

REALM

Engineering

1767 Market Street, Suite C, Redding, CA 96001



HYDROLOGY REPORT

6243 EICKHOFF ROAD, LAKEPORT, CA

NOVEMBER 11, 2021





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INTRODUCTION

The purpose of this Hydrology Study/Report is to provide adequate information regarding the water usage for a proposed cannabis cultivation operation and its impacts to surrounding areas. This report was written to meet the requirements of an Urgency Ordinance requiring land use applicants to provide enhanced water analysis during a declared drought emergency, approved by the Lake County Board of Supervisors on July 27th, 2021 (**Attachment A – Urgency Ordinance No. 3106**).

PROJECT DESCRIPTION

RS Greenery, LLC (RSG) is seeking a Major Use Permit from the County of Lake for a proposed outdoor commercial cannabis cultivation operation at 6243 Eickhoff Road near Lakeport, CA on Lake County APN 003-046-02 (Project Parcel). The proposed cultivation operation would be composed of 84,848 ft² of outdoor cultivation/canopy area, two 160 ft² harvest storage areas (existing onsite metal shipping/storage containers), a 120 ft² Pesticides & Agricultural Chemicals Storage Area (proposed wooden shed), and a 120 ft² Security Center (proposed wooden shed). All water for the proposed cultivation operation would come from an existing onsite groundwater well located at 39.1728° and Longitude: -122.94968°.

The 78.7-acre Rural Lands-zoned Project Parcel is located on the southern slopes of Poe Mountain, within the Middle Scotts Creek Watershed (HUC 12), and approximately two miles northwest of the City of Lakeport (Figure 1: Site Location Map). The Project Parcel is accessed via a shared private gravel and native soil surfaced access road off of Eickhoff Road. An unnamed intermittent Class II watercourse (NHD/DFG Water ID 116954856), flows from north to south through the Project Parcel, and five ephemeral Class III watercourses form on the Project Parcel and flow into the unnamed intermittent watercourse (**Attachment B – Existing and Proposed Conditions Site Plans**). The Project Parcel is not located within any of the Groundwater Management Plan Areas/Basins outlined in the 2006 Lake County Groundwater Management Plan¹.

The proposed outdoor cultivation/canopy areas would be enclosed with 6-foot tall galvanized woven wire fences, with locking metal gates and privacy mesh/screen. The growing medium of the proposed outdoor cultivation/canopy areas would be an imported organic soilless growing medium (composed mostly of composted forest material) in aboveground fabric pots. Drip irrigation systems would be used to deliver irrigation water to the aboveground fabric pots. Water from the onsite groundwater well would be pumped to four proposed 5,000-gallon heavy-duty plastic water storage tanks located upslope and east of the proposed cultivation operation. Irrigation water would be gravity fed from the water storage tanks to the drip irrigation systems of the proposed cultivation/canopy areas, via HDPE water supply lines.

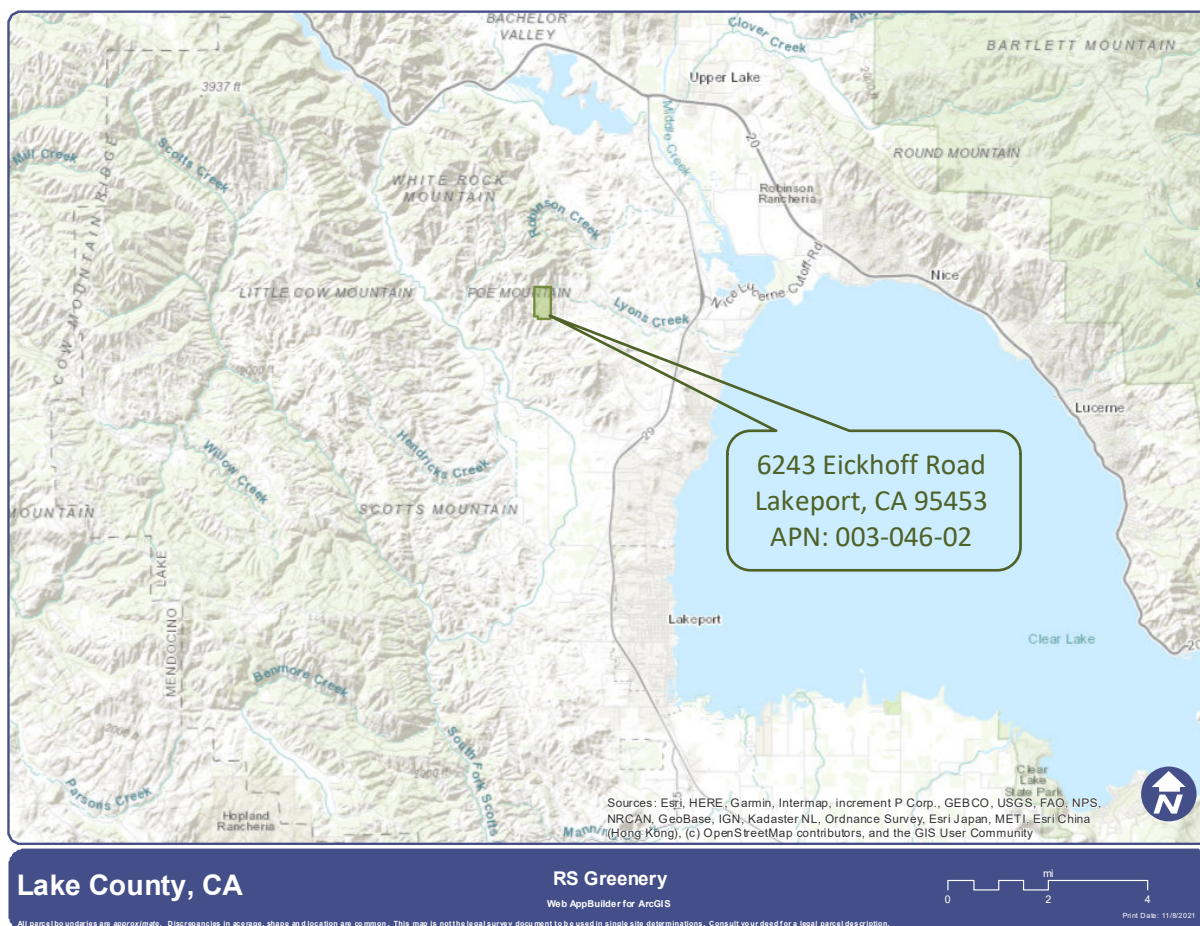


Figure 1 – Site Location Map

WATER USAGE

Cannabis has often been characterized as a high-water-use plant. Bauer et al. (2015)² and Carah et al (2015)³ estimate that cannabis plants can consume up to approximately 6 gallons per plant per day, whereas grapes consume approximately 3.5 gallons per plant per day in the North Coast region of California. Other authors, however, have reported that water use requirement for cannabis plants are similar to those of other agricultural crops, such as corn and hops, with an estimated water use requirement of 25-35 inches per year (Hammon et al. 2015⁴). According to a recent study published in the Journal of Environmental Management (Dillis et al. 2020⁵), outdoor and mixed-light cannabis cultivation uses the most water during the months of August, with an estimated water use of approximately 58,704 gallons per acre during the month of August.

According to RSG's Property Management Plan, they expect a total annual water use requirement of 4.1 acre-feet or approximately 1,336,000 gallons for irrigation purposes, with the greatest daily water usage during the months of August, September, and October (approximately 8,690 gallons per day). RSG's maximum total proposed cannabis cultivation/canopy area is 84,848 ft². Using the water use requirements outlined in Hammon et al. 2015⁴, we estimate that the proposed cultivation operation would have an annual water use requirement between 4.1 and 5.7 acre-feet.



The following table presents the expected water use of the proposed cultivation operation in gallons by month during the cultivation season (May through November), using water usage information provided in RSG's Property Management Plan.

	May	June	July	August	September	October	November
Low (25" per year)	97,760	162,930	228,100	260,680	260,680	260,680	65,170
High (35" per year)	135,000	228,000	318,000	364,000	364,000	364,000	91,000

Based on the water use estimates above, we estimate that the proposed cultivation operation would have a maximum daily water use requirement of approximately 12,133 gallons, with an average daily water use requirement between 6,370 and 8,880 gallons per day during the cultivation season (May through November).

WATER AVAILABILITY

All water for the proposed cultivation operation would come from the existing onsite groundwater well located at Latitude: 39.1728° and Longitude: -122.94968°, near the southern boundary of the Project Parcel and east of the proposed cultivation operation. This groundwater well was drilled to a depth of 140 feet below ground surface (bgs) in August of 2018, through brown rocky soil (0-82 feet bgs), black shale and sandstone (82-106 feet bgs), and shale (106-140 feet bgs). This well had an estimated yield of 50 gallons per minute (gpm) at the time it was drilled (**Attachment C: Onsite Well Completion and Performance Test Reports**). On December 18th, 2020 JAK Drilling & Pump (License No. 1013957) conducted a 6-hour well performance test of the onsite groundwater well. During the well performance test, the water level in the onsite groundwater well was monitored while it was pumped at 15.5 gpm. The static water level in the onsite groundwater well was 90.0 feet bgs prior to the start of the well performance test. During the well performance test, the water level in the onsite groundwater well dropped to 91.2 feet bgs, where it stabilized for the last 2.5 hours of the 6-hour well performance test (**Attachment C: Onsite Well Completion Report and Well Test**). The water level within the well recovered to 90.7 feet bgs within 40 minutes after the pumping ceased. A Specific Capacity of 12.9 gpm/foot of drawdown (i.e., 15.5 gpm / 1.2 feet) was calculated from the well performance test data.

The well yield test data indicates that the onsite groundwater well can produce approximately 12.9 gpm for every foot of drawdown, and at least 15.5 gpm. The well recovery observations demonstrate that the well may be able to produce this water without causing overdraft conditions. The peak anticipated daily demand for water of the proposed cultivation operation is ~12,133 gallons per day, which the onsite groundwater well could produce in approximately 13 hours, when pumped at 15.5 gpm. The onsite groundwater well was pumped at 15.5 gpm during the well performance test, and the water level in the well only dropped 1.2 feet. Additionally, RSG proposes to establish at least 20,000 gallons of water storage capacity on the property. Based on the well performance test data and the estimated water use requirements of the proposed cultivation operation, it appears that the existing onsite groundwater well could sustainably produce the water needed to meet the project demands.



AQUIFER/GROUNDWATER RECHARGE

Groundwater recharge is the replenishment of an aquifer with water from the land surface. It is usually expressed as an average rate of inches of water per year, similar to precipitation. Thus, the volume of recharge is the rate times the land area under consideration times the time period, and is usually expressed as acre-ft per year. In addition to precipitation, other sources of recharge to an aquifer are stream and lake or pond seepage, irrigation return flow (both from canals and fields), inter-aquifer flows, and urban recharge (from water mains, septic tanks, sewers, and drainage ditches).

To estimate the groundwater recharge at the site, we first must assume that the recharge to the aquifer is primarily through rainfall across the 78.7-acre Project Parcel (Lake County APNs 003-046-02). Therefore, the annual precipitation available for recharge onsite can initially be estimated using the following data and equation.

$$78.7 \text{ acres} \times 2.8 \text{ feet (Average Annual Precipitation for Lakeport, CA}^6\text{)} = 220 \text{ acre-feet}$$
$$\underline{\text{Estimated Annual Precipitation Onsite} = 220 \text{ acre-feet/year}}$$

However, this estimate does not account for surface run-off, stream underflow, and evapotranspiration that occurs in all watersheds. According to the USGS, the long-term average precipitation that recharges groundwater in the northern California region is approximately 15 percent. Since the soils of and geology of/under the Project Parcel are typical for the northern California region, we can estimate that the long-term average precipitation that recharges groundwater within the entire site to be at least 10 percent. With this data and the precipitation data presented above, we can estimate the groundwater recharge of the Project Property by using the following equation.

$$220 \text{ acre-feet/year (annual precipitation onsite)} \times 0.10 \text{ (long term average recharge)} =$$
$$\underline{\text{Estimated Groundwater Recharge} = 22 \text{ acre-feet/year}}$$

Based on the estimated average annual recharge to the aquifer under the Project Parcel (~22 acre-feet/year) and the estimated annual water usage of the proposed cultivation operation (4.1 to 5.7 acre-feet/year), it appears that RSG will have enough water to meet their demands without causing overdraft conditions.

POTENTIAL IMPACTS TO STREAMS & NEIGHBORING WELLS

Urgency Ordinance 3106 requires analysis of the “Cumulative impact of water use to surrounding areas due to project” implementation. To do this, we must first identify surrounding areas and uses that could be impacted from the project’s well pumping/water usage. As outlined in previous sections of this report, all water for the proposed cultivation operation would come from an existing onsite groundwater and the proposed cultivation operation would have an annual water use requirement between 4.1 and 5.7 acre-feet (1,336,000 to 1,864,000 gallons) per year.

An unnamed intermittent Class II watercourse flows from north to south through the western half of the Project Parcel, passing within approximately 800 feet of the existing onsite groundwater well. Multiple unnamed ephemeral Class III watercourses form on the Project Parcel and flow into the unnamed intermittent Class II watercourse. The ephemeral watercourses of the Project



Parcel do not support aquatic habitat and are typically dry by May of each year, when pumping for the proposed cultivation operation would begin.

The California Department of Water Resources' Well Completion Report Map Application indicates that there is only one other groundwater well in the same Section as the Project Property (Township 13N, Range 10W, Section 27). This well is located at 6133 Eickhoff Road on Lake County APN 003-046-32, and was drilled in 2021 to a depth of 300 feet bgs. Figure 2 shows the approximate location of this well, as well as the approximate location of the nearest known wells to the Project Parcel (Figure 2 – Nearest Known Wells Location Map).

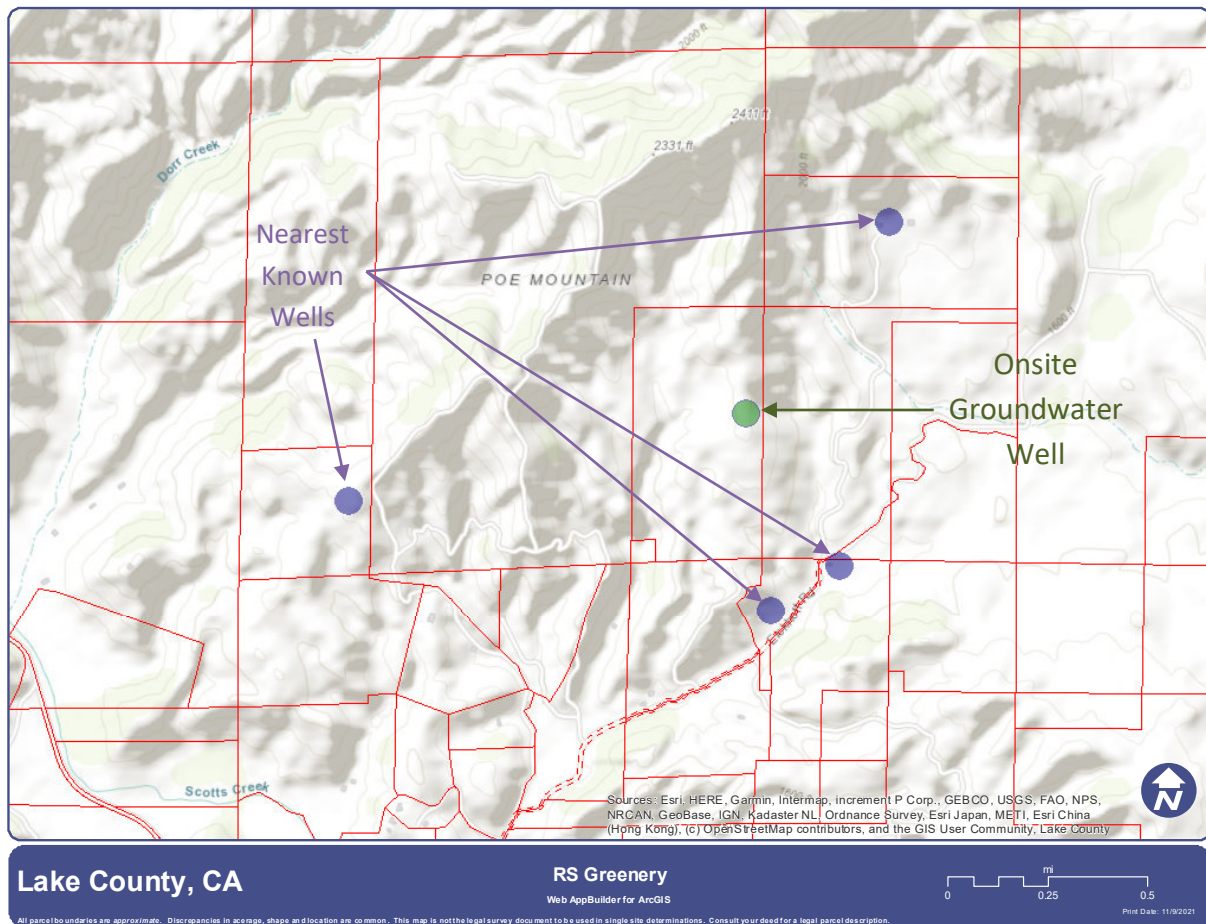


Figure 2 – Nearest Known Wells Location Map

To evaluate potential well pumping impacts to surrounding areas and uses, the potential lateral extent of pumping from the onsite groundwater well was estimated. Using general relationships discussed in *Groundwater and Wells, Second Edition* (Driscoll 1986⁷), we estimate the lateral pumping influence using information from the onsite groundwater well's Well Completion Report and from the well performance test performed by JAK Drilling & Pump on December 18th, 2020 (**Attachment C: Onsite Well Completion and Performance Test Reports**). An approximate relationship between specific capacity calculated from the well performance test and aquifer transmissivity was used to obtain aquifer characteristics and estimate a potential radius of pumping influence. Transmissivity was estimated for a unconfined aquifer, using the relationship of specific capacity (yield/drawdown) multiplied by the coefficient of 1,500 (for a unconfined aquifer). To



develop the slope of the drawdown curve from the pumping well, the value of Δs (drawdown over on log graph cycle) was calculated for a distance-drawdown relationship, where $T = 528Q/\Delta s$ (Driscoll 1986, equation 9.11⁷). The analysis is shown on the attached semi-log plot (**Attachment D – Radius of Influence Analysis**).

Using data from the Well Completion and Performance Test Reports and the general relationships outlined above, we calculated a zone of pumping influence extending approximately 300 feet from the onsite groundwater well. The unnamed intermittent Class II watercourse of the Project Parcel passes within approximately 800 feet of the onsite groundwater well. All of the nearest known neighboring wells are located over 1,500 feet from the onsite groundwater well. Given the horizontal and vertical separations between the onsite groundwater well and neighboring wells, it does not appear that pumping for the proposed cultivation operation will result in well interference. The radius of pumping influence graphs indicate that pumping of the onsite groundwater well would not impact stream flows within the unnamed intermittent Class II watercourse.

DROUGHT MANAGEMENT PLAN

The Urgency Ordinance approved by the Lake County Board of Supervisors on July 27th, 2021 (Ordinance No. 3106) requires applicants to provide a plan depicting how the applicants plan to reduce water use during a declared drought emergency. RSG's proposed cannabis cultivation operation would have up to 84,848 ft² of outdoor cultivation/canopy area, with a total combined estimated annual water use requirement between 4.1 and 5.7 acre-feet (1,336,000 to 1,864,000 gallons). RSG intends to plant the proposed canopy areas on or around May 15th of each year (depending on climatic conditions). Per the Water Conservation and Use requirements outlined in the State Water Resources Control Board's Cannabis General Order, RSG shall implement the following Best Practical Treatment and Control (BPTC) measures to conserve water resources:

- Regularly inspect the entire water delivery system for leaks and immediately repair any leaky faucets, pipes, connectors, or other leaks;
- Apply weed-free mulch in cultivation areas that do not have ground cover to conserve soil moisture and minimize evaporative loss;
- Implement water conserving irrigation methods (drip or trickle and micro-spray irrigation);
- Maintain daily records of all water used for irrigation of cannabis. Daily records will be calculated by using a measuring device (inline water meter) installed on the main irrigation supply line between the water storage area and cultivation area(s);
- Install float valves on all water storage tanks to keep them from overflowing onto the ground.

With the Water Conservation and Use requirements outlined above, RSG's proposed cultivation operation would efficiently use water resources at all times.

To ensure both success and decreased impacts to the surrounding areas, RSG plans to reduce their outdoor cultivation/canopy area and water usage by 10 percent, when a drought emergency has been declared for their region. To reduce their water usage by 10 percent, RSG will not plant 8,485 ft² or more of their proposed cultivation/canopy area. The cultivation/canopy area(s) to be left fallow will depend on when a drought emergency is declared (before or after the proposed cultivation/canopy areas have been planted), and RSG will prioritize the preferred



cultivation/canopy areas over less desirable cultivation/canopy areas (based on cultivation experience). By implementing the Drought Management Plan outlined above, EMF will reduce their estimated annual water demand from 1,336,000 to 1,864,000 gallons, to 1,202,400 – 1,677,600 gallons (10 percent), during periods of drought.

CONCLUSIONS

All water for the proposed cultivation operation will come from the existing onsite groundwater well located at Latitude: 38.1728° and Longitude: -122.94968°. This groundwater well was drilled to a depth of 140 feet below ground surface in August of 2018, with an estimated yield of 50 gallons per minute at the time it was drilled. A well performance test performed in December of 2020, indicates that the onsite groundwater well can sustainably produce at least 15.5 gallons per minute. From the well performance test data we calculated a Specific Capacity of approximately 12.9 gpm/foot for the onsite groundwater well. The total estimated annual water use requirement for the proposed cultivation operation is between 1,336,000 to 1,864,000 gallons per year.

Based on data from the recent well performance test and the estimated water use requirement(s) for the proposed cultivation operation, it appears that the onsite groundwater well is a sufficient water source for the proposed cultivation operation. Based on the estimated average annual recharge to the aquifer under the Project Property (~22 acre-feet/year) and the estimated annual water usage of the proposed cultivation operation (4.1 to 5.7 acre-feet/year), it appears that the aquifer storage and recharge area are sufficient to provide for sustainable annual water use at the site and on the Project Property.

The calculated a zone of pumping influence for the proposed cultivation operation extends approximately 300 feet from the onsite groundwater well. It does not appear that pumping for the proposed cultivation operation will impact neighboring wells, given the horizontal and vertical separations between the onsite groundwater well and the nearest known wells. Pumping for the proposed cultivation operation should not impact nearby ephemeral watercourses, as they are typically dry by May of each year, when pumping for the proposed cultivation operation would start. Additionally, pumping of the onsite ground water well should not impact the onsite intermittent watercourse, as it does not flow through the calculated zone of pumping influence.

RS Greenery's Drought Management Plan is to reduce their outdoor cultivation/canopy area and water usage by 10 percent, to ensure both success and decreased impacts to the surrounding areas during a drought emergency. The cultivation/canopy area(s) to be left fallow will depend on when a drought emergency is declared, prioritizing the preferred cultivation/canopy areas over less desirable cultivation/canopy areas. By implementing their Drought Management Plan, RS Greenery would reduce their estimated annual water demand from 1,336,000 to 1,864,000 gallons, to 1,202,400 – 1,677,600 gallons, during periods of drought.



LIMITATIONS

Realm Engineering is not responsible for the independent conclusions, opinions or recommendations made by others based on the records review, site inspection, field exploration, and interpretations presented in this report.

Groundwater systems of Lake County are typically complex, and available data rarely allows for more than general assessment of groundwater conditions and delineation of aquifers. Hydrologic interpretations are based on Well Completion Reports made available to us through the California Department of Water Resources, available geologic maps and hydrological studies and professional judgment. This analysis is based on limited available data and relies significantly on interpretation of data from disparate sources of disparate quality.

It should be noted that hydrological assessments are inherently limited in the sense that conclusions are drawn and recommendations developed from information obtained from limited research and site evaluation. Additionally, the passage of time may result in a change in the environmental characteristics at this site and surrounding properties. This report does not warrant against future operations or conditions, nor does this warrant operations or conditions present or a type or at a location not investigated.

This report is for the exclusive use of RS Greenery, LLC, their affiliates, designates and assignees, and no other party shall have any right to rely on any service provided by Realm Engineering without prior written consent.

Please feel free to contact me with any questions that you may have regarding this Hydrology Study/Report.

Sincerely,
Jason Vine, P.E. 67800



Realm Engineering
1767 Market Street, Suite C
Redding, CA 96001
530-526-7493
info@realm-engineering.com



REFERENCES

- ¹Lake County Watershed Protection District, Lake County Groundwater Management Plan, 2006
- ²Bauer, S., Olson, J., Cockrill, A., et al. 2015. Impacts of surface water diversions for marijuana cultivation on aquatic habitat in four northwestern California watersheds. PLOS ONE, 10(9): e0137935
- ³Carah, J.K., Howard, J.K., Thompson, S.E., *et al.* 2015. High time for conservation: adding the environment to the debate on marijuana liberalization. Bioscience, 65, pp.822-829
- ⁴Hammon, B., Rizza, J. and Dean, D. 2015. Current impacts of outdoor growth of cannabis in Colorado. Colorado State University Extension, Fact Sheet No. 0.308
- ⁵Dillis, C.R., Grantham, T.E., McIntee, C., McFadin, B., Grady, K.V. 2020. Water storage and irrigation practices for cannabis drive seasonal patterns of water extraction and use in Northern California. Journal of Environmental Management, Volume 272, 15 October 2020, 110955
- ⁶Scotts Creek Watershed Council, Scotts Creek Watershed Assessment, 2010
- ⁷Driscoll, Fletcher G., 1986, Groundwater and Wells, Second Edition, Johnson Division, St. Paul Minnesota, 1089p.

ATTACHEMENT A

URGENCY ORDINANCE NO. 3106

BOARD OF SUPERVISORS, COUNTY OF LAKE, STATE OF CALIFORNIA

ORDINANCE NO. 3106

AN URGENCY ORDINANCE REQUIRING LAND USE APPLICANTS TO PROVIDE ENHANCED WATER ANALYSIS DURING A DECLARED DROUGHT EMERGENCY

WHEREAS, the Sheriff, acting as the OES Director of Lake County, declared a local emergency due to drought conditions on May 6, 2021; and

WHEREAS, the Lake County Board of Supervisors approved the ratification of the declaration of a local emergency due to drought conditions on May 11, 2021; and

WHEREAS, the Board of Supervisors wish to ensure continued access to drinking water from private wells or from water purveyors throughout the county; and

WHEREAS, the Board of Supervisors wish to ensure that all current agricultural activities and projects find success during this declared drought emergency; and

WHEREAS, the Board of Supervisors of the County of Lake finds that additional information is critical to ensuring that the Planning Commission approves projects based on evidence of water use and water impacts and the analysis of the impacts to the surrounding areas.

NOW THEREFORE, the Board of Supervisors of the County of Lake hereby ordains as follows:

Section One: Due to the exceptional drought that we are experiencing and the declaration of a drought emergency, any land use approvals are required to provide adequate information regarding water usage for the project being considered and its impacts to surrounding areas. All projects that require a CEQA analysis of water use must include these additional items:

- A. Hydrology report prepared by a California licensed civil engineer, hydro-geologist, hydrologist, or geologist experienced in water resources
 - a. Approximate amount of water available for the project's identified water source
 - b. Approximate recharge rate for the project's identified water source
 - c. Cumulative impact of water use to surrounding areas due to project
- B. Drought Management Plan
 - a. Provide a plan depicting how the applicants plan to reduce water use during a declared drought emergency, to ensure both success and decreased impacts to the surrounding areas

Section Two: This urgency ordinance, if approved, shall take effect on all future Planning Commission considerations until the declared drought emergency has expired or if the Board of Supervisors revokes the ordinance.

Section Three: It can be seen with certainty that there is no possibility that this urgency Ordinance may have a significant effect on the environment.

Section Four: All ordinances or parts of ordinances or resolutions or parts of resolutions in conflict herewith are hereby repealed to the extent of such conflict and no further.

Section Five: This ordinance shall go into effect immediately, and before the expiration of fifteen days after its passage, it shall be published at least once in a newspaper of general circulation printed and published in the County of Lake.

Section Six: This Ordinance is adopted as an urgency Ordinance pursuant to the provisions of Government Code sections 25123 and 25131 and shall be effective immediately upon adoption. Based on the declaration of purpose and facts constituting the urgency set forth above in Section One of this Ordinance, the Board of Supervisors finds and determines that the adoption of this Ordinance as an urgency Ordinance is necessary for the immediate preservation of the public peace, health and safety to address critical groundwater conditions in Lake County.

The Foregoing Ordinance was introduced before the Board of Supervisors on the 27th day of July, 2021, and passed by the following vote on the 7th day of July, 2021.

AYES: Supervisors Simon, Crandell, Scott, Pyska, and Sabatier

NOES: None

ABSENT OR NOT VOTING: None

COUNTY OF LAKE


Supervisor, County of Lake, 2021 (04/15/2021)

Chair, Board of Supervisors

ATTEST: CAROL J. HUCHINGSON
Clerk of the Board of Supervisors

By: _____
Deputy

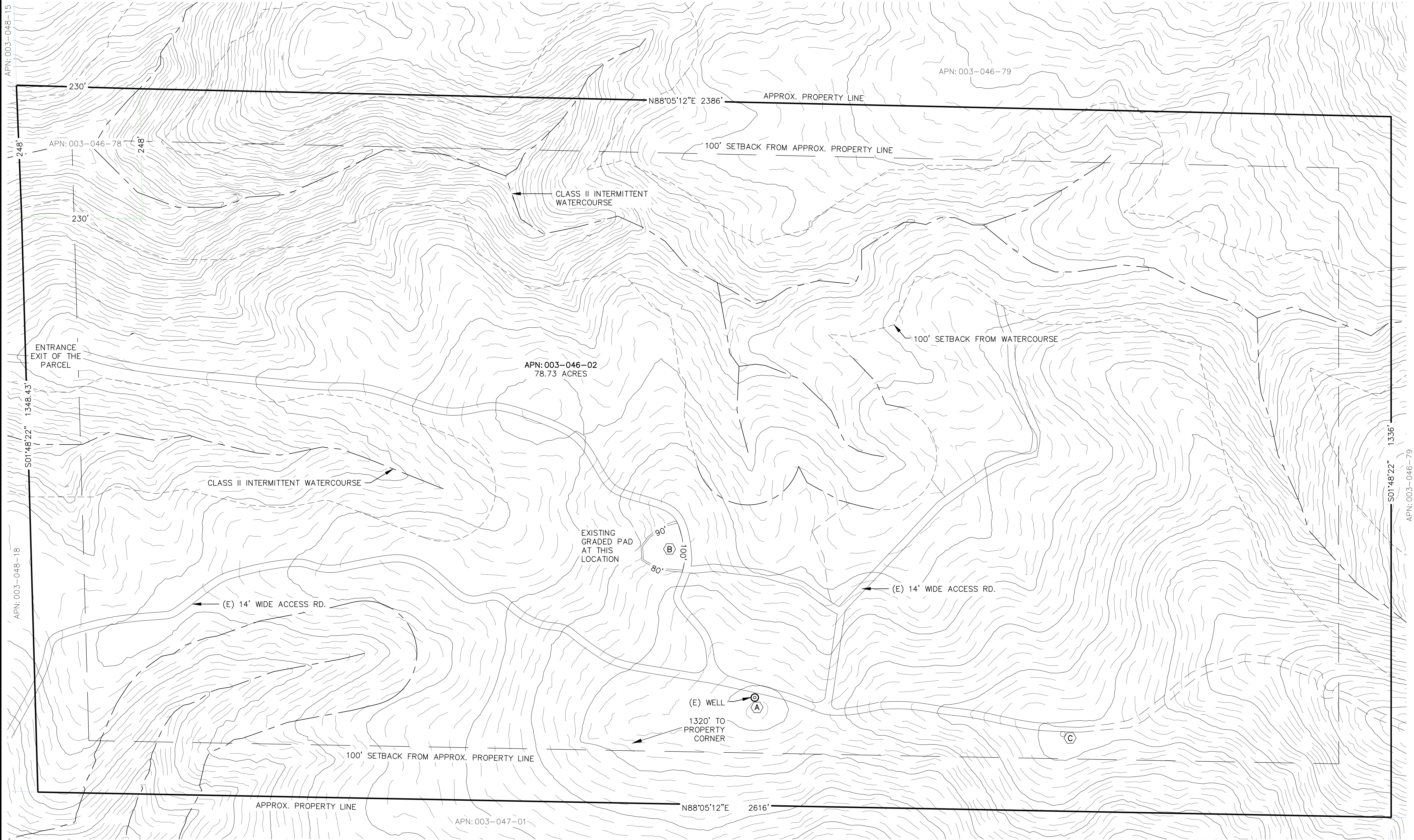
APPROVED AS TO FORM:

ANITA L. GRANT
County Counsel

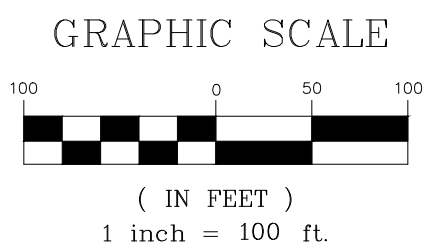
By: _____

ATTACHEMENT B

EXISTING AND PROPOSED CONDITIONS SITE PLANS



EXISTING CONDITIONS SITE PLAN



KELLY HUNTER
6243 EICKHOFF RD.
LAKEPORT, CA 95453
APN:003-046-02

LEGEND:

- 1530 CONTOUR ELEVATION
- FENCE
- ASPHALT
- GRAVEL
- EARTH
- WATERCOURSE / SWALE
- EXISTING POWER POLE
- TREES
- PONDED SPRING
- APN ASSESSOR'S PARCEL NUMBER
- APPROX APPROXIMATELY
- DWY DRIVEWAY
- (E) EXISTING
- (P) PROPOSED
- RD ROAD
- SF SQUARE FEET
- OH OVER HEAD POWER LINES

NOTES:

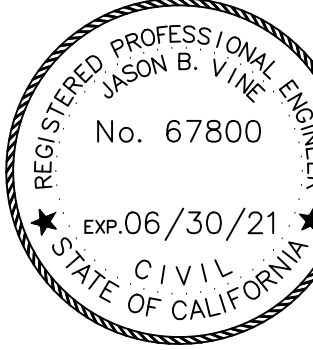
1. CONTOUR INTERVAL IS 5'

- (E) GROUNDWATER WELL
LAT: 39.1728
LONG: -122.94968
BENEFICIAL USES: IRRIGATION & FIRE PROTECTION
- (B) EXISTING FLATTENED OUT AREA
- (C) (E) 5,000 SF WATER TANK

Revisions:

REALM ENGINEERING
CIVIL ENGINEERING, SURVEYING & PLANNING
1767 MARKET STREET SUITE C
REDDING, CA. 96001
530-526-7493

PLANS PREPARED UNDER THE
SUPERVISION OF:



EXISTING CONDITIONS SITE PLAN
LAKE COUNTY - KELLY HUNTER

RS GREENERY, LLC
6243 EICKHOFF ROAD
LAKEPORT, CA 95453
LAKE COUNTY APN:003-046-02

PLOTTED BY:

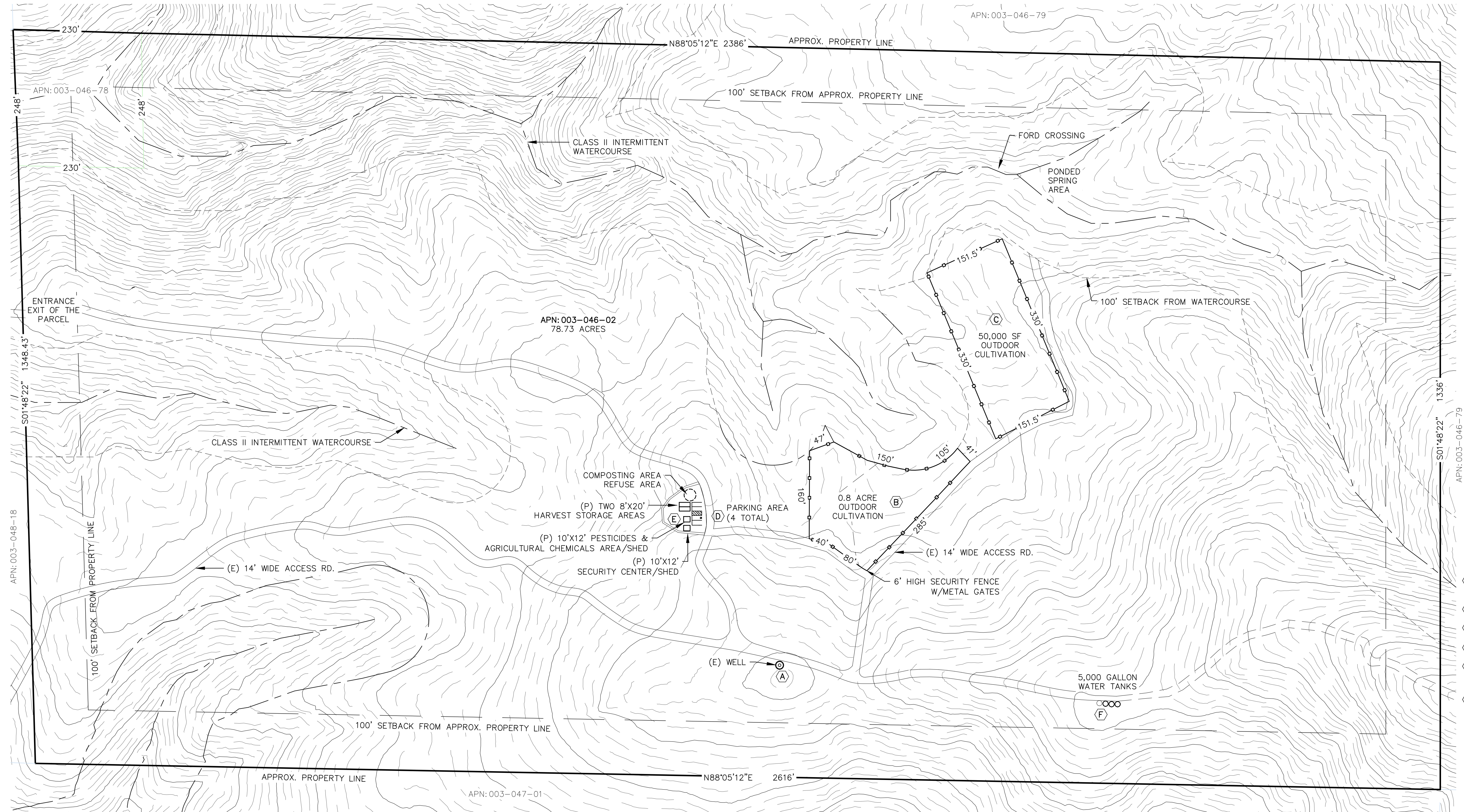
DATE PLOTTED:

SCALE OF DRAWING:

JOB NUMBER:

ADD FILE:

SHEET:



KELLY HUNTER
6243 EICKHOFF RD.
LAKEPORT, CA 95453
APN:003-046-02

LEGEND:

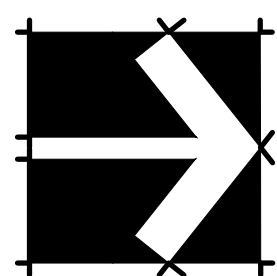
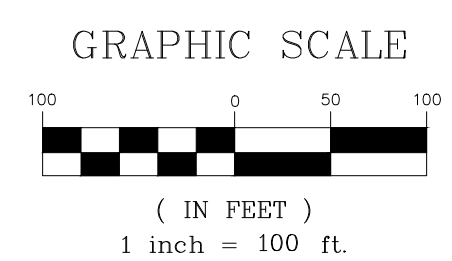
- 1530 CONTOUR ELEVATION
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- GRAVEL
- EARTH
- WATERCOURSE / SWALE
- EXISTING POWER POLE
- TREES
- APN ASSESSOR'S PARCEL NUMBER
- APPROX APPROXIMATELY
- DWY DRIVEWAY
- (E) EXISTING
- (P) PROPOSED
- RD ROAD
- SF SQUARE FEET
- OH OVER HEAD POWER LINES

NOTES:

1. CONTOUR INTERVAL IS 5'

- (E) GROUNDWATER WELL
LAT: 39.1728
LONG: -122.94968
BENEFICIAL USES: IRRIGATION & FIRE PROTECTION
- (A) (P) 0.8 ACRE-34,848 SF CULTIVATION/CANOPY AREA
- (B) (P) 1.1 ACRE-50,000 SF CULTIVATION/CANOPY AREA
- (C) (P) 1 ADA AND 3 NORMAL PARKING SPACES (4 TOTAL)
- (D) (P) 10'x12' PESTICIDES & AGRICULTURE CHEMICALS STORAGE AREA. (WOODEN SHED)
- (E) (E) 1-EXISTING 5,000 GALLON WATER STORAGE TANKS
(F) 3-NEW 5,000 GALLON WATER STORAGE TANKS

PROPOSED CONDITIONS SITE PLAN



Revisions:

REALM ENGINEERING
CIVIL ENGINEERING, SURVEYING & PLANNING
1767 MARKET STREET SUITE C
REDDING, CA. 96001
530-526-7493

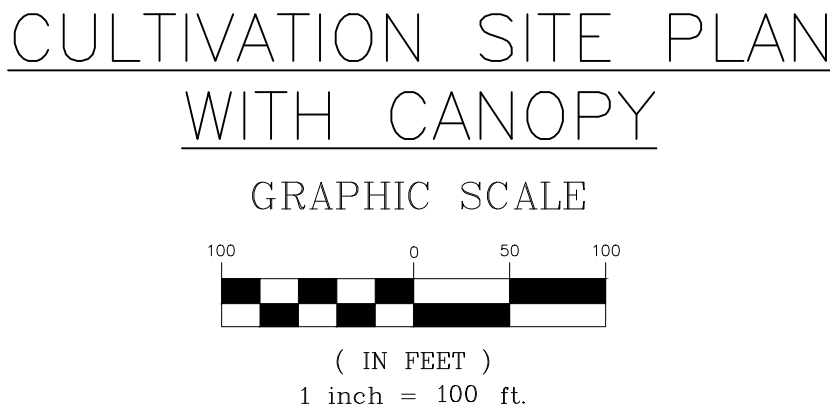
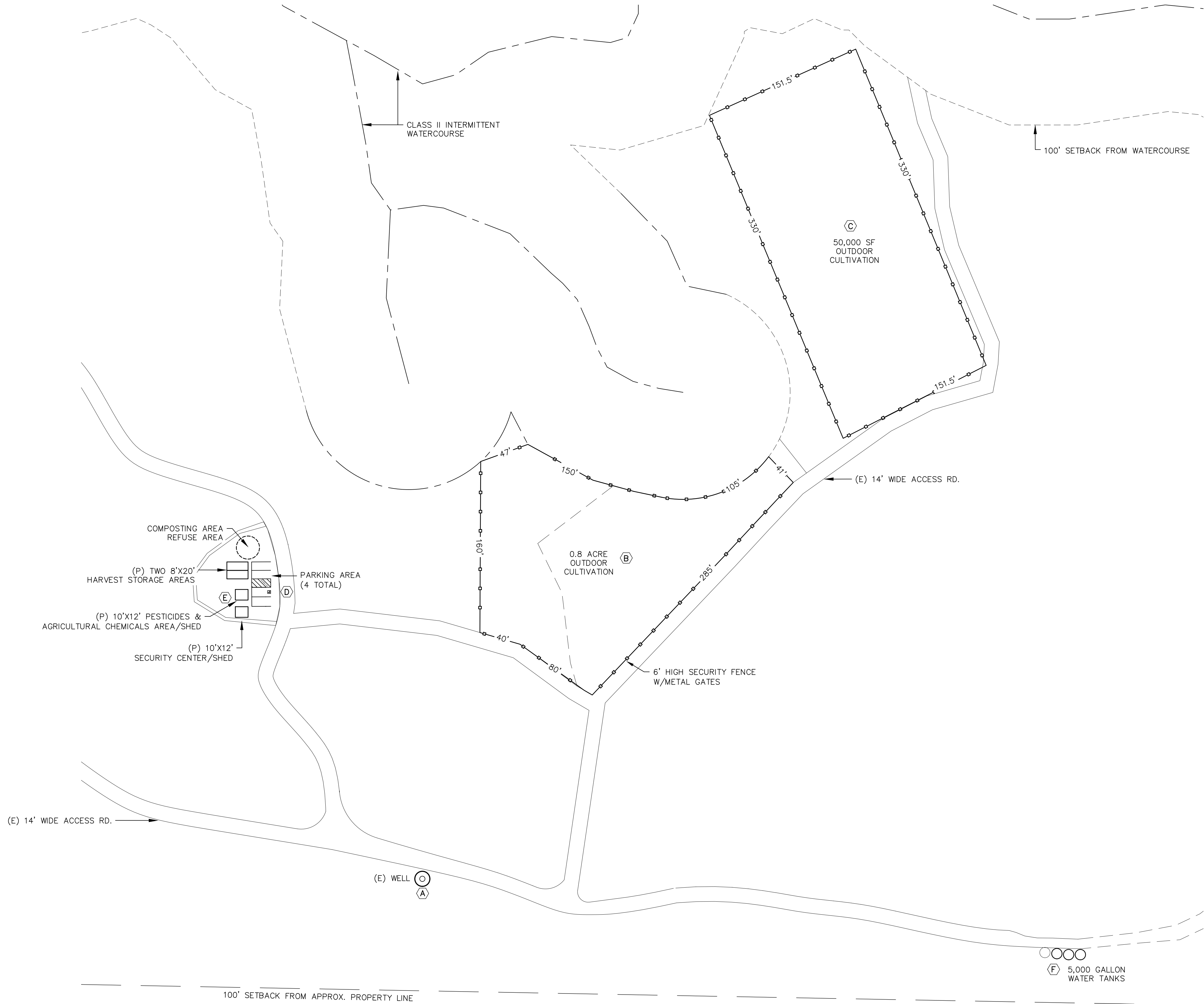
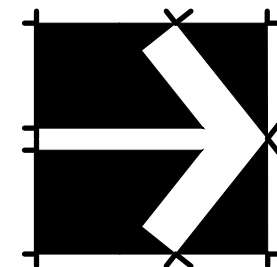
PLANS PREPARED UNDER THE SUPERVISION OF:

REGISTERED PROFESSIONAL ENGINEER
JASON B. VINE
No. 67800
EXP. 06/30/21
CIVIL
STATE OF CALIFORNIA

PROPOSED CONDITIONS SITE PLAN
LAKE COUNTY - KELLY HUNTER

RS GREENERY, LLC
6243 EICKHOFF ROAD
LAKEPORT, CA 95453
LAKE COUNTY APN:003-046-02

PLOTTED BY:
DATE PLOTTED:
1/10/21
SCALE OF DRAWING:
SEE PLAN
JOB NUMBER:
CADD FILE:
SHEET:



- LEGEND:**
- 1530 CONTOUR ELEVATION
 - FENCE
 - ASPHALT
 - GRAVEL
 - EARTH
 - WATERCOURSE / SWALE
 - EXISTING POWER POLE
 - TREES
 - APN ASSESSOR'S PARCEL NUMBER
 - APPROX APPROXIMATELY
 - DWY DRIVEWAY
 - (E) EXISTING
 - (P) PROPOSED
 - RD ROAD
 - SF SQUARE FEET
 - OH OVER HEAD POWER LINES

NOTES:
1. CONTOUR INTERVAL IS 5'

- (E) GROUNDWATER WELL
LAT: 39.1728
LONG: -122.94968
BENEFICIAL USES: IRRIGATION & FIRE PROTECTION
- (B) (P) 0.8 ACRE-34,848 SF CULTIVATION/CANOPY AREA
- (C) (P) 1.1 ACRE-50,000 SF CULTIVATION/CANOPY AREA
- (D) (P) 1 ADA AND 3 NORMAL PARKING SPACES (4 TOTAL)
- (E) (P) 10'x12' PESTICIDES & AGRICULTURE CHEMICALS STORAGE AREA. (WOODEN SHED)
- (F) (E) 1-EXISTING 5,000 GALLON WATER STORAGE TANKS
(P) 3-NEW 5,000 GALLON WATER STORAGE TANKS

KELLY HUNTER
6243 EICKHOFF RD.
LAKEPORT, CA 95453
APN:003-046-02

Revisions:

REALM ENGINEERING
CIVIL ENGINEERING, SURVEYING & PLANNING
1767 MARKET STREET SUITE C
REDDING, CA. 96001
530-526-7493

PLANS PREPARED UNDER THE SUPERVISION OF:

REGISTERED PROFESSIONAL ENGINEER
JASON B. VINE
No. 67800
EXP. 06/30/21
CIVIL
STATE OF CALIFORNIA

CULTIVATION SITE PLAN WITH CANOPY
LAKE COUNTY - KELLY HUNTER
RS GREENERY, LLC
6243 EICKHOFF ROAD
LAKEPORT, CA 95453
LAKE COUNTY APN003-046-02

PLOTTED BY:

DATE PLOTTED:
1/10/21
SCALE OF DRAWING:
SEE PLAN
JOB NUMBER:

CADD FILE:

SHEET:
1

ATTACHEMENT C

ONSITE WELL COMPLETION AND WELL PERFORMANCE TEST REPORTS

Page _____ of _____
 Owner's Well Number _____
 Date Work Began _____
 Local Permit Agency _____
 Permit Number _____

No.	Date Work Ended
-----	-----------------

DWR Use Only – Do Not Fill In	
State Well Number/Site Number	
N	W
Latitude	Longitude
APN/TRS/Other	

[illegible]

Well Owner										
Name										
Mailing Address										
City				State			Zip			
Well Location										
Address										
City				County						
Latitude			Deg.		Min.		Sec.		N Longitude	
Datum			Dec.		Min.		Sec.		W	
APN Book				Page			Decimal Long.			
Township				Range			Section			
Location Sketch (Sketch must be drawn by hand after form is printed.)					Activity					
North					New Well Modification/Repair Deepen Other Destroy <small>Describe procedures and materials under "GEOLOGIC LOG"</small>					
<div style="display: flex; justify-content: space-between;"> West East </div>					Planned Uses					
					Water Supply Domestic Public Irrigation Industrial Cathodic Protection Dewatering Heat Exchange Injection Monitoring Remediation Sparging Test Well Vapor Extraction Other					
South <small>Illustrate or describe distance of well from roads, buildings, fences, rivers, etc., and attach a map. Use additional paper if necessary. Please be accurate and complete.</small>										
Water Level and Yield of Completed Well										
Depth to first water					(Feet below surface)					
Depth to Static										
Water Level			(Feet)		Date Measured					
Estimated Yield *			(GPM)		Test Type					
Test Length			(Hours)		Total Drawdown			(Feet)		
*May not be representative of a well's long term yield.										

Casings								Annular Material				
Depth from Surface Feet to Feet		Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)	Depth from Surface Feet to Feet		Fill	Description
+												

Attachments		Certification Statement				
Geologic Log Well Construction Diagram Geophysical Log(s) Soil/Water Chemical Analyses Other Attach additional information, if it exists.		I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief Name _____ _____ Person, Firm or Corporation _____ Address _____ City _____ State _____ Zip _____ Signed _____ _____ C-57 Licensed Water Well Contractor				
		Date Signed		C-57 License Number		



WELL PERFORMANCE TEST REPORT

Client Name: Kelly Hunter
Property Location: 6243 Eickhoff Road, Lakeport, CA
Parcel Number: 003-046-02
Number of Wells Evaluated: One
Well Performance Test Completion Date: December 18, 2020
Water Samples Collected: No
Pump Technician: Jim Jackson

Location Description: (approximately) 39.11750, -122.949722
Total Depth: 120-feet below top of casing
Depth to Static Water Level: 90.0-feet below the top of casing
Diameter of well: 5-inches
Casing type: PVC
Test Duration: 6-hours
Test Type: Pump
Pumping Rate: 15.5 Gallons Per Minute (GPM)

Observations: The well is located on the east side of the unpaved access road through the property (see attached Well Location Map). The existing submersible pump, a 1-horse 10-GPM Flowtech brand powered with a generator, appears to be operational.

Well Performance Pump Test:

The six-hour pump test was conducted on December 18 2020, using the existing submersible pump set in accordance with industry standards. The static water level within the well was measured prior to the start of the test. Once the performance test began, the depth-to-water or pumping level was measured manually with a Powers Water Meter in the well every five minutes during the first half hour of the test and then every 10-minutes for the next hour of the test. The measurement interval was then increased to every 30-minutes for the remainder of the six-hour test. The pumping rate was measured by timing the flow through a newly installed totalizing flow meter. The pumping rate was measured at the same intervals as the pumping level. Both the depth-to-water/pumping level and pumping rate measurements are summarized in the attached table.

The static water level was measured at 90.0-feet below the top of casing at the start of the performance test. The pumping level slowly decreased over the course of the test, for example the maximum drawdown of 1.17-feet was observed after 3.5-hours of the test at 91.17-feet below the top of casing. The pumping level remained at 91.17-feet below the top of casing for the duration of the test. The pumping rate, measured by timing the flow through the totalizing



flow meter, measured at 15.5-GPM and remained constant for the duration of the test. After six hours of pumping, the well produced 5,818-gallons which averages out to a pumping rate of 16.166-GPM. The well pump was shut off and the well was then allowed to rest and recharge. The depth-to-water was measured in the well after 10-minutes at 90.92-feet and then again in the well after 30-minutes at 90.67 indicating a recharge rate of approximately 43%. Based on this recharge rate, the well would be fully recharged in less than 24-hours.

Continuous Compliance Monitoring: Prior to the start of the well performance test, JAK installed a new totalizing flow meter that measures the total amount of water produced from the well through positive displacement. JAK also installed a datalogging sonic depth sounding meter called a Well Watch™670 at the well head. When powered, the Well Watch™670 measures the water level within the well utilizing low frequency sound waves and the depth to water is measured continuously while the internal datalogger logs/records the measurement every minute.

Water Quality: During the course of the performance test, JAK collected a water sample for the purpose of a field quality test with the following results:

Parameter	Concentration	Discussion
Hardness	12-Grains per gallon	Moderately hard, a softener is recommended when the hardness is greater than 7-gpg
Iron (ferrous)	2-part per million	EPA suggests a concentration of less than 0.3ppm for public drinking water system, higher concentrations can cause rust staining over time
pH	7.4	A pH of 7.0 is considered neutral
Total Dissolved Solids	348-part per million	Less than 500-ppm is acceptable, the higher the concentration the harder the water typically

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.

Please feel free to contact our office if there are any questions regarding the well test and/or well test report.

Sincerely,

Jessica Moreno
JAK Drilling & Pump

Attachments:

Well Location Map

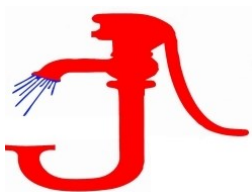
Table 1: Well Performance Test Data



WELL LOCATION MAP

6243 Eickhoff Road

Lakeport, CA



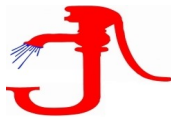


TABLE 1
WELL PERFORMANCE TEST DATA
6243 Eickhoff Road, Lakeport, CA
December 18, 2020

Time	Gallons Per Minute	Depth to Water In Feet Below Top of Casing
10:25	Static	90.00
10:30	15.50	90.17
10:35	15.50	90.17
10:40	15.50	90.17
10:45	15.50	90.25
10:50	15.50	90.25
10:55	15.50	90.25
11:05	15.50	90.25
11:15	15.50	90.33
11:25	15.50	90.33
11:35	15.50	90.33
11:45	15.50	90.33
11:55	15.50	90.42
12:25	15.50	90.67
12:55	15.50	90.83
13:25	15.50	91.00
13:55	15.50	91.00
14:25	15.50	91.17
14:55	15.50	91.17
15:25	15.50	91.17
15:55	15.50	91.17
16:25	15.50	91.17
16:35	RECHARGE	90.92
17:05	RECHARGE	90.67

Flow rate measured by timing flow through totalizing flow meter.

Flow rate measured by timing flow into a volume confirmed 5-gallon bucket.

ATTACHEMENT D

RADIUS OF INFLUENCE ANALYSIS

Radius of Influence Analysis

Well Borehole Radius (from Well Completion Report) = $8''/2 \times 1'/12'' = 0.33$ feet

Specific Capacity (using data from Well Performance Test Report)
 $15.5 \text{ gpm (yield)} / 1.2 \text{ feet (drawdown)} = 12.9 \text{ gpm/foot of drawdown}$
Specific Capacity (SC) = 12.9

Modified Jacob's equation from Driscoll Appendix 16-D (Driscoll 1986⁷)
Transmissivity Unconfined Aquifer $T = SC \times 1500$; $T = 19,350 \text{ gpft/day}$

Distance Drawdown Equation Driscoll 9.11 (Driscoll 1986⁵) $T = 528Q / \Delta s$
 $\Delta s = 528Q / T$; $\Delta s = 528 \times 15.5 \text{ gpm} / 19,350$
 $\Delta s = 0.4'$

