WATER AVAILABILITY ANALYSIS

HIGHLAND FARMS, LP

7634 Highland Springs Road

Lakeport, CA 95453

APNs 007-006-40, 007-006-34, 007-006-35, 007-006-27, 007-006-41, 007-057-01, 007-057-02

SUMMIT

CIVIL STRUCTURAL WATER|WASTEWATER ELECTRICAL PLANNING

Project No. 2021038
January 20, 2022

TABLE OF CONTENTS

LIST OF ENCLOSURES

PROJECT OVERVIEW

Highland Farms, LP, located at 7634 Highland Springs Road in Lakeport, CA is a proposed cannabis cultivation and processing facility. Highland Farms (Facility) operations will take place on several adjacent parcels (APN 007-006-34, -35, and -40). Several additional adjacent parcels are owned by the Facility and will be considered in this report (Enclosure A). These additional parcels are not proposed to have cultivation or processing facilities installed on them at this time. The Facility is located approximately 6.5 miles south of the city of Lakeport and 5 miles southwest of the city of Kelseyville. The surrounding area is hill range that is bordered by Highland Creek to the south and Highland Springs Reservoir to the east. This area of Lake County is contained within the Big Valley inventory unit of Lake County as defined by the 2006 *Lake County Inventory and Analysis* report, however the area is not located within an identified groundwater basin, so groundwater hydrogeology characteristics are unknown. Water availability estimates will therefore be conservatively limited to estimated surface recharge capabilities only. A low recharge rate will be used to compensate for the lack of site-specific recharge and storage capacities. The cumulative impact area is assumed to follow the topology of the surrounding area (Enclosure A).

The Facility is being requested by Lake County to evaluate water demands and sources to meet the requirements of its emergency drought ordinance (Ordinance 3106, dated July 27, 2021). Summit Engineering has prepared the following Water Availability Analysis to demonstrate that the water consumption associated with the proposed Facility's operations do not exceed conservative estimates of the water production capabilities of the project area and therefore should not negatively impact other users in the impact area.

The Facility's water demand is supplied by three onsite wells (Table 1). Well logs and 4-hour yield tests for each well are included in Enclosure B. Yield testing resulted in an estimated flow rate of 75 gpm, 129 gpm, and 132 gpm for Wells 1-3, respectively. Well 1 recovered to within 13 feet of its starting level within 45 minutes of stopping its pump. Wells 2 and 3 recovered to their starting level within 15 minutes of stopping their respective pumps. The total combined flow for the well is 336 gpm, which is expected to meet the domestic, cultivation, and landscape irrigation demands of the Facility.

Table 1. Existing well capacities.

Well Name	Primary Use	Well Depth (ft)	Pump Depth (ft)	Status	Capacity (gpm)
Well 1	Domestic/Cultivation/Irrigation	180	160	Active	75
Well 2	Domestic/Cultivation/Irrigation	140	100	Active	129
Well 3	Domestic/Cultivation/Irrigation	200	160	Active	132

ESTIMATED WATER DEMAND

Estimated water uses on the property are based on the following:

- Cannabis cultivation water demand,
- Cannabis processing water demand,
- Domestic water demand associated with employees and visitors,

Fire suppression demand is not accounted for in this analysis as fire flows are typically supplied by a separate water system and are not regularly used. Landscape demand is also not considered for this site as there are currently no plans for ornamental vegetation.

CANNABIS CULTIVATION WATER DEMAND

Water demand estimates for cannabis cultivation vary greatly between available studies, but per the Facility's Farm Management Plan, the assumed average water demand is 30 inches per acre per year (2.5 acre-feet per acre per year, or 814,620 gallons per acre per year). This demand is multiplied by the planted acreage and a canopy coverage percent (Table 2). For outdoor cultivation at the Facility, the canopy coverage is estimated to be 40%. Nursery demand is estimated in with the same method but uses a canopy coverage of 70%.

Once properly permitted, the Facility plans to cultivate up to 12.34 acres of outdoor vegetation, use a 29,600 square foot (0.68 acres) area as a year-round greenhouse nursery, and a 47,270 square foot area (1.09 acres) as a year-round greenhouse. This corresponds to 12.3 acre-feet per year of outdoor water demand, 1.19 acre-feet per year of greenhouse nursery water demand, and 1.91 acre-feet per year of greenhouse water demand for a total estimated cultivation water demand of 15.44 acre-feet per year (5,030,278 gallons per year). This demand will vary by month depending on which crop is being grown at the time. An estimated monthly distribution of demand is summarized in Table 2.

Table 2. Estimated monthly cultivation water demand.

Month	Outdoor Cultivation Demand (gallons)	Nursery Cultivation Demand (gallons)	Greenhouse Cultivation Demand (gallons)	Total Cultivation Demand (gallons)
January	0	32,313	51,796	84,110
February	0	32,313	51,796	84,110
March	0	32,313	51,796	84,110
April	250,384	32,313	51,796	334,494
May	482,595	32,313	51,796	566,705
June	583,975	32,313	51,796	668,085
July	667,436	32,313	51,796	751,546
August	667,436	32,313	51,796	751,546
September	667,436	32,313	51,796	751,546
October	482,595	32,313	51,796	566,705
November	219,105	32,313	51,796	303,215
December	0	32,313	51,796	84,110
Total (gallons)	**4,020,964**	**387,759**	**621,555**	**5,030,278**
Total (ac-ft)	**12.34**	**1.19**	**1.91**	**15.44**

CANNABIS PROCESS WATER DEMAND

Water demand for cannabis processing is assumed to be required for two proposed processing buildings. Process water will be used for washdowns, ice use, and other cleaning activities. This water demand is anticipated to occur year-round and total to approximately 3.76 acre-feet of water per year (Table 3). Estimates for this demand are based on data from the 2012 water consumption survey performed by the United States Energy Information Administration's Commercial Building Energy Consumption Survey. This is a conservative estimate as there is likely some overlap between this data and the domestic water demand estimate mentioned in the section below.

Table 3. Estimated monthly process water demand.

Month	Processing Building I Demand (gallons)	Processing Building E Demand (gallons)	Total Process Demand (gallons)
January	66,000	36,000	102,000
February	66,000	36,000	102,000
March	66,000	36,000	102,000
April	66,000	36,000	102,000
May	66,000	36,000	102,000
June	66,000	36,000	102,000
July	66,000	36,000	102,000
August	66,000	36,000	102,000
September	66,000	36,000	102,000
October	66,000	36,000	102,000
November	66,000	36,000	102,000
December	66,000	36,000	102,000
Total (gallons)	**792,000**	**432,000**	**1,224,000**
Total (ac-ft)	**2.43**	**1.33**	**3.76**

DOMESTIC WATER DEMAND

The domestic water demand of the Facility is estimated based on a maximum of 22 full-time employees, up to 30 part-time employees, and 5 visitors per week. Sanitary sewage (SS) generation and facility domestic water demand are expected to be equivalent, and as such, prescribed sewage flows are used to calculate estimated domestic water demand. Daily water demand per employee is assumed to be 78 gallons per day and is based on a 2006 County report title *Lake County Water Demand Forecast*. This daily demand per employee is significantly larger than anticipated demands (15 gallons per employee per day); however, the larger value is used for conservatism. The annual domestic water demand for the Facility is estimated to be 3.46 acre-ft per year (Table 4).

Table 4. Estimated facility domestic water demand.

Use Type	Number (people/day)	Water Demand (gal/person)	Daily Demand (gal/day)	Frequency (times/year)	Annual Demand (gal/year)
Full-Time Employees [1]	22	78 [4]	1716	365	626,340
Part-Time Employees [2]	30	78 [4]	2340	214	500,760
Visitors [3]	5	3	15	12	180
Total Annual Domestic Water Demand (gallons)					**1,127,280**
Total Annual Domestic Water Demand (ac-ft/year)					**3.46**
Average Daily Water Use (GPD)					**3,088**

Notes:

1. Peak number of employees assumed every day to be conservative.
2. Part time employees are assumed to be onsite between April-October.
3. Assumed to have up to five visitors per month.
4. Employee water demand assumed to be 78 GPCD per the Lake County Water Demand Forecast (CDM 2006)

TOTAL WATER DEMAND & PEAK DEMAND

The total water demand for the Facility is conservatively estimated to be 22.7 acre-ft/year (Table 5). Cannabis cultivation is the highest demand source for the Facility, accounting for over 68% of total anticipated demand.

Table 5. Total Projected Annual Water Demand

Source of Demand	Average Gallons per Day	Gallons per Year	Acre-ft per Year
Cannabis Cultivation Use	13,782	5,030,278	15.44
Cannabis Process Use	3,353	1,224,000	3.76
Domestic Use	3,088	1,127,280	3.46
Total	**20,223**	**7,381,558**	**22.7**

Peak demand for the facility is assumed to occur during peak growing season and is estimated to be 61,480 gallons per day (Table 6). Assuming a normal facility operating schedule of 8 hours per day, the minutely-demand of the peak day is estimated to be approximately 128 gpm. Wells 2 or 3 are anticipated to be capable of sustaining this demand alone. In total, the facility has access to up to 336 gpm of groundwater via its three wells. The facility is proposed to initially have twenty-eight 5,000-gallon poly-tanks for a total storage capacity of 140,000 gallons, which would provide up to two days of peak flow. Once use permit UP20-96 is approved, the facility would install three engineered tanks totaling 192,000 gallons.

Table 6. Estimated peak day water demand.

Use Type	Use Source	Number (unit/day)	Water Demand (gal/unit)	Daily Demand (gal/day)
Domestic	Full-Time Employees	22	78	1,716
	Part-Time Employees	30	78	2,340
	Visitors	5	3	15
			Subtotal	**4,080**
Cultivation	Facility Operations	-	25,100 [1]	25,100
			Subtotal	**25,100**
Process	Facility Operations	-	3,400 [2]	3,400
			Subtotal	**3,400**
			Total	**32,580**

1. Peak cultivation demand is assumed to be the average day demand during the peak month. Peak month demand is divided by 30 days.
2. Peak process demand is assumed to be the average day demand during the peak month. Peak month demand is divided by 30 days.

ESTIMATED AVERAGE ANNUAL GROUNDWATER RECHARGE

An estimate of the average annual groundwater recharge for the Facility is being provided as an estimate of available water. To be conservative, only potential surface water recharge will be evaluated since groundwater transfers in and out of the local aquifer are unknown. The project consists of seven parcels, with the largest being approximately 269 acres of brushed hill lands. The total area across all project parcels is estimated to be 507 acres, with only approximately 4.6 acres being impervious (Table 7). The remaining area is primarily native vegetation which is typically conducive to groundwater recharge through precipitation.

Precipitation recharge estimates rely on simple water balance principles with the recharge mechanic of interest being infiltration of rainwater to the groundwater table. Precipitation recharge rates are highly variable and depend on area geology, topology, and groundwater hydrology. Due to these characteristics being unknown at the Facility, the precipitation recharge rate is assumed to be minimal (5% of total annual precipitation).

The average annual precipitation is estimated to be 29.8 inches/year from precipitation normals for Clearlake from the National Oceanic and Atmospheric Administration (NOAA) climate database for the period between 1991-2020 (Enclosure C). The Clearlake station is the closest NOAA monitoring station to the Facility.

Utilizing the project parcel's pervious area, assumed rainfall recharge fraction of 5%, and normal annual precipitation, the anticipated annual recharge for a typical year would be calculated as:

$$Typical\ Annual\ Recharge = \left(Pervious\ Area\ (ac) * Precipitation\ \left(\frac{ft}{year}\right) * Recharge\ Fraction\ (\%) \right)$$
$$= \left(502.6\ acres * \frac{29.8 \frac{in}{year}}{12 \frac{in}{ft}} * 5\% \right)$$
$$= 62.5\ \frac{acre\text{-}ft}{year}$$

Table 7. Estimated groundwater recharge per project parcel.

Parcel APN	Total Area (ac)	Est. Impervious Area (ac) [3]	Recharge Area (ac)	Avg. Annual Precipitation (in) [4]	Aquifer Recharge Rate (%) [5]	Est. Annual Recharge (ac-ft)
007-006-34 [1, 2]	44.4	0.85	43.55			5.4
007-006-35 [1, 2]	30.7	3.24	27.46			3.4
007-006-40 [1, 2]	39.2	0.5	38.7			4.8
007-006-41	39.1	0	39.1	29.86	5%	4.9
007-006-27	269.1	0	269.1			33.5
007-057-01	79.9	0	79.9			9.9
007-057-02	4.8	0	4.8			0.6
Total	**507**	**4.59**	**502.61**	**29.86**	**5%**	**62.5**

Notes

1. Parcels 007-006-34, -35, and -40 are currently proposed to be the only developed parcels of the project.
2. Parcels 007-006-34, -35, and -40 have approved permits for three new groundwater wells.
3. Site impervious area estimate includes area of proposed buildings, roads, and impervious areas visible from aerial imagery.
4. Average annual precipitation for Clearlake based on NOAA Climate Normals for 1991-2020 (NOAA 2021).
5. Aquifer recharge rate of precipitation assumed to be minor for conservatism.

WATER AVAILABILITY

The total estimated water demand for the Facility is 22.7 acre-feet per year, which represents 36% of the conservatively estimated 62.5 acre-feet per year of groundwater recharge potential for the project site. The water demand of the Facility does not surpass its estimated precipitation recharge potential which suggests that there would be no impacts to other facilities in the cumulative impact area.

WELL INTERFERENCE AND DRAWDOWN

A well drawdown analysis is included for reference and is intended to estimate any interference between onsite wells, offsite wells, or springs that could affect their supply capacity due to water usage (Enclosure D). The objective of this analysis is to determine if any well (existing or in the future) installed outside of the Facility parcel could be affected by the drawdown of the Facility's well. The analysis was performed for each active well onsite (Wells 1-3). Aquifer characteristics such as thickness, specific storage, and hydraulic conductivity are estimated due to unknown site conditions. Specific storage and hydraulic conductivity are varied to provide a range of potential drawdown effects.

- Method

  Using the Theis equation the groundwater drawdown from the property well to the edge of the parcel was determined. The assumed closest distance that any neighboring well could be located is the edge of the parcel. Due to the limited data on the aquifer, values that would yield a conservative drawdown estimate were used.

  Assumptions:

  - Aquifer Thickness of 100 ft.
  - Hydraulic Conductivity low range of 10 to 30 ft/day
  - Specific Storage range of 1.5x 10^{-5} to 3.1x 10^{-4} (1/ft)

  The Theis equation can be seen below along with an example calculation.

$$\text{Theis Equation: Drawdown} = \frac{\text{Flow}}{(4\pi \times \text{Transmissivity})} \times W(u)$$

$$W(u) = \int_u^{\infty} \frac{1}{\omega} e^{-\omega} d\omega$$

$$u = \frac{(\text{Distance}^2 \times \text{Specific Storage})}{(4 \times \text{Transmissivity} \times \text{Time})}$$

$$\text{Transmissivity} = \text{ Hydraulic Conductivity } \times \text{Aquifer Thickness}$$

  Example for the domestic well drawdown effect on possible wells on adjacent properties:

$$u = \frac{(500 \text{ ft})^2 \times (1.50 \text{ X } 10^{-5})}{4 \times 10 \frac{\text{ft}}{\text{day}} \times 100 \text{ ft} \times 1\text{day}} = 9.38 \times 10^{-4}$$

  With this value of u, W(u) = 6.40

$$\text{Drawdown} = \frac{75 \frac{\text{gal}}{\text{min}} \times \ 0.1337 \frac{\text{cuft}}{\text{gal}} \times 1{,}440 \frac{\text{min}}{\text{day}}}{4\pi \ \times 10 \frac{\text{ft}}{\text{day}} \times 100 \text{ ft}} \times 6.40 = 7.35 \text{ ft}$$

  The table below shows a summary of the worst-case scenario of drawdown results for the onsite wells. The radius of influence for Well 1 is set as 500 feet, but the nearest property line bordering a parcel not owned by the facility is greater than 500 feet. More detailed tables can be found in Enclosure D.

Table 8. Well Drawdown Calculations

	Well Flow Rate (gpm)	Radius of Influence (ft)	Estimated Drawdown (ft)
Well 1	75	500	7.35
Well 2	129	175	14.6
Well 3	132	265	13.3

Results

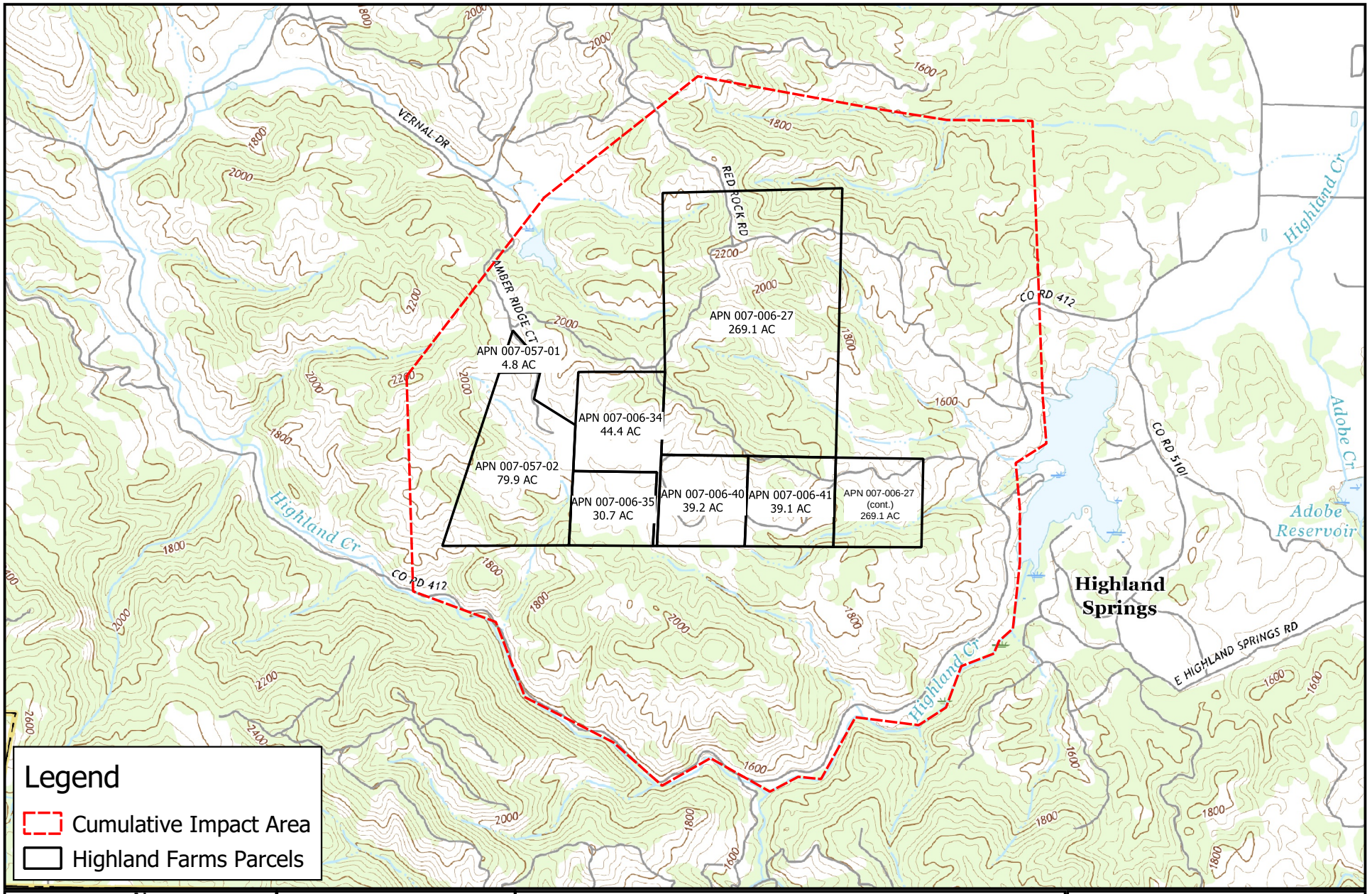
Using estimates for aquifer thickness, specific storage, and hydraulic conductivity, the Facility's wells are not expected to produce a drawdown greater than 15 feet within their respective radii of influence. Wells 2 and 3 produce larger drawdowns due to their pump rate and their proximity to a parcel boundary that is not owned by the Facility. Per the California Department of Water Resources' Well Completion Report Map Application, there does not appear to be any existing wells that are not owned by the Facility in the project area. Well completion reports for each of the Facility wells are available from the Well Completion Report Map Application so future well drilling by adjacent parcels will have access to their information for pump installation purposes.

CONCLUSION

The total annual water demand of Highland Farms for cultivation, process, and domestic uses is projected to be 22.7 acre-feet per year, which is below the conservatively estimated parcel groundwater recharge rate of 62.5 acre-feet per year. The parcel groundwater recharge rate is a conservative estimate that only accounts for groundwater recharge via precipitation infiltration. Other sources of recharge are possible which may result in greater recharge rates than what is estimated. The water use by Highland Farms is not expected to negatively impact other users in the cumulative impact area. The anticipated peak day water demand for the parcel is estimated to be met by the existing 336 gpm of onsite well capacity. The proposed use of the well pumps is not anticipated to cause drawdown issues for neighboring properties should they install wells in the future.

ENCLOSURE A

OVERALL SITE PLAN AND CUMULATIVE IMPACT AREA WELL LOCATION MAP

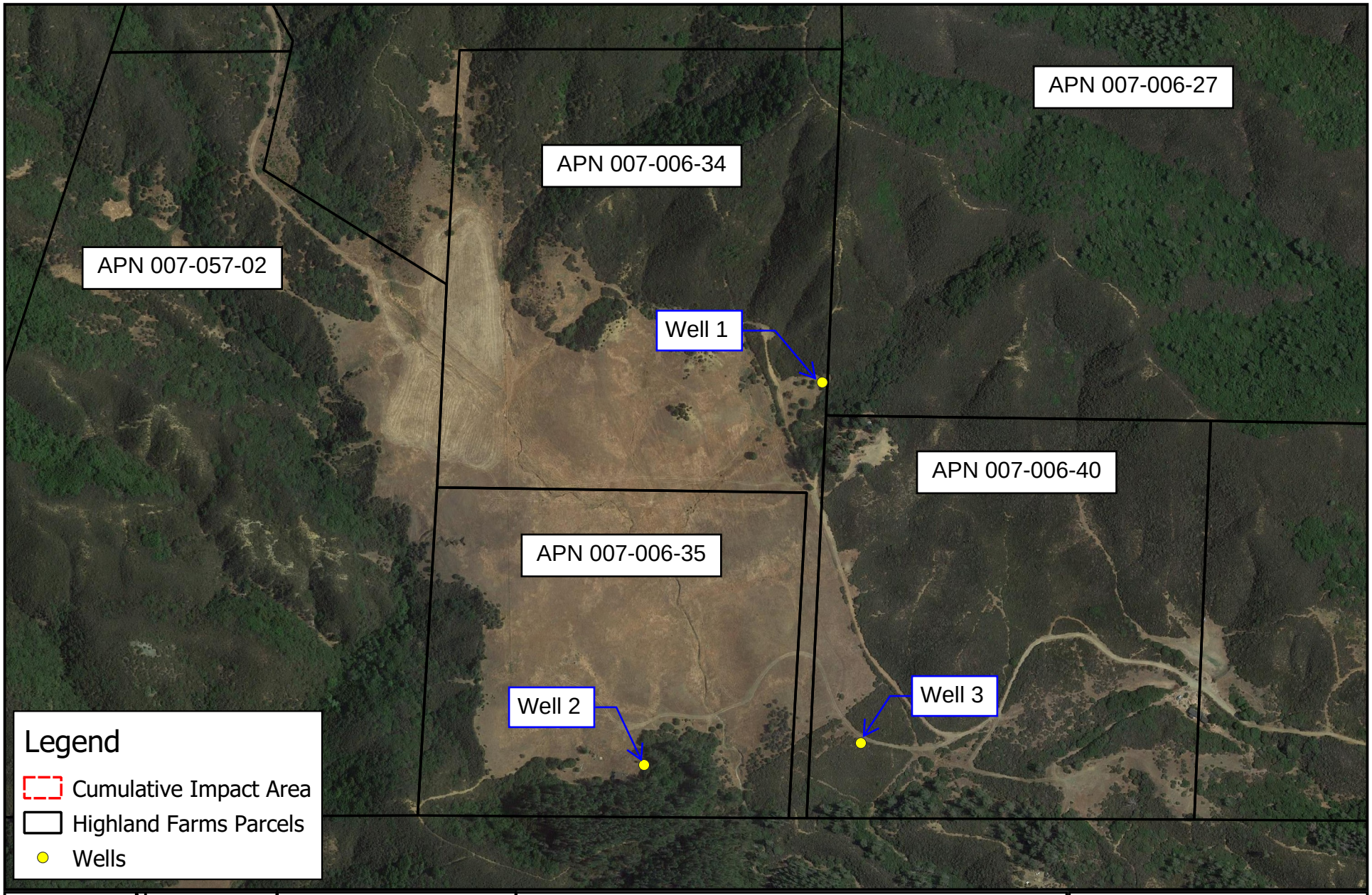


PROJECT NO. 2021038
DATE 10/11/2021
BASEMAP USGS Topo

Overall Site Plan

HIGHLAND FARMS
7522 HIGHLAND SPRINGS RD
LAKEPORT, CA
APN 007-006-35

SUMMIT
SUMMIT ENGINEERING, INC.
463 Aviation Blvd., Suite 200
Santa Rosa, CA 95403 707.527.0775



N

0 225 450 675 ft

PROJECT NO. 2021038
DATE 12/28/2021
BASEMAP USGS Topo

Overall Site Plan - Well Locations

HIGHLAND FARMS
7522 HIGHLAND SPRINGS RD
LAKEPORT, CA
APN 007-006-35

SUMMIT
SUMMIT ENGINEERING, INC.
463 Aviation Blvd., Suite 200
Santa Rosa, CA 95403 707.527.0775

ENCLOSURE B

WELL LOGS AND YIELD TESTS

State of California

Well Completion Report

Form DWR 188 Submitted 11/30/2020

WCR2020-016453

Owner's Well Number | Date Work Began: 11/13/2020 | Date Work Ended: 11/17/2020

Local Permit Agency: Lake County Health Services Department - Environmental Health Division

Secondary Permit Agency | Permit Number: WE-5448 | Permit Date: 09/23/2020

Well Owner (must remain confidential pursuant to Water Code 13752)

Name: Patrick McMurray

Mailing Address: 44017 County Road 17

City: Woodland | State: Ca | Zip: 95776

Planned Use and Activity

Activity: New Well

Planned Use: Water Supply Irrigation - Agriculture

Well Location

Address: 7408 Highland Springs RD

City: Lakeport | Zip: 95453 | County: Lake

Latitude: 38 Deg. 56 Min. 36.41 Sec. N | Longitude: -122 Deg. 55 Min. 37.54 Sec. W

Dec. Lat.: 38.9434472 | Dec. Long.: -122.9270944

Vertical Datum | Horizontal Datum: WGS84

Location Accuracy: 20 Ft | Location Determination Method

APN: 007-006-341

Township: 13 N

Range: 10 W

Section: 25

Baseline Meridian: Mount Diablo

Ground Surface Elevation

Elevation Accuracy

Elevation Determination Method

Borehole Information

Orientation: Vertical | Specify

Drilling Method: Direct Rotary | Drilling Fluid: Bentonite

Total Depth of Boring: 180 Feet

Total Depth of Completed Well: 180 Feet

Water Level and Yield of Completed Well

Depth to first water (Feet below surface)

Depth to Static Water Level: 37 (Feet) | Date Measured: 11/17/2020

Estimated Yield*: 50 (GPM) | Test Type: Air Lift

Test Length: 2 (Hours) | Total Drawdown: 131 (feet)

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

Geologic Log - Free Form

Depth from Surface Feet to Feet		Description
0	43	Soil and gravel
43	79	Shale
79	180	Sandstone and green quartz

Casings

Casing #	Depth from Surface Feet to Feet		Casing Type	Material	Casings Specificatons	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	120	Blank	PVC	OD: 5.563 in. | SDR: 21 | Thickness: 0.265 in.	0.265	5.563			
1	120	180	Screen	PVC	OD: 5.563 in. | SDR: 21 | Thickness: 0.265 in.	0.265	5.563	Milled Slots	0.032	

Annular Material

Depth from Surface Feet to Feet		Fill	Fill Type Details	Filter Pack Size	Description
0	20	Bentonite	Non Hydrated Bentonite		Surface Seal
20	180	Filter Pack	Other Gravel Pack	3/8	Pea Gravel

Other Observations:

Borehole Specifications

Depth from Surface Feet to Feet		Borehole Diameter (inches)
0	20	11
20	180	7.875

Certification Statement

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

Name: WEEKS DRILLING AND PUMP CO (Person, Firm or Corporation)

PO BOX 176 (Address) | SEBASTOPOL (City) | CA (State) | 94573- (Zip)

Signed: *electronic signature received* (C-57 Licensed Water Well Contractor) | 11/30/2020 (Date Signed) | 177681 (C-57 License Number)

Attachments

007-006-341.pdf - Location Map

DWR Use Only

CSG #	State Well Number	Site Code	Local Well Number

N — Latitude Deg/Min/Sec

W — Longitude Deg/Min/Sec

TRS:

APN:

GPS:
New Well - 38°56'36.41"N / 122°55'37.54"W

APN:007-006-341

WEEKS Drilling & Pump Company

TITLE	DESCRIPTION
New Well	7408 Highland Springs Road Lakeport Ca 95453
DATE **9/5/2020**	PAGE 1 of 1

CAL-TECH PUMP WELL & WATER TREATMENT

P.O. Box 1261
Middletown, CA 95461
Ph. 707-987-4488

www.cal-techpump.com
State License # 923640
Fax. 707-987-4411

Well Inspection Log

For: Cultivo Inc.

Site: 7527 Highland Springs Rd.
Project:
Escrow #:
Email:

Ph:

Start Date: 12/15/2020

Technician: Joe

WELL DEPTH	CASING SIZE	STATIC LEVEL	PUMP TYPE	PUMP SETTING	MAX PUMP OUTPUT	TOTAL DRAWDOWN	DEAD HEAD	AMPS	VOLTAGE
176'	5" PVC	48	10 HP Grundfos	160' on 2" sch. 80	76	92'			460v Generator
			60S100						

DATE	TIME	TECH	WATER LEVEL	GAL.PER MINUTE	WATER COLOR	WATER METER	COMMENTS
12/15/2020	10:55 AM	Joe	48	76	murky/cold	329,800	
	10:57		64	76	little murky/cold		
	11:01		66	76	clear/cold		
	11:06		69	76	clear/cold		
	11:16		74	75	clear/cold		
	11:27		76	75	clear/cold		
	11:46		81	75	clear/cold		
	12:08		83	75	clear/cold		
	12:20		84	75	clear/cold		
	12:50		86	75	clear/cold		
	1:26		89	75	clear/cold		
	2:03		90	75	clear/cold		
	2:55		92	75	clear/cold	348,000	
Recovery:	3:40		61				

Water Quality Sample Taken: No
Pump Broke Suction During Test: No

Total Pumping Time: 4 Hrs.
Total Volume Pumped: 18,200 Gallons
Well Yield For Duration Of Test: 75.8 Gallons per minute

NOTES & RECOMMENDATIONS:

Set 10 HP 60S100 to 160' on 2" sch. 80 drop pipe. Well casing is above grade and is covered with a 5" PVC cap. We ran the Test for four hours, the water level drew down to 92', doing approx. 75 GPM.

State of California

Well Completion Report

Form DWR 188 Submitted 12/8/2021

WCR2021-015562

Owner's Well Number: Well #2 | Date Work Began: 10/09/2021 | Date Work Ended: 10/17/2021

Local Permit Agency: Lake County Health Services Department - Environmental Health Division

Secondary Permit Agency: | Permit Number: We5737ag | Permit Date: 09/20/2021

Well Owner (must remain confidential pursuant to Water Code 13752)

Name: LAKE CO DEVELOPMENT CO,

Mailing Address: 12762 Hwy 29

City: Lower Lake | State: Ca | Zip: 65457

Planned Use and Activity

Activity: New Well

Planned Use: Water Supply Irrigation - Agriculture

Well Location

Address: 7522 Highland springs RD

City: Lakeport | Zip: 95457 | County: Lake

Latitude: 38 Deg. 56 Min. 32.6457 Sec. N | Longitude: -122 Deg. 55 Min. 47.6814 Sec. W

Dec. Lat.: 38.9424016 | Dec. Long.: -122.9299115

Vertical Datum: | Horizontal Datum: WGS84

Location Accuracy: | Location Determination Method:

APN: 007006351

Township: 13 N

Range: 10 W

Section: 25

Baseline Meridian: Mount Diablo

Ground Surface Elevation:

Elevation Accuracy:

Elevation Determination Method:

Borehole Information

Orientation: Vertical | Specify:

Drilling Method: Downhole Rotary Hammer | Drilling Fluid: Air

Total Depth of Boring: 140 Feet

Total Depth of Completed Well: 140 Feet

Water Level and Yield of Completed Well

Depth to first water: 75 (Feet below surface)

Depth to Static Water Level: 52 (Feet) | Date Measured:

Estimated Yield*: 50 (GPM) | Test Type:

Test Length: (Hours) | Total Drawdown: (feet)

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

Geologic Log - Lite

Depth from Surface Feet to Feet		Material Type	Material Color	Material Texture	Material Description
0	50	Clay			
50	75	Rock	Green	Soft	
75	80	Rock	Green	Fractured	
80	95	Rock	Green		
95	140	Rock	Green	Fractured	

Casings

Casing #	Depth from Surface Feet to Feet		Casing Type	Material	Casings Specificatons	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	100	Blank	Low Carbon Steel	Grade: ASTM A53	0.188	6.625			
1	100	140	Screen	Low Carbon Steel	Grade: ASTM A53	0.188	6.625	Milled Slots	0.25	

Annular Material

Depth from Surface Feet to Feet		Fill	Fill Type Details	Filter Pack Size	Description
0	52	Cement	Portland Cement/Neat Cement		
52	140	Other Fill	See description.		None

Other Observations:

Borehole Specifications

Depth from Surface Feet to Feet		Borehole Diameter (inches)
0	52	14
52	140	7

Certification Statement

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

Name: J W MORRISON INC (Person, Firm or Corporation)

P O BOX 1617 (Address) | LAYTONVILLE (City) | CA (State) | 95454 (Zip)

Signed: *electronic signature received* (C-57 Licensed Water Well Contractor) | 12/08/2021 (Date Signed) | 970906 (C-57 License Number)

DWR Use Only

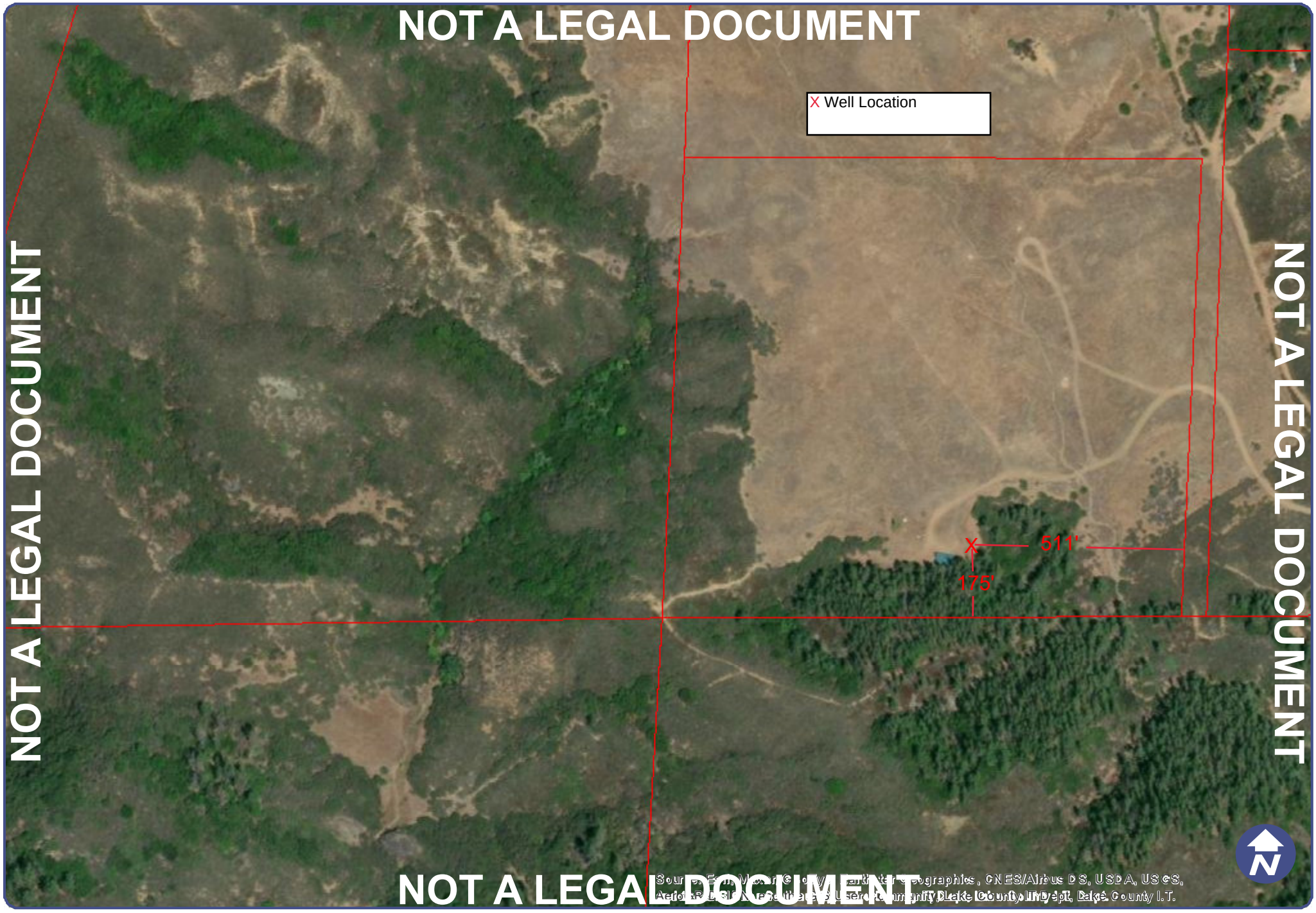
CSG #	State Well Number	Site Code	Local Well Number

N — Latitude Deg/Min/Sec

W — Longitude Deg/Min/Sec

TRS:

APN:



Lake County, CA

Highland Springs

Web AppBuilder for ArcGIS

mi
0 0.07 0.14

Print Date: 7/28/2021

Date: Dec. 17-2021

CONTRACTOR

J W MORRISON, INC.
State License # 970906 "General A, C57, D49
Mailing Address: P.O. Box 1617
Physical Address: 47901 Woodruff Road,
Laytonville, Calif. 95454
Email jwmorrisoninc@hughes.net
Office (707) 984-8858 Fax (707) 984-8815

BUYER / OWNER

LAKE COUNTY DEVELOMENT CO., LLC.
Autumn Karcey Mgr.
(530) 379-8588
12762 HWY 29
Lower Lake, Ca. 95457
autumn@lakecodevelopment.com

Site Address: 7522 Highland Springs Rd. Lakeport, CA. 95453 APN#007-006-351

Well Depth	Well Size	Water Static	Pump Size	Total Draw Down	Test Length
140'	6" Steel	54'	100GPM 10HP	74'	4 Hours

Date	Time	Water Level	Gal Per Minute	Water Meter	Comments
12/17/2021	10:20PM	54		35300	Initial Draw Down
	10:30PM	73	133	36400	Start of Test
	10:45PM	73	126	38400	
	11:00PM	73	140	40300	
	11:15PM	73	120	42400	
	11:30PM	73	126	44200	
	11:45PM	73	140	46100	
12/18/2021	12:00AM	73	120	47900	
	12:15AM	73	160	49500	
	12:30AM	74	126	51900	
	12:45AM	74	133	53800	
	1:00AM	74	126	55800	
	1:15AM	74	126	57700	
	1:30AM	74	133	59600	
	1:45AM	74	126	61600	
	2:00AM	74	126	63500	
	2:15AM	74	126	65400	
	2:30AM	74	126	67300	
	2:43AM	54			Recovery

Total Gallons Pumped	Estimated Yield Overall	Water Quality Test Taken
32000	129 GPM	No

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

Comments: Set 10 Hp 100 GPM pump at 100' on 2 1/2 inch galvanized pipe. Ran pump on 70kw generator. Water was clear.

State of California

Well Completion Report

Form DWR 188 Submitted 12/7/2021

WCR2021-015478

Owner's Well Number: Well #3 | Date Work Began: 11/01/2021 | Date Work Ended: 11/06/2021

Local Permit Agency: Lake County Health Services Department - Environmental Health Division

Secondary Permit Agency: | Permit Number: We5758 | Permit Date: 10/25/2021

Well Owner (must remain confidential pursuant to Water Code 13752)

Name: LEVENTHAT REALTY HIGHLAND SPRINGS LLC,

Mailing Address: 505 Martainsville Rd

City: Basking Ridge | State: NJ | Zip: 07920

Planned Use and Activity

Activity: New Well

Planned Use: Water Supply Irrigation - Agriculture

Well Location

Address: 7634 Highland springs

City: Lakeport | Zip: 95453 | County: Lake

Latitude: 38 Deg. 56 Min. 28.7091 Sec. N | Longitude: -122 Deg. 55 Min. 29.5802 Sec. W

Dec. Lat.: 38.9413081 | Dec. Long.: -122.9248834

Vertical Datum: | Horizontal Datum: WGS84

Location Accuracy: | Location Determination Method:

APN: 007006401

Township: 13 N

Range: 10 W

Section: 25

Baseline Meridian: Mount Diablo

Ground Surface Elevation:

Elevation Accuracy:

Elevation Determination Method:

Borehole Information

Orientation: Vertical | Specify:

Drilling Method: Downhole Rotary Hammer | Drilling Fluid: Air

Total Depth of Boring: 200 Feet

Total Depth of Completed Well: 200 Feet

Water Level and Yield of Completed Well

Depth to first water: 65 (Feet below surface)

Depth to Static Water Level: (Feet) | Date Measured:

Estimated Yield*: 50 (GPM) | Test Type: Air Lift

Test Length: 0.5 (Hours) | Total Drawdown: (feet)

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

Geologic Log - Lite

Depth from Surface Feet to Feet		Material Type	Material Color	Material Texture	Material Description
0	40	Rock	Brown		
40	80	Rock	Green		
80	125	Rock	Black		
125	160	Rock	Green		
160	175	Rock	Light Brown		
175	200	Rock	Green		

Casings

Casing #	Depth from Surface Feet to Feet		Casing Type	Material	Casings Specificatons	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	160	Blank	Low Carbon Steel	Grade: ASTM A53	0.188	6.625			
1	160	200	Screen	Low Carbon Steel	Grade: ASTM A53	188	6.625	Milled Slots	0.25	

Annular Material

Depth from Surface Feet to Feet		Fill	Fill Type Details	Filter Pack Size	Description
0	52	Cement	Portland Cement/Neat Cement		
52	200	Other Fill	See description.		None

Other Observations:

Borehole Specifications

Depth from Surface Feet to Feet		Borehole Diameter (inches)
0	52	14
52	200	7

Certification Statement

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

Name: J W MORRISON INC (Person, Firm or Corporation)

P O BOX 1617 (Address) | LAYTONVILLE (City) | CA (State) | 95454 (Zip)

Signed: *electronic signature received* (C-57 Licensed Water Well Contractor) | 12/07/2021 (Date Signed) | 970906 (C-57 License Number)

DWR Use Only

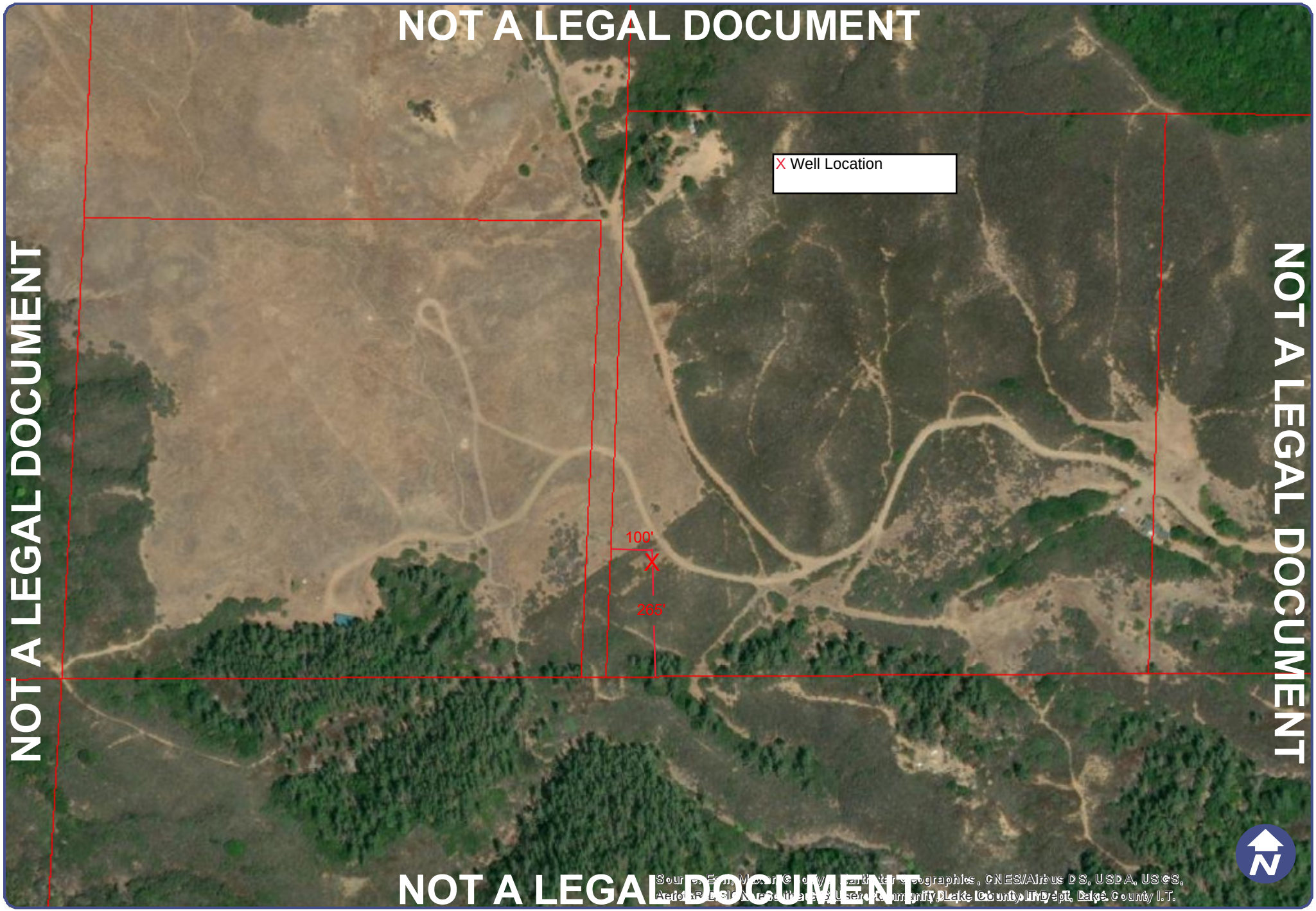
CSG #	State Well Number	Site Code	Local Well Number

N — Latitude Deg/Min/Sec

W — Longitude Deg/Min/Sec

TRS:

APN:



Lake County, CA

Highland Springs

Web AppBuilder for ArcGIS

mi

0 0.07 0.14

Print Date: 7/28/2021

Date: Dec. 17-2021

CONTRACTOR

J W MORRISON, INC.
State License # 970906 "General A, C57, D49
Mailing Address: P.O. Box 1617
Physical Address: 47901 Woodruff Road,
Laytonville, Calif. 95454
Email jwmorrisoninc@hughes.net
Office (707) 984-8858 Fax (707) 984-8815

BUYER / OWNER

LAKE COUNTY DEVELOMENT CO., LLC.
Autumn Karcey Mgr.
(530) 379-8588
12762 HWY 29
Lower Lake, Ca. 95457
autumn@lakecodevelopment.com

Site Address: 7634 Highland Springs Rd. Lakeport, CA. 95453 APN#007-006-401

Well Depth	Well Size	Water Static	Pump Size	Total Draw Down	Test Length
200'	6" Steel	52'	100GPM 10HP	109'	4 Hours

Date	Time	Water Level	Gal Per Minute	Water Meter	Comments
12/17/2021	3:30PM	52	133	1400	Initial Draw Down
	3:45PM	107	133	3400	Start of Test
	4:00PM	107	133	5400	
	4:15PM	107	133	7300	
	4:30PM	107	126	9100	
	4:45PM	108	120	10900	
	5:00PM	108	126	12800	
	5:15PM	108	126	14700	
	5:30PM	109	126	16600	
	5:45PM	109	126	18500	
	6:00PM	109	120	20200	
	6:15PM	109	133	22200	
	6:30PM	109	120	24000	
	6:45PM	109	126	25900	
	7:00PM	109	126	27800	
	7:15PM	109	126	29700	
	7:30PM	109	120	31500	
	7:45PM	109	126	33400	
	8:00PM	109	126	35300	
12/17/2021	8:09PM	52			Recovery

Total Gallons Pumped	Estimated Yield Overall	Water Quality Test Taken
31900	132 GPM	No

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

Comments: Set 10 Hp 100 GPM pump at 160' on 2 1/2 inch galvanized pipe. Ran pump on 70kw generator. Water was clear.

ENCLOSURE C

NOAA CLIMATE NORMALS

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Summary of Monthly Normals
1991-2020

Generated on 09/21/2021

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 1349 ft. Lat: 38.9239° N Lon: -122.5672° W
Station: **CLEARLAKE 4 SE, CA US USC00041806**

Precipitation (in.)								
	Totals	**Mean Number of Days**				**Precipitation Probabilities Probability that precipitation will be equal to or less than the indicated amount**		
	Means	**Daily Precipitation**				**Monthly Precipitation vs. Probability Levels**		
Month	**Mean**	**>= 0.01**	**>= 0.10**	**>= 0.50**	**>= 1.00**	**0.25**	**0.50**	**0.75**
01	6.19	13.6	9.2	4.1	1.8	2.47	4.13	9.15
02	6.15	12.7	8.5	4.9	2.5	0.77	5.55	9.12
03	3.99	10.3	6.4	2.8	0.9	1.64	2.98	4.92
04	1.99	8.1	4.3	1.1	0.2	0.41	1.21	2.81
05	1.16	5.4	2.7	0.8	0.2	0.34	0.92	1.57
06	0.23	1.7	0.6	0.1	0.0	0.00	0.05	0.35
07	0.01	0.2	0.0	0.0	0.0	0.00	0.00	0.00
08	0.09	0.2	0.2	0.2	0.0	0.00	0.00	0.00
09	0.17	0.6	0.3	0.1	0.1	0.00	0.02	0.17
10	0.91	4.0	2.4	1.1	0.2	0.07	0.62	1.29
11	2.89	9.2	5.2	1.8	0.9	1.56	2.47	3.86
12	6.08	12.6	8.8	4.8	2.2	2.89	4.79	9.38
Summary	29.86	78.6	48.6	21.8	9.0	10.15	22.74	42.62

Empty or blank cells indicate data is missing or insufficient occurrences to compute value

ENCLOSURE D

WELL DRAWDOWN CALCULATION TABLES

SUMMIT ENGINEERING, INC.	Highland Farms Water Availability Well Drawdown Analysis Well 1	PROJECT NO. 2021038 BY: JM CHK: GG

Site Specific Parameters

Well Flow:
75 gpm

Radius of Influence:
500 ft

Aquifer Thickness
100 ft

Pumping Time:
1 day

Low End Specific Storage:
1.50E-05 1/ft

High End Specific Storage:
3.10E-04 1/ft

Low Hydraulic Conductivity:
10 ft/day

High Hydraulic Conductivity:
30 ft/day

Theis Drawdown

Scenario	Specific Storage (1/ft):	Hydraulic Conductivity (ft/day)	Theis u value (unitless):	u_a, rounded down (unitless):	u_b, rounded up (unitless):	$W(u_a)$	$W(u_b)$	W(u), interpolated	Theis s value	Drawdown(ft)
High S, Low h	3.10E-04	10	1.94E-02	1.00E-02	2.00E-02	4.038	3.355	3.40	0.0203	3.90
Low S, Low h	**1.50E-05**	**10**	**9.38E-04**	**9.00E-04**	**1.00E-03**	**6.437**	**6.332**	**6.40**	**0.0382**	**7.35**
High S, High h	3.10E-04	30	6.46E-03	6.00E-03	7.00E-03	4.545	4.392	4.47	0.0089	1.71
Low S, High h	1.50E-05	30	3.13E-04	3.00E-04	4.00E-04	7.535	7.247	7.50	0.0149	2.87

Notes:
1) Four conditions (varying specific storage and hydraulic conductivity) are considered
2) Low specific storage and low hydraulic conductivity typically will result in max drawdown (highlighted in green)
3) Drawdowns greater than 10 ft typically indicate significant impacts
4) Assumes a full day of pumping instead of a typical 8-hour operating day

SUMMIT ENGINEERING, INC.	Highland Farms Water Availability Well Drawdown Analysis Well 2	PROJECT NO. 2021038 BY: JM CHK: GG

Site Specific Parameters

Well Flow:
129 gpm

Radius of Influence:
175 ft

Aquifer Thickness
100 ft

Pumping Time:
0.33 day

Low End Specific Storage:
1.50E-05 1/ft

High End Specific Storage:
3.10E-04 1/ft

Low Hydraulic Conductivity:
10 ft/day

High Hydraulic Conductivity:
30 ft/day

Theis Drawdown

Scenario	Specific Storage (1/ft):	Hydraulic Conductivity (ft/day)	Theis u value (unitless):	u_a, rounded down (unitless):	u_b, rounded up (unitless):	$W(u_a)$	$W(u_b)$	W(u), interpolated	Theis s value	Drawdown(ft)
High S, Low h	3.10E-04	10	7.12E-03	7.00E-03	8.00E-03	4.392	4.259	4.38	0.0449	8.65
Low S, Low h	**1.50E-05**	**10**	**3.45E-04**	**3.00E-04**	**4.00E-04**	**7.535**	**7.247**	**7.41**	**0.0760**	**14.64**
High S, High h	3.10E-04	30	2.37E-03	2.00E-03	3.00E-03	5.639	5.235	5.49	0.0188	3.62
Low S, High h	1.50E-05	30	1.15E-04	1.00E-04	2.00E-04	8.633	7.94	8.53	0.0292	5.62

Notes:
1) Four conditions (varying specific storage and hydraulic conductivity) are considered
2) Low specific storage and low hydraulic conductivity typically will result in max drawdown (highlighted in green)
3) Drawdowns greater than 10 ft typically indicate significant impacts
4) Assumes a full day of pumping instead of a typical 8-hour operating day

SUMMIT ENGINEERING, INC.	Highland Farms Water Availability Well Drawdown Analysis Well 3	PROJECT NO. 2021038 BY: JM CHK: GG

Site Specific Parameters

Well Flow:
132 gpm

Radius of Influence:
265 ft

Aquifer Thickness
100 ft

Pumping Time:
0.33 day

Low End Specific Storage:
1.50E-05 1/ft

High End Specific Storage:
3.10E-04 1/ft

Low Hydraulic Conductivity:
10 ft/day

High Hydraulic Conductivity:
30 ft/day

Theis Drawdown

Scenario	Specific Storage (1/ft):	Hydraulic Conductivity (ft/day)	Theis u value (unitless):	u_a, rounded down (unitless):	u_b, rounded up (unitless):	$W(u_a)$	$W(u_b)$	W(u), interpolated	Theis s value	Drawdown(ft)
High S, Low h	3.10E-04	10	1.63E-02	1.00E-02	2.00E-02	4.038	3.355	3.61	0.0379	7.29
Low S, Low h	**1.50E-05**	**10**	**7.90E-04**	**7.00E-04**	**8.00E-04**	**6.688**	**6.555**	**6.57**	**0.0690**	**13.28**
High S, High h	3.10E-04	30	5.44E-03	5.00E-03	6.00E-03	4.726	4.545	4.65	0.0163	3.13
Low S, High h	1.50E-05	30	2.63E-04	2.00E-04	3.00E-04	7.94	7.535	7.68	0.0269	5.18

Notes:
1) Four conditions (varying specific storage and hydraulic conductivity) are considered
2) Low specific storage and low hydraulic conductivity typically will result in max drawdown (highlighted in green)
3) Drawdowns greater than 10 ft typically indicate significant impacts
4) Assumes a full day of pumping instead of a typical 8-hour operating day

SUMMIT ENGINEERING, INC.
463 Aviation Blvd., Suite 200
Santa Rosa, CA 95403
707 527-0775
sfo@summit-sr.com