

WATER USE/ WATER AVAILABILITY STUDY

**10030 Bottle Rock Road
Kelseyville, CA, 95451
APN 011-057-022/011-057-023**

PREPARED FOR:

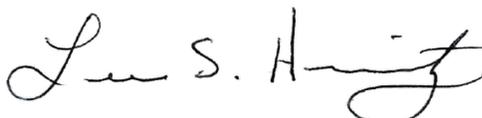
Bottle Rock Farms FJA Trust
C/O Jennifer Berg
315 College Avenue
Santa Rosa, CA 95401

January 27, 2020

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. 5079.01

January 27, 2020

Bottle Rock Farms FJA Trust
C/O Jennifer Berg
315 College Avenue
Santa Rosa, CA 95401

RE: Water Use / Water Availability Study
10030 Bottle Rock Road
Kelseyville, CA
APN 011-057-022/011-057-023
Hurvitz Environmental Project No. 5079.01

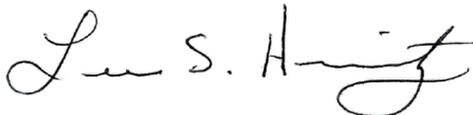
Ms. Berg:

Hurvitz Environmental Services, Inc. (HES) is pleased to submit this Water Use / Water Availability Study for the above referenced property. HES prepared this Report in accordance with the Lake County Permit and Resource Management Departments Cannabis Ordinance. The purpose of this Report was to outline the sites proposed water usage rates and water conveyance systems as well as to demonstrate that the project water supply can legally and adequately meet the sites water demands.

Based on the information and assessments contained herein, we conclude that the wells discharge capacity appears to be sufficient to provide for the projected annual water use at the site and the well recharge rate appears to indicate that the proposed water usage rates are sustainable. The quantity of groundwater to be used for the project is unlikely to result in significant declines in 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

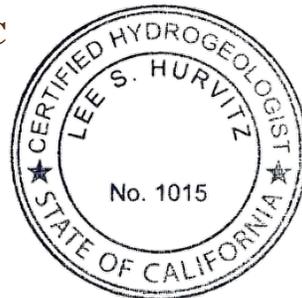


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1.0 INTRODUCTION AND SCOPE OF SERVICES

We understand that Ms. Jennifer Berg (the applicant) is applying to Lake County for approval to develop an approximately 4-acre outdoor cannabis cultivation facility (the project) at the property identified as 10030 Bottle Rock Road, Kelseyville, California (the site). The proposed project encompasses two separate, but adjoining parcels with a combined area of 93.24 acres. According to the Lake County Cannabis Ordinance, development of property with the intent to cultivate cannabis requires a Water Use / Water Availability Study. Therefore, on behalf of the applicant Hurvitz Environmental Services (HES) conducted a Water Use Water Availability Study for the site in accordance with the Lake County Permit Requirements.

This Water Use/Water Availability 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 of Well Completion Report (drillers' logs) from the site well.
- Performance of 6-hr well yield test.
- Review of Water Quality Data from Domestic Well.
- Discussion on proposed methods for water level and water usage monitoring.
- 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, on the east side of Bottle Rock Road. Access to the property is obtained via Nancy Drive, off Bottle Rock Road (**PLATE 1 – SITE LOCATION MAP**). The Lake County Assessor’s Office identified the site as Assessor’s Parcel No. (APN) 011-057-230 and 011-057-220 (**PLATE 2 – ASSESSORS PARCEL MAP**). The site lies in the California Coastal Mountain Range, approximately 5.2 miles southeast of the town of Kelseyville and 9.6 miles west of the Town of Lower Lake. The southern parcel (011-057-230) consists of 47.68 acres and is developed with one approximately 1,200 sq/ft residential cabin along with an inground septic system and domestic well. In addition, the applicant is currently constructing a 6,000 sf accessory building on this parcel. The northern parcel (011-057-220) is approximately 45.56 acres and is undeveloped. Both parcels are primarily wooded with canopy forest covering most of the site. Site Photographs are presented in **APPENDIX A**.

2.1 USGS 7.5 MINUTE QUADRANGLE MAP

HES reviewed the United States Geological Survey (USGS) Kelseyville 7.5-minute Quadrangle Map, 2015, (**PLATE 3 – USGS TOPOGRAPHIC MAP**). The approximately 90-acre site generally slopes from southeast to northwest and encompasses a variety of topographic terrains. The southern parcel slopes northwesterly with a peak elevation of approximately 2,800 feet above mean sea level (MSL) on the properties southeast corner and a low elevation of approximately 2,320 along the parcels’ northern boundary. The northern parcel also generally slopes to the northwest with the high elevation of approximately 2,500 at the southeast corner of the parcel and a low elevation of approximately 2,300 feet above MSL along the parcels northern boundary. One unnamed Class II intermittent stream flows northerly across the western side of both parcels. The intermittent creek continues flowing north off the northern parcel for approximately 0.4 miles before coalescing with Cole Cree. Cole Cree continues to flow northerly until eventually draining into Clearlake.

2.2 GEOLOGICAL CONDITIONS

HES reviewed the Geologic Map and Structure Sections from the Clear Lake Volcanics, Northern California, 1995, prepared by the California Department of Conservation California Geologic Survey². According to the Map reviewed, the site lies within a geologic region characterized by the Pleistocene aged obsidian (*rto*) and to a lesser extent stony rhyolite (*rts*) **PLATE 5 – GEOLOGIC MAP**.

² Geologic Map and Structure Section of the Clear Lake Volcanics, Northern California, California Dept. of Conservation, California Geologic Survey, 1995.

2.3 REGIONAL GROUNDWATER

According to www.ecoatlas.com³ the project site is located within the Upper Cache Hydrologic Region (sub-basin - HUC-8), the Kelsey Creek-Clear Lake Watershed Region (watershed -HUC-10), and the 180201160302 Region (sub-watershed-HUC-12), all within the jurisdiction of the North Coast Regional Water Quality Control Board.

The Kelsey Creek Watershed totals 28,614 acres, or 44.7 square miles and occupies approximately 10% of the entire Clear Lake watershed. Kelsey Creek is the primary drainage in the watershed and is the third largest tributary to Clear Lake and contributes to approximately 16% of the streamflow into Clear Lake. The site is located in the southern portion of the Kelsey Creek Watershed that is characterized by uplands with elevations in as high as 4,700 above MSL. The region is thought to have two distinct aquifers. The first being a shallow, generally unconfined alluvial aquifer, and the deeper aquifer consisting of volcanic rock and ash. The recharge to the shallow aquifers is thought to be through a combination of direct precipitation and stream flow while recharge to the deeper volcanic aquifer is less known but is generally thought to be by underflow from adjacent uplands. Domestic wells proximate to the site generally tap water from the deeper volcanic aquifer.

³ EcoAtlas has been developed through funding from the US Environmental Protection Agency and the California State Water Resources Control Board.

3.0 SITE DEVELOPMENT AND WATER USE

It is our understanding that the site will be developed with a total of 4-acres of outdoor cannabis cultivation space. In addition, the project will utilize approximately 1,000 sq/ft for plant propagation to support onsite cultivation activities. The applicant proposes to cultivate two acres of outdoor cannabis on each of the two adjoining parcels. The onsite domestic well (Well # 824915), is located approximately 300 feet from the northern cultivation area and approximately 1,300 feet from the southern cultivation area and will provide water for the entire cultivation project. Discussions on the well construction and yield are presented in Section 3.5 and 3.6 of this Report. The approximate locations of the proposed outdoor cultivation areas, domestic well and onsite cabin are shown on **(PLATE 4 – ENGINEERED SITE PLAN)**.

Water from the domestic well is currently plumbed to the onsite residence only. As part of the site development the applicant plans to re-design the water distribution system so that the well water intended for cannabis will pump directly into a 5,000-gallon poly storage tank located proximate to the well head. From there, the water will be transferred to additional poly tanks located adjacent to each of the proposed cultivation areas using transfer pumps and irrigation lines. Additional small mixing tanks (500-gallons or less) will also be utilized at the cultivation sites.

The project plans do not involve any water diversions, or imported water but does call for rainwater catchment off of the existing cabin. The estimated annual water use for the entire 4-acre cultivation project (outdoor/propagation and employees) is 1.1 million gallons, which is approximately 3.37 acre-feet of groundwater per year. Details on the cultivation projects water usage, including breakdowns of average and peak monthly usage, are presented in **TABLE 1**.

3.1 OUTDOOR CULTIVATION

The applicant plans to develop 2 acres of outdoor cultivation area on each of the 45+ acre parcels. The applicant has not had any specific experience growing cannabis at this location but the applicant is an experienced cannabis cultivator and is designing the system to use minimal amounts of water. First, through the use of “Auto Flowering” plants the applicant will greatly reduce the size, watering frequency, and growing/flowering time, thus creating significantly lower water usage rates than for large plants with a longer cultivation season. The applicant plans to harvest the “Auto Flower” plants twice a season with the entire growing season lasting 6 months and extending from mid-April until mid-October. Second, the applicant plans to utilize point emitter drip irrigation and irrigate early in the day while temperatures are coolest to minimize evaporation rates. Finally the applicant plans to incorporate rainwater catchment tanks proximate to the residence to use for landscape irrigation and dust control.

It is our understanding that a cannabis water usage rate of 2-acre feet/acre/year for outdoor cultivation is not out of the ordinary for typical 6-month cycle large cannabis plants. However, based on the proposed farming methods discussed above, the applicant estimates that they will use approximately 1,100,000 gallons or 3.37-acre feet/year for the entire 4-acre cannabis project. Therefore, we estimate that the applicant will use an average of approximately 6,100 gallons/day over the cultivation season.

3.2 PROPAGATION GREENHOUSE

The applicant also plans to develop 1,000 sq/ft for cannabis propagation space as part of the Project development. The propagation greenhouse will only hold immature plants and clones that are in the process of rooting or growing. Water use is anticipated to be approximately 1,100 gallons per month for the propagation greenhouse or 13,000gallons/year. Breakdowns on the propagation greenhouse water use are presented on **TABLE 1**.

3.2 RESIDENTIAL WATER USE

Domestic water use at the site will initially be used by one 1,200 sq/ft residential dwellings that will occupied by two full time farm managers. The established Napa County Water Availability Analysis methods specify annual domestic water use for a property at 0.75 acre-feet for first dwelling and 0.5 acre-feet for additional dwellings, and 15 gallons per day per worker.⁶ So, for this assessment we used the Napa County water use criteria to estimate the annual domestic water use at the site as follows:

$$1 \text{ (primary residence)} \times 0.75 \text{ acre-feet/year (Napa County Water Use Criteria)} = \underline{0.75 \text{ acre-feet/year} = \text{Annual Residential Water Use}}$$

3.3 EMPLOYEE WATER USE

We understand that the Project will require two full-time farm mangers, as well as, several part-time seasonal employees. Therefore, for the purpose of this Assessment we estimate that the project will require an average of eight full-time employees throughout the year. Potable water for farm workers will come from the Project Well (#824915). Using the Napa County Water Availability Guidance Document⁷ estimate of 15 gallons of water utilized per day per cultivation worker on site, we calculated the following groundwater usage for the Project:

- Annual Onsite Worker Water Use = 8 (average number of daily employees) x 15 gallons/day (daily employee water usage) x 365 days/year) = 43,800 gallons /year = 0.13 acre-feet/year = Worker Groundwater Use

So, the annual Project water use estimate is 1,100,000 gallons (Outdoor cultivation) + 13,000 gallons (Propagation Greenhouse) + 43,800gallons (Employee Water Usage) + 244,000 gallons (Residential) = 1,400,800 gallons or 4.29 acre-feet/year

3.4 RAIN WATER CATCHMENT

The applicant plans to install rainwater catchment onto the existing 1,200 square-foot residential structure as well as the 6,000 square-foot building currently being constructed. The captured water would be stored in a series of poly tanks and used onsite for onsite landscaping and dust control. We estimate that the average rainfall at the site is 41-inches a year and that the total roof capture space is 7,000 sq/ft. Based on these assumptions the rain water capture potential at the

⁶ Water Availability Analysis (WAA) Guidance Document, Napa County, Adopted May 12, 2015.

⁷ Water Availability Analysis (WAA) Guidance Document, Napa County, Adopted May 12, 2015.

site is approximately 106,764 gallons/year. This is calculated using the Permit Sonoma Model for rainwater catchment which provides a coefficient for drought conditions and system efficiency. The rainwater capture potential is estimated below.

$$0.6 \text{ (drought and efficiency factor)} \times 0.62 \text{ (unit conversion)} \times 7,000 \text{ sq/ft (catchment area)} \\ \times 41\text{-inches (average annual precipitation)} = \\ \underline{106,764 \text{ gallons or } 0.33 \text{ acre-feet/year} = \text{Total Rainwater Catchment Potential}}$$

TABLE 1 – TOTAL PROJECT AND SITE WATER USAGE

Source	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
	-----Gallons-----												
Residential	20,000	20,000	20,000	20,000	20,000	20,000	20,000	22,000	22,000	20,000	20,000	20,000	244,000
Outdoor Cultivation	0	0	0	130,000	180,000	180,000	150,000	180,000	180,000	100,000	0	0	1,100,000
Propagation	1,000	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,000	13,000
Employees	2,200	2,200	2,200	4,000	4,000	5,000	5,000	4,000	5,000	5,000	3,000	2,200	43,800
TOTAL USAGE	23,200	23,300	23,300	155,100	205,100	206,100	176,100	207,100	208,100	126,100	24,100	23,200	1,400,800
** Rainwater capture total based on Permit Sonoma Model for Rain Water Catchment Potential.													

Based on these estimates for onsite water use it appears that the peak water demand at the site will occur annually between May and September with peak daily water demand being approximately 6,800 gallons/day.

3.5 DOMESTIC WELL INFORMATION

HES reviewed the well completion report for the proposed project well (**APPENDIX B – Well Completion Report**). The well was installed in August of 2003 under permit number WE-3356. The well has a total depth of 450 feet and static water levels were recorded at approximately 105 feet from the top of casing at the time of installation. The well is equipped with a 1.5 horse power motor and has a water totalizing meter installed at the well head. The well yield at the time of installation was measured at 16.5 gallons/minute. Review of the geologic log on the Well Completion Report indicates that the site is underlain by soft volcanic ash with obsidian from the surface to approximately 105 feet BG. The volcanic ash and obsidian is underlain to approximately 120 feet BG by broken obsidian and the remainder of the borehole to 450 BG was identified as gray volcanics. The well screens though materials identified primarily as gray volcanics and broken obsidian which is consistent with the Obsidian and Stony Rhyolite identified on the Geologic Map.

3.6 WELL YIELD TEST

On January 13, 2020, HES conducted a 6-hour well yield test at the on-site domestic well. we used an existing 1.5hp submersible pump set in the well to perform the test. The yield test began

at 8:50am and ended at 2:55pm the same day. We were not able to measure drawdown of the water level in the well during pumping due to constraints at the well head. However, we were able to measure the well discharge rate in gallons per minute (GPM) which can be approximately correlated to groundwater levels. During the well test, HES pumped the well at an initial rate of 13.2 GPM. Within 1 hour the flow rate was reduced to 11.1 GPM and within approximately 4 hours the pumping rate stabilized and sustained at approximately 9 GPM (**Appendix C – Well Yield Test Data**).

Based on the pump curve for 1.5hp pump and the historically measured static groundwater level we estimate the static water level at the start of the well test was approximately 105 feet BG. After 4 hours of pumping the well discharge stabilized at 9GPM. At this point the well continued to pump at a constant rate for an additional 2.5 hrs. This indicates that the drawdown in the well had stabilized. The total amount of water generated during the 6-hour pump test was 3,678 gallons or an average of 10.1 GPM. The measured flow rate after approximately 17 hours of not pumping from the well was back to 13.2 GPM indicating that the water levels had fully recovered from the drawdown seen the previous day. The well yield test data and pump curve are attached in **APPENDIX C**.

Based on the results of the pump test we estimate that it will take approximately 11-12 hours of pumping from the project well to meet the sites peak daily water demand and only 9-10 hours to meet the average groundwater demand during the growing season. Therefore, based on well yield and recovery measurements it appears that the well can sustainably produce the water required to meet the proposed projects water demand.

3.7 MONITORING AND REPORTING

The applicant currently has a water totalizing meter installed at the well head. The meter measures the total gallons pumped but can also be used to calculate the GPM of the well discharge. Once the project is further developed the applicant plans to re-design the water distribution system so that they can pump water to both cultivation sites as well as the ancillary buildings. The water meter will be reinstalled at this time and utilized to measure water use associated with cannabis irrigation. Monthly water usage totals will be recorded in a log book that will be kept onsite and provided to the oversight agencies upon request.

The project well will also be serviced so that a standard water level probe and measuring tape can be lowered into the well through the well head. Once configured the applicant will utilize a Solinist® Water Level Meter to obtain monthly depth to water readings from the site well. The readings will be taken on the same day of each month and prior to daily pumping activities. Results of the water level measurements will be recorded in a log book and stored onsite and provided to the oversight agencies upon request.

4.0 WATER QUALITY

A water quality assessment of the project well was not performed as part of this Assessment Report. However, the property owner recently performed general water chemistry analysis on groundwater from the well. The results of the well testing are summarized below on **TABLE 2 Water Quality Results**, and a copy of the Laboratory Report is attached in **APPENDIX D**. While the results of the water testing did not identify any contaminants of concern the well water may need to be treated to meet the specific needs of the cannabis irrigation. In addition, we recommend that total coliform and e-Coli bacteria should be analyzed prior to the well being used as a potable water source for employees.

TABLE 2 – Water Quality Results

Location (APN)	Visual Appearance	pH	EC Mmhos/cm	Nitrate as N03 ⁻ (mg/L)	Total Manganese (mg/L)	Silica (mg/L)
011-057-230	Clear	5.5	0.11	0.2	NA	NA
California Maximum Contaminant Level (MCL)	NA	NA*	NA	45	0.05	70**

TABLE 2 Continued - METALS AND MINERALS

Sample No.	MINERALS					
	Boron (mg/L)	Na (mg/L)	Ca (mg/L)	Mg (mg/L)	Fe (mg/L)	Hardness
011-057-230	<0.02	6.7	7.2	3.2	5.5	31.1
California Maximum Contaminant Level (MCL)	1.0*	NA	NA	NA	NA	NA

*Federal Action Level (AL)

TABLE 2 Continued – ALKALINITY, ANIONS, TDS AND SAR

Sample No.	ALKALINITY				ANIONS		TDS	SAR
	Total	Bicarbonate	Carbonate	Hydroxide	Chloride (mg/L)	Sulfate as SO4 ((mg/L)	Total Dissolved Solids (mg/L)	Sodium Absorption Ratio
011-057-230	53.5	65	0.0	NA	9	2.3	530	0.52
California Maximum Contaminant Level (MCL)	NA	NA	NA	NAQ	600	500	1000	NA*

5.0 CONCLUSIONS

The project site is located in the Kelsey Creek- Clear Lake Watershed within an aquifer consisting of broken obsidian, stony rhyolite and volcanic ash of Pleistocene age. The aquifer is considered semi-confined and recharge to the aquifer likely occurs primarily through underflow from the overlying upland areas. The estimated groundwater usage for the entire site including the proposed project is approximately 4.29 acre-feet/year. This value includes the proposed project water usage of 3.37 acre-feet/year but does not include the applicants proposed rainwater catchment which will slightly offset the groundwater usage values in the future. 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 Water Usage at Project Site (proposed cultivation/propagation) = 3.37 acre-feet/year

Additional Site Water Use (residential and employees) = 0.92 acre-feet/year

Total Estimated Site Water Use = 4.29 acre-feet/year

Potential Rainwater Offset = 0.33 acre-feet

Sustained Well Yield after 6 hrs. of pumping = 9 gpm

Peak Daily Water Demand = 6,800 gallons

The quantity of groundwater to be used for the project compared to the 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 streams and neighboring wells should not result in significant well interference or impacts to creeks. In addition, the permitted domestic well is equipped with the required water totalizing meter and will be re-configured to allow for monthly depth to water recordings directly from the well head.

6.0 LIMITATIONS

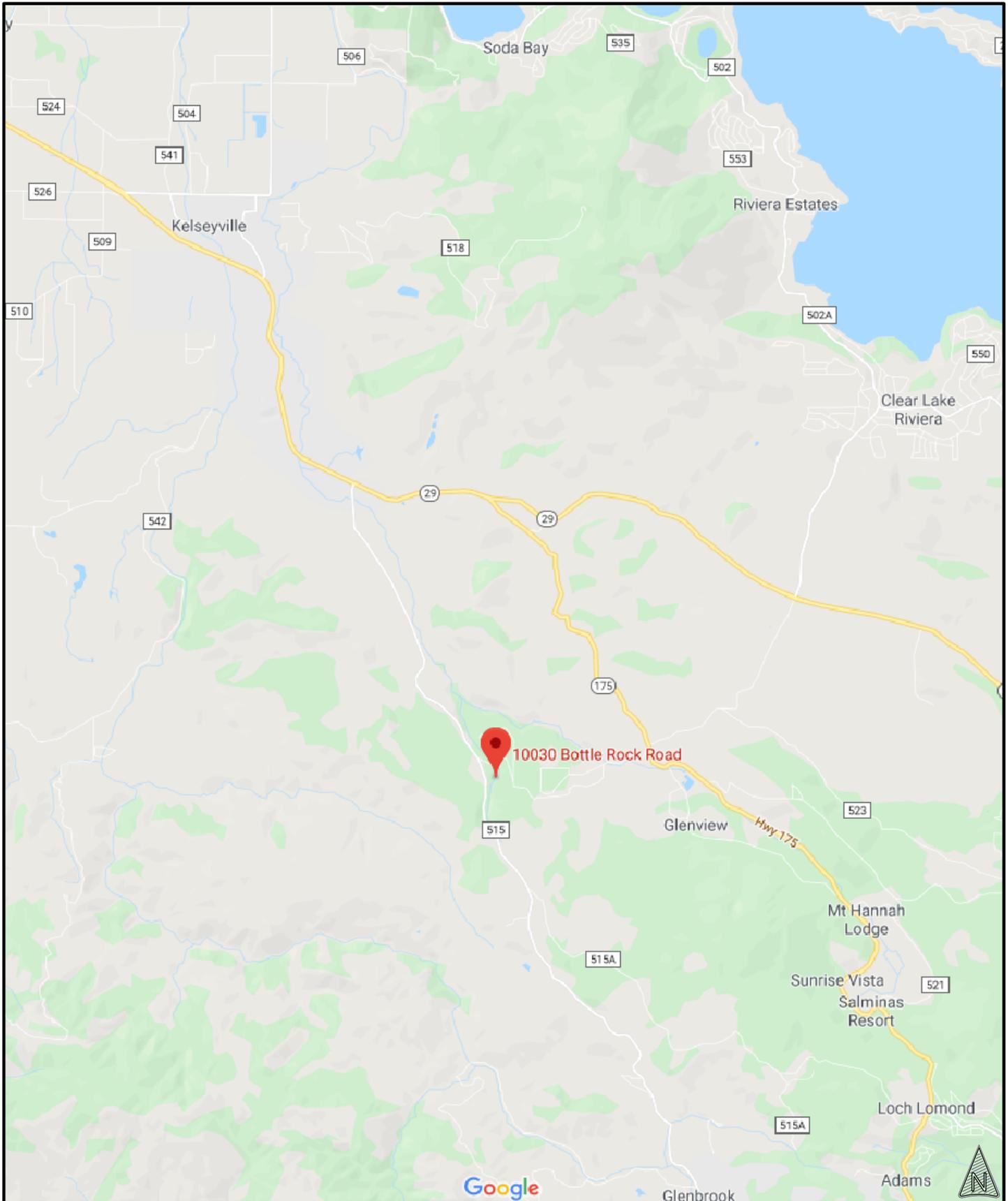
HES is not responsible for the independent conclusions, opinions or recommendations made by others based on the records review, site inspection, field exploration, laboratory test data and interpretations presented in this report.

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 Ms. Jennifer Berg, her 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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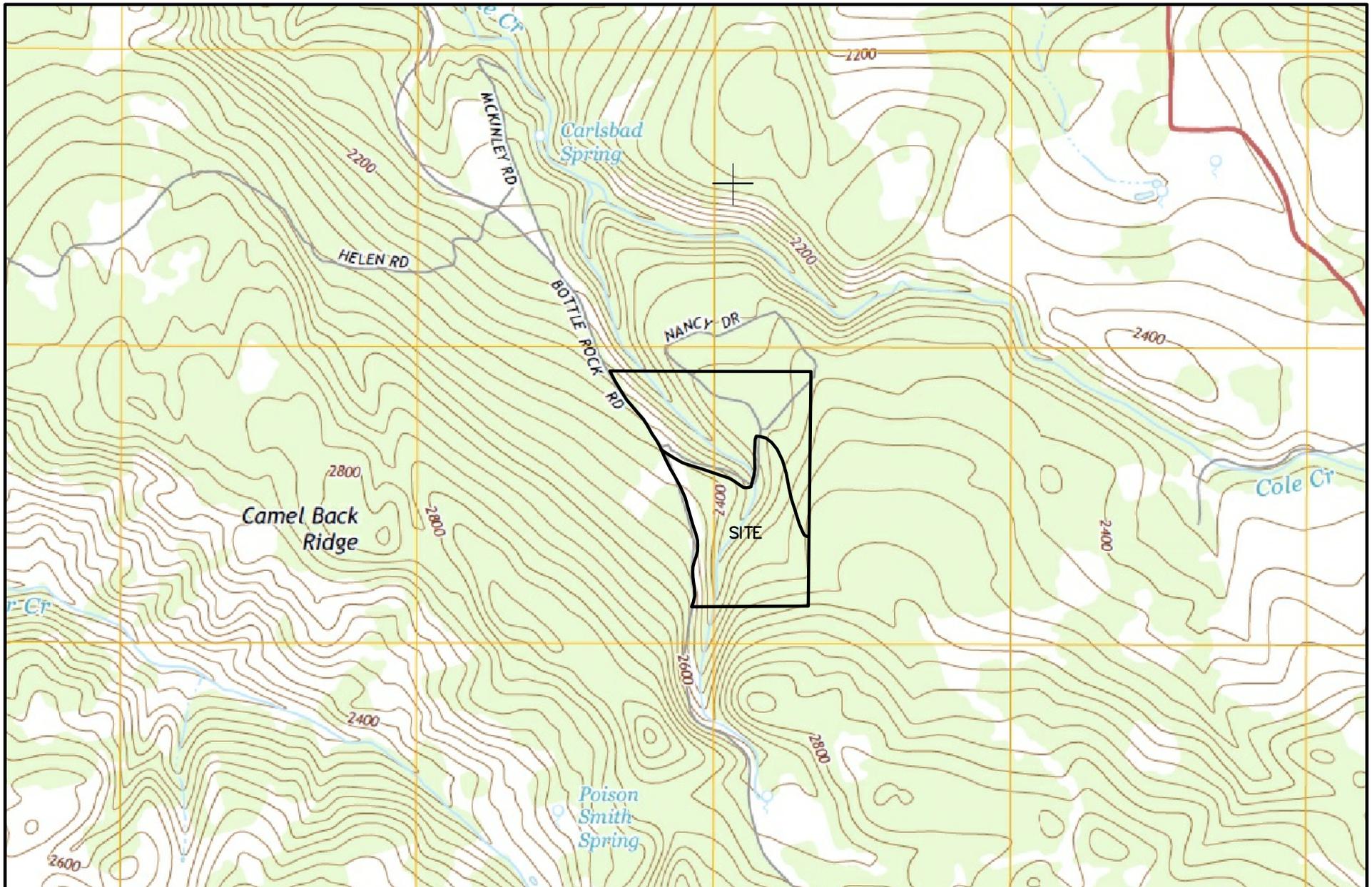
SITE LOCATION MAP

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JOB NUMBER:
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DATE:
1/24/20

PLATE:
1



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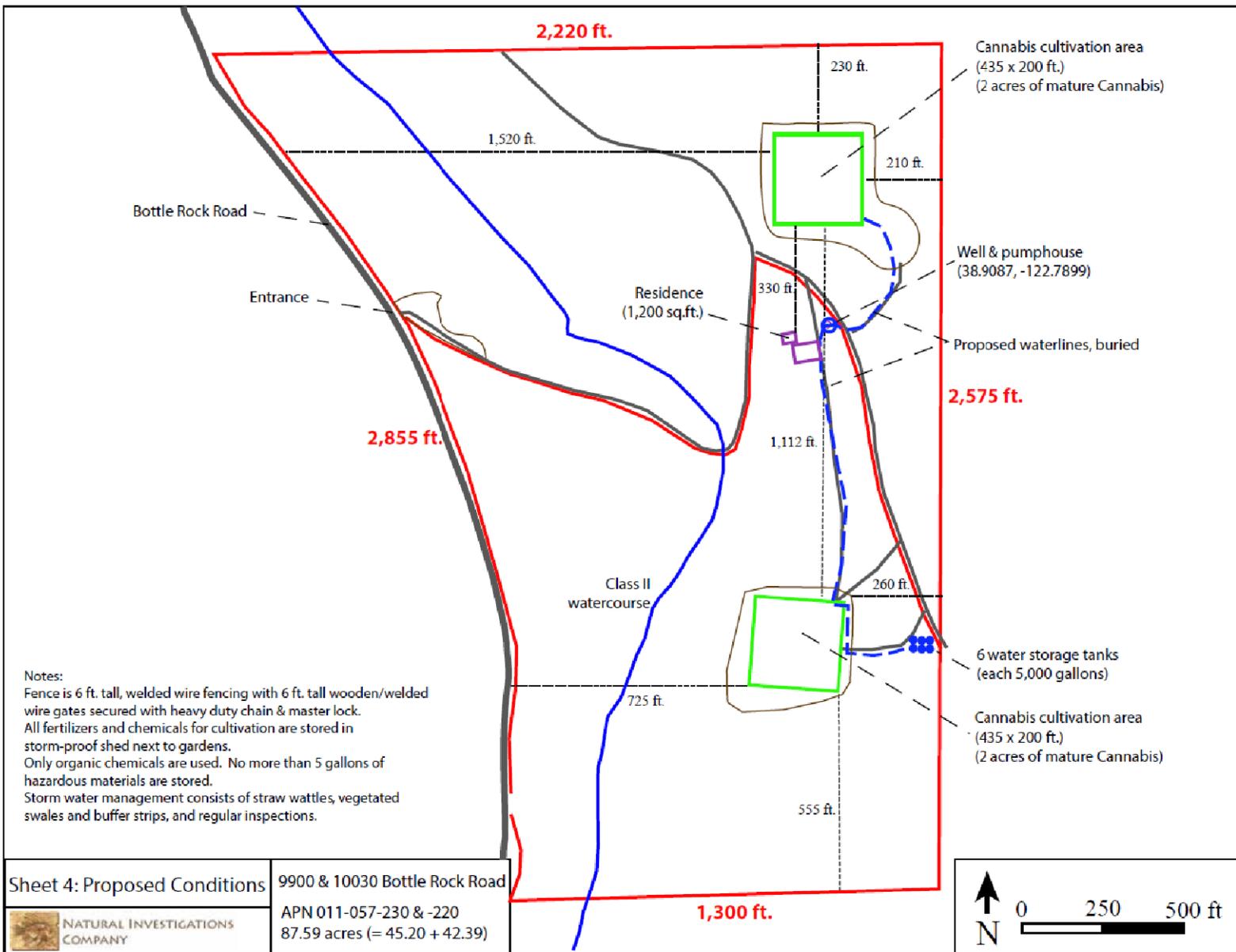
TOPOGRAPHIC MAP

APN 011-057-220/011-057-230
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PLATE:
 3



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SITE PLAN

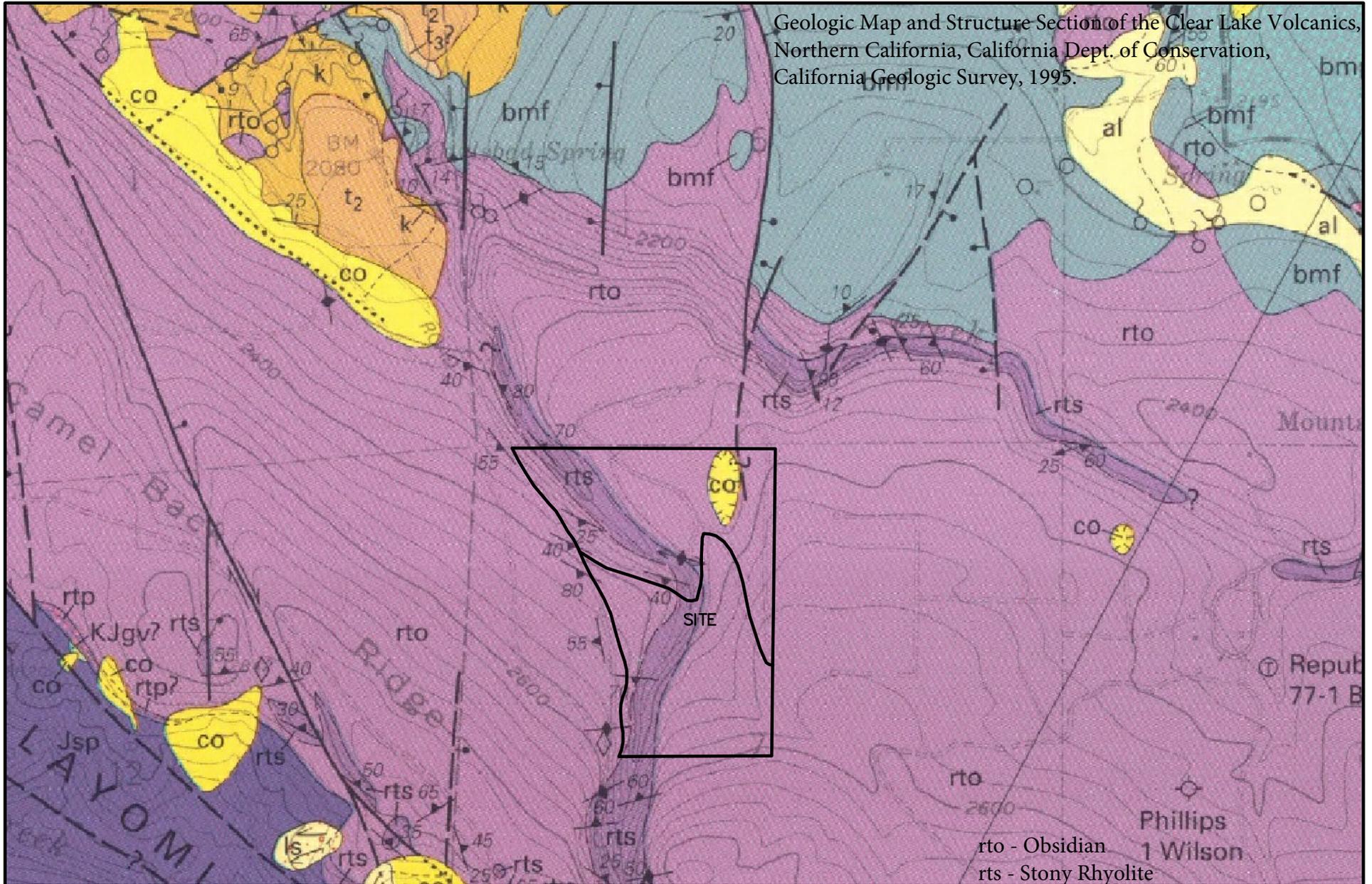
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DATE:
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PLATE:
4

Geologic Map and Structure Section of the Clear Lake Volcanics, Northern California, California Dept. of Conservation, California Geologic Survey, 1995.



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GEOLOGIC MAP

APN 011-057-220/011-057-230
 10030 BOTTLE ROCK RD
 KELSEYVILLE, CALIFORNIA 95451

JOB NUMBER:
 5079.01

DATE:
 1/24/20

PLATE:
 5

APPENDIX A
SITE PHOTOGRAPHS

SITE PHOTOGRAPHS
January 13, 2020



Photo 1: View of site well # 824915.

SITE PHOTOGRAPHS
January 13, 2020



Photo 2: Close-up view of site well # 824915 and water flow meter installed at well head.

SITE PHOTOGRAPHS
January 13, 2020



Photo 3: View of site looking north from the site well.



Photo 4: View of well discharge during pump test.

APPENDIX B
WELL COMPLETION REPORT

TRIPPLICATE
Owner's Copy

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

DWR USE ONLY - DO NOT FILL IN

STATE WELL NO./STATION NO.

LATITUDE LONGITUDE

APN/IRB/OTHER

Page 1 of 1
Owner's Well No. No. **824915**
Date Work Began 8-19-03 Ended 8-25-03
Local Permit Agency Health Dept.
Permit No. W-3356 Permit Date 8-18-03

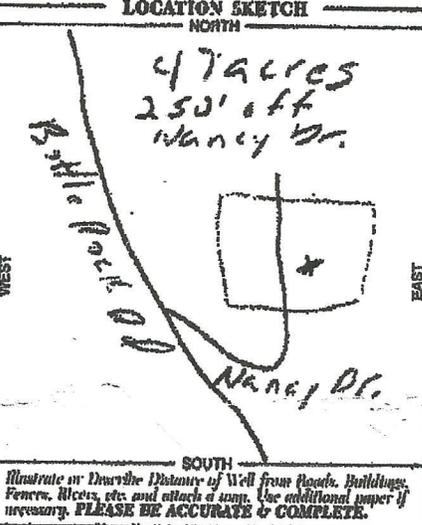
ORIENTATION (✓)		DRILLING METHOD	FLUID	DESCRIPTION
VERTICAL	HORIZONTAL			
	<input checked="" type="checkbox"/>	air rotary		Describe material, grain size, color, etc.
DEPTH FROM SURFACE	FL	TO	FL	
	0	105		Soft Volcanic Ash w/ obsidian sand
	105	120		Broken Obsidian
	120	150		Gray Volcanics

WELL OWNER

Name Kristi Wells
Mailing Address 9649 Crestview Dr. Clearlake Ca 95422
CITY STATE ZIP

WELL LOCATION

Address 10030 Saddle Rock Rd
City Kelseyville
County Lake
APN Book 011 Page 057 Parcel 17
Township 12N Range 5W Section 7
Latitude Longitude



ACTIVITY (✓)

NEW WELL

MODIFICATION/REPAIR

Deepen

Other (Specify)

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

PLANNED USES (✓)

WATER SUPPLY

Domestic Public

Irrigation Industrial

MONITORING

TEST WELL

CATHODIC PROTECTION

HEAT EXCHANGE

DIRECT PUSH

PURGATION

VAPOR EXTRACTION

SPARGING

REMEDIATION

OTHER (SPECIFY)

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 120 (Feet) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 105 (Feet) & DATE MEASURED 8-22-03

ESTIMATED YIELD 160.5 (GPM) & TEST TYPE air lift

TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN (Feet)

* 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				
		TYPE (✓)	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)	CEMENT (✓)		BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)		
0	9	<input checked="" type="checkbox"/>	PVC	4 1/2	160		0	20	X				
20	7	<input checked="" type="checkbox"/>	"	"	"		20	450				5/16 Pca	
20	3	<input checked="" type="checkbox"/>	"	"	"	18							
62	2	<input checked="" type="checkbox"/>	"	"	200	1032							
85	2	<input checked="" type="checkbox"/>	"	"	160	18							

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 Larry Herman Drilling

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

ADDRESS 13011 Hwy 29 Lower Lake Ca 95451

CITY STATE ZIP

Signed Larry Herman Date 8-26-03 465071

DS FF DS JB

APPENDIX C
WELL YIELD TEST

Water Yield # _____

Well Permit # WE-3356

I. Individual performing test: Lee S. Hurvitz

II. Type of license/registration, number and expiration date: CHG #1015 5/31/21-exp.

III. Location of well:
Address: 10030 Bottle Rock Rd. Kelseyville, CA A.P. #: 011-057-023

IV. Type and model of test pump: Franklin I. Shp. Submersible

V. Test pump setting depth: NA

VI. Maximum reported yield for this pump type at this setting: NA

VII. Type of discharge measurement method: Water Meter

VIII. Type and model of flow meter (or provide an accurate description of weir or orifice plate):
Budger M-25 flow meter

Geographic coordinates (Plane Coordinate Method or distance from fixed landmarks): _____

IX. Estimated elevation of well head: _____

X. Initial static water level (include measuring points such as top of casing, surface seal, access port): Not Available

XI. Date & time of initial static water level measurement 1/13/20 8:50 a.m./p.m.

- A. Discharge Rate: 13.2 - 9 gpm
- B. Dynamic Water Level: NA
- C. Specific Capacity: NA
- D. Pump Test duration: 6 hrs

XII. Immediately after the test take the following measurements:

- A. Dynamic water level: NA
- B. Final discharge rate: 9 gpm

XIII. Post - Test Measurement:

- A. Dynamic water level: NA
- B. Static water level: NA
- C. Percentage of recovery of final static level: NA

Testing performed by (signature): [Signature]

Date: 1-13-20

Company: Hurvitz Environmental

Phone Number: 707-824-1690

Well Pump Test Data Recordation

Address: 10030 Bottle Rock Rd. Kelseyville APN-011-057-023

Date	Time	Interval	SWL	GPM	Comments
1-13-2020	8:50 A	1 Min	NA	13.2	45,877 gallons @ Start
	8:51	1 Min	↓	13.2	
	8:52	1 Min		13.2	
	8:53	1 Min		13.2	
	8:54	1 Min		13.2	
	9:00	5 Mins			12.9
	9:05	5 Mins		12.9	
	9:10	5 Mins		12.7	
	9:15	5 Mins		12.3	
	9:20	5 Mins		12.0	
	9:25	5 Mins		11.8	
	9:30	5 Mins		11.5	
	9:35	5 Mins		11.2	
	9:40	5 Mins		10.9	
	9:45	5 Mins		10.7	
	9:50	5 Mins		10.5	
	9:55	5 Mins		10.3	
	10:15	20 Mins		9.9	
	10:35	20 Mins		9.6	
	10:55	20 Mins		9.3	
	11:25	30 Mins		9.0	
	11:55	30 Mins		9.0	
	12:25 p	30 Mins		9.0	
	12:55	30 Mins		9.0	
	1:25	30 Mins		9.0	
	1:55	30 Mins		9.0	
	2:25	30 Mins		9.0	
	2:55	30 Mins	↓	9.0	49,555 gallons @ End
		30 Mins			Total Volume = 3,678 gallons Total Time = 6 hrs 5 minutes Average gpm = 10.08 gpm Stabilized gpm = 9 gpm
		30 Mins			
		30 Mins			
		30 Mins			
		30 Mins			
		30 Mins			
		30 Mins			
		30 Mins			
		30 Mins			
		30 Mins			
1-14-2020	8:30 p		NA	13.2	
		72 Hrs. or			

APPENDIX D
WELL TESTING RESULTS



Water Analysis Report

Job Name Andrew Allen

Company Andrew Allen

Contact

Sample ID 369707

Rep

Lab Number 15866

Submitted By

Run Date 12/17/2019

Sample Location BRW 1

Notes

Sample Name

pH 5.5
Hardness ppm 31.1
Hardness Grains /gal 1.82
Conductivity mmhos/cm 0.11
Sodium Adsorption Ratio 0.52

		<i>ppm</i>	<i>meq/L</i>	<i>lbs/A in</i>
Calcium	Ca	7.2	0.36	1.63
Magnesium	Mg	3.2	0.27	0.72
Potassium	K	5.4	0.14	1.23
Sodium	Na	6.7	0.29	1.51
Iron	Fe	5.5		1.25

		<i>meq/L</i>	<i>lbs/A in</i>
Total Alkalinity		53.5	12.16
Carbonate		0.0	0.00
Bicarbonate		65.0	14.77
Chloride		9.0	2.05
Sulfate		2.3	0.53
Salt Concentration		70.4	16.00
Boron		< 0.02	

Cation/Anion Ratio 0.77

Nitrate ppm 0.2
P ppm 0.14
pHc 8.82
Adj. SAR 0.3