

HYDROGEOLOGIC ASSESSMENT REPORT

Dezel Ranch
660 Junction Plaza
Clearlake, CA 95423
APNs 010-055-28, 010-055-29, 010-055-33, 010-055-37 and 010-055-38

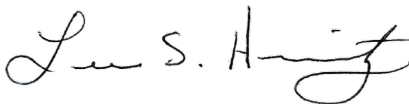
Prepared For:
Mr. Simon Whetzel
660 Junction Plaza
Clearlake, CA 95423

February 2, 2022
Revised October 7, 2022

Prepared By:

HURVITZ ENVIRONMENTAL SERVICES INC.

105 Morris Street, Suite 188
Sebastopol, California 95472



Lee S. Hurvitz, PG #7573 CHG #1015
Certified Hydrogeologist



Project No. 5185.01

February 2, 2022
Revised October 7, 2022

Mr. Simon Whetzel
660 Junction Plaza
Clearlake, CA 95423

Re: Hydrogeologic Assessment Report
Dezel Ranch
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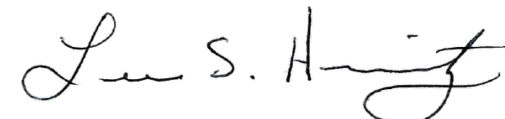
Mr. Simon Whetzel:

Hurvitz Environmental Services, Inc. (HES) is pleased to submit this Hydrogeologic Assessment Report for the above referenced property. HES prepared this Report in accordance with the Lake County Cannabis Ordinance. The purpose of this Report was to outline the site's proposed water usage rates and water conveyance systems as well as to evaluate whether or not the project water supply can adequately meet the proposed water demands without creating aquifer overdraft.

Based on the information and assessments contained herein, we conclude that the wells discharge capacity and rate of recharge are sufficient to sustainably provide for the projected annual water use at the site. The quantity of groundwater to be used for the project is unlikely to result in significant declines in regional groundwater availability or depletion of groundwater resources over time. The potential for the project water-use to cause well interference or impacts to creeks are also considered minimal.

We appreciate the opportunity to provide you with these services. Please do not hesitate to contact us at your convenience, should you have any questions or comments regarding this report or our recommendations.

Sincerely,
HURVITZ ENVIRONMENTAL SERVICES, INC



Lee S. Hurvitz, PG #7573 CHG #1015
Certified Hydrogeologist



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1.0 INTRODUCTION AND SCOPE OF SERVICES

We understand that Simon Whetzel, (the applicant) is applying to Lake County for approval to develop approximately 8-acres (348,480 ft²) of outdoor cannabis cultivation and 0.92-acres (39,936ft²) of mixed light greenhouse cultivation (the project) at the property located at 660 Junction Plaza Clearlake, CA 95423, Assessor's Parcel Numbers (APN) 010-055-28, 010-055-29, 010-055-33, 010-055-37 and 010-055-38 (Site). According to the Lake County Cannabis Ordinance, development of property with the intent to cultivate cannabis requires a Hydrogeologic Assessment Report. Therefore, on behalf of the applicant Hurvitz Environmental Services (HES) conducted a Hydrogeologic Assessment Study and prepared this Report in accordance with the Lake County requirements.

This Hydrogeologic Assessment Report includes the following elements:

- Estimates of existing and proposed water uses for the property.
- Characterization of local geologic and hydrogeologic conditions including defining water sheds and sub-basins.
- Review and analysis of 6-hour well yield and recharge tests.
- Well Completion Report assessment.
- Discussion on proposed methods for water level and water usage monitoring.
- Aquifer storage and recharge assessment.
- Assess potential for well interference between the project well and neighboring wells and between the project well and nearby streams.

2.0 SITE DESCRIPTION

The site is located in unincorporated Lake County, California, approximately 1 mile north of the City of Clearlake. Access to the site is obtained from Highway 53 south of Junction Plaza to the east on Ogulin Canyon Road (county road 215B) with private gravel and native soil surfaced access roads off of Ogulin Canyon Road (**Plate 1 – Site location Map**). The site consists of five parcels 010-055-28 (100.48-acres), 010-55-29 (17.66-acres), 010-055-33 (81.71-acres), 010-055-37 (153.92-acres) and 010-055-38 (77.81-acres) totaling approximately 431 acres (**Plate 2 – Assessor’s Parcel Map**). Cultivation activities are only proposed on the three parcels APN 010-055-28, 010-055-29, and 010-055-33 (Cultivation Parcels – 199.85-acres).

The site lies in the Mayacama Mountains of the Coast Ranges to the east of Clearlake. Site landscapes range from flat grasslands to oak and chaparral forest. The topography in this location is undulating, consisting of a series of ridgelines and valleys with elevations that range from approximately 1,600 to 1,900 feet above mean sea level (MSL). (**Plate 3 – USGS Topographic Map**). The site has been improved with four groundwater wells and a small hunting cabin (**Plate 4 – Site Plan**). **Site photographs** are presented in **Appendix A** and the **Engineering Site Plans** are presented in **Appendix B**.

2.1 USGS 7.5 MINUTE QUADRANGLE MAP

HES reviewed the United States Geological Survey (USGS) Benmore Canyon 7.5-Minute Quadrangle Maps, 2015, (**Plate 3 – USGS Topographic Map**). The 431-acre site is separated by a north-south trending, watershed divide or ridge ridgeline that separates surface water flow patterns across the site. Surface water on the western portion of the site, including the cultivation parcels, drains west/southwest and into Burns Valley Creek and then Clearlake, while surface water from the eastern portion of the site drains east/southeast and into Phipps Creek and then Cache Creek.

Multiple ephemeral Class III watercourses drain southwesterly across the cultivation parcels and into an intermittent tributary to Burns Valley Creek. The intermittent tributary stream flows north-south, paralleling Ogulin Canyon Road, through all three cultivation parcels before discharging to Burns Valley Creek approximately 1-mile south of the site. Watersheds are discussed in section 2.3 below.

The peak elevation on the site is 1,960 feet MSL on the north boundary of parcel 010-055-38. The peak elevation on the cultivation parcels is 1,800 feet MSL, located on parcel 010-055-28. The lowest elevation onsite is approximately 1,560 feet MSL on the southside of parcel 010-055-28 where the unnamed intermittent watercourse flows south off the site (**Plate 3 – USGS Topographic Map**).

2.2 GEOLOGICAL CONDITIONS

HES reviewed the Geologic Map and Structure Section of the Clear Lake Volcanics, Northern California¹. According to the Map reviewed, the site lies within a geologic region characterized mostly by Quaternary deposits of the Cache Formation (Qtc) including siltstone, sandstone, conglomeritic sandstone and tuff. These rocks are overlain by younger alluvium (al), colluvium (co), and landslide (ls) deposits of Holocene age. In addition, Pleistocene terrace deposits of the Burns Valley (tb) are found in the canyons created by the unnamed tributary to Burns Valley in the western portion of the site. Also on the western side of the site are early basaltic rocks of Pleistocene and Pliocene age characterized as undivided flows pyroclastic and intrusive rock composed of olivine basalt and olivine basaltic andesite (beu). These volcanics were deposited over the Upper Cretaceous to Upper Jurassic Franciscan Complex (KFJ) basement rock which is a mixture of marine chert, greenstone, greywacke, shale and metamorphic rocks of blueschist grade. To the west of the site is the Cross Spring Fault Zone.

2.3 REGIONAL GROUNDWATER

The western portion of the site including the cultivation areas are located within the Burns Valley-Frontal Clear Lake Sub-watershed (HUC 12 - 180201160309) and the east side of the site is located in the Grizzly Creek-North Fork Cache Creek Sub-watershed (HUC 12 - 180201160408). Water from the Burns Valley-Frontal Clear Lake Sub-watershed flows to Clearlake and water from the Grizzly Creek-North Fork Cache Creek Sub-watershed flows to the Central Valley. These watersheds are within the jurisdiction of the Central Valley Regional Water Quality Control Board. (**Plate 3 – USGS Topographic Map**).

The western side of the site, including the cultivation areas, is located within the Burns Valley Groundwater Basins as identified in the 2006 Lake County Groundwater Management Plan², while the remainder of the site is located within the Clear Lake Cache Formation Groundwater Basins. The Burns Valley Basin is in the Shoreline Inventory Unit. The Franciscan Complex 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. Water-bearing formations include the Quaternary alluvium and terrace deposits as well as recent basaltic volcanics.

¹ USGS 1995 Geologic Map and Structure section of the Clear Lake Volcanics, Northern California, B.C. Hearn, Jr, J.M. Donnelly-Nolan, and F.E. Goff.

² Camp Dresser and McKee Inc. 2006. Lake County Groundwater Management Plan. Camp Dresser & McKee Inc., Sacramento, California. Report prepared for Lake County Flood Control and Watershed Protection District, Lake County, California.

3.0 SITE DEVELOPMENT AND WATER USE

The proposed cultivation operation would be composed of 348,480 ft² outdoor canopy area and a 39,936 ft² canopy area in mixed light greenhouses. The proposed outdoor canopy area would be planted in early June and harvested throughout the month of October (~150-day cultivation season). Plants would be cultivated within the proposed mixed-light canopy area year-round, with minimal operations occurring during the months of January and February. The growing medium of the proposed outdoor canopy area will be native soil amended with compost. The proposed mixed-light canopy area would be located within gutter connected greenhouse structures, composted of steel frames and polycarbonate walls and roofs. The growing medium of the proposed mixed-light canopy area will be an imported organic soilless growing medium (composed mostly of composted forest material) in garden beds and nursery pots.

Irrigation for cultivation will be from two irrigation wells designated as irrigation wells A and B and located adjacent to the cultivation area as shown on **Plate 4 – Site Plan** and in **Appendix B - Engineered Site Plan**. Discussions on the irrigation wells construction and yields are presented in Section 3.4 and 3.5 of this Report. The approximate location of the proposed outdoor cultivation area, wells, and other site features are also shown on **Plate 4 – Site Plan** and in **Appendix B -Engineered Site Plan**.

Irrigation water will be pumped from the irrigation well to water storage tanks. From the tanks the water will be distributed to the cultivation areas. To conserve water resources the proposed cultivation operation will utilize drip irrigation systems. The project plans do not involve any water diversions, or imported water so all project water will be derived from the project irrigation wells. Details on the cultivation projects water usage, including breakdowns of average and peak monthly usage, are presented in **Table 1 – Total Project and Site Water Usage**.

3.1 CULTIVATION WATER USAGE

The applicant plans to cultivate up 8-acres (348,480 ft²) outdoor cultivation areas for 150 days and 0.92 acres (39,936 ft²) mixed light in greenhouses year-round. The applicant has not had any specific experience growing cannabis at this location but is working with experienced cannabis cultivators and is designing the system to use the least amount of water possible.

It is our understanding that a cannabis water usage rate of 2 acre-feet/acre/year for outdoor cultivation and 3 acre-feet/acre/year for indoor or mixed light cultivation is generally consistent with northern California averages. The applicant estimates that this 8-acre cultivation project will require a total of 5,213,616 gallons/year (16 acre-ft/year) and the mixed light green house area will require 896,225 gallons (2.75 acre-feet/year) as detailed on **Table 1 – Total Project and Site Water Usage**.

Therefore, a total of 18.75 acre-feet or 2.1-acre feet/acre/year of groundwater will be required for project irrigation.

3.2 RESIDENTIAL WATER USE

There are no residential buildings onsite and there are no immediate plans for residential development onsite. Therefore, residential water use was not a factor in this assessment.

3.3 EMPLOYEE WATER USAGE

We understand that the project will require two full-time farm managers, as well as, and multiple part-time employees. Therefore, for the purpose of this Assessment we estimate that the project will require an average of eight (8) seasonal employees throughout the growing season (150 days) and two year-round employees. Potable water for farm workers will come from the two irrigation wells. Using the Napa County Water Availability Guidance Document³ estimate of 15 gallons of water utilized per day per cultivation worker on site. As shown on **Table 1 – Total Project and Site Water Usage** Employee Water Usage was calculated as follows:

Part time Workers= 8 (seasonal employees) x 15 gallons/day (daily water use) x 150 days/year = 18,000 gallons/year
 Full time workers = 2 (year-round employees) x 15 gallons/day x 365 days/year = 10,950
 Total worker water use = 18,000 (seasonal employees) +10,950 year-round employees = **28,950 gallons /year = 0.09 acre-feet/year = Employee Groundwater Use**

3.4 TOTAL PROJECT WATER USAGE

The annual project water use estimate is:

5,213,616 (outdoor cultivation + 896,225 gallons (mixed light cultivation) + 28,950 gallons (employee) = **6,138,791 gallons or 18.84 acre-feet/year = Total Site Water Usage**

TABLE 1 – TOTAL PROJECT AND SITE WATER USAGE

Source	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total	Total
	-----Gallons-----													acre-ft
Outdoor Cultivation	0	0	0	0	0	800,000	1,150,000	1,250,000	1,250,000	763,616	0	0	5,213,616	15.99
Mixed Light Cultivation	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	50,000	46,225	896,225	2.75
Full Time Employees	912	913	912	913	912	913	912	913	912	913	912	913	10,950	0.03
Part Time	0	0	0	0	0	3,600	3,600	3,600	3,600	3,600	0	0	18,000	0.06
TOTAL USAGE	80,912	80,913	80,912	80,913	80,912	884,513	1,234,512	1,334,513	1,334,512	848,129	50,912	47,138	6,138,791	18.83

³ Water Availability Analysis (WAA) Guidance Document, Napa County, Adopted May 12, 2015.

Based on these estimates for onsite water use it appears that average water use for the total project would be **16,819 gallons/day** (6,138,791 gallons/365 days). During the peak cultivation season (July- September), the applicant will use a daily maximum of approximately **42,430 gallons/day**.

3.5 SITE WELL INFORMATION

There are four water supply wells located on the site, two of the wells (A and B) will be used for cultivation and one well (# 0952152) supplies a hunting cabin on parcel APN 010-055-33. The Well Completion Reports for all site wells are presented in **Appendix C** and well testing for the two proposed project irrigation wells are presented in **Appendix D**. Well locations are shown on the **Site Plan, Plate 4** and on the **Engineered Site Plans, Appendix B**.

The two proposed irrigation wells (A and B) were constructed and tested in 2021 and have yields between 68 and 70 gallons per minute (gpm). The Well Completion Report for well A shows that the well was completed to a total depth of 395 feet below grade (bg), has a 5-inch diameter PVC well casing, and is screened with 100-feet of slotted sections. Well B was completed to a total depth of 300 feet bg), has a 4.5-inch diameter PVC well casing, and is screened with 129 feet of slotted sections. Both irrigation wells appear to be screened into permeable members of the Franciscan complex rocks (Sandstone, greenstone and gravels).

On November 18, and 19, 2021, well yield tests were conducted on both irrigation wells A and B by JAK Drilling & Pump, **Appendix D – Well Yield Test**. Each well was pumped for 6 hours and recovery was monitored for 30 minutes after the pumping stopped. Well A was pumped at 70 gpm with a stabilized drawdown of 22 feet. Based on these measurements, the specific capacity for the irrigation Well A was calculated to be 3.18 gpm/foot of drawdown (70 gpm/22 feet). Recharge was measured after the pumping ceased and within 30 minutes the water level in the well had recovered 100%. Well B was pumped at 68 gpm with a stabilized drawdown of 62 feet. Based on these measurements, the specific capacity for the irrigation Well B was calculated to be 1.10 gpm/foot of drawdown (68 gpm/60 feet). Recharge was measured after the pumping ceased and within 30 minutes the water level in the well had recovered 100%. Of the two wells, Well A produced a higher flow rate with less drawdown resulting in a specific capacity value nearly three times higher. It is likely that well A can sustainably produce greater than 70 gpm recorded if a larger pump were utilized.

Results of the well yield test indicate the irrigation wells have a combined capability of producing 138 gpm for at least 6-hours without overdrawing the aquifer. The average daily water demand at the site over the cultivation season is expected to be **25,411 gallons/day** gallons/day. Pumping at 138 gpm this would require 184 minutes (3 hours and 4 minutes) of pumping a day to produce that volume of water. The peak daily water demand of **65,256** gallons/day would require approximately 473 minutes (7 hours 52 minutes) of pumping.

TABLE 2 – Site Well Details

APN/ Well Number	Well install/ Test Year	Distance to Site Well* (Feet)	Surface Elevation (Feet)	Total Well Depth (Feet)	Screen Interval (Feet)	Total Screen Thickness (Feet)	Well Yield* (GPM)	Draw- down* (Feet)	Specific Capacity	Aquifer material	Watershed
Well A/ 010- 055-29	2021	Site well	1620	395	160-200 340-400	100	70	22	3.18	Sandstone and greenstone	Burns Valley- Frontal Clearlake
Well B/ 010- 055-28	2021	Site well	1631	300	180-300	120	68	62	1.10	Cemented Franciscan Gravel	Burns Valley- Frontal Clearlake
0952152/ 010- 055-33	2015	2,901**	1847	395	240-395	155	7	NA	NA	Gravelly clay	Grizzly Creek- North Fork Cache Creek
0952153/ 010- 055-28	2015	3,901**	1746	387	220-387	167	5	NA	NA	Gravelly clay	Grizzly Creek- North Fork Cache Creek
Average Well TD = 369 ft bgs				Average Screen Thickness = 136 ft				Average Specific Capacity = 2.14			
NA - Not available * From JAK testing in November 2021 ** distance to Well A											

4.0 WATER BALANCE INFORMATION

4.1 PRECIPITATION

Precipitation, primarily as rainfall is the major source of inflow aquifers in this area. Though there are no climate stations on site or in the immediate vicinity, we estimate that the seasonal precipitation for the site is 31.42-inches/year⁴. Based on this precipitation it can be reasonably expected that approximately 2.62 acre-feet of rain falls on every acre of the site annually, or 523.61 acre-feet over the three cultivation parcels which total to 199.85 acres.

4.2 GROUNDWATER STORAGE

From data obtained from the 2006 Lake County Water Inventory and Analysis⁵ specific yields for aquifers proximate to the site range between 3% - 8%. For the purpose of this assessment, we have assumed a conservative specific yield value of 4%. As discussed in Section 3.6 of this Report, well log information indicated that the well screen interval of the irrigation wells were 100 feet (Well A) and 120 feet (Well B). Therefore, if we assume that the aquifer thickness is consistent with the average well screen interval (110 ft) we can use this value along with regional specific yields to estimate an aquifer storage at the site.

$$\begin{aligned} &\text{Average Aquifer Thickness (110 feet) x Specific Yield (0.04)} \\ &\text{x Project Parcels (199.85-acres) =} \\ &\underline{\text{Estimated Aquifer Storage = 879.34 acre-feet}} \end{aligned}$$

4.3 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-feet 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, drainage ditches).

The depth to the static water levels were much higher than the first encountered water levels when drilling which suggests that the aquifer at the site is semi-confined to confined. Drainage features that intersect and border the site have likely eroded through some of the overlying layers and are contributing to the recharge of the site's aquifer through the stream bottom. However, it is also likely that a portion of the rain water falling directly on the site infiltrates the ground surface and migrates downward through the soil matrix until it recharges the aquifer. In addition, flow in the intermittent creek from the north may contribute to recharge of the aquifer near the cultivation areas.

⁴ <http://rainharvestcalculator.com/Rainfall/CA/Clearlake/95422> based on 30-year average (1981-2010)

⁵ Lake County Water Inventory and Analysis, California Department of Water Resources, March 2006.

To estimate the groundwater recharge at the site we first assumed that the recharge to the aquifer is primarily through rainfall and that all rainfall accumulated within the three cultivation parcels (199.85-acre) drains to onsite and near-site creeks. Therefore, the annual precipitation available for recharge onsite can be estimated using the following data and equation.

$$199.85 \text{ acres} \times 2.62 \text{ feet (annual precipitation on the Cultivation Parcel)} =$$
$$\text{Estimated Annual Precipitation Onsite} = 523.61 \text{ acre-feet}$$

However, this estimate does not account for surface run-off, stream underflow, and evapo-transpiration that occurs in all watersheds. According to the USGS, the long-term average precipitation that recharges groundwater in these northern California regions is approximately 15 percent but can be as low as 1.67%. Since this site has relatively mixed topography with both upland and low-lying areas, we estimate that the long-term average precipitation that recharges groundwater within the entire site is slightly below the regional average of 15%. With this data and the precipitation data presented above, we can re-calculate the groundwater recharge within the cultivation parcel using the following equation.

$$523.61 \text{ acre-feet (annual precipitation onsite)} \times 0.15 \text{ (long term average for recharge)} =$$
$$\text{Estimated Average Groundwater Recharge} = 78.54 \text{ acre-feet/year}$$

The total site water usage is estimated to be **18.83 acre-feet/year** and the groundwater recharge is estimated to be **78.54 acre-feet/year**. Therefore, it appears that the project will have enough water to meet the demands without causing overdraft conditions.

4.3.1 DROUGHT CONDITIONS

The recharge assessment was based on a recent 30-year average for rainfall in the region (1981-2010). However, this average, did not account for severe drought conditions as we have seen over the past 2 years (2019-2020). If we were to assume drought conditions by using a value of 50% of the 30-year average rainfall used above, and assume that the groundwater recharge rate will be reduced to 12%, we can estimate the potential drought condition or low-end value for annual aquifer recharge as follows.

$$523.61 \text{ acre-feet (average precipitation onsite)} \times 0.5 \text{ (drought factor)} \times 0.12 \text{ (conservative long-term average for recharge)} =$$

$$\text{Estimated Severe Drought Value for Groundwater Recharge} = 31.42 \text{ acre-feet/year}$$

5.0 PUMPING INFLUENCE TO SURROUNDING PROPERTIES

To evaluate potential well pumping impacts to surface water bodies or wells on other properties, the potential lateral extent of pumping from the planned project well was estimated. Using general relationships discussed in Driscoll (1986)⁶, we estimated the lateral pumping influence using information from the November 2021, well yield test performed by JAK (**Appendix D – Well Yield Tests**). An approximate relationship between specific capacity calculated from the well yield testing, and aquifer transmissivity was used to obtain aquifer characteristics and estimate a potential radius of pumping influence. Transmissivity was estimated for an unconfined aquifer and confined aquifer, using the relationship of Specific Capacity (yield/drawdown) x the coefficient of 1,500 (unconfined) and 2,000 (confined). To develop the slope of the drawdown curve from the pumping well, the value of Δs (drawdown over one log graph cycle) was calculated for a distance-drawdown relationship, where $T = 528Q/\Delta s$ (Driscoll, 1986, Equation 9.11), where Q = flow rate in gallons per minute (gpm). The analysis is shown on the attached semi-log plots for the two site irrigation wells (**Appendix E – Radius of Pumping Influence**).

The specific capacity for the irrigation well A was calculated to be 3.18 gpm/foot drawdown (70 gpm/ 22 feet drawdown) and for well B, 1.10 gpm/foot drawdown (68 gpm/ 62 feet drawdown). Using this data and applying it to the site, we calculated a zone of pumping influence for confined aquifer conditions. Based on the calculations, it is estimated that the maximum radius of influence for both irrigation wells A and B is 1,200 feet (**Appendix E – Radius of Pumping Influence**).

Wells A and B are located about 1,200 feet apart which indicates they may have some influence on each other if pumped simultaneously, however drawdowns were relatively low so impacts may not be easily measured. The other site wells are not expected to be impacted by pumping of the irrigation wells because they are located outside the calculated radius of pumping influence and in an adjacent watershed (**Site Plan, Plate 4**).

There is a Class II intermittent watercourse that runs adjacent to Ogulin Canyon Road that is approximately 300 feet east of irrigation well A and approximately 700 feet east of irrigation well B. Based on the well completion report data, the wells are drawing from a confined or semi-confined aquifer (> 100 feet depth) and therefore do not appear to have any direct connection with this intermittent watercourse. Therefore, pumping from the irrigation wells is not expected to impact this creek.

⁶ Groundwater and Wells, Second Edition, Fletcher G. Driscoll, 1986, published by Johnson Division, St. Paul Minnesota, 1089p.

6.0 WATER QUALITY

During well yield testing, water samples were collected from the domestic well by JAK Drilling and Pump and tested for, Hardness, Iron (ferrous), pH and Total dissolved solids (TDS). The results of the water testing are presented in **Table 3 – Water Quality Data** and the laboratory analytical reports are included with the well yield testing forms in **APPENDIX D – Well Yield Tests**.

TABLE 3 – WATER QUALITY DATA

Location	pH	Iron (mg/L)	TDS (mg/L)	Hardness (g/g)
Well A	7.5	1.5	426	9
Well B	7.5	3.8	425	9
California Secondary Drinking Water Standards	NA	0.3	500	10
NA – Not Applicable				

7.0 CONCLUSIONS

The site is located within two watersheds however the cultivation areas are in the Burns Valley - Frontal Clearlake Sub-watershed and in the Burns Valley Aquifer area. The two project irrigation wells (A and B) are drawing groundwater from a semi-confined to confined aquifer consisting primarily of sedimentary rocks (Gravels, sandstone and greenstone). Recharge to the groundwater likely occurs primarily from direct precipitation and percolation as well as from stream flow from onsite creeks. The estimated groundwater usage for the entire project including employees is approximately 18.83 acre-feet/year. Average annual recharge available to the site aquifer is estimated at 78.54 acre-feet/year. Based on well yield test data collected at the site, it appears that the aquifer storage and recharge area are sufficient to provide for sustainable annual water use at the site and within the area.

In summary:

Estimated Cultivation Irrigation Water Use – 18.74 acre-feet/year
Site Worker Water Use - 0.09 acre-feet/year
Total Estimated Site Water Use – 28.45 acre-feet/year
Estimated Annual Recharge – 78.28 acre-feet/year
Estimated Recharge including Severe Drought – 31.42 acre-feet/year
Irrigation Wells Combined Sustainable Pumping Rate – 138 gpm
Average Daily Water Demand for Cannabis – 16,819 gallons/day
Peak Daily Water Demand for Cannabis – 42,430 gallons/day

- The quantity of groundwater to be used for the project compared to the average quantity of available groundwater indicates that pumping for the proposed project is unlikely to result in significant declines in groundwater elevations or depletion of groundwater resources over time.
- The horizontal and vertical separations between the project wells and the nearest neighboring properties should not result in significant well interference. Potential impacts to nearby intermittent or ephemeral watercourses are also not considered a concern to this assessment.
- Only a limited water quality assessment has been performed and therefore we recommend that the project water supplies be tested for bacteria and common contaminants such as arsenic and nitrates before being utilized as a potable water source.

8.0 LIMITATIONS

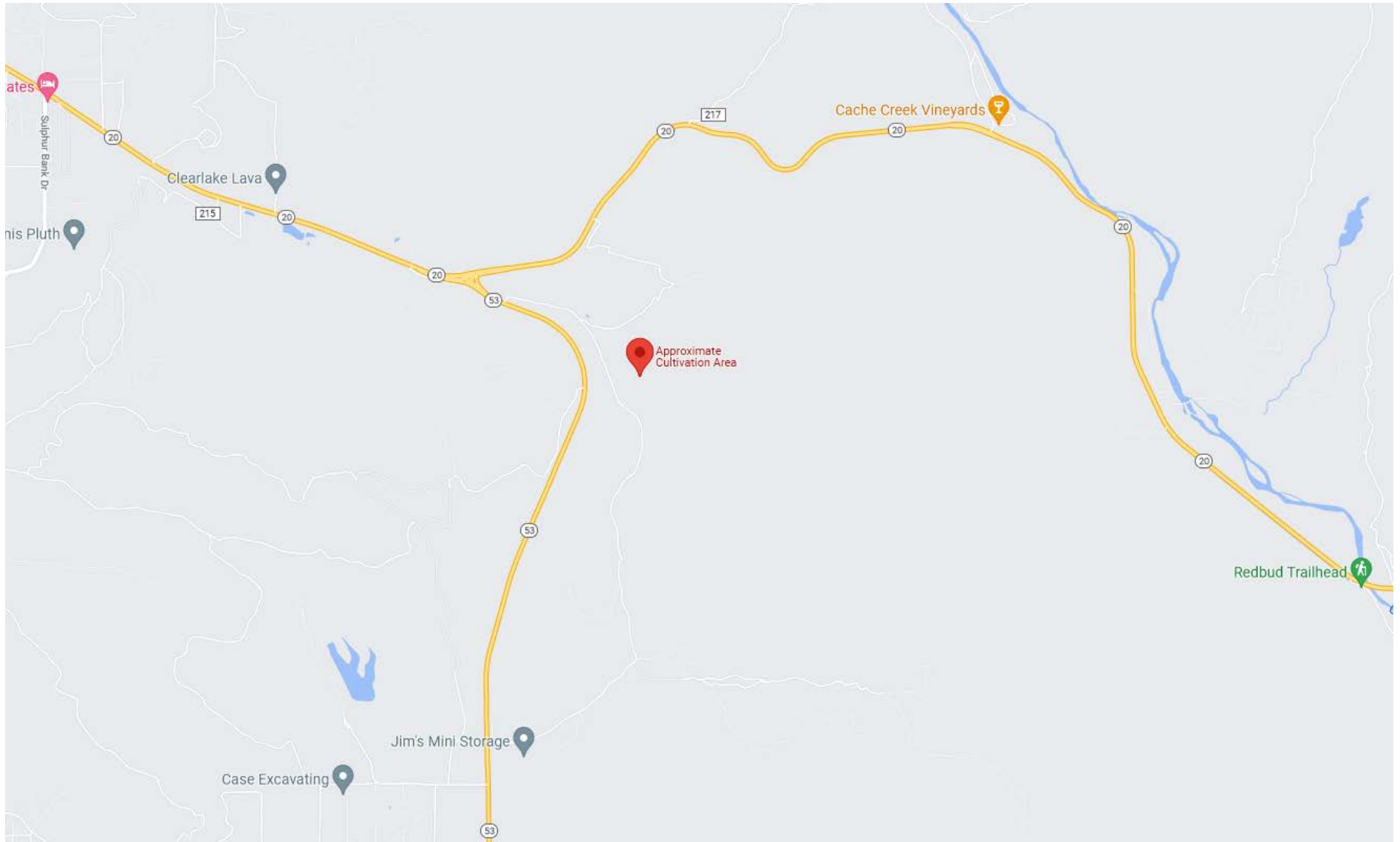
HES is not responsible for the independent conclusions, opinions or recommendations made by others based on the records review, site inspection, field exploration, laboratory test data and interpretations presented in this report.

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. Hydrogeologic interpretations are based on the drillers' reports made available to us through the California Department of Water Resources, available geologic maps and hydrogeologic 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 hydro-geological 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 of a type or at a location not investigated.

This study is not intended to assess if any soil contamination, waste emplacement, or groundwater contamination exists by subsurface sampling through the completion of soil borings and the installation of monitoring wells. The scope of work, determined by the client, did not include these activities.

This Report is for the exclusive use of Mr. Simon Whetzel, his affiliates, designates and assignees and no other party shall have any right to rely on any service provided by Hurvitz Environmental Services without prior written consent.



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SEBASTOPOL, CA 95472
PH: 707.824.1690
FX: 707.824.2675
HURVITZ.ENVIRONMENTAL@GMAIL.COM
CA PG# 7573

SITE MAP

010-055-28, 010-055-29, 010-055-33, 010-055-37 and 010-055-38

660 Junction Plaza
Clearlake, CA 95423

JOB NUMBER:
5185.01

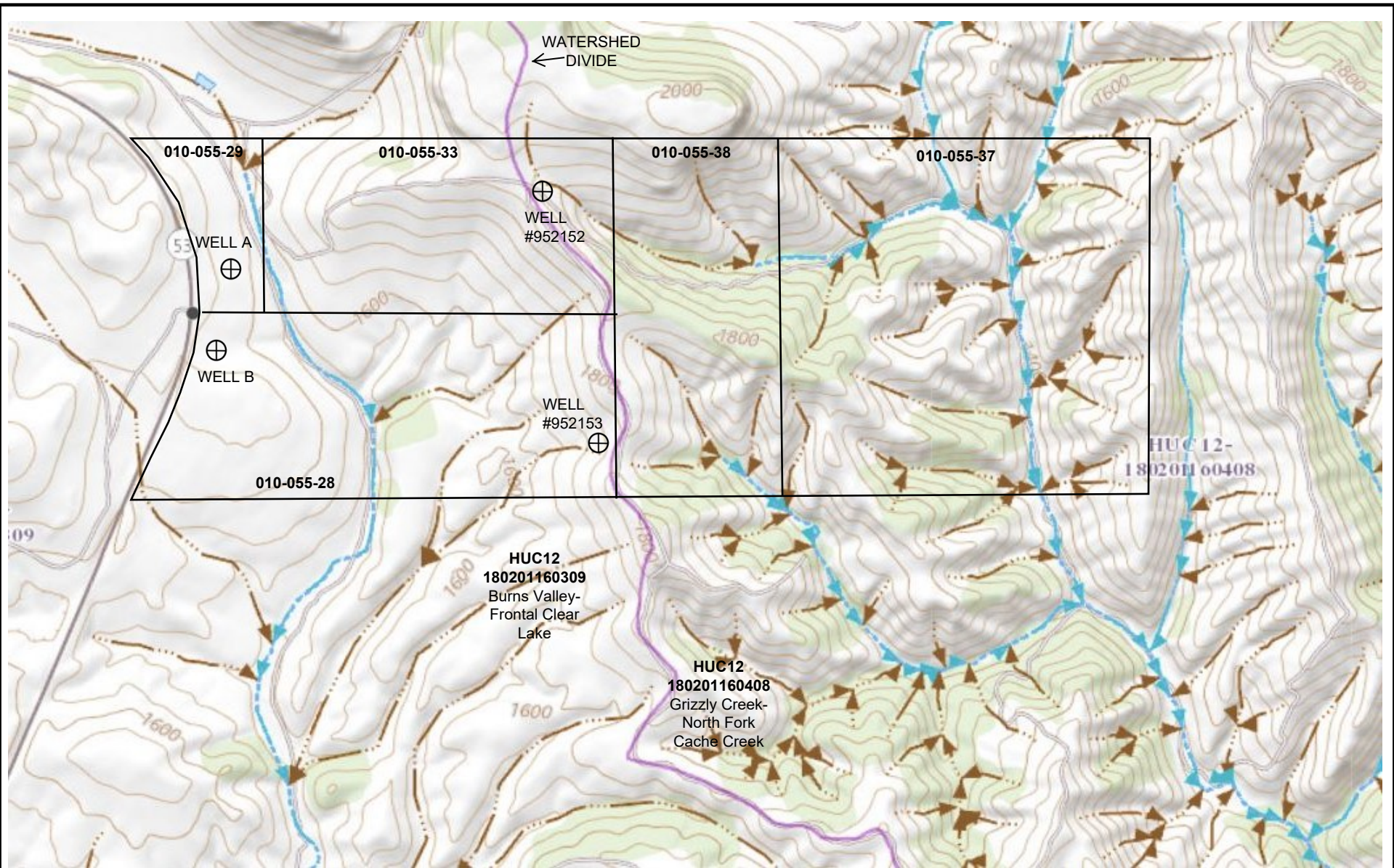
DATE:
01/28/2022

PLATE:
1



THIS MAP WAS PREPARED FOR
ASSESSMENT PURPOSES ONLY
NO LIABILITY IS ASSUMED FOR
THE ACCURACY OF THE DATA
DELINEATED HEREON.





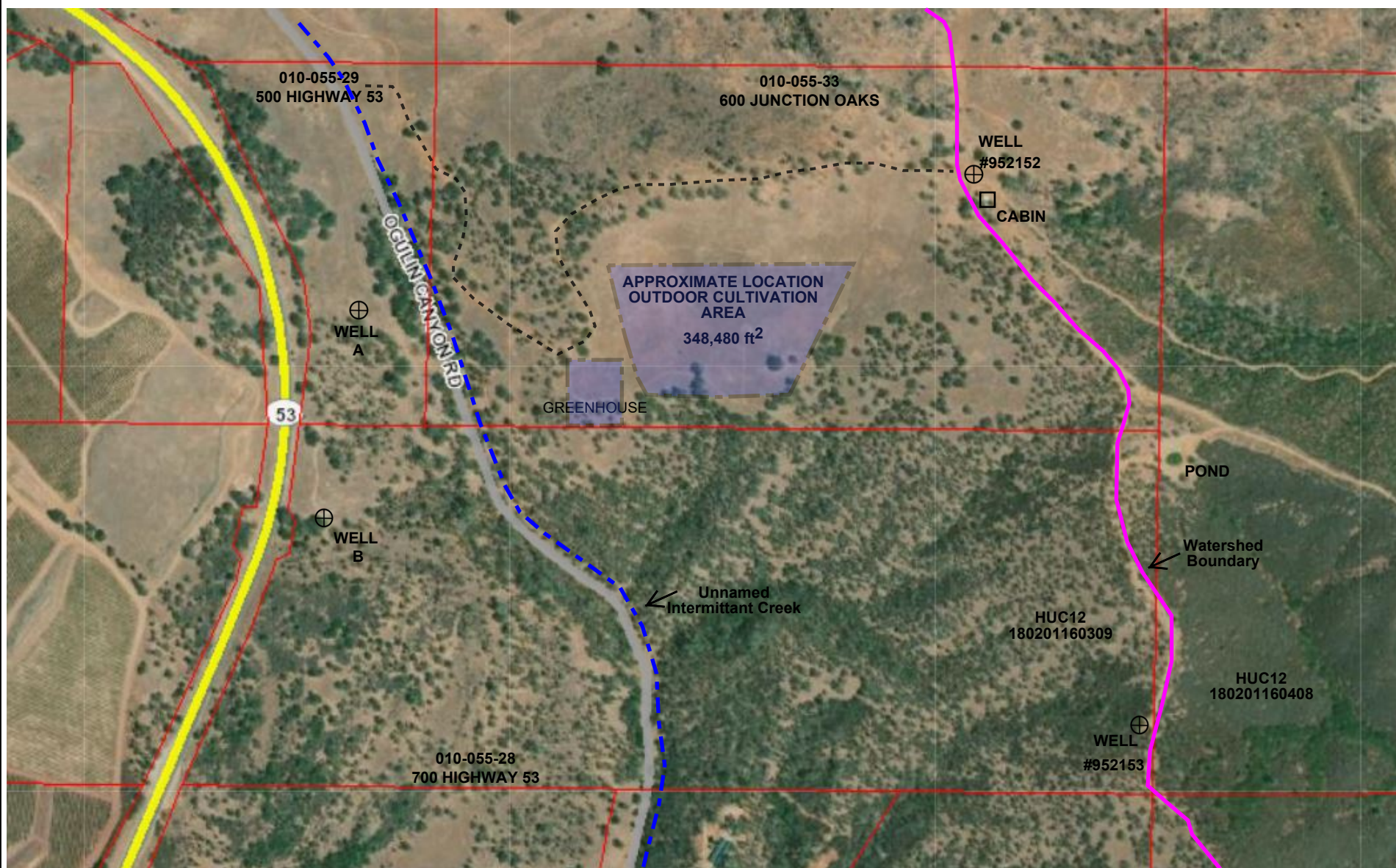
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 PH: 707.824.1690
 FX: 707.824.2675
 HURVITZ.ENVIRONMENTAL@GMAIL.COM
 CA PG# 7573

USGS TOPOGRAPHIC MAP

010-055-28, 010-055-29, 010-055-33, 010-055-37 and 010-055-38

660 Junction Plaza
 Clearlake, CA 95423

JOB NUMBER:
 5185.01
 DATE:
 01/28/2022
 PLATE:
 3



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CA PG# 7573

SITE PLAN

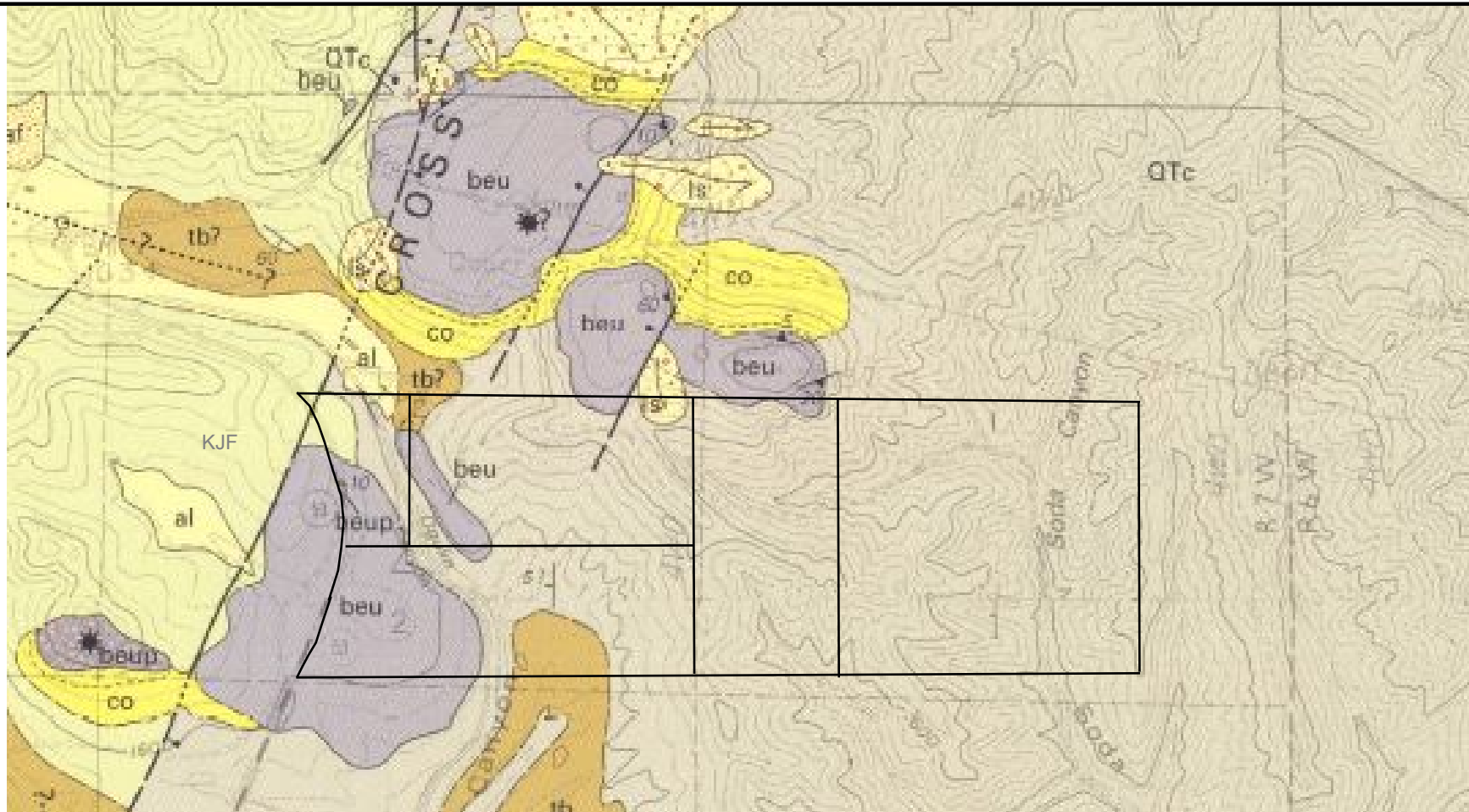
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660 Junction Plaza
Clearlake, CA 95423

JOB NUMBER:
5185.01

DATE:
01/28/2022

PLATE:
4



SOURCE: USGS 1995 Geologic Map and Structure section of the Clear Lake Volcanics, Northern California, B.C. Hearn, Jr, J.M. Donnelly-Nolan, and F.E. Goff

ls – Holocene, surficial landslide deposits – unsorted angular blocks and soil.

co – Holocene surficial colluvium deposits – slope deposits of silt sand and coarser angular clast.

al – Holocene alluvial deposits – flood plain, channel and lake deposits of clay, silt, sand and gravel.

QTc – Pleistocene and Pliocene – Siltstone, sandstone, conglomeratic sandstone and tuff.

tb – Pleistocene terrace deposits of the Burns Valley – sand and gravel predominately composed of chert and greenstone clast from the Cache Formation.

beu - Pleistocene and Pliocene – undivided early basaltic rocks- olivine basalt and olivine basaltic andesite dominantly in flows, with some pyroclastic deposits and intrusive rocks.

KJF Franciscan Assemblage – Upper Cretaceous to Upper Jurassic- Structurally complex basement rocks includes: chert, greenstone, greywacke, shale and metamorphic rocks of blueschist grade.



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CA PG# 7573

GEOLOGIC MAP

010-055-28, 010-055-29, 010-055-33, 010-055-37 and 010-055-38

660 Junction Plaza
Clearlake, CA 95423

JOB NUMBER:
5185.01

DATE:
01/28/2022

PLATE:
5

APPENDIX A
SITE PHOTOGRAPHS

CULTIVATION RELATED PHOTOS



Location Proposed Outdoor Cultivation/Canopy Area (northeast view)



Location Proposed Outdoor Cultivation/Canopy Area (west view)

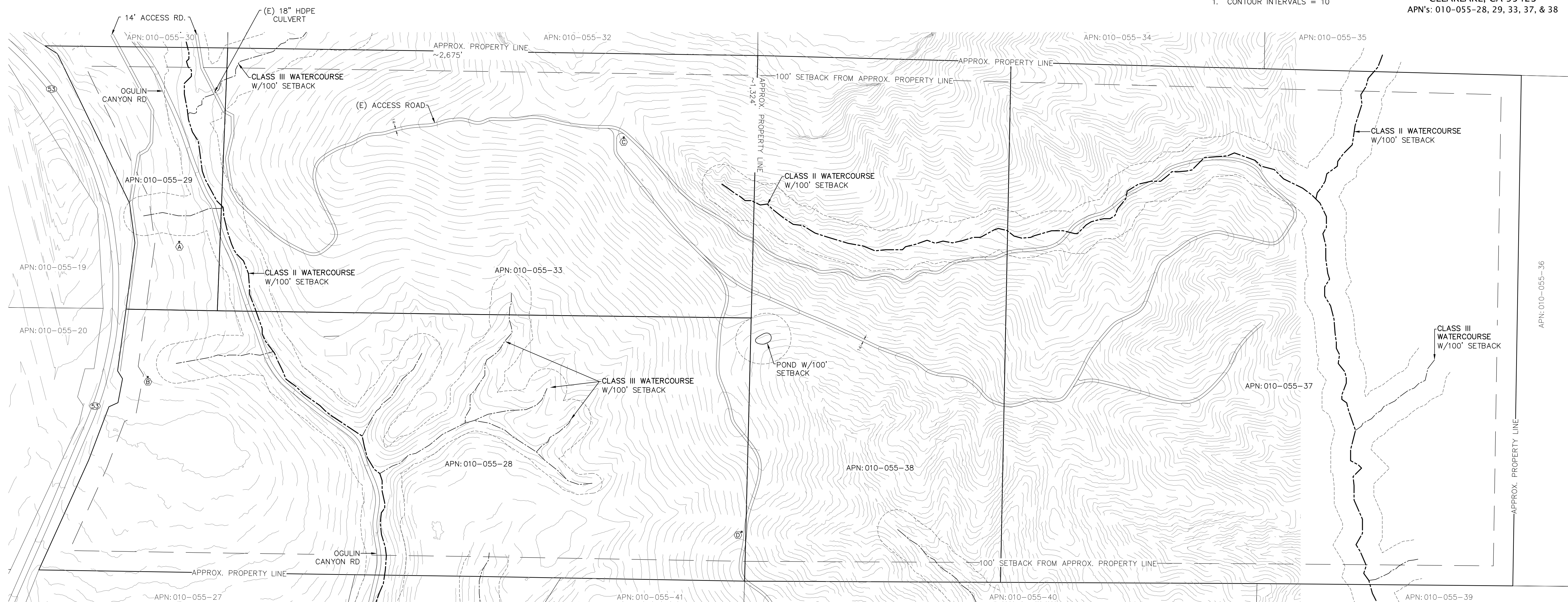


Existing Native Soil Surfaced Access Road of Project Property.



Existing Native Soil Surfaced Access Road of Project Property.

APPENDIX B
ENGINEERED SITE PLANS



LEGEND:

—1530— CONTOUR ELEVATION

 FENCE

— — — CREEK / SWALE

APN ASSESSOR'S PARCEL NUMBER

APPROX APPROXIMATELY

DWY DRIVEWAY

(E) EXISTING

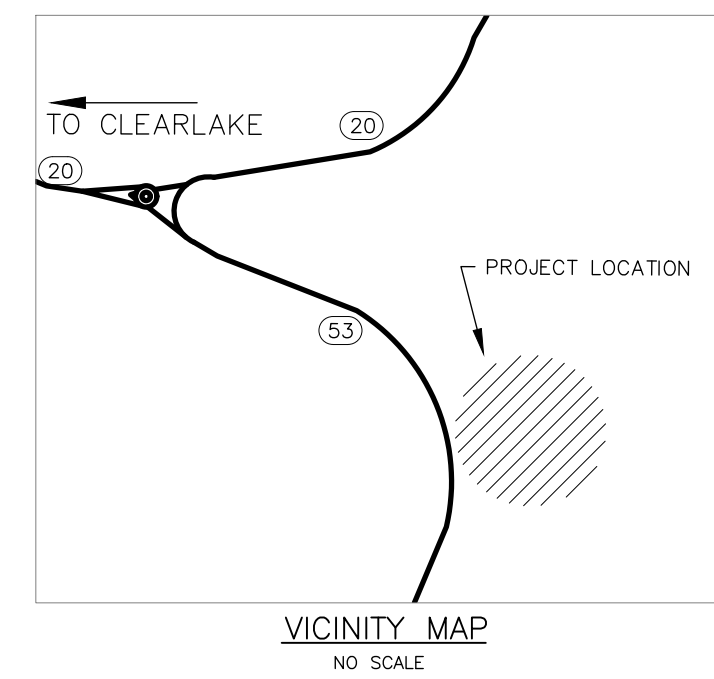
(P) PROPOSED

RD ROAD

SF SQUARE FEET

NOTES:

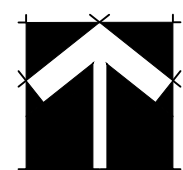
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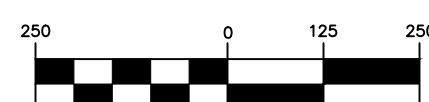
DEZEL RANCH
660 JUNCTION PLAZA
CLEARLAKE, CA 95423
APN's: 010-055-28, 29, 33, 37, & 38

EXISTING CONDITIONS

SITE PLAN



GRAPHIC SCALE



(IN FEET)
1 inch = 250 ft.

(E) GROUNDWATER WELL
LAT: 39.002447*
(A) LONG: -122.603713*
BENEFICIAL USES: XX

(E) GROUNDWATER WELL
LAT: 39.000588°
LONG: -122.604261°
BENEFICIAL USES: XX

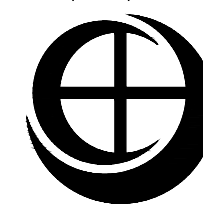
(E) GROUNDWATER WELL
LAT: 39.003929*
LONG: -122.595859*
BENEFICIAL USES: XX

(E) GROUNDWATER WELL
LAT: 38.998653*
LONG: -122.593546*
BENEFICIAL USES: XX

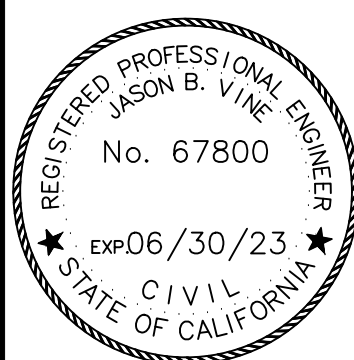
Revisions:

1

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PLANS PREPARED UNDER THE
SUPERVISION OF:



EXISTING CONDITIONS SITE PLAN
DEZEL RANCH

660 JUNCTION PLAZA
CLEARLAKE, CA 95423

LAKE COUNTY
APN's: 010-055-28, 29, 33, 37, & 38

PLOTTED BY:

DATE PLOTTED:

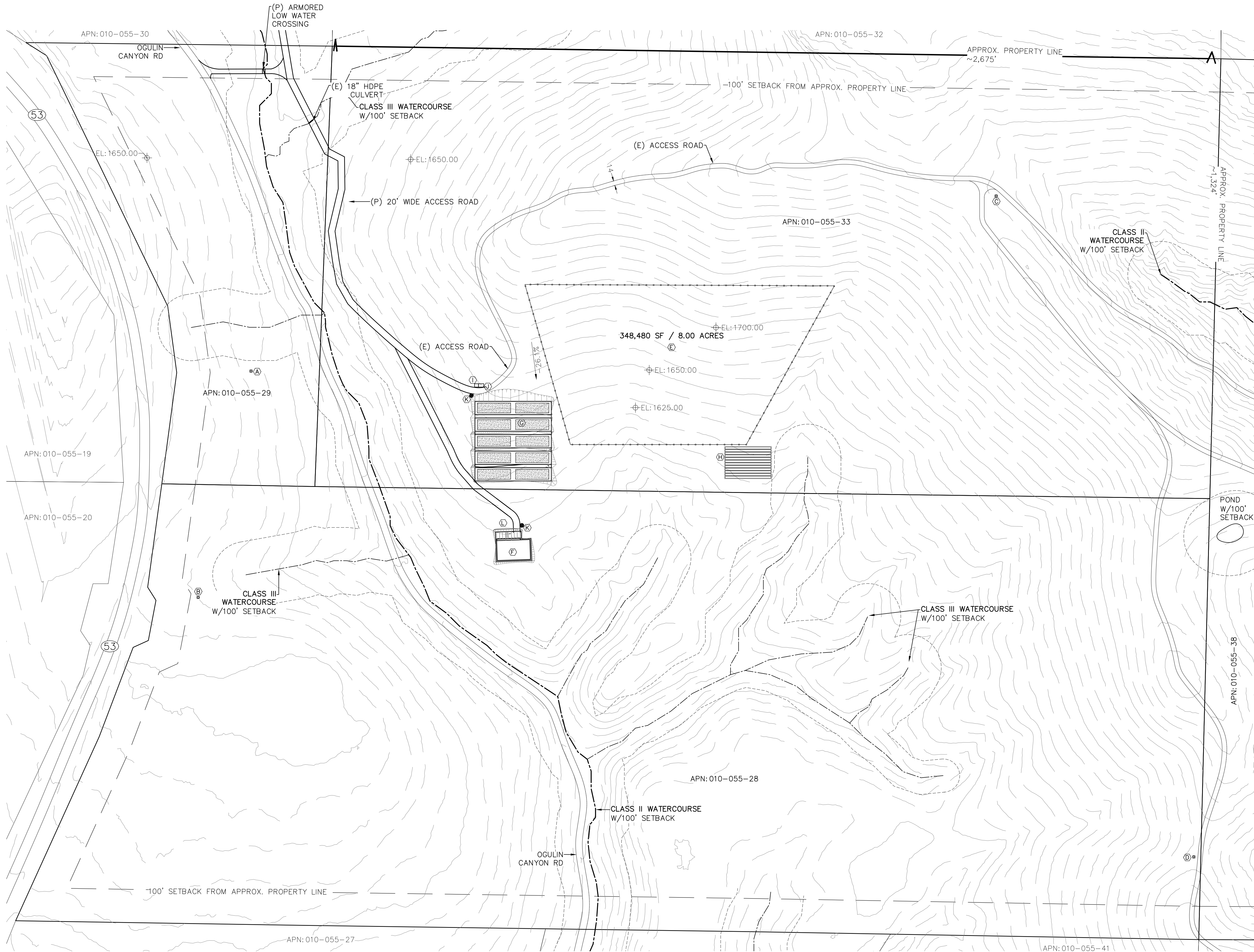
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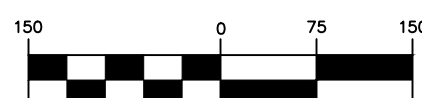
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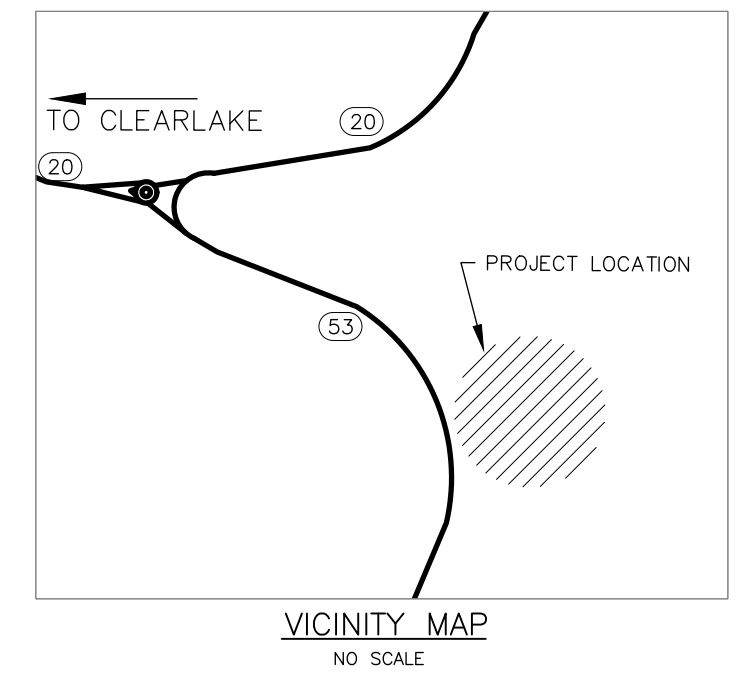


PROPOSED CONDITIONS
SITE PLAN

GRAPHIC SCALE



(IN FEET)
1 inch = 150 ft.



DEZEL RANCH
660 JUNCTION PLAZA
CLEARLAKE, CA 95423
APN's: 010-055-28, 29, 33, 37, & 38

LEGEND:

- 1530- CONTOUR ELEVATION
- o- FENCE
- - - CREEK / SWALE
- APN ASSESSOR'S PARCEL NUMBER
- APPROX APPROXIMATELY
- DWY DRIVEWAY
- (E) EXISTING
- (P) PROPOSED
- RD ROAD
- SF SQUARE FEET

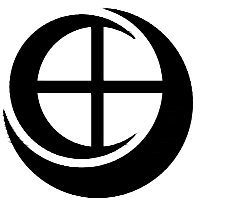
NOTES:

1. CONTOUR INTERVALS = 5.0'

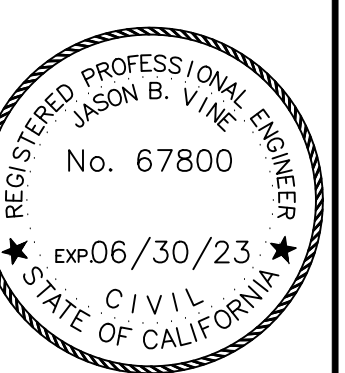
- (E) GROUNDWATER WELL
LAT: 39.002447°
LONG: -122.603713°
BENEFICIAL USES: IRRIGATION
- (E) GROUNDWATER WELL
LAT: 39.000588°
LONG: -122.604261°
BENEFICIAL USES: IRRIGATION
- (E) GROUNDWATER WELL
LAT: 39.003923°
LONG: -122.595859°
BENEFICIAL USES: IRRIGATION
- (E) GROUNDWATER WELL
LAT: 38.998653°
LONG: -122.593546°
BENEFICIAL USES: IRRIGATION
- (E) 348,480 SF OUTDOOR CULTIVATION/CANOPY AREA
- (P) 60'x100' PROCESSING BUILDING
- TEN - 30'x100' (3,000 SQFT) GREENHOUSES
- (P) TWELVE- 6'x100' (828 SQ.FT) MIXED-LIGHT CANOPY AREAS (LOW HOOPS)
- (P) 120 SQ.FT. SECURITY SHED
- (P) 160 SQ.FT. PESTICIDES & AGRICULTURAL CHEMICAL STROAGE
- (P) 5,000 GALLON METAL FIRE WATER TANKS
- (P) PARKING STALLS. 1 A.D.A AND 7 NORMAL SPOTS

Revisions:

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530-526-7493



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PROPOSED CONDITIONS SITE PLAN
DEZEL RANCH
660 JUNCTION PLAZA
CLEARLAKE, CA 95423
APN's: 010-055-28, 29, 33, 37, & 38

PLOTTED BY:

DATE PLOTTED:

10/03/2022

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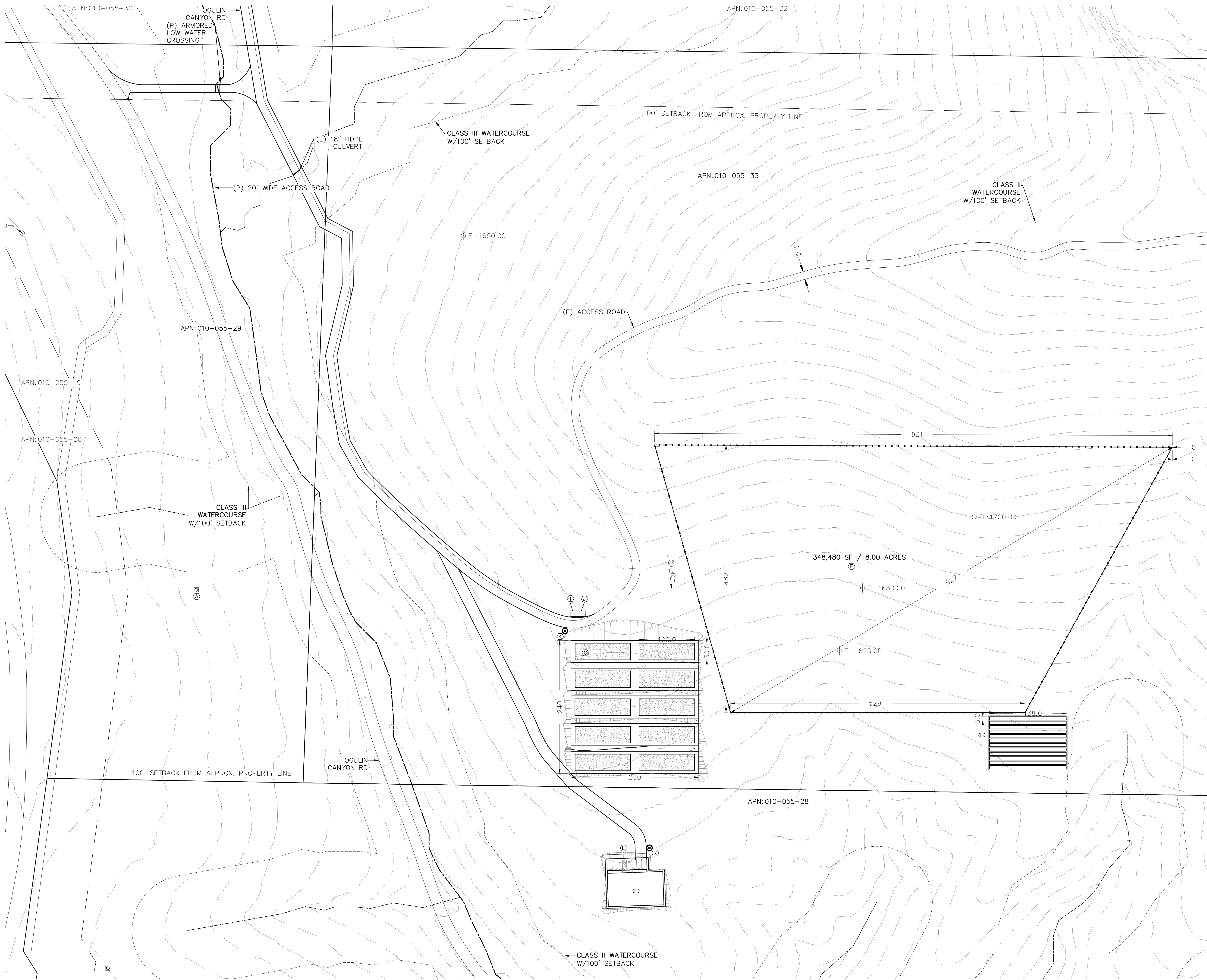
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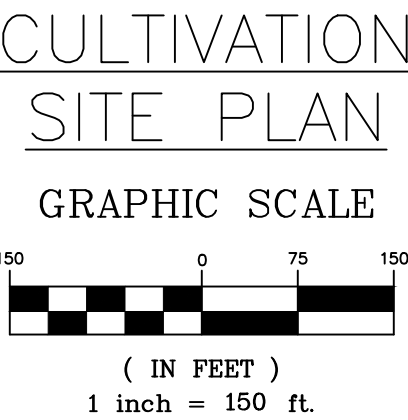


DEZEL RANCH
660 JUNCTION PLAZA
CLEARLAKE, CA 95423
APN's: 010-055-28, 29, 33, 37, & 38

- LEGEND:**
- 1530— CONTOUR ELEVATION
 - FENCE
 - — CREEK / SWALE
 - APN ASSESSOR'S PARCEL NUMBER
 - APPROX APPROXIMATELY
 - DWY DRIVEWAY
 - (E) EXISTING
 - (P) PROPOSED
 - RD ROAD
 - SF SQUARE FEET

NOTES:
1. CONTOUR INTERVALS = 5.0'

- (E) GROUNDWATER WELL
LAT: 38.002447°
LONG: -122.603713°
BENEFICIAL USES: XX
- (E) 348,480SF OUTDOOR CULTIVATION/CANOPY AREA
- (P) 60'x100' PROCESSING BUILDING
- TEN — 30'x100' (3,000 SQFT) GREENHOUSES
- (P) TWELVE— 6'x100' (828 SQ.FT) MIXED-LIGHT CANOPY AREAS (LOW HOOPS)
- (P) 120 SQ.FT. SECURITY SHED
- (P) 160 SQ.FT. PESTICIDES & AGRICULTURAL CHEMICAL STROAGE
- (P) 5,000 GALLON METAL FIRE WATER TANKS
- (P) PARKING STALLS. 1 A.D.A AND 7 NORMAL SPOTS



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530-526-7493

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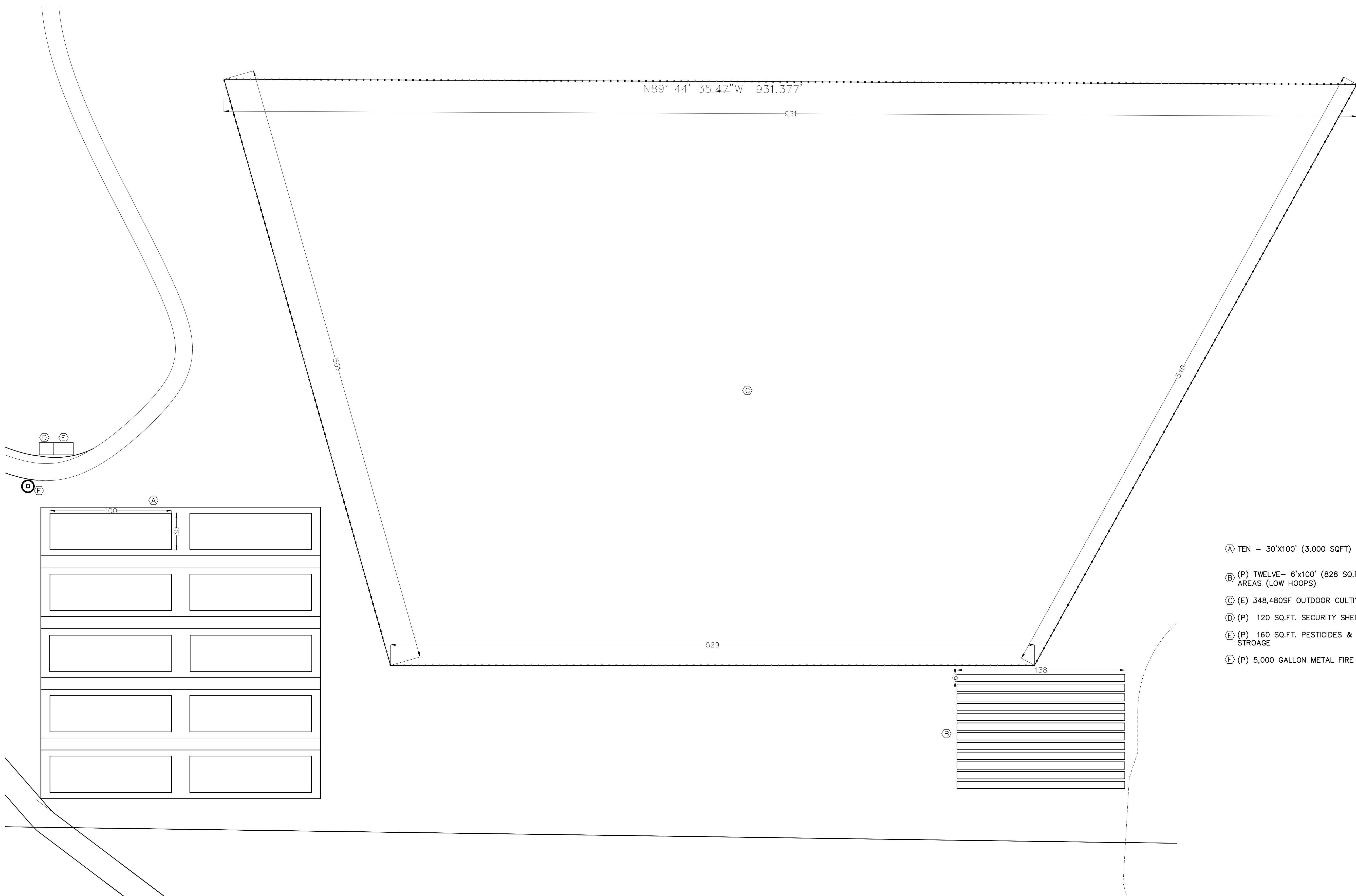
REGISTERED PROFESSIONAL ENGINEER
JASON B. VANE
No. 67800
EXP 06/30/23
CIVIL
STATE OF CALIFORNIA

CULTIVATION SITE WITH CANOPY
DEZEL RANCH
660 JUNCTION PLAZA
CLEARLAKE, CA 95423
APN's: 010-055-28, 29, 33, 37, & 38

PLOTTED BY:

DATE PLOTTED:
10/03/2022
SCALE OF DRAWING:
SEE PLAN
JOB NUMBER:
CADD FILE:
SHEET:

A2.0



CULTIVATION SITE PLAN
WITH CANOPY

- (A) TEN - 30'X100' (3,000 SQFT) GREENHOUSES
- (B) (P) TWELVE- 6'X100' (828 SQ.FT) MIXED-LIGHT CANOPY AREAS (LOW HOOPS)
- (C) (E) 348,480SF OUTDOOR CULTIVATION/CANOPY AREA
- (D) (P) 120 SQ.FT. SECURITY SHED
- (E) (P) 160 SQ.FT. PESTICIDES & AGRICULTURAL CHEMICAL STORAGE
- (F) (P) 5,000 GALLON METAL FIRE WATER TANKS

Revisions:

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THE SUPERVISION OF:


PROPOSED CANOPY SITE PLAN
DEZEL RANCH

660 JUNCTION PLAZA
CLEARLAKE, CA 95432
LAKE COUNTY
APNS: 010-055-28, 29, 33, 37, & 38

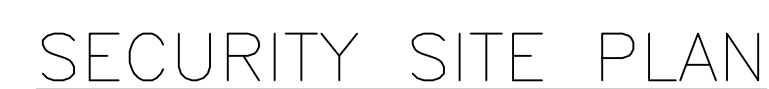
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DATE PLOTTED:
10/03/2022
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SEE PLAN
JOB NUMBER:

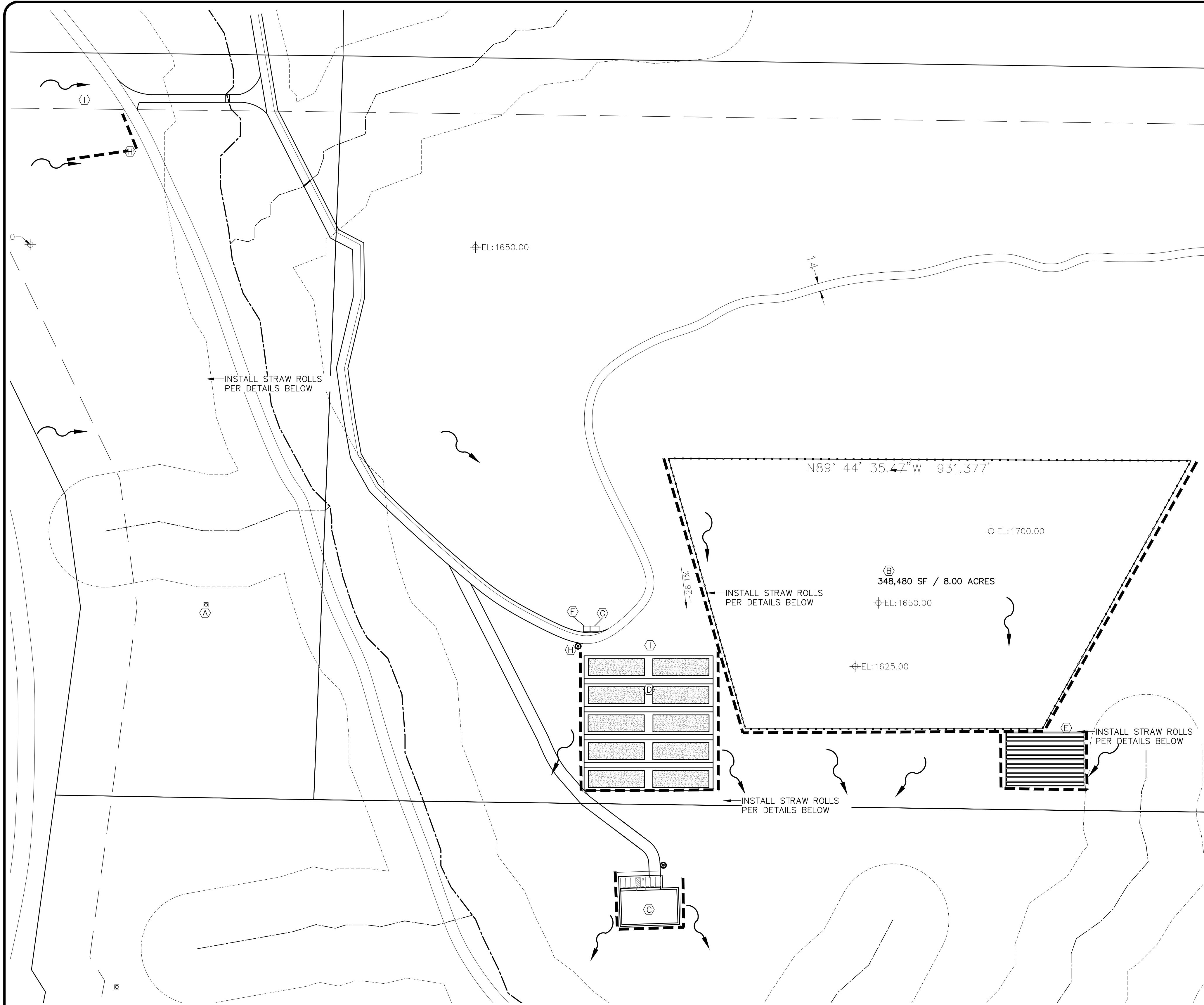
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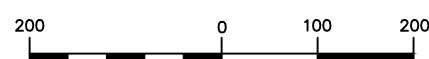


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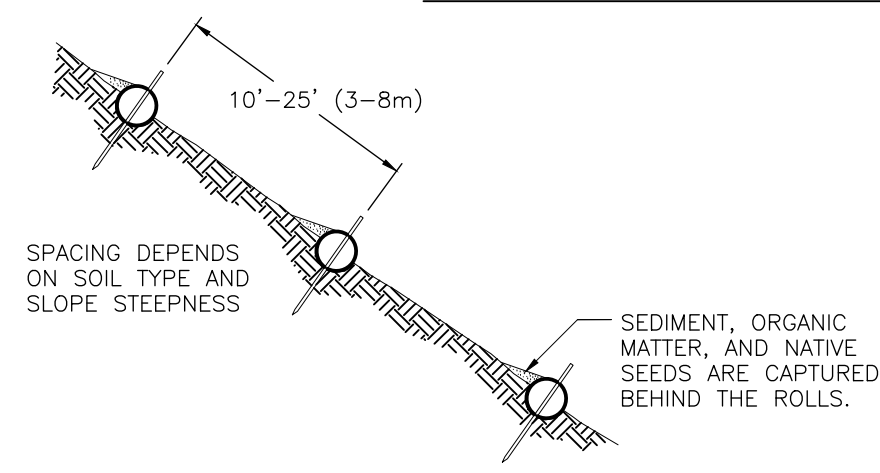
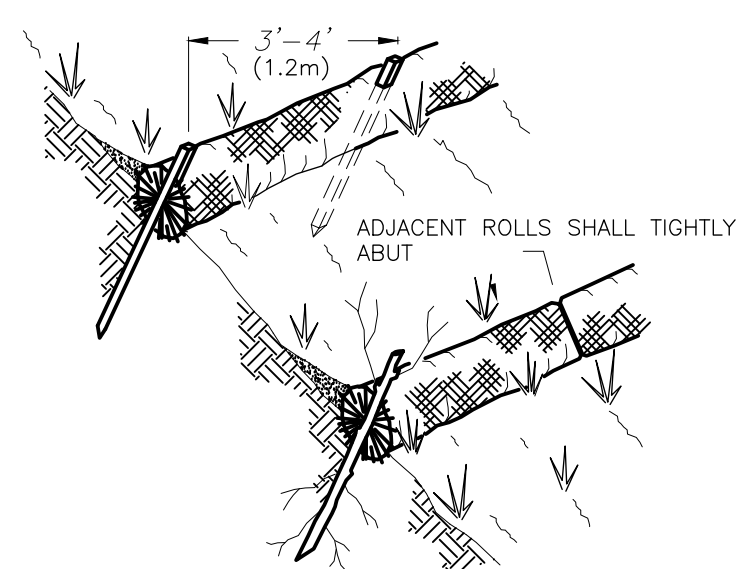
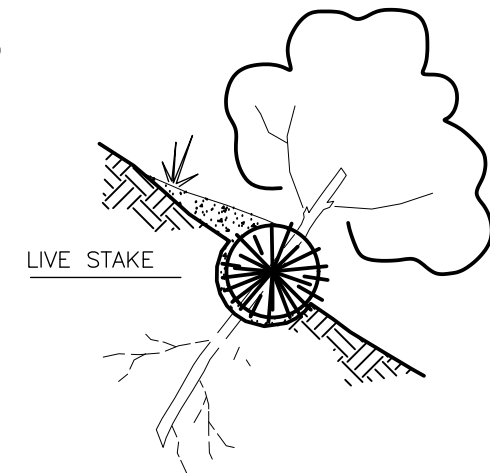
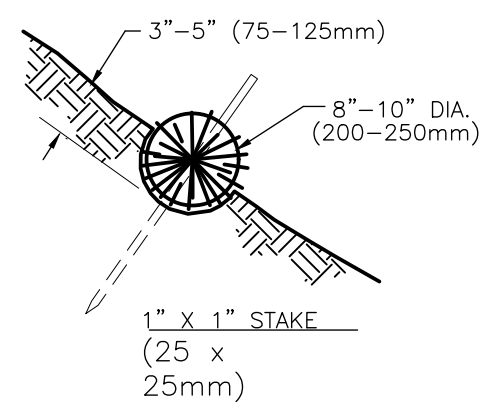


EROSION & SEDIMENT CONTROL PLAN

GRAPHIC SCALE



(IN FEET)
1 inch = 200 ft.



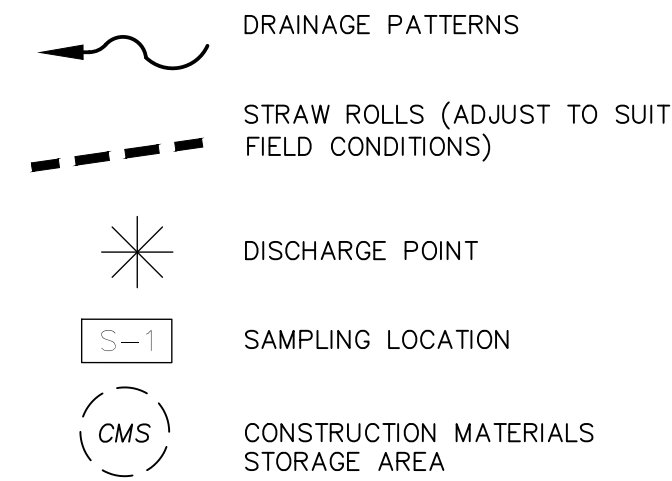
STRAW ROLL DETAILS

NOTES:

1. STRAW ROLL INSTALLATION REQUIRES THE PLACEMENT AND SECURE STAKING OF THE ROLL IN A TRENCH, 3"-5" (75-125mm) DEEP, DUG ON CONTOUR. RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND ROLL.
2. STRAW ROLLS MUST BE PLACED ALONG SLOPE CONTOURS

EROSION & SEDIMENT CONTROL NOTES:

1. CONTRACTOR IS TO IMPLEMENT BEST MANAGEMENT PRACTICES (BMPs) TO CONTROL EROSION CONTROL AND REDUCE THE OFF-SITE DISCHARGE OF SEDIMENT TO THE MAXIMUM EXTENT PRACTICABLE.
2. EROSION CONTROL BMPs SHALL BE IN PLACE AND MAINTAINED ALL YEAR ROUND.
3. HE CONTRACTOR SHALL FOLLOW THE GUIDELINES FROM THE "CALIFORNIA STORMWATER BMP HANDBOOK" FOR THE MEASURES SHOWN OR STATED ON THESE PLANS.
4. CONTRACTOR MUST ENSURE THAT THE CONSTRUCTION SITE IS PREPARED PRIOR TO THE ONSET OF ANY STORM.
5. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED UNTIL DISTURBED AREAS ARE STABILIZED. CHANGES TO THIS EROSION AND SEDIMENT CONTROL PLAN SHALL BE MADE TO MEET FIELD CONDITIONS ONLY WITH THE APPROVAL OF OR AT THE DIRECTION OF THE QUALIFIED SWPPP PRACTITIONER (QSP).
6. THIS PLAN MAY NOT COVER ALL THE SITUATIONS THAT ARISE DURING CONSTRUCTION DUE TO ANTICIPATED FIELD CONDITIONS. VARIATIONS MAY BE MADE TO THE PLAN IN THE FIELD SUBJECT TO THE APPROVAL OF OR AT THE DIRECTION OF A REPRESENTATIVE OF LAKE COUNTY.
7. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CHECKED BEFORE AND AFTER ALL STORMS TO ENSURE MEASURES ARE FUNCTIONING PROPERLY.
8. CONTRACTOR SHALL MAINTAIN A LOG AT THE SITE OF ALL INSPECTIONS OR MAINTENANCE OF BMPs, AS WELL AS, ANY CORRECTIVE CHANGES TO THE BMPs OR EROSION AND SEDIMENT CONTROL PLAN.
9. THE CONTRACTOR SHALL INSTALL THE STABILIZED CONSTRUCTION ENTRANCE PRIOR TO COMMENCEMENT OF GRADING. LOCATION OF THE ENTRANCE MAY BE ADJUSTED BY THE CONTRACTOR TO FACILITATE GRADING OPERATIONS. ALL CONSTRUCTION TRAFFIC ENTERING THE PAVED ROAD MUST CROSS THE STABILIZED CONSTRUCTION ENTRANCE.
10. ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS SHALL BE SWEEPED AT THE END OF EACH WORKING DAY OR AS NECESSARY.
11. ANY LOOSE GROUND FROM EXCAVATING GRADING OPERATIONS SHALL BE SECURED PRIOR TO ANY RAIN EVENT. STRAW OR TARP ALL DISTURBED OR EXCAVATED GROUND.
12. CONTRACTOR SHALL PLACE GRAVEL BAGS AROUND ALL NEW DRAINAGE STRUCTURE OPENINGS IMMEDIATELY AFTER THE STRUCTURE OPENING IS CONSTRUCTED. THESE GRAVEL BAGS SHALL BE MAINTAINED AND REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETED.
13. AS A MINIMUM, ALL GRADED AREAS AND EXPOSED SOIL WITHIN THE PROJECT SHALL BE SEEDED PER THE REQUIREMENTS OF LAKE COUNTY.
14. DUST GENERATION MUST BE MINIMIZED AND A WATER TRUCK MUST BE AVAILABLE ON-SITE FOR ADEQUATE DUST CONTROL.



LEGEND:

1530	CONTOUR ELEVATION
FENCE	FENCE
ASPHALT	ASPHALT
GRAVEL	GRAVEL
CREEK / SWALE	CREEK / SWALE
APN	ASSESSOR'S PARCEL NUMBER
APPROX	APPROXIMATELY
DWY	DRIVEWAY
(E)	EXISTING
(P)	PROPOSED
RD	ROAD
SF	SQUARE FEET

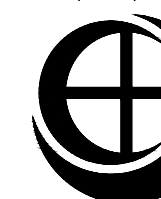
NOTES:

1. CONTOUR INTERVAL IS 5.0'

(A)	(E) GROUNDWATER WELL LAT: 39.002447° LONG: -122.603713° BENEFICIAL USES: XX
(B)	(E) 348,480SF OUTDOOR CULTIVATION/CANOPY AREA
(C)	(P) 60'x100' PROCESSING BUILDING
(D)	(P) TWELVE 30'x100' GUTTER CONNECTED GREENHOUSES
(E)	(P) EIGHTEEN -6'x92.5' CUTTER CONNECTED GREEN HOUSES
(F)	(P) 120 SQ.FT. SECURITY SHED
(G)	(P) 160 SQ.FT. PESTICIDES & AGRICULTURAL CHEMICAL STROAGE
(H)	(P) 5,000 GALLON METAL FIRE WATER TANKS
(I)	(P) PARKING STALLS. 1 A.D.A AND 7 NORMAL SPOTS

Revisions:

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CIVIL ENGINEERING, SURVEYING & PLANNING
1767 MARKET STREET SUITE C
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530-526-7493



PLANS PREPARED UNDER THE SUPERVISION OF:



EROSION & SEDIMENT CONTROL PLAN
DEZEL RANCH
660 JUNCTION PLAZA
CLEARLAKE, CA 95423
APN# 010-055-28, 29, 33, 37, & 38

PLOTTED BY:

DATE PLOTTED:

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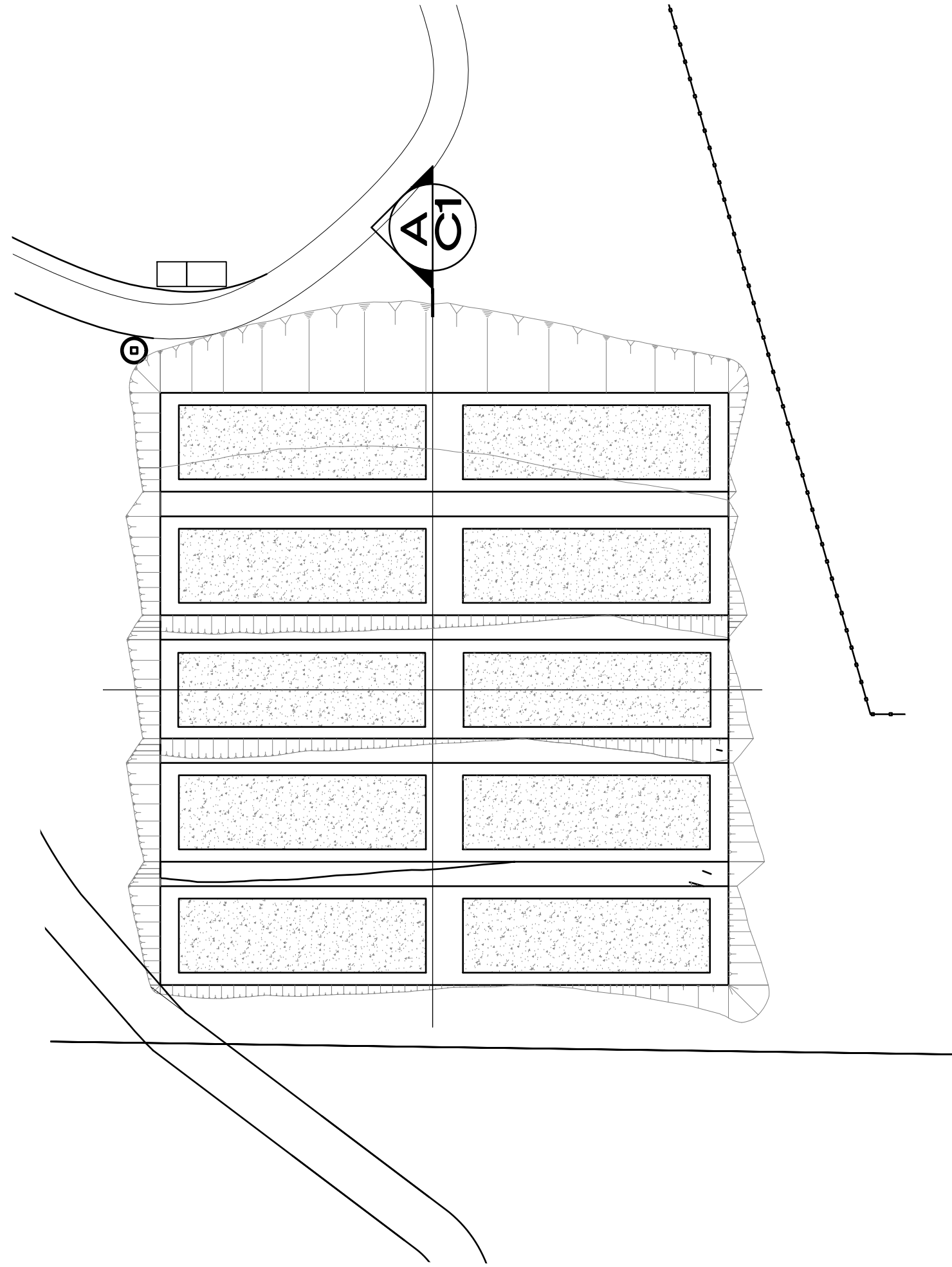
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JOB NUMBER:

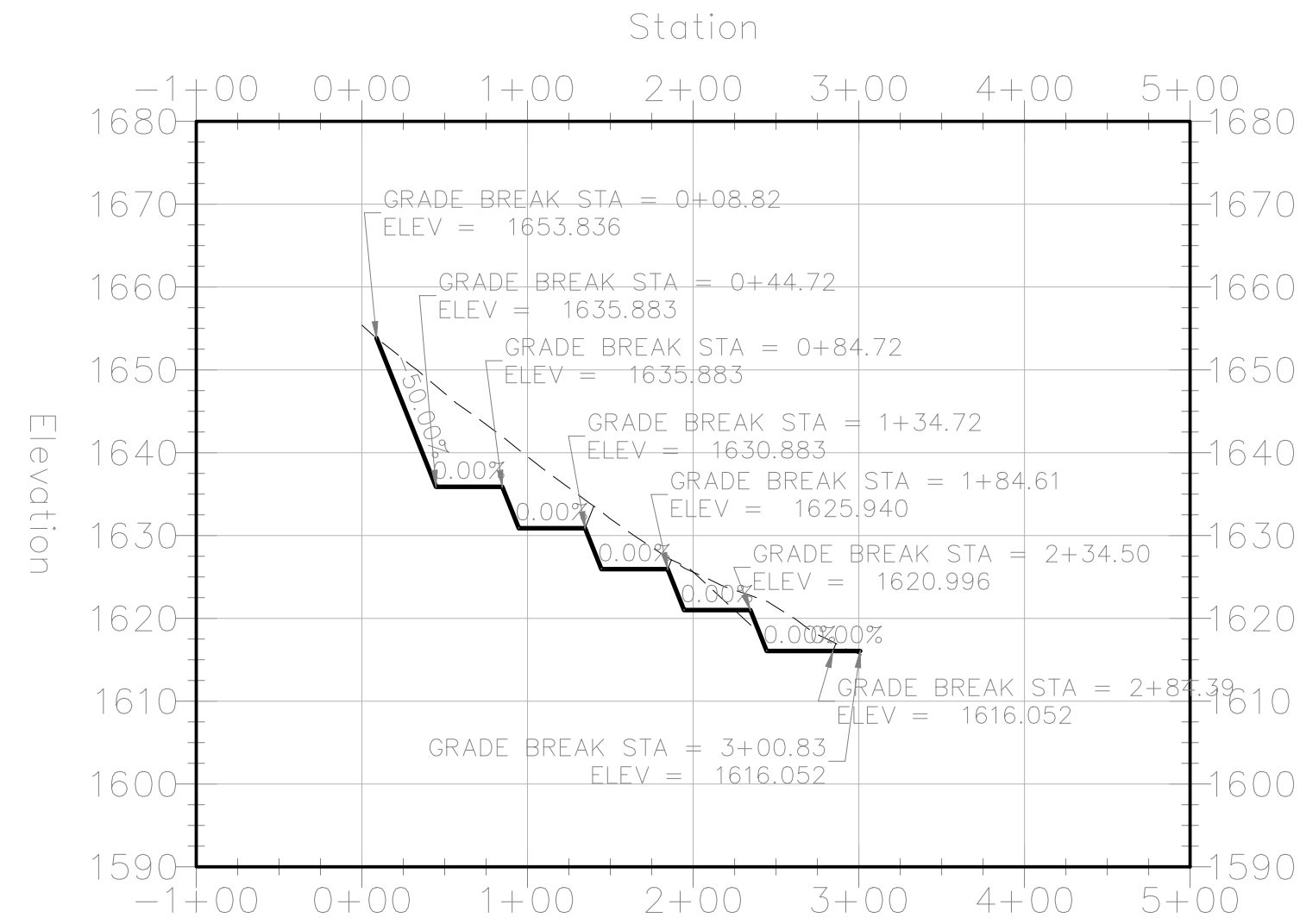
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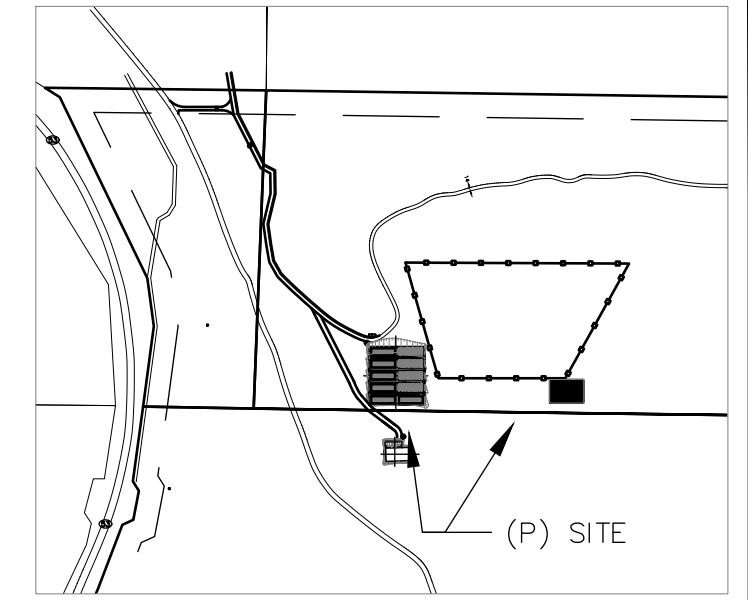
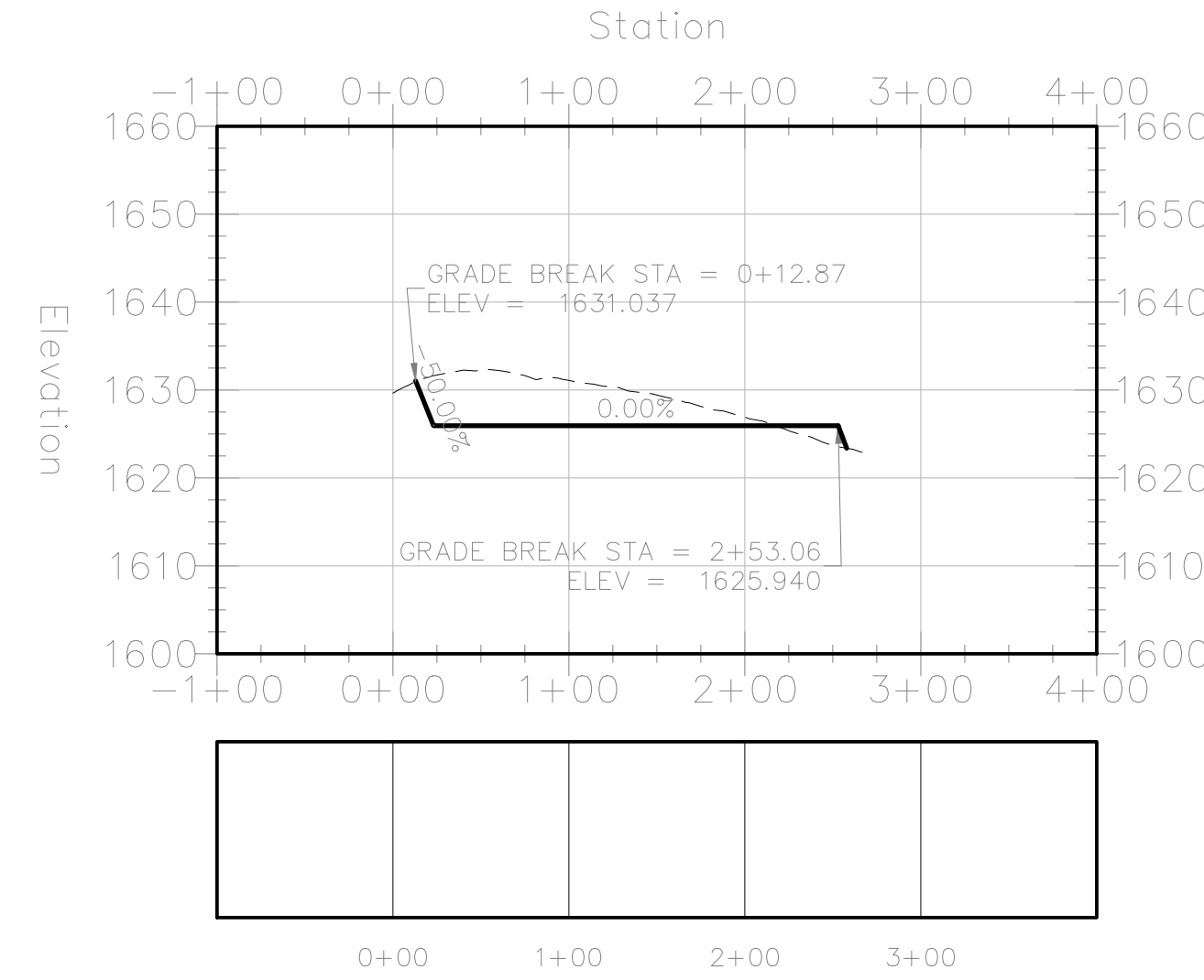
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A GREENHOUSE SECTION A-A'
SCALE: 1" = 100'

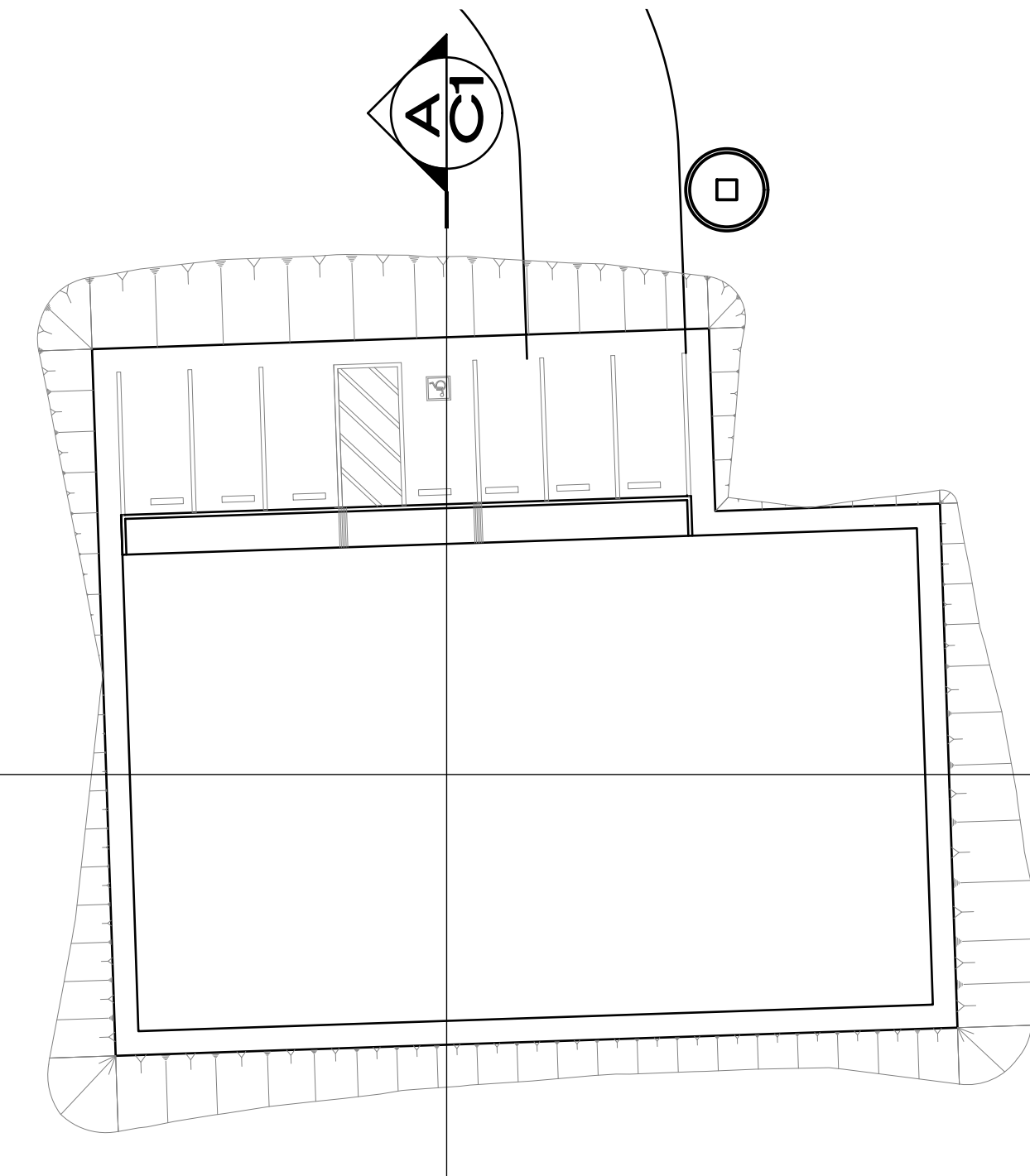
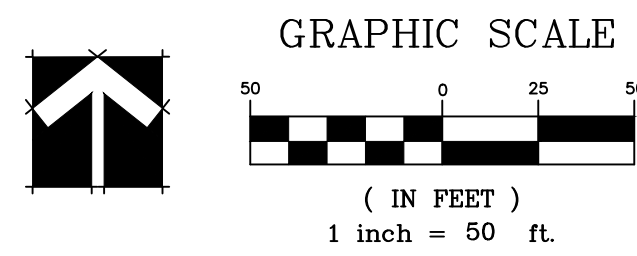


B GREENHOUSE SECTION B-B'
SCALE: 1" = 100'

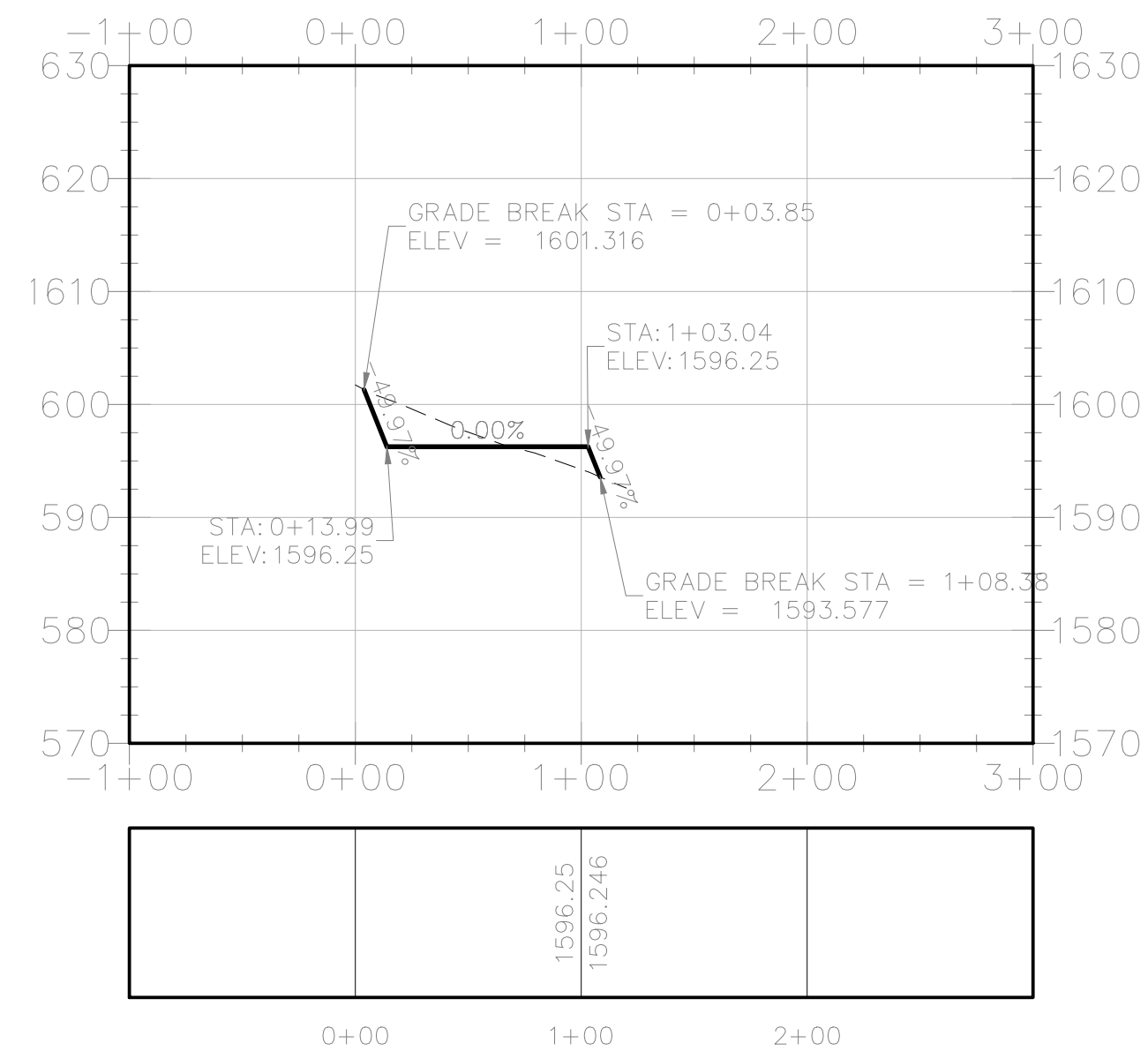


DEZEL RANCH
660 JUNCTION PLAZA
CLEARLAKE, CA 95423
APN's: 010-055-28, 29, 33, 37, & 38

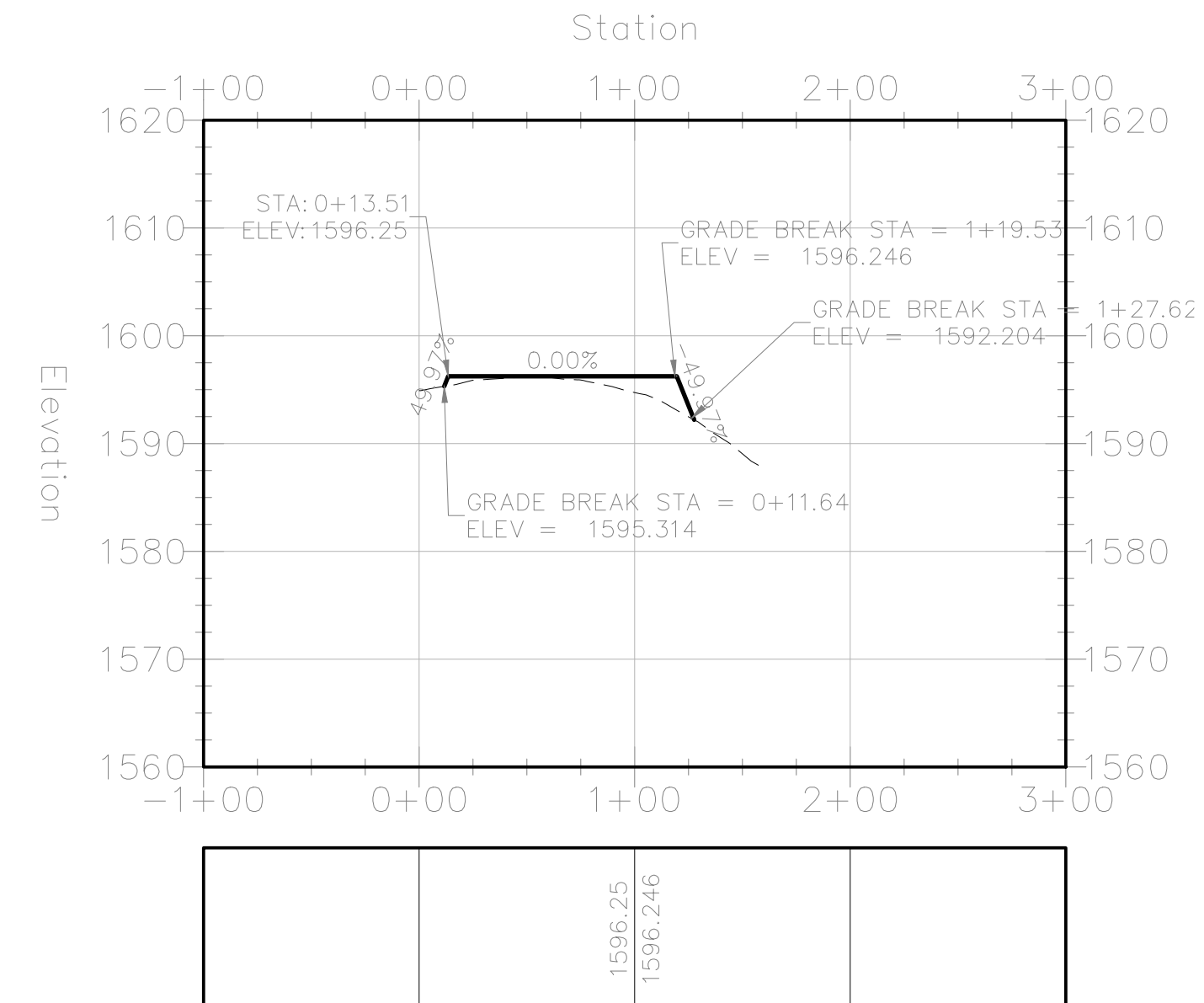
GRADING PROFILE OF
(P) PHASE II



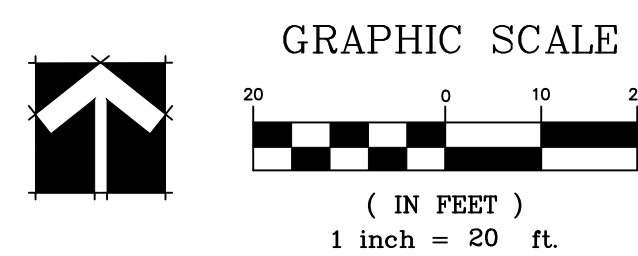
A GREENHOUSE SECTION A-A'
SCALE: 1" = 75'



B GREENHOUSE SECTION B-B'
SCALE: 1" = 100'



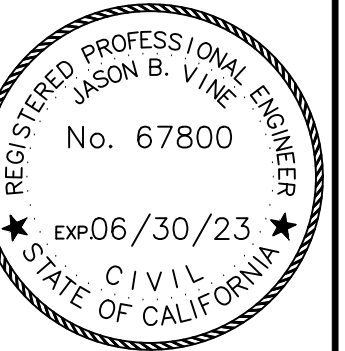
GRADING PROFILE OF
(P) PHASE II



Revisions:

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

PLANS PREPARED UNDER THE
SUPERVISION OF:



SECURITY SITE PLAN
DEZEL RANCH
660 JUNCTION PLAZA
CLEARLAKE, CA 95423
APN's: 010-055-28, 29, 33, 37, & 38

PLOTTED BY:

DATE PLOTTED:
10/03/2022

SCALE OF DRAWING:

SEE PLAN
JOB NUMBER:

CADD FILE:

SHEET:

C1

APPENDIX C
WELL COMPLETION REPORTS

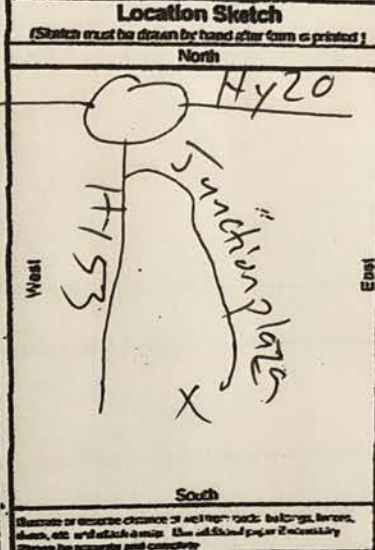
Page 1 of 1
 Owner's Well Number 4
 Date Work Began 8-30-21 No. XXXXXX
 Local Permit Agency LAKE County Environmental Health Date Work Ended 9-1-21
 Permit Number WE 5040 AG Permit Date 6-7-21

Latitude Longitude
 APN/TRS/Other

Geologic Log		
Orientation <input checked="" type="radio"/> Vertical <input type="radio"/> Horizontal		
Drilling Method <u>Air Rotary</u>		
Angle <u> </u> Spitz <u> </u>		
Drilling Fluid <u> </u>		
Depth from Surface Feet to Feet	Description Describe material, grain size, color, etc	
0 10	Brown clay	
10 20	Black volcanic Rock & Brown clay	
20 45	Black volcanic Rock	
45 70	Maroon volcanic Rock	
70 80	Black volcanic Rock & trace sandstone	
80 90	Red volcanic sanders	
90 100	Black & Red volcanic	
100 140	Sandstone	
140 400	Greenstone & sandstone	

Well Owner
 Name Simon Whetzel
 Mailing Address P.O. Box 2524
 City Lafayette State CA Zip 95015

Well Location
 Address 1660 Junction Pkwy
 City Clearlake County LAKE
 Latitude N Longitude W
 Datum Dec. Lat. Dec. Long.
 APN Book 010 Page 055 Parcel 33
 Township Range Section



- Activity**
☐ New Well
☐ Modification/Repair
☐ Deepen
☐ Other
☐ Destroy
Describe procedures and methods under "CFS 82C10C"
- Planned Uses**
☐ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
☐ Cathodic Protection
☐ Dewatering
☐ Heat Exchange
☐ Injection
☐ Monitoring
☐ Remediation
☐ Sparging
☐ Test Well
☐ Vapor Extraction
☐ Other

Total Depth of Boring 400 Feet
 Total Depth of Completed Well 395 Feet

Water Level and Yield of Completed Well
 Depth to first water 100' (Feet below surface)
 Depth to Static
 Water Level (Feet) Date Measured 8-31-21
 Estimated Yield 150 (GPM) Test Type Air Lift
 Test Length 2 HRS (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	
0	160	9"	SAREI	PVC			Blank		0	1	Concrete	SEAL
160	220	9"					Perfs	.032	1	21	Bedrock	
220	340	9"					Blanks		21	395	5/16 Pea	Gravel Pack
340	400	9"					Perfs	.032				
Certification Statement												
I certify that the data herein is true and accurate to the best of my knowledge and belief												

- Attachments**
☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☐ Other

Certification Statement
 I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
 Name Will Peterson Title Drilling State CA License Number 95451
 Address P.O. Box 695 City Kelseyville State CA Zip 95451
 Signed [Signature] Date Signed 9-1-21 C-57 License Number 1009053
 C-57 Licensed Water Well Constructor

NOV 02 2015

STATE OF CALIFORNIA
WELL COMPLETION REPORT

Refer to Instruction Pamphlet

DWR USE ONLY — DO NOT FILL IN	
13N/07W-02	
STATE WELL NO./STATION NO.	
LATITUDE	LONGITUDE
APN/TRS/OTHER	

Page ____ of ____

Owner's Well No. _____

No. 0952153

Date Work Began 9/28/2015 Ended 10/3/2015

Local Permit Agency Lake County Environmental Health

Permit No. WE 4638 Permit Date 9/21/2015

GEOLOGIC LOG

ORIENTATION (°)		DRILLING METHOD	FLUID
X VERTICAL		Rotary	Air
HORIZONTAL			
ANGLE			
(SPECIFY)			
DEPTH FROM SURFACE		DESCRIPTION	
Ft.	to Ft.	Describe material, grain size, color, etc.	
0	5	Brown Soil	
5	95	Brown Gravelly Clay	
95	190	Brown Gravelly Clay	
190	210	Brown Gravelly Clay	
210	350	Brown Gravelly Clay	
350	380	Brown Gravelly Clay	
380	400	Gray Gravelly Clay	
TOTAL DEPTH OF BORING 400' (Feet)			
TOTAL DEPTH OF COMPLETED WELL 387' (Feet)			

WELL LOCATION	
Address	700 State Hwy 53
City	Charlake
County	Lake
APN Book	010
Page	055
Parcel	2B
Township	
Range	
Section	
Lat	
DEG.	MIN.
SEC.	N
Long	
DEG.	MIN.
SEC.	W

LOCATION SKETCH

NORTH

WEST

WELL

20'

40'

property line

EAST

SOUTH

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.

ACTIVITY (°)

X NEW WELL

MODIFICATION/REPAIR

Deepen

Other (Specify)

DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

USES (°)

WATER SUPPLY

X Domestic

Public

Irrigation

Industrial

MONITORING

TEST WELL

CATHODIC PROTECTION

HEAT EXCHANGE

DIRECT PUSH

INJECTION

VAPOR EXTRACTION

SPARGING

REMEDICATION

OTHER (SPECIFY)

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER	350'	(Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL	212'	(Ft.) & DATE MEASURED 10/3/2015
ESTIMATED YIELD	5	(GPM) & TEST TYPE Air Lift
TEST LENGTH	1	(Hrs.) TOTAL DRAWDOWN
		(Ft.)

* May not be representative of a well's long-term yield.

DEPTH FROM SURFACE		BORE-HOLE DIA. (Inches)	CASING (S)					DEPTH FROM SURFACE		ANNULAR MATERIAL			
Ft.	to Ft.		TYPE (°)	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)	Ft.	to Ft.	CE-MENT (°)	BEN-TONITE (°)	FILL (°)	FILTER PACK (TYPE/SIZE)
0	95	9	X	PVC 1/2" 40	4 1/2	SDR26		0	1	X			
95	220	1	X	" "	" "	" "		1	23		X		
220	387	1	X	" "	" "	" "	.032	23	387				pea gravel

ATTACHMENTS (°)

- Geologic Log
- Well Construction Diagram
- Geophysical Log(s)
- Soil/Water Chemical Analyses
- Other

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME	Dan Mc Mullen Well Drilling		
(PERSON, FIRM, OR CORPORATION)	(TYPED OR PRINTED)		
ADDRESS	PO Box 951	Lower Lake	CA 95457
Signed	DATE SIGNED	STATE	CITY
C-57 LICENSED WATER WELL CONTRACTOR	10/30/2015	CA	ZIP
	533152		
	C-57 LICENSE NUMBER		

File Original with DWR

Page 1 of 3

Owner's Well Number 3

Date Work Began 4-24-21

Local Permit Agency LAKE County Environmental Health

Permit Number WE-5611 AG

Well Completion Report

State of California

Refer to Instructional Pamphlet

No. xxxxxx

Date Work Ended 4-26-21

Permit Date 4-20-21

DWR Use Only - Do Not Fill In

State Well Number/Size Number

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ☒ Vertical ☐ Horizontal ☐ Angle ☐ Specialty
Drilling Method Air Rotary Drilling Fluid

Depth from Surface
Feet to Feet Describe material, grain size, color, etc.

0	25	Brown clay
25	140	Black loess
140	180	Red & black volcanics
180	300	Cemented Franciscan Gneiss

Well Owner

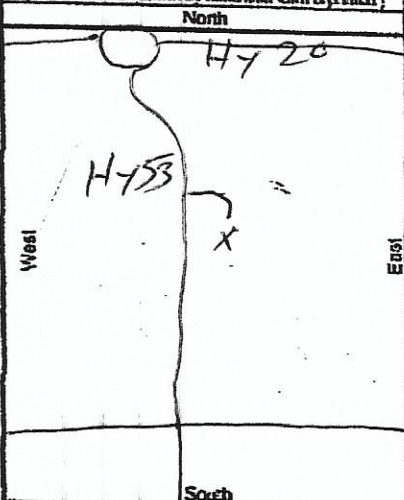
Name Simon Wefel
Mailing Address P.O. Box 2524
City Cupertino State CA Zip 95015

Well Location

Address 700 H-53
City Cupertino County LAKE
Latitude 37° 14' 30" N Longitude 122° 05' 30" W
Datum Dec. Lat. Dec. Long.
APN Book 010 Page 055 Parcel 28
Township Range Section

Location Sketch

(Sketch must be drawn by hand after form is printed)



Illustrate or describe changes in well construction, casing, screen, etc. and attach a scale. Use additional paper if necessary. Please be accurate and complete.

Activity

☒ New Well
☐ Modification/Repair
☐ Deepen
☐ Other
☐ Destroy
Describe procedures and materials under CCR 00100

Planned Uses

☒ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
☐ Cathodic Protection
☐ Dewatering
☐ Heat Exchange
☐ Injection
☐ Monitoring
☐ Remediation
☐ Sparging
☐ Test Well
☐ Vapor Extraction
☐ Other

Total Depth of Boring 305 Feet
Total Depth of Completed Well 300 Feet

Water Level and Yield of Completed Well

Depth to first water 180 (Feet below surface)
Depth to Static
Water Level (Feet) Date Measured 4-26-21
Estimated Yield 100 GPM Test Type Air Lift
Test Length 2 HRS (Hours) Total Drawdown (Feet)
*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet ± Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)
0	40	9"	F480	PVC	1/4"	4 1/2"	Blank
40	180	7 1/4"	F480	PVC	1/4"	4 1/2"	Blank
180	300	7 1/4"	F480	PVC	1/4"	4 1/2"	Perforated .032"

Annular Material

Depth from Surface Feet ± Feet	Fill	Description
0	1	Concrete SEAL
1	22	Bentonite
22	300	100 mesh Gravel/rock

Attachments

- ☐ Geologic Log
- ☐ Well Construction Diagram
- ☐ Geophysical Log(s)
- ☐ Soil/Water Chemical Analyses
- ☐ Other

Attach additional information, if it exists

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
Name William Peterson Well Drilling
Person, Firm, or Corporation
Signed William Peterson
City Kelseyville State CA
Date Signed 4-26-21 License Number 16290533
CST Licensed Water Well Constructor

NOV 02 2015

STATE OF CALIFORNIA
WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. **0952152**

DWR USE ONLY — DO NOT FILL IN

13N/07W-02

STATE WELL NO./STATION NO.

LATITUDE LONGITUDE

APN/TRS/OTHER

Page of

Owner's Well No.

Date Work Began 10/13/2015 Ended 10/16/2015

Local Permit Agency Lake County Excavation Permit

Permit No. WE 4536 Permit Date 10/21/2015

GEOLOGIC LOG

ORIENTATION () ☒ VERTICAL ☐ HORIZONTAL ☐ ANGLE ☐ (SPECIFY)

DRILLING METHOD Rotary FLUID Air

DEPTH FROM SURFACE		DESCRIPTION <i>Describe material, grain size, color, etc.</i>
Ft.	to Ft.	
0	8	Brown Soil
8	85	Brown Gravelly Clay
85	170	Green Gravelly Clay
170	200	Brown Gravelly Clay
200	360	Green Gravelly Clay
360	400	Gray Gravelly Clay

WELL LOCATION

Address 660 Tullien Plaza

City Clearlake

County Lake

APN Book 10 Page 255 Parcel 330

Township Range Section

Lat DEG. MIN. SEC. N Long DEG. MIN. SEC. W

LOCATION SKETCH

NORTH

WEST EAST

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.**

ACTIVITY ()

☒ NEW WELL

MODIFICATION/REPAIR

☐ Deepen

☐ Other (Specify)

USES ()

☒ WATER SUPPLY

☐ Domestic ☐ Public

☐ Irrigation ☐ Industrial

☐ MONITORING

☐ TEST WELL

☐ CATHODIC PROTECTION

☐ HEAT EXCHANGE

☐ DIRECT PUSH

☐ INJECTION

☐ VAPOR EXTRACTION

☐ SPARGING

☐ REMEDIATION

☐ OTHER (SPECIFY)

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 250 (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 127 (Ft.) & DATE MEASURED 10/16/2015

ESTIMATED YIELD 1 (GPM) & TEST TYPE Air Lift

TEST LENGTH 1 (Hrs.) TOTAL DRAWDOWN (Ft.)

* May not be representative of a well's long-term yield.

DEPTH FROM SURFACE Ft. to Ft.	BORE-HOLE DIA. (Inches)	CASING (S)					SLOT SIZE IF ANY (Inches)	DEPTH FROM SURFACE Ft. to Ft.	ANNULAR MATERIAL			
		TYPE ()	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	TYPE			CE- MENT ()	BEN- TONITE ()	FILL ()	FILTER PACK (TYPE/SIZE)
0 to 100	9	<input checked="" type="checkbox"/> BLANK	AC/1480	4 1/2	SDR26		0 to 1	<input checked="" type="checkbox"/>				
100 to 240	7	<input checked="" type="checkbox"/> SCREEN	11	11	11		1 to 22		<input checked="" type="checkbox"/>			
240 to 395	7	<input checked="" type="checkbox"/> CON- DUCTOR	11	11	11	.032	22 to 395					AC gravel

ATTACHMENTS ()

- ☐ Geologic Log
- ☐ Well Construction Diagram
- ☐ Geophysical Log(s)
- ☐ Soil/Water Chemical Analyses
- ☐ Other

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME Dan Mc Mullen Well Drilling

(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

ADDRESS P.O. Box 951 CITY Lower Lake STATE CA ZIP 95457

Signed Dan Mc Mullen DATE SIGNED 10/30/2015 C-57 LICENSE NUMBER 533152

C-57 LICENSED WATER WELL CONTRACTOR

APPENDIX D
WELL YIELD TESTS



Well A

Date: 11/19/2021				Technician: Jim Jackson	
Client Name: Simon Whetzel					
Site Address: 500 State Hwy 53, Clearlake				APN: 010-055-29	
Well Pump Info (size, type, brand, etc.): 10hp, 3-Phase 460V with 55-Series Pump End					
Power Source (hardwired, generator, solar only, solar with generator back up): Gen					
Total Depth of Well? 391-feet				Static Water Level? 66-Feet	
Diameter of Well? 5-inch		Casing Type? PVC			
Last time the water was pumped from the well? New Construction					
Was the pumping level measured from ground surface or top of casing? Ground Surface					
Interval	Time	Flow Rate*	Pumping Level	*Flow Rate Measured via Bucket or Meter	
5	9:30	70	84.0	Meter Start: 400150	
5	9:35	70	84.0		
5	9:40	70	85.0	Meter Stop: 425380	
5	9:45	70	85.5		
5	9:50	70	86.0	Gallons Pumped: 25,230	
5	9:55	70	86.3		
10	10:05	70	86.1		
10	10:15	70	86.7		
10	10:25	70	86.8		
10	10:35	70	87.0		
10	10:45	70	87.1	Field Quality Test Completed (Y/N): Y	
10	10:55	70	87.2		
30	11:25	70	87.3	pH: 7.5	
30	11:55	70	87.5		
30	12:25	70	88.0	TDS: 426 ppm	
30	12:55	70	88.0		
30	13:25	70	88.0	Hardness: 9 grains per gallon	
30	13:55	70	88.0		
30	14:25	70	88.0	Iron: 1.5 ppm	
30	14:55	70	88.0		
30	15:25	70	88.0	GPS: 39.00253626, -122.60369434	
STOP					
10	15:35	RECHARGE	68		
30	16:05	RECHARGE	66		
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.					



Well B

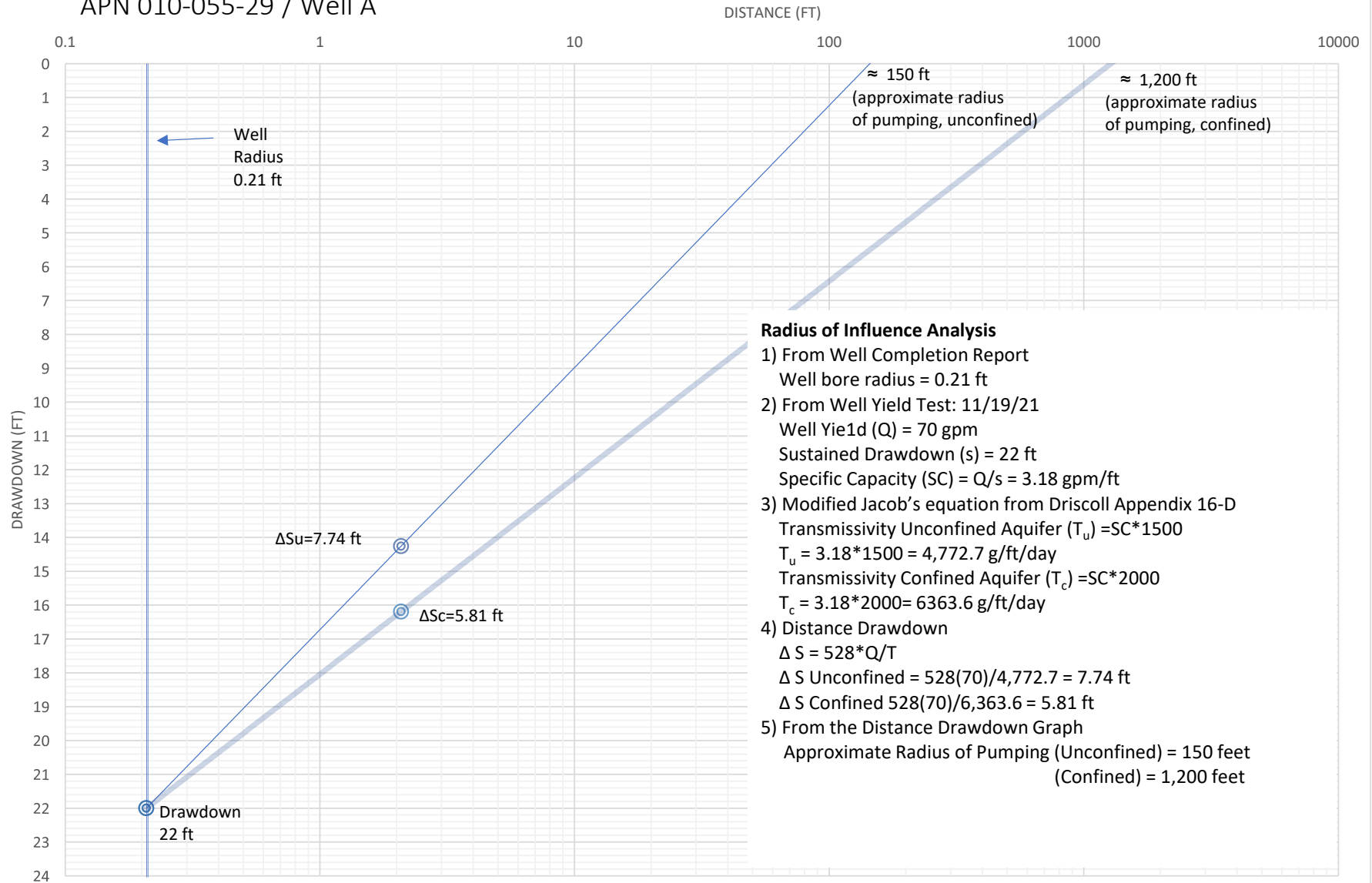
Date: 11/18/2021				Technician: Jim Jackson	
Client Name: Simon Whetzel					
Site Address: 700 State Hwy 53, Clearlake				APN: 010-055-28	
Well Pump Info (size, type, brand, etc.): 10hp, 3-Phase 460V with 55-Series Pump End					
Power Source (hardwired, generator, solar only, solar with generator back up): Gen					
Total Depth of Well? 318-feet				Static Water Level? 116-Feet	
Diameter of Well? 4.5-inch		Casing Type? PVC			
Last time the water was pumped from the well? New Construction					
Was the pumping level measured from ground surface or top of casing? Ground Surface					
Interval	Time	Flow Rate*	Pumping Level	*Flow Rate Measured via Bucket or Meter	
5	8:00	68	156.0	Meter Start: 375670	
5	8:05	68	165.0		
5	8:10	68	169.0	Meter Stop: 400150	
5	8:15	68	171.0		
5	8:20	68	171.2	Gallons Pumped: 24,480	
5	8:25	68	172.0		
10	8:35	68	173.0		
10	8:45	68	174.0		
10	8:55	68	174.5		
10	9:05	68	175.0		
10	9:15	68	175.5	Field Quality Test Completed (Y/N): Y	
10	9:25	68	176.1		
30	9:55	68	176.5	pH: 7.5	
30	10:25	68	177.0		
30	10:55	68	177.7	TDS: 425 ppm	
30	11:25	68	178.0		
30	11:55	68	178.0	Hardness: 9 grains per gallon	
30	12:25	68	178.0		
30	12:55	68	178.0	Iron: 3.8 ppm	
30	13:25	68	178.0		
30	13:55	68	178.0	GPS: 39.00252839, -122.60433554	
STOP					
10	14:05	RECHARGE	125.0		
30	14:35	RECHARGE	99.0		
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.					

APPENDIX E
RADIUS OF INFLUENCE PLOTS

500 Hwy 53
Clearlake, CA

APN 010-055-29 / Well A

Radius of Pumping Influence



700 Hwy 53
Clearlake, CA
APN 010-055-28 / Well B

Radius of Pumping Influence

