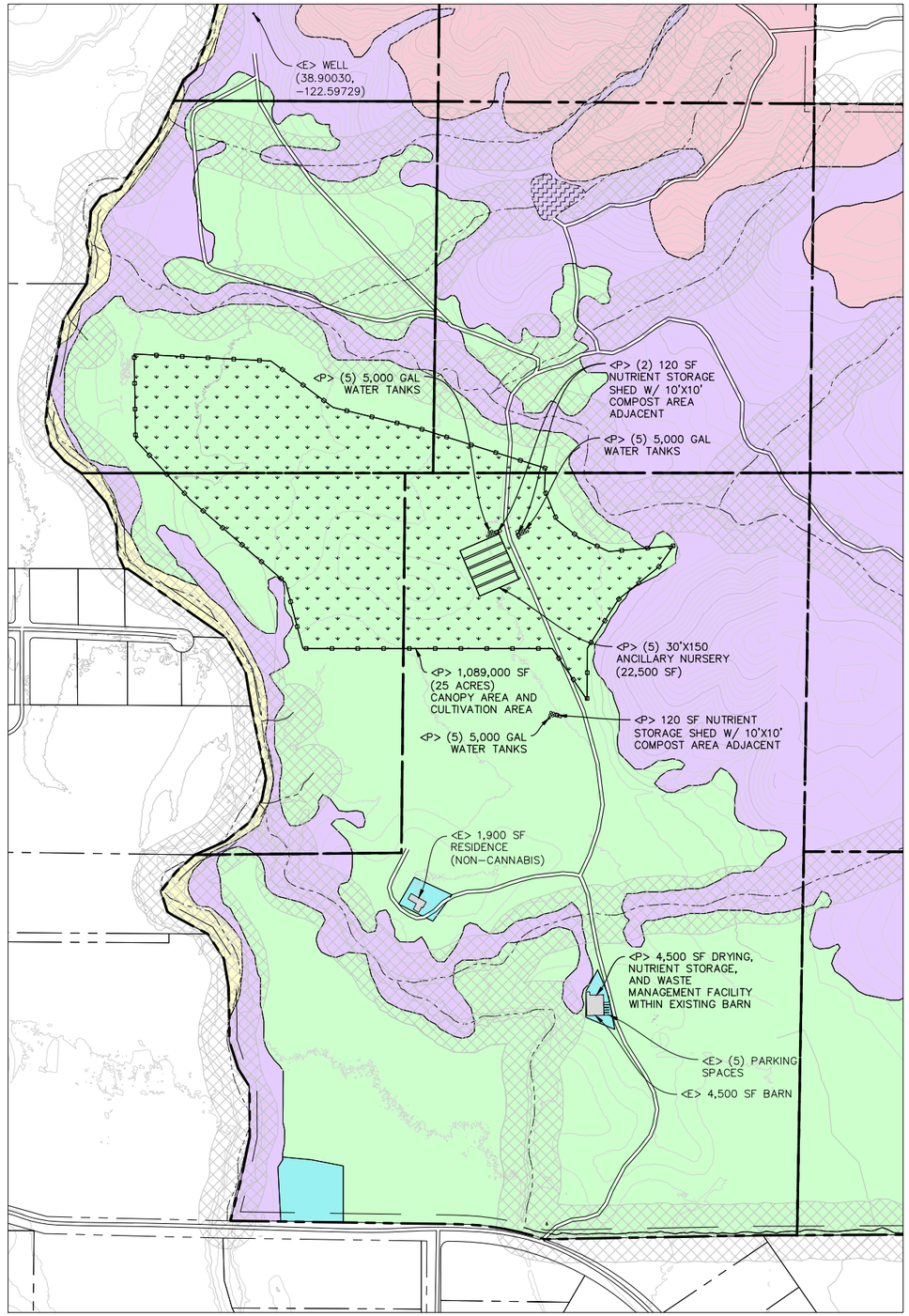
PLOT PLAN

22x34 SHEET: 1"=500'
11x17 SHEET: 1"=1000'

0 250 500 1000

LEGEND:

- – DEVELOPED AREA
- – ANNUAL GRASSLAND
- – CHAPARREL
- – WOODLAND
- – RIPARIAN



DETAIL AREA

22x34 SHEET: 1"=250'
11x17 SHEET: 1"=500'

0 125 250 500

DRAWN BY:
REVISIONS
DATE:

NORTHPOINT
CONSULTING GROUP, INC.
1117 Samoa Blvd., Arcata, CA 95521

THE JOEL MICHAELY GROW, LLC
11450 & 11474 SPRUCE GROVE RD. LOWER LAKE, CA 95457
PHASE I PROPOSED SITE CONDITIONS

PROJ. MGR.: AD
DRAWN BY: CJG
DATE: 03/03/22
SCALE: AS SHOWN

SHEET
C2
21-118

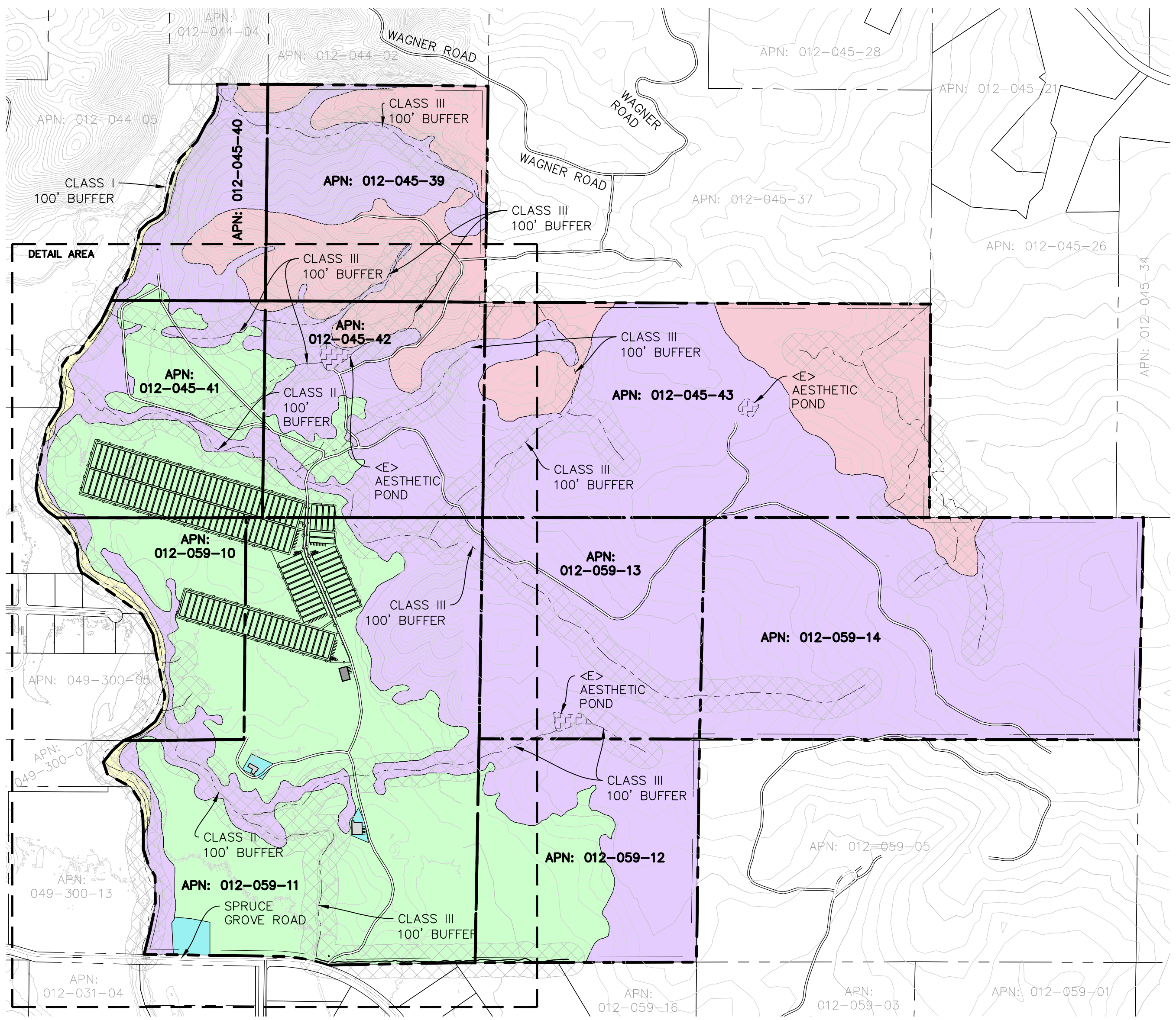
March 4, 2022 - 14:05 Dwg Name: p:\michaely, joshua - rest\v - 21-118\CAD\Rest\v - CUP.dwg Updated By: ChangCheng

THE JOEL MICHAELY GROW, LLC

MAJOR USE PERMIT

PROPOSED SITE CONDITIONS - PHASE II

APN: 012-045-40, 012-045-41, 012-059-10, 012-059-11, 012-059-12, 012-059-13, 012-059-14, 012-059-14, 012-045-43, 012-045-42, & 012-045-039



PLOT PLAN

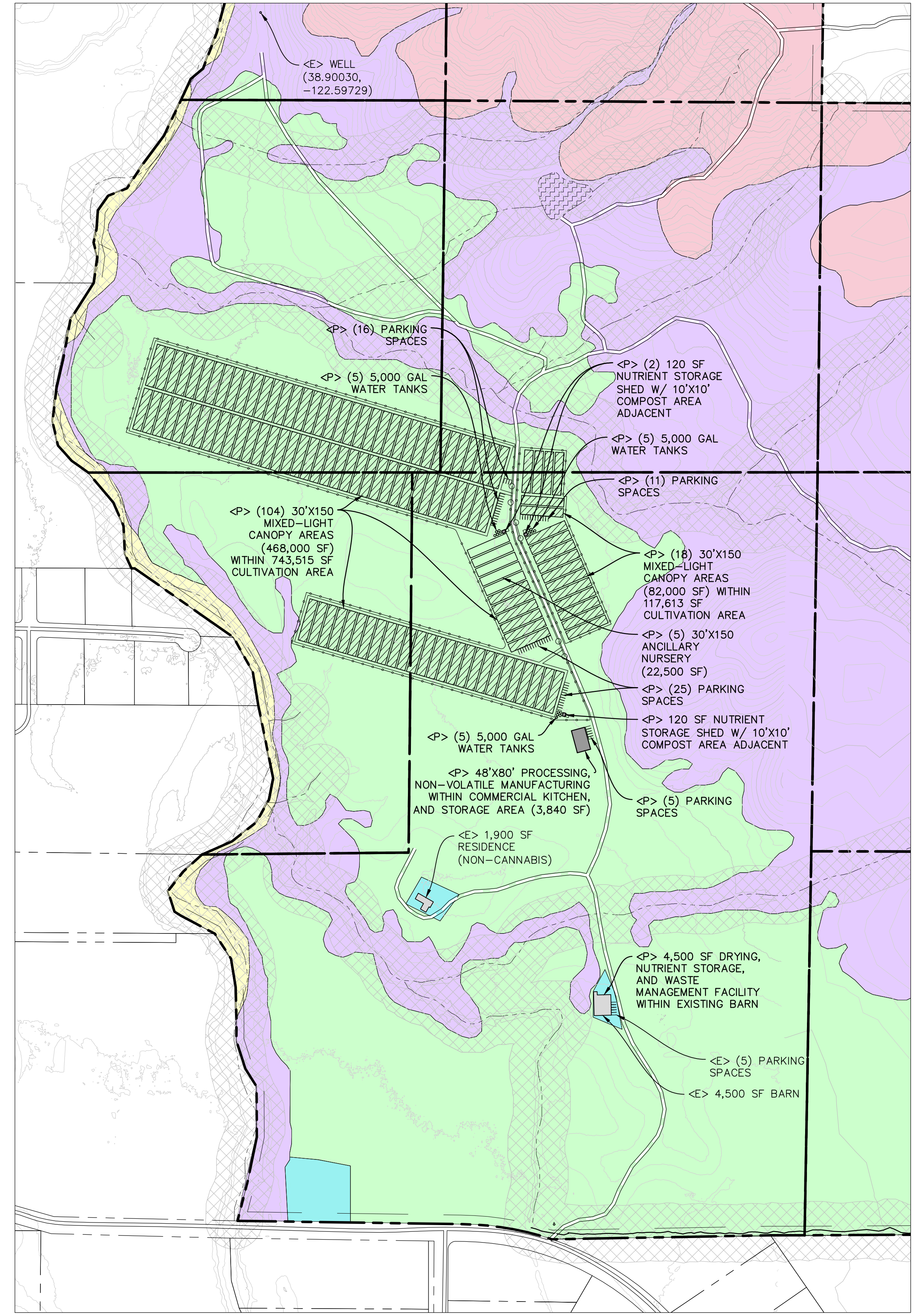
22x34 SHEET: 1"=500'
11x17 SHEET: 1"=1000'

0 250 500 1000

N

LEGEND:

- DEVELOPED AREA
- ANNUAL GRASSLAND
- CHAPARREL
- WOODLAND
- RIPARIAN



DETAIL AREA

22x34 SHEET: 1"=250'
11x17 SHEET: 1"=500'

0 125 250 500

N

DRAWN BY	
REVISIONS	
DATE	

NORTHPOINT CONSULTING GROUP, INC.
1117 Samoa Blvd., Arcata, CA 95521

THE JOEL MICHAELY GROW, LLC
11450 & 11474 SPRUCE GROVE RD. LOWER LAKE, CA 95457
PHASE II PROPOSED SITE CONDITIONS

PROJ. MGR.:	AD
DRAWN BY:	CJG
DATE:	03/03/22
SCALE:	AS SHOWN

SHEET
C3

21-118

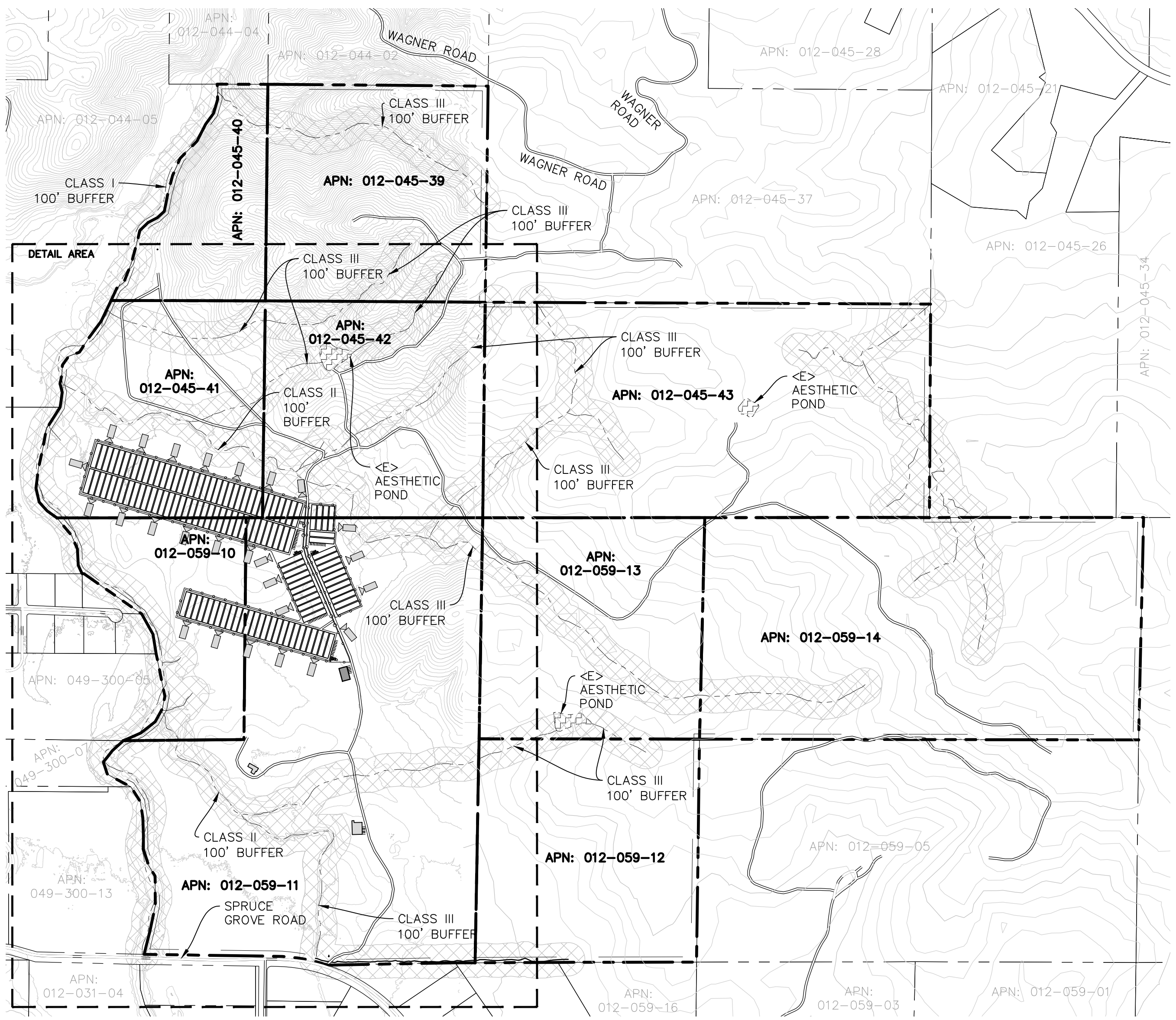
March 4, 2022 - 14:00 Dwg Name: p:\michaely_joshua - redtyle - 21-118\CAD\Redtyle - CUP.dwg Updated By: ChoniCheng

THE JOEL MICHAELY GROW, LLC

MAJOR USE PERMIT

PROPOSED SECURITY PLAN

APN: 012-045-40, 012-045-41, 012-059-10, 012-059-11, 012-059-12,
012-059-13, 012-059-14, 012-059-14, 012-045-43, 012-045-42, & 012-045-039



PLOT PLAN

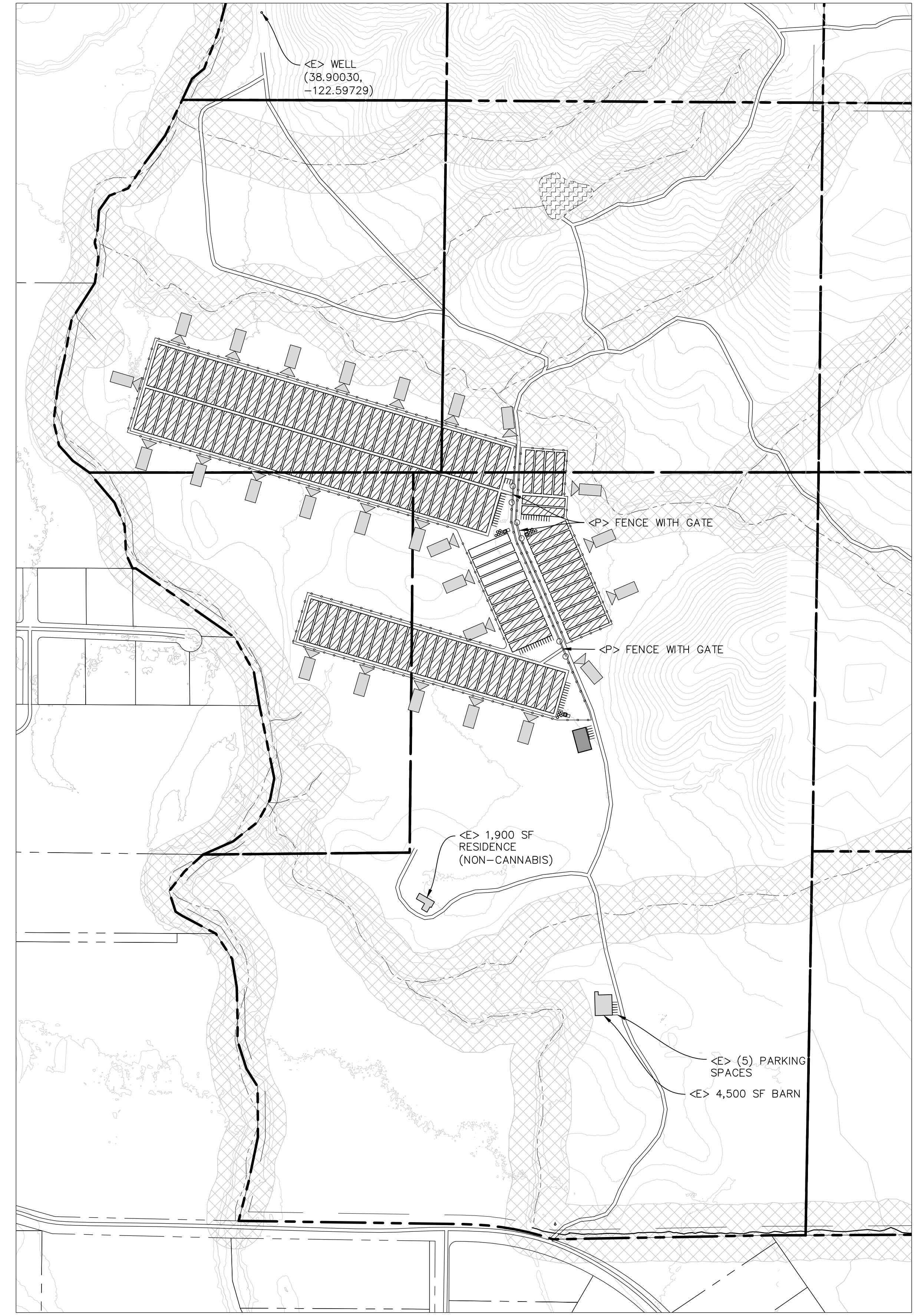
22x34 SHEET: 1"=500'
11x17 SHEET: 1"=1000'

0 250 500 1000

N

SECURITY LEGEND:

- CAMERA
- MOTION SENSOR, LIGHTING AND SECURITY CAMERA
- FENCE
- GATE



DETAIL AREA

22x34 SHEET: 1"=250'
11x17 SHEET: 1"=500'

0 125 250 500

N

DRAWN BY

REVISIONS

DATE

NORTHPOINT CONSULTING GROUP, INC.
1117 Samoa Blvd., Arcata, CA 95521

THE JOEL MICHAELY GROW, LLC
11450 & 11474 SPRUCE GROVE RD. LOWER LAKE, CA 95457
PROPOSED SECURITY PLAN

PROJ. MGR.: AD
DRAWN BY: CJG
DATE: 03/03/22
SCALE: AS SHOWN

SHEET
C4
21-118

Attachment 2:
Well Completion Report

Date: **1/11/2022** Technician: **Jim Jackson**

Client Name: **Nick Taix**

Site Address: **11450 Spruce Grove Rd, Lower Lake** APN: **012-059-10**

Well Pump Info (size, type, brand, etc.): **5HP Series 60 Test Pump**

Power Source (hardwired, generator, solar only, solar with generator back up): **Generator**

Total Depth of Well? **183-feet** Static Water Level? **27.33**

Diameter of Well? **6-inches** Casing Type? **PVC**

Last time the water was pumped from the well? **Unknown (greater than 24-hours)**

Was the pumping level measured from ground surface or top of casing? **Top of Casing**

Interval	Time	Flow Rate*	Pumping Level
5	9:30	79	43.33
5	9:35	75	52.50
5	9:40	75	56.42
5	9:45	75	60.50
5	9:50	75	62.92
5	9:55	75	65.33
10	10:05	75	69.42
10	10:15	73	72.58
10	10:25	73	76.58
10	10:35	70	79.25
10	10:45	70	81.58
10	10:55	70	83.92
30	11:25	70	89.33
30	11:55	70	93.58
30	12:25	70	97.50
30	12:55	70	101.17
30	13:25	70	101.50
30	13:55	70	101.50
30	14:25	70	101.50
30	14:55	70	101.50
30	15:25	70	101.50
STOP			
10	15:35	RECHARGE	89.8
30	16:05	RECHARGE	47.0

*Flow Rate Measured via ~~Bucket~~ or **Meter**

Meter Start: **407620**

Meter Stop: **432920**

Total Gallons Pumped: **25,300**

Average GPM: **70.28**

Recharge Rate: **93.69%**

Field Quality Test Completed:

pH: **7.6**

TDS: **960 ppm**

Hardness: **2 grains per gallon**

Iron: **1.0 ppm**

GPS: **38.90030, -122.59729**

Notes: Technician notes sulfur smell

DISCLAIMER

Observations made of the well(s) are strictly limited to the date and time that the test(s) was conducted and are in no way a guarantee of future conditions, including but not limited to the quantity and/or quality of the water produced by this well.

Attachment 3:
WCR Review and Data Summary

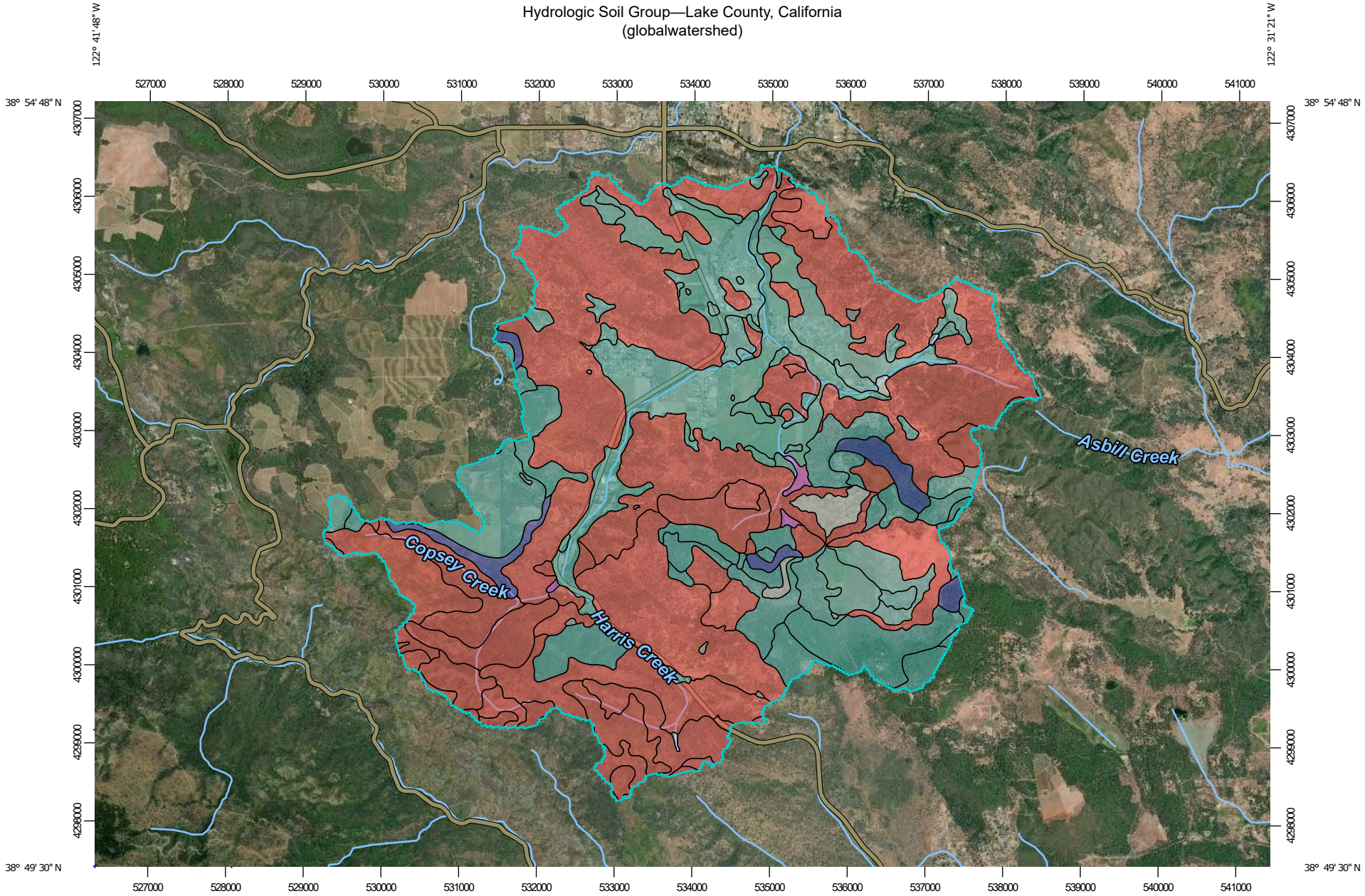
Parameter	
Area of alluvium (sq m)	6589217.8
Count of WCRs in alluvium	40
Area (Acres)	**1628.2**
Average depth of alluvium	**37**
Average depth to static water level (ft bgs)	**17**
Aquifer thickness	**20**
Specific Yield	**0.15**
Estimated usable storage capacity (AF)	**4898**
Parcel count	**253**
Alluvial basin well demand (gpy)	27703500
Alluvial basin well demand (AF)	**85**
Percentage of estimated usable capacity	**1.7**
Agricultural estimated water demand	
Alluvial basin estimated ag water demand (AF)	**1021**
Percentage of estimated usable capacity	**20.85**
Cumulative annual water demand in alluvial basin	**1105.95**
Percentage of total usable GW storage in alluvium	**22.6**
Percentage of demand with proposed project	**23.5**

Well number	Depth of alluvium	Depth to static water table
210830	34	24
177905	33	18
236825	30	15
57818	45	80/Na
56311	57	8
66468	66	8
66456	33	25
87402	38	17
83640	58	32
83628	60	10
105678	30	21
105616	30	15
105186	30	18
105171	40	18
110378	45	20
11926	34	12
11922	39	14
141407A	57	18
116056	32	12
56703	40	22
94154	43	10
94152	39	10
56830	34	25
58776	20	17
58767	20	18

58687	59	15
12583	15	12
12582	35	20
12581	25	12
12539	36	20
12534	30	20
15829	31	18
12060	30	6
2457	38	22
2454	38	22
2453	38	22
2451	38	22
18626	27	22
451163	25	10
784178	20	5
950526	40	18

Attachment 4:
NRCS Soil Survey Results

Hydrologic Soil Group—Lake County, California
(globalwatershed)



Map Scale: 1:69,100 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 1000 2000 4000 6000

Feet
0 3000 6000 12000 18000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

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 18, Sep 6, 2021

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—Nov 4, 2017

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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
101	Aiken-Sobrante association, 5 to 15 percent slopes	C	18.2	0.2%
116	Benridge variant loam, 2 to 15 percent slopes	D	203.0	1.9%
122	Clear Lake variant clay, drained	C	45.9	0.4%
127	Collayomi-Aiken-Whispering complex, 5 to 30 percent slopes	C	541.4	5.2%
128	Collayomi-Aiken-Whispering complex, 30 to 50 percent slopes	C	415.0	4.0%
129	Collayomi-Whispering complex, 30 to 50 percent slopes	B	250.2	2.4%
142	Henneke-Montara-Rock outcrop complex, 10 to 50 percent slopes, MLRA 15	D	36.3	0.3%
147	Kelsey fine sandy loam	A	29.1	0.3%
149	Kidd-Forward complex, 30 to 50 percent slopes	D	3.3	0.0%
150	Kilaga variant loam, 0 to 5 percent slopes	C	758.8	7.2%
152	Konocti-Hambright complex, 5 to 15 percent slopes	C	8.8	0.1%
153	Konocti-Hambright complex, 15 to 30 percent slopes	C	203.0	1.9%
154	Konocti-Hambright-Rock outcrop complex, 30 to 75 percent slopes		18.7	0.2%
156	Konocti variant-Konocti-Hambright complex, 15 to 30 percent slopes	C	255.8	2.4%
167	Maymen-Etsel-Mayacama complex, 20 to 60 percent slopes	D	92.9	0.9%
169	Maymen-Etsel-Snook complex, 30 to 75 percent slopes	D	514.9	4.9%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
170	Maymen-Etsel-Speaker association, 30 to 50 percent slopes	D	172.8	1.6%
173	Maymen-Hopland-Mayacama association, 20 to 60 percent slopes, MLRA 15	D	210.6	2.0%
175	Maymen-Millsholm-Bressa complex, 30 to 50 percent slopes	D	293.2	2.8%
177	Millsholm-Bressa loams, 30 to 50 percent slopes	D	1,000.6	9.5%
178	Millsholm-Bressa-Hopland association, 30 to 50 percent slopes	D	178.3	1.7%
179	Millsholm-Squawrock-Pomo complex, 30 to 50 percent slopes	D	47.0	0.4%
180	Mocho variant loam	C	99.5	0.9%
200	Rock outcrop-Etsel-Snook complex, 50 to 80 percent slopes		78.5	0.7%
208	Skyhigh-Asbill complex, 15 to 50 percent slopes	D	71.0	0.7%
209	Skyhigh-Millsholm loams, 15 to 50 percent slopes	D	3,440.4	32.8%
210	Skyhigh-Sleeper-Millsholm association, 8 to 15 percent slopes	D	6.4	0.1%
211	Skyhigh-Sleeper-Millsholm association, 1 to 35 percent slopes, MLRA 15	C	128.2	1.2%
213	Sleeper variant-Sleeper loams, 5 to 15 percent slopes	C	124.4	1.2%
216	Sobrante-Collayomi-Whispering association, 15 to 30 percent slopes	C	44.9	0.4%
217	Sobrante-Collayomi-Whispering association, 30 to 50 percent slopes	C	50.1	0.5%
218	Sobrante-Guenoc-Hambright complex, 2 to 15 percent slopes	C	76.3	0.7%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
219	Sobrante-Guenoc-Hambright complex, 15 to 30 percent slopes	C	38.7	0.4%
226	Speaker-Maymen-Marpa association, 50 to 75 percent slopes	C	33.0	0.3%
232	Still loam	C	855.8	8.2%
233	Still loam, stratified substratum	C	8.0	0.1%
236	Stonyford-Guenoc complex, 20 to 50 percent slopes, MLRA 15	D	33.3	0.3%
241	Vitrandepts-Cinder land complex, 15 to 75 percent slopes		8.1	0.1%
242	Wappo loam, 2 to 8 percent slopes	D	30.8	0.3%
256	Water		23.2	0.2%
1690	Maymen-Etsel-Snook complex, 30 to 75 percent slopes, low ffd	D	49.2	0.5%
Totals for Area of Interest			**10,497.5**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Attachment 5:
PRISM Climate Precipitation
1895-2020

PRISM Time Series Data
Location: Lat: 38.8952 Lon: -122.5899 Elev: 1549ft
Climate variable: ppt
Spatial resolution: 4km
Period: 1895 - 2020
Dataset: AN81m
PRISM day definition: 24 hours ending at 1200 UTC on the day shown
Grid Cell Interpolation: On
Time series generated: 2021-Dec-23
Details: http://www.prism.oregonstate.edu/documents/PRISM_datasets.pdf

Date	ppt (inches)		
1895	37.1	minimum	6.0
1896	41.42	average	29.7
1897	27.18		
1898	16		
1899	37.99		
1900	26.03		
1901	27.87		
1902	37.16		
1903	28.23		
1904	46.62		
1905	24.39		
1906	45.51		
1907	38.48		
1908	19.6		
1909	49.85		
1910	18.44		
1911	35.31		
1912	21.94		
1913	28.16		
1914	33.29		
1915	38.73		
1916	32.25		
1917	14.68		
1918	22.3		
1919	24.86		
1920	31.63		
1921	25.68		
1922	29.88		
1923	15.19		
1924	21.98		
1925	27.63		
1926	36.17		
1927	30.69		
1928	22.18		
1929	16.9		
1930	18.28		

1931	26.75
1932	13.69
1933	22.78
1934	19.85
1935	26.83
1936	27.27
1937	36.45
1938	33.49
1939	14.15
1940	50.58
1941	48.42
1942	35.52
1943	23.04
1944	29.01
1945	32.58
1946	15.88
1947	18.44
1948	25.73
1949	18.66
1950	37.26
1951	32.21
1952	37.84
1953	23.47
1954	32.21
1955	30.21
1956	23.87
1957	33.88
1958	37.97
1959	22.19
1960	30.31
1961	22.37
1962	30.45
1963	32.04
1964	28.86
1965	27.68
1966	25.95
1967	31.95
1968	33.66
1969	39.44
1970	41.66
1971	20.29
1972	22.23
1973	45.22
1974	26.74
1975	26.91
1976	9.52
1977	21.38

1978	32.57
1979	37.39
1980	27.22
1981	34.72
1982	39.17
1983	65.85
1984	21.74
1985	18.63
1986	39.67
1987	28.96
1988	18.36
1989	21.48
1990	17.23
1991	25.19
1992	31.26
1993	37.66
1994	21.88
1995	57.89
1996	42.03
1997	30.87
1998	52.96
1999	24.81
2000	28.67
2001	37.32
2002	30.86
2003	33.88
2004	34.43
2005	41.27
2006	36.04
2007	14.41
2008	20.9
2009	19.52
2010	36.91
2011	26.43
2012	36.27
2013	6
2014	31.58
2015	17.26
2016	36.85
2017	48.74
2018	24.87
2019	47.07
2020	10.6