

EXHIBIT D

WATER AVAILABILITY ANALYSIS

Ovid Winery
255 Long Ranch Road

St. Helena, California
APN 032-030-065,066

SUMMIT 

CIVIL STRUCTURAL ELECTRICAL WATER|WASTEWATER

Project No. 2017079

June 2018

Revised: October 2018

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- Enclosure A: Water System Site Plan (prepared by RSA+)

- Enclosure B: Water Demand and Tier 1 Recharge Analysis
 NOAA Precipitation Normals
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- Enclosure C: Well Test Logs and Pump Tests

- Enclosure D: Tier II Analysis: Well Drawdown Calculation Tables

PROJECT SUMMARY

Ovid Winery is applying for a Track 1 vineyard planting at the existing facility at 255 Long Ranch Road, St. Helena (APN: 032-030-065, & 066). The facility plans to plant an additional 31.5 acres of vineyard, to increase the total vineyard size from the existing 15.4 acres to 46.9 acres total. The additional vineyard will be planted in two separate phases. The 3.6 acre onsite fruit orchard will be removed as part of vineyard development. Phase I will introduce 23.5 acres of new vineyard, and after these vines are established, Phase II will introduce 8 acres of new vineyard. No changes to the current Use Permit for the existing winery facility are proposed. Summit has prepared the following Water Availability Analysis, which provides a comparison between the proposed water use and the available water capacity on the property, to justify the increase in vineyard acreage.

Total annual water demand at Ovid Winery associated with the proposed replant for Phase I is 32.09 ac-ft/year while the young vines are being established, and reducing to 28.34 ac-ft/year during Phase II. After the phased installation of vines is complete and the vines reach maturity, the long-term annual water demand is 24.34 ac-ft/year. This estimate represents an increase of 13.75 ac-ft per year from the current water usage. The site is not located within the Napa Valley floor or Miliken-Sarco-Tuluca (MST) groundwater deficient area, so the water availability criterion is based on estimated rainfall-recharge for the project site. The Tier 1 analysis shows that the total project acreage (including adjacent vineyard parcel owned by Metamorphosis, LLC, totaling 2 parcels) is approximately 73.62 acres, as summarized in the table below:

Table 1. Project Parcels and Use

APN	Description	Parcel Size (ac)
032-030-065	Vineyard	32.17
032-030-066	Winery & Vineyard	41.45
TOTAL		73.62

The Phase I annual water demand is anticipated to be 32.09 ac-ft per year while new vines are being established, which is below the estimated 34.01 acre-ft/year of rainfall recharge for a typical rainfall year. The Phase II short term annual water demand is anticipated to be 28.34 ac-ft/year, which is also less than the estimated annual rainfall recharge, reducing to 24.34 ac-ft/year after the Phase II vines are established.

The winery parcel peak domestic and process water demand can be met with the existing domestic well #11 (located on an adjacent residential parcel, APN: 032-030-068) operating for 8 hours per day at 4.8 gpm. The well completion report is provided in Enclosure C, which includes an 8-hour pump test completed in March of 2017, and showing a 75 GPM well yield.

SITE DESCRIPTION

The winery facility is located on a 41.45 acre parcel along Long Ranch Road and on the eastern hillsides of the County, in an agricultural area with vineyards to the east and west and sparse residential properties to the north and south. The site topography slopes downward to the south and west to the Napa Valley floor and the Napa River. Surface drainage typically flows overland to the southwest, with a small portion of the site draining to the north towards Lake Hennessy. Prior to the development of the winery, the property was used as agricultural land. No distillation occurs at the facility. A water system map for the facility is provided in Enclosure A.

The existing winery parcel (APN: 032-030-066) consists of winery buildings, onsite vineyards, landscaping, a sanitary sewage pressure distribution leach field, and a winery process wastewater hold and haul storage system. Water sources for the project consist of four groundwater wells, including one domestic water supply well, Well #11. Irrigation water supply is provided by three agricultural wells, Wells #1, #5 and #12.

WATER DEMAND

EXISTING WATER DEMAND

Current water use at the facility and adjacent vineyard parcel, also owned by Metamorphosis, LLC, is based on the following needs:

- Process needs for production capacity of 18,000 gallons of wine per year
- Full Time Employees = 7 per day
- Part Time Employees = 3 per day
- Tasting Visitors = 35 peak per day
- Special Event = 40 peak per event with meals, up to 6 events per year
- Special Event = 75 peak per event, up to 2 events per year
- Irrigation of 15.4 acres of vineyard
- Irrigation of landscape and onsite orchard (estimated based on Napa County WAA guidelines and irrigation records for the orchard)

PROPOSED WATER DEMAND

Anticipated water use at the facility and adjacent vineyard parcels will be based on the following needs:

- Process needs for production capacity of 18,000 gallons of wine per year
- Full Time Employees = 7 per day
- Part Time Employees = 3 per day
- Tasting Visitors = 35 peak per day
- Special Event = 40 peak per event with meals, up to 6 events per year
- Special Event = 75 peak per event, up to 2 events per year

- **Irrigation of 46.9 acres of vineyard**
- Irrigation of landscape (estimated based on Napa County WAA guidelines)

WINERY PROCESS WATER DEMAND

Water demand for wine production is expected to correlate to the process wastewater (PW) generated at the facility. Based on typical flow data from wineries of similar size and characteristics, the approximate process water demand for the current wine production is calculated as follows:

Existing Annual production	=	18,000 gal wine/year
PW generation rate	=	9 gal PW/gal wine ^a
Annual PW Flow	=	18,000 gal wine x 9 gal PW/gal wine
	=	162,000 gal PW/year
Average PW Flow	=	(162,000 gal PW/year) / (365 days)
	=	450 gal PW/day
Peak PW Flow	=	(162,000 gal PW/year x 16 ^b %)/(30 day)
	=	890 gal PW/day
Annual Production Water Demand	=	(162,000 gal water/yr) / (325,851 gal/ac-ft)
	=	0.50 ac-ft water/year

^a Generation rate based on process water use records for the facility

^b The harvest month of September accounts for approximately 16.4 percent of the annual water demand based on facilities of a similar size and operation.

The approximate annual water use associated with the existing production capacity is 162,000 gallons of water per year, or 0.50 ac-ft per year. Winery process water demand will continue to be provided by the existing domestic Well #11. Refer to Enclosure B for wastewater generation and water demand estimates.

DOMESTIC WATER DEMAND

Domestic water use at the facility is determined based on the total number of employees, visitors and event guests. Domestic water is currently supplied by the domestic Well #11. Sanitary sewage generation is expected to be equivalent to the water demand for domestic uses. Using Napa County Environmental Management's Table 4 from "Regulations for Design, Construction, and Installation of Alternative Sewage Treatment Systems", annual domestic water usage is estimated as follows:

Table 2. Existing Domestic Water Use at Ovid Winery

Use Type	Maximum Quantity (persons/day)	Water Demand (gal/person)	Daily Demand (gal/day)	Number of Days (days/year)	Annual Water Use (gal/year)
Full Time Employee	7	15	105	365	38,325
Part Time Employee ^a	3	15	45	365	16,425
Tasting Visitors	35	3	105	365	38,325
Special Event	40	15	600	6	3,600
Special Event	75	15	1,125	2	2,250
Total Water Use					98,925
Total Water Use (ac-ft/yr)					0.30

^a Part time employees are assumed year round, as a conservative estimation

The estimated existing annual domestic water use is 98,925 gallons per year, or 0.30 ac-ft per year. Annual average domestic water use is approximately 271 gallons per day, with a typical day typical day water demand (no special events) of 255 gallons per day. No changes are proposed to the employee, visitation, or marketing plan at this time. Refer to Enclosure B for wastewater generation and water demand estimates.

IRRIGATION WATER DEMAND

- Vineyard Irrigation

Water from the agricultural wells (Wells #1, #5 and #12) is currently used to irrigate 15.4 acres of vineyards. The total acreage of vineyard will increase by 31.5 acres (to 46.9 acres total), according to the vineyard planting plan. Napa County Water Availability Analysis Phase 1 standard rates for vineyard irrigation are 0.2 to 0.5 ac-ft/acre/year. Vineyard irrigation demand for established vineyards was estimated using a rate of 0.5 ac-ft per acre of vineyard. The existing vineyard irrigation is estimated to be:

$$15.4 \text{ acres} \times 0.5 \text{ ac-ft/acre/year} = 7.7 \text{ ac-ft/yr} = 2,509,053 \text{ gal/yr}$$

Vineyard irrigation demand for new vines, before they have been fully established, was estimated by the vineyard management staff as 1.0 ac-ft/acre/year for 3 years, before the vines reach maturity. Therefore the short term demand for establishing 23.5 acres of new vineyard in Phase I is estimated to be:

$$23.5 \text{ acres} \times 1.0 \text{ ac-ft/acre/year} = 23.5 \text{ ac-ft/yr} = 7,657,499 \text{ gal/yr}$$

During Phase II, the vines from Phase I will be reduced to the established watering rate of 0.5 ac-ft/acre. Combined with the existing vines, the total acreage of established vineyard will be 38.9. The irrigation demand for established vineyards at the start of Phase II is calculated as follows:

$$38.9 \text{ acres} \times 0.5 \text{ ac-ft/acre/year} = 19.45 \text{ ac-ft/yr} = 6,337,802 \text{ gal/yr}$$

The short term demand for establishing 8 acres of new vineyard in Phase II is estimated to be:

$$8.0 \text{ acres} \times 1.0 \text{ ac-ft/acre/year} = 8.0 \text{ ac-ft/yr} = 2,606,808 \text{ gal/yr}$$

As the newly planted vines mature, the water demand will reduce back to the expected 0.5 ac-ft/acre/year for the entire 46.9 acres of vineyard. The final vineyard irrigation water demand is estimated to then be:

$$46.9 \text{ acres} \times 0.5 \text{ ac-ft/acre/year} = 23.45 \text{ ac-ft/yr} = 7,641,206 \text{ gal/yr}$$

The total proposed vineyard irrigation demand during the establishment of the new vines in Phase I will be approximately 10,456,878 gallons per year and in Phase II will be approximately 9,234,937 gallons per year. Once the new vines are well established the irrigation demand decreases. Should the short term water demand (in Phase I or Phase II) exceed the estimate for annual recharge and lead to decreasing water levels in the site wells, water will be supplied from an offsite source and trucked into the facility. Due to the conservative nature of the annual recharge estimate, it is unlikely that offsite water supplies will be utilized.

- Landscape/Orchard Irrigation

Water from the agricultural wells is used to irrigate landscaping and existing orchards on the winery parcels. The total acreage of landscape will not change from the approximately 3.3 acres of landscaping, but the existing 3.6 acres of orchard will be replaced with vineyard. The landscape irrigation demand was estimated based on the Napa County WAA guideline of 0.5 ac-ft/ 100,000 gallons of wine. The orchard demand was estimated based on meter readings for orchard irrigation, indicating approximately 0.55 ac-ft/acre/year, or 2 ac-ft/year total.

$$\text{Landscape Irrigation Demand} = 0.5 \frac{\text{ac} \cdot \text{ft}}{\text{year}} \times \frac{18,000 \text{ gal}}{100,000 \text{ gal}} = 0.09 \frac{\text{ac} \cdot \text{ft}}{\text{year}}$$

$$\text{Orchard Irrigation} = 0.55 \frac{\text{ac} \cdot \text{ft}}{\text{year}} \times 3.6 \text{ acres} = 2 \frac{\text{ac} \cdot \text{ft}}{\text{year}}$$

TOTAL WATER DEMAND

The total water demand at the facility associated with the proposed vineyard expansion after the new vines are established is expected to be 24.34 ac-ft per year, which is equivalent to 7.9 million gallons per year. This will occur when Phase I & II are complete, and includes an overall increase in irrigation demand of 13.75 ac-ft/year due to the removal of existing orchard and new vineyard. Refer to Enclosure B for wastewater generation and water demand estimates.

Table 3. Total Projected Long-Term Annual Water Demand

Water Use	Average Gallons per day	Gallons per year	Acre-Feet per year
Wine Production	450	162,000	0.50
Domestic Use	271	99,000	0.30
Vineyard Irrigation	31,189 ^a	7,641,206	23.45
Landscape Irrigation	120 ^a	29,327	0.09
Total	32,030	7,931,533	24.34

^a Estimated assuming that during the months of November through February no irrigation is required.

Based on the proposed new vineyard and removal of existing orchard, there is an overall increase in projected water demand of about 13.75 ac-ft/year (see Table 4) in the long term.

Table 4. Water Demand Comparison

Water Use	Existing (ac-ft)	Proposed (ac-ft)	Difference (ac-ft)
Wine Production	0.50	0.5	0.0
Domestic Use	0.30	0.3	0.0
Vineyard Irrigation	7.70	23.45	15.75
Landscape Irrigation	0.09	0.09	0.0
Orchard Irrigation	2.00	0	-2
Total	10.59	24.34	13.75

TIER I ANALYSIS: WATER USE CRITERIA

The Tier I analysis criteria for all parcels not located within the "Napa Valley Floor" is based on a site specific recharge, per the WAA guidelines. Ovid Winery is not located within the Napa Valley floor, therefore a Tier I analysis estimating annual recharge is required.

Luhdorff & Scalmanini Consulting Engineers (LSCE) previously prepared a Hydrogeologic Conceptualization and Characterization of Conditions for the groundwater and hydrogeology of the Napa Valley, including a detailed study of the anticipated rainfall recharge in several individual watersheds. The Ovid Winery parcels are located

predominantly within the Napa River at Napa watershed, with approximately 18 acres of one parcel located within the Conn Creek watershed. The annual average recharge is estimated using groundwater recharge estimate of 17% of precipitation, corresponding to the Napa River at Napa watershed, as this is a more conservative estimation than the Conn Creek recharge percentage (21%). A brief discussion on surface geology, soil characteristics, and annual precipitation is also included below for this parcel.

Annual precipitation was estimated from precipitation normals from the National Oceanic and Atmospheric Administration climate database for the period between 1981-2010. The site precipitation was assumed to be 33.79 inches per year, from the Yountville station. This station is proximal to the project site, and also falls within the Napa County isohyetal boundary as the site, indicating that rainfall patterns are typically similar across the isohyet.

The site geology has been previously characterized by various hydrogeological efforts, with a recent summary conducted by Michael Malone in 2016. That report states that the Sonoma Volcanics generally cover the site, with bedrock consisting of the Great Valley Assemblage at depths between 500 and 900 feet in the site vicinity. The capability of the volcanic rocks, ash and tuff to store and transmit water is dependent upon the frequency and volume of fractures, with lava flow rocks associated with the Sonoma Volcanics typically capable of providing high yielding groundwater aquifers. In this report, groundwater recharge was indicated as being primarily from rainfall infiltration, with a range of 5 to 15% expected but no references or calculations to support this estimate.

The site slope ranges from substantially flat to upwards of 31%, with limited areas of steeper slopes. To account for the reduced infiltration expected from land sloped at greater than 30%, a site slope analysis was prepared based on the Napa County GIS contours. The total site area with slopes greater than 30% is approximately 2.58 acres, which will be removed from the parcel acreage when calculating recharge. Therefore, the total land area available for recharge is approximately 71.04 acres.

Utilizing the rainfall recharge fraction of 17%, according to the LSCE groundwater characterization, the anticipated annual recharge for a typical year would be calculated as:

$$\text{Typical Annual Recharge} = 71.04 \text{ acres} \times 33.79 \frac{\text{inches}}{\text{year}} \times \frac{1 \text{ foot}}{12 \text{ inches}} \times 17\% = 34.01 \frac{\text{ac} - \text{ft}}{\text{year}}$$

WATER AVAILABILITY

The total estimated water demand of 32.09 ac-ft/year in the short term (Phase I) represents 94% of the anticipated water recharge for the project. The long term demand of 24.34 ac-ft/year likewise represents 72% of the typical annual recharge. There are 4 wells currently serving the winery and vineyards, as indicated on the attached Water System Map (Enclosure A). Well information is in Enclosure C.

The domestic well will be required to supply sufficient water to meet the domestic and process demands. The peak water demand should include 1,380 gal/day of domestic water and 890 gal/day of process water, for a total of 2,300 gal/day; therefore the domestic well will be required to supply on average 4.8 gpm over 8 hours. The existing domestic well should have sufficient capacity to supply the potable water demand.

TIER II ANALYSIS: WELL INTERFERENCE

A Tier II analysis is required for parcels not located within the "Napa Valley Floor" per the WAA guidelines. This analysis is included to estimate any potential interference between wells and springs that could affect their supply capacity due to water usage. The objective of the Tier II analysis is to determine if any well (existing or in the future) within 500 feet of the project's wells could be affected by the drawdown of the project's wells. The analysis was performed for all wells onsite that are within 500 feet of the property line, to cover any possibility of an existing neighboring well or future well within a 500 ft range from the existing property wells.

- Method

Using the Theis equation as indicated in the WAA Napa County guidelines, the groundwater drawdown from all property wells 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 selected from Napa County Water Availability Analysis guidelines.

Assumptions:

- Aquifer Thickness of 75 ft.
- Hydraulic Conductivity moderate range of 10 to 30 ft/day for project site (Water Availability Analysis Figure F-3)
- Specific Storage range of 1.5×10^{-5} to 3.1×10^{-4} (1/ft) (Water Availability Analysis table F3)

The Theis equation can be seen below along with an example calculation, for the domestic well.

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

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

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

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

Example for the domestic well drawdown effect on possible wells on adjacent properties, with the pumping time estimated based on the amount of time the well is anticipated to run to meet the daily demand (40 minutes per day):

$$u = \frac{(120 \text{ ft})^2 \times (1.50 \times 10^{-5})}{4 \times 10 \frac{\text{ft}}{\text{day}} \times 75 \text{ ft} \times .0278 \text{ day}} = 7.20 \times 10^{-5}$$

With this value of u, $W(u) = 5.40$

$$\text{Drawdown} = \frac{75 \frac{\text{gal}}{\text{min}} \times 0.1337 \frac{\text{cuft}}{\text{gal}} \times 1,440 \frac{\text{min}}{\text{day}}}{4\pi \times 10 \frac{\text{ft}}{\text{day}} \times 75 \text{ ft}} \times 5.40 = 8.27 \text{ ft}$$

The table below shows a summary of the worst case scenario of drawdown results for the onsite wells closest to neighboring non-project parcels. More detailed tables can be found in Enclosure D, Tier II Well Drawdown Calculation Tables.

Table 4. Well Drawdown Calculations

	Use	Well Flow Rate (gpm)	Distance to Property Line (ft)	Estimated Drawdown (ft)
Well #11	Domestic/ Process	75	120	8.27
Well #1	Irrigation	40	162	6.88
Well #5	Irrigation	22.5	50	4.95
Well #12	Irrigation	77.2	500	9.71

Results

Using very conservative estimates for aquifer thickness, specific storage, and hydraulic conductivity, based on values from the Water Availability Analysis guidelines adopted by Napa County, none of the wells should produce a drawdown greater than 10 feet on any existing or future wells that could be adjacent to the property. The Water Availability Analysis guidelines establish a 10 foot drawdown as the default criteria to determine significant adverse effects. Since the wells estimated drawdown is less than 10 feet, no significant drawdown impact is expected for wells in adjacent parcels. It should be noted that there are no known offsite wells located within close proximity to the property boundaries.

TIER III ANALYSIS: GROUNDWATER AND SURFACE WATER INTERACTION

Based on the screening criteria from the Water Availability Analysis guidelines from May 2015, a Tier III analysis is not required for either the Napa Valley Floor, MST or all other areas, unless substantial evidence determines the need for such analysis. Due to the lack of substantial evidence, no analysis is needed for Tier III.

CONCLUSION

Total annual water demand at Ovid Winery, associated with the existing Use Permit, removal of 3.6 acres of existing orchard, proposed planting of 31.5 new acres of vineyard, is estimated to be 24.34 ac-ft per year, representing an increase of 13.75 ac-ft per year from the current water uses. The Tier I analysis estimates the groundwater allotment for the project parcels is a total of 34.01 ac-ft/year, based on a site specific recharge analysis. This water availability analysis establishes that the estimated water demand for the facility represents

OVID WINERY
Water Availability Analysis
June 21, 2018
Revised: October 22, 2018

SUMMIT ENGINEERING, INC.
Project No. 2017079

94% of the total water availability for the combined parcels per year in the short term, during vineyard establishment in Phase I, and 24.34 ac-ft/year or 72% once the vines are mature and Phase II is complete.

OVID WINERY

Water Availability Analysis

November 2, 2018

SUMMIT ENGINEERING, INC.

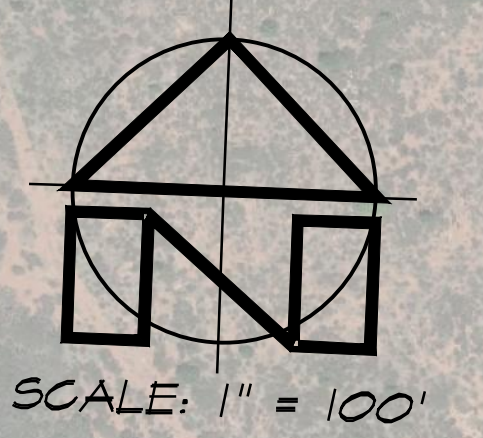
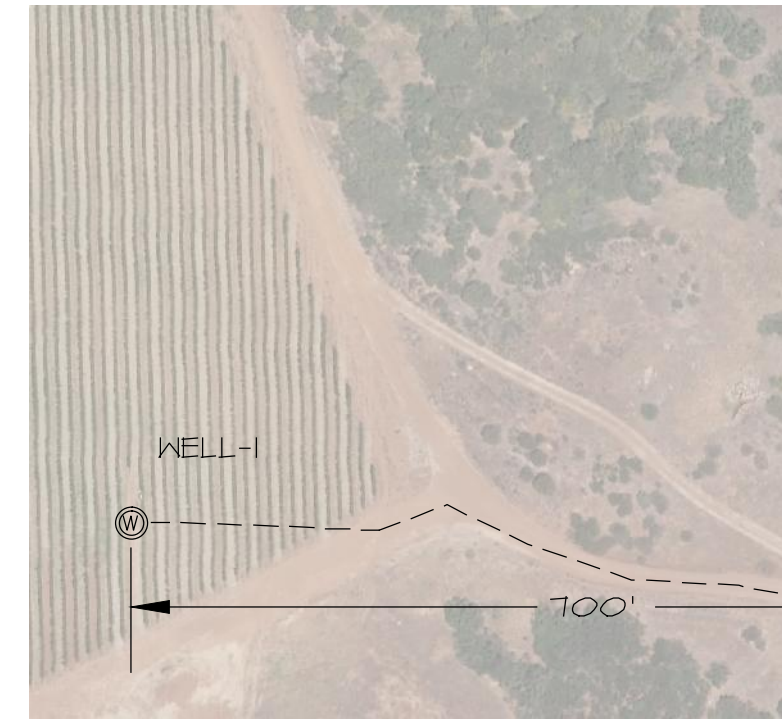
Project No. 2017079

ENCLOSURE A

OVERALL SITE PLAN

SITE SLOPE ANALYSIS

SUMMIT 



NOTE: ALL TRENCH/UTILITY LINES SHOWN ARE PER DRAWINGS AND MARK-UPS PROVIDED BY GRASSI CONSTRUCTION AND CONSTRUCTION PLANS. THIS INFORMATION HAS NOT BEEN FIELD VERIFIED.

LEGEND

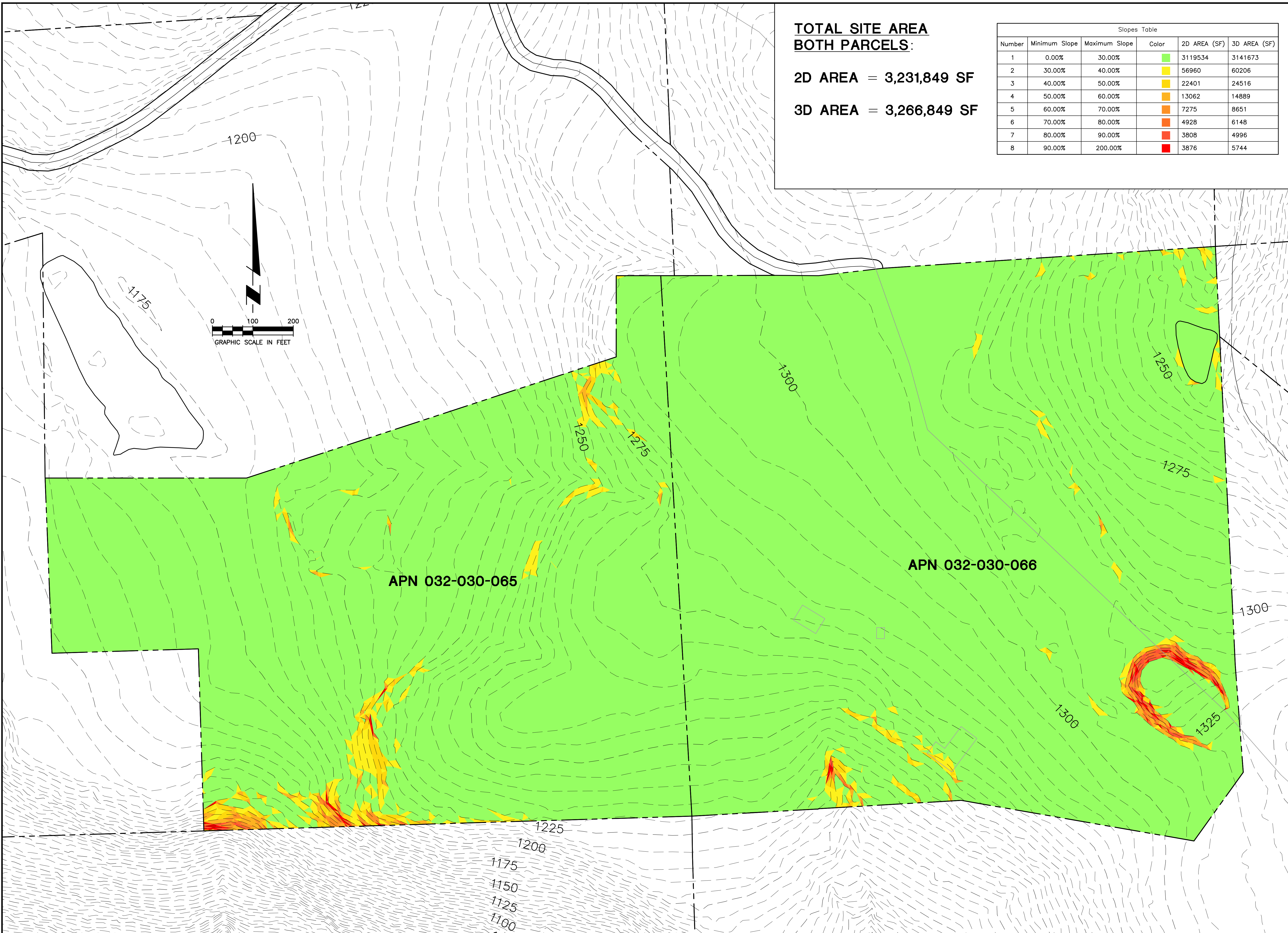
⊙	WELL HEAD
⊗	FIRE HYDRANT
F.D.C.	FIRE DEPT. CONNECTOR
P.I.V.	POST INDICATOR VALVE

WATER SYSTEM
 OF THE LANDS OF
OMNIA TERRA, LLC
 A.P.N. 032-030-065 & 066 (SFAP)
 NAPA COUNTY, CALIFORNIA
 PREPARED BY:

RSA+ 1515 FOURTH STREET
 NAPA, CALIF. 94559
 OFFICE | 707.252.3301
 + www.RSAcivil.com +

RSA* CONSULTING CIVIL ENGINEERS + SURVEYORS + 1980

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**TOTAL SITE AREA
BOTH PARCELS:**

2D AREA = 3,231,849 SF

3D AREA = 3,266,849 SF

Slopes Table					
Number	Minimum Slope	Maximum Slope	Color	2D AREA (SF)	3D AREA (SF)
1	0.00%	30.00%	Green	3119534	3141673
2	30.00%	40.00%	Yellow	56960	60206
3	40.00%	50.00%	Orange	22401	24516
4	50.00%	60.00%	Red-Orange	13062	14889
5	60.00%	70.00%	Red	7275	8651
6	70.00%	80.00%	Dark Red	4928	6148
7	80.00%	90.00%	Bright Red	3808	4996
8	90.00%	200.00%	Red	3876	5744

2018-11-02
FOR REVIEW

DATE: 2018-10-18
JOB NO: 2017079
SCALE: AS SHOWN
DRAWN: TF
CHECKED: SW
SHEET

OVID WINERY

Water Availability Analysis

November 2, 2018

SUMMIT ENGINEERING, INC.

Project No. 2017079

ENCLOSURE B

WATER DEMAND AND TIER I RECHARGE

NOAA PRECIPITATION NORMALS

SUMMIT 

SUMMIT ENGINEERING, INC.	OID WINERY Water Availability Analysis Water Demand	PROJECT NO. 2017079 BY: SW CHK: GG
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WATER DEMAND

WINERY DEMAND

Domestic Demand

Annual SS Water Use	=	99,000 gal/yr	
Typical Daily SS Flow	=	255 gpd	
Peak SS Flow (events w/o meals)	=	1,380 gpd	(2 times/year)
Peak SS Flow (events w/meals)	=	855 gpd	(6 times/year)

Winery Production Demand

Annual Wine Production	=	18,000 gal/yr	
Wine to PW Generation Rate	=	9.0 gal PW to gal wine	
Annual PW Water Use	=	162,000 gal/yr	
Average Day Flow	=	450 gpd	
NCEM Peak Day Flow	=	450 gpd	
Average Day Harvest Flow	=	780 gpd	
Average Day Peak Harvest Month Flow	=	890 gpd	

Total Domestic & Process Water Demand

Total Winery Annual Water Demand	=	261,000 gal/yr	
Peak Day Winery Water Demand	=	2,300 gpd	
Well Supply required (8 hr operation)	=	4.8 gpm	
Peaking Factor	=	2.3	
Maximum Daily Demand	=	5,175 gal	
Storage Recommended	=	6,000 gal	
Storage Available	=	11,000 gal	

IRRIGATION DEMAND

Vineyard Irrigation

Vineyard Irrigation Water Use (per NC-PBES)	=	0.5 ac-ft./ac/yr	
Existing Acres of Vineyard (per PPI)	=	15.4 acres	
Existing Vineyard Irrigation Demand	=	2,509,053 gal/yr	
New Vineyard Irrigation Water Use (per facility)	=	1 ac-ft./ac/yr	
Proposed Acres of Vineyard (per PPI)	=	31.5 acres	
Short Term (re-plant) Vineyard Demand	=	10,264,307 gal/yr	
Proposed Vineyard Irrigation Demand	=	5,132,153 gal/yr	

Overall Estimated Water Demand - Established Vines

Domestic Demand	=	99,000 gal/year	
Winery Production Demand	=	162,000 gal/year	
Vineyard Irrigation (Long Term)	=	7,641,206 gal/year	
Landscape Irrigation (Per Napa County WAA guidelines)	=	29,327 gal/year	
TOTAL (Long Term)	=	7,931,533 gal/year	
		24.34 ac-ft/year	

PHASED WATER DEMAND

Phase I (during new vine establishment)

New Vineyard Proposed	=	23.5 acres	
Domestic Demand	=	99,000 gal/year	
Winery Production Demand	=	162,000 gal/year	
Landscape Irrigation (Per Napa County WAA guidelines)	=	29,327 gal/year	
Existing Vineyard	=	2,509,053 gal/year	
Phase I (3 years)	=	7,657,499 gal/year	
TOTAL (Phase I)	=	10,456,878 gal/year	
		32.09 ac-ft/year	

Phase II (during new vine establishment)

New Vineyard Proposed	=	8 acres	
Domestic Demand	=	99,000 gal/year	
Winery Production Demand	=	162,000 gal/year	
Landscape Irrigation (Per Napa County WAA guidelines)	=	29,327 gal/year	
Existing Vineyard	=	6,337,802 gal/year	
Phase II (3 years)	=	2,606,808 gal/year	
Phase II Total	=	9,234,937 gal/year	
		28.34 ac-ft/year	

SUMMIT ENGINEERING, INC.	<p style="text-align: center;">OVID WINERY Water Availability Analysis Estimated Parcel Specific Annual Recharge</p>	<p>PROJECT NO. 2017079 BY: SW CHK: GG</p>
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Estimated Annual Recharge

Parcel Size	=	73.62 acres
Slopes > 30%	=	2.58 acres
Annual Typical Rainfall	=	33.79 inches/year
Recharge Percentage	=	17%

Parcel APNs:

032-030-065	32.17 ac
032-030-066	41.45 ac

Summary of Monthly Normals 1981-2010

Elev: 95 ft. Lat: 38.395° N Lon: 122.357° W

Generated on 07/31/2017

Station: **YOUNTVILLE, CA US GHCND:USC00049859**

Temperature (°F)																						
Mean							Cooling Degree Days						Heating Degree Days				Mean Number of Days					
							Base (above)						Base (below)									
Month	Daily Max	Daily Min	Mean	Long Term Max Std. Dev.	Long Term Min Std. Dev.	Long Term Avg Std. Dev.	55	57	60	65	70	72	55	57	60	65	Max >= 100	Max >= 90	Max >= 50	Max <= 32	Min <= 32	Min <= 0
1	58.1	36.6	47.4				3	2	1	-7777	0	0	240	301	393	547	0.0	0.0	28.4	0.0	6.9	0.0
2	62.8	38.8	50.8				8	2	-7777	-7777	0	0	125	175	258	398	0.0	0.0	27.7	0.0	2.8	0.0
3	66.7	41.6	54.2				59	38	18	3	0	0	86	126	199	339	0.0	0.0	30.8	0.0	0.9	0.0
4	71.5	42.6	57.1				92	59	26	8	2	-7777	31	58	115	246	0.0	0.5	29.8	0.0	0.0	0.0
5	78.9	47.4	63.2				255	198	121	38	6	3	3	7	23	96	0.0	2.7	30.8	0.0	0.0	0.0
6	84.4	50.8	67.6				378	318	229	99	28	16	0	-7777	1	21	0.7	7.1	30.0	0.0	0.0	0.0
7	85.9	52.7	69.3				443	381	288	139	35	16	0	0	-7777	6	0.9	6.8	31.0	0.0	0.0	0.0
8	86.5	52.4	69.5				448	386	293	143	38	18	0	0	-7777	5	0.5	8.8	31.0	0.0	0.0	0.0
9	84.8	50.5	67.7				379	319	232	107	38	21	0	-7777	2	28	1.5	7.4	30.0	0.0	0.0	0.0
10	78.5	45.8	62.2				227	172	101	28	5	3	6	13	35	117	0.0	1.8	31.0	0.0	0.0	0.0
11	66.5	40.7	53.6				43	23	7	1	-7777	-7777	85	125	199	343	0.0	0.0	29.7	0.0	1.8	0.0
12	58.6	36.4	47.5				2	1	-7777	-7777	0	0	234	295	387	542	0.0	0.0	30.3	0.0	9.4	0.0
Summary	73.6	44.7	59.2				2337	1899	1316	566	152	77	810	1100	1612	2688	3.6	35.1	360.5	0.0	21.8	0.0

@ Denotes mean number of days greater than 0 but less than 0.05.

-7777: a non-zero value that would round to zero

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

**Summary of
 Monthly Normals
 1981-2010**

Elev: 95 ft. Lat: 38.395° N Lon: 122.357° W

Generated on 07/31/2017

Station: **YOUNTVILLE, CA US GHCND:USC00049859**

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	.25	.50	.75
1	6.26	@	@	@	@			
2	6.84	@	@	@	@			
3	4.76	@	@	@	@			
4	1.86	@	@	@	@			
5	1.23	@	@	@	@			
6	0.16	@	@	@	@			
7	0.00	@	@	@	@			
8	0.06	@	@	@	@			
9	0.33	@	@	@	@			
10	1.48	@	@	@	@			
11	4.03	@	@	@	@			
12	6.78	@	@	@	@			
Summary	33.79	0.0	0.0	0.0	0.0			

@ Denotes mean number of days greater than 0 but less than 0.05.
 -7777: a non-zero value that would round to zero
 Empty or blank cells indicate data is missing or insufficient occurrences to compute value.

Summary of Monthly Normals 1981-2010

Elev: 95 ft. Lat: 38.395° N Lon: 122.357° W

Generated on 07/31/2017

Station: **YOUNTVILLE, CA US GHCND:USC00049859**

Growing Degree Units (Monthly)												
Base	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
40	229	302	439	511	718	828	909	913	829	687	408	234
45	93	167	286	362	563	678	753	758	679	532	260	99
50	21	57	151	215	408	528	598	603	529	377	130	22
55	3	8	59	92	255	378	443	448	379	227	43	2
60	1	-7777	18	26	121	229	288	293	232	101	7	-7777
Growing Degree Units for Corn (Monthly)												
50/86	129	180	261	322	447	509	569	566	509	438	249	135

Growing Degree Units (Accumulated Monthly)												
Base	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
40	229	531	970	1481	2199	3027	3936	4849	5678	6365	6773	7007
45	93	260	546	908	1471	2149	2902	3660	4339	4871	5131	5230
50	21	78	229	444	852	1380	1978	2581	3110	3487	3617	3639
55	3	11	70	162	417	795	1238	1686	2065	2292	2335	2337
60	1	1	19	45	166	395	683	976	1208	1309	1316	1316
Growing Degree Units for Corn (Monthly)												
50/86	129	309	570	892	1339	1848	2417	2983	3492	3930	4179	4314

Note: For corn, temperatures below 50 are set to 50, and temperatures above 86 are set to 86

M indicates the value is missing

-7777: a non-zero value that would round to zero

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

OVID WINERY

Water Availability Analysis

November 2, 2018

SUMMIT ENGINEERING, INC.

Project No. 2017079

ENCLOSURE C

WELL LOGS AND PUMP TESTS



Phone: 707 823 3191 Fax: 707 317 0057 Email: rayswelltesting@gmail.com Lic#:903708
Address: 4853 Vine Hill Rd, Sebastopol Ca 95472

Date: 03/22/17
Report #: 8987 – Well #1
Report By: Cody Monday

Subject Property Address: 255 Long Ranch Rd, Saint Helena, Ca 94574
Customer Name: Jack Bittner

WELL DATA:

Location/Description of well:	Well #1
Type of Well:	Drilled
Depth of Well:	872 Feet per well log
Diameter of Well Casing:	5" PVC
Sanitary Seal (plate seal at top of well):	Yes
Annular Well Seal (in ground seal of bore hole):	21 Feet per well log

PUMP DATA:

Pump HP and Type:	10 HP Goulds 40S100-30
Depth of Pump Suction:	695' per pump records
Size of Tee at Well Head:	2" Galvanized
Submersible Cable Size:	#8 – 4
Water Level Control:	520CS
Backpressure Test:	33.3 GPM @ 100 PSI @ 500.1'

WELL PRODUCTION SUMMARY (see next page for pumping log):

Length of Test:	6 hours		
Type of Test:	Drawdown and constant level testing		
Static Water Level:	500.1 Feet	Starting Flow	33.3 GPM
Water Level Drawdown:	49.4 Feet		
Final Pumping Level:	549.5 Feet	Final Flow	40.1 GPM

WELL PRODUCTION DATA & PUMPING LOG:

Date	Time	Interval	Water Level	Appearance	Sulfur Odor	Sand	GPM
03/22/17	12:25 PM	0 Min	500.1	Yellow tint	No	No	33.3
03/22/17	12:40 PM	15 min	528.7	Clear	No	No	37.9
03/22/17	12:55 PM	15 min	540.2	Clear	No	No	41.3
03/22/17	01:10 PM	15 min	549.5	Clear	No	No	40.1
03/22/17	01:25 PM	15 min	549.5	Clear	No	No	40.1
03/22/17	01:40 PM	15 min	549.5	Clear	No	No	40.1
03/22/17	01:55 PM	15 min	549.5	Clear	No	No	40.1
03/22/17	02:10 PM	15 min	549.5	Clear	No	No	40.1
03/22/17	02:25 PM	15 min	549.5	Clear	No	No	40.1
03/22/17	02:55 PM	30 min	549.5	Clear	No	No	40.1
03/22/17	03:25 PM	30 min	549.5	Clear	No	No	40.1
03/22/17	03:55 PM	30 min	549.5	Clear	No	No	40.1
03/22/17	04:25 PM	30 min	549.5	Clear	No	No	40.1
03/22/17	04:55 PM	30 min	549.5	Clear	No	No	40.1
03/22/17	05:25 PM	30 min	549.5	Clear	No	No	40.1
03/22/17	05:55 PM	30 min	549.5	Clear	No	No	40.1
03/22/17	06:25 PM	30 min	549.5	Clear	No	No	40.1

Final Pumping Level: 549.5 Feet
Final Flow Rate: 40.1 GPM

- Water levels recorded as feet below surface.
- Water levels calculated with air tube readings from existing 1/4" air tube installed in the well.

DISCLAIMER:

Results of well production are accurate only at time of test. We cannot predict future production or water yield.

WATER QUALITY: (The following samples are being analyzed, please refer to follow up report)

Analysis Choice: Residential + Irrigation **Turnaround:** 3 day rush

QUADRUPPLICATE
For Local Requirements

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

32030-0000
DWR USE ONLY
STATE WELL NO. STAT. W. NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Page of
Owner's Well No. No. **700339**
Date Work Began 9/9/98, Ended 9/21/98
Local Permit Agency **NAPA CO. ENVIRONMENTAL MANAGEMENT**
Receipt # **46509** Permit Date 8/26/98

GEOLOGIC LOG			WELL OWNER	
ORIENTATION () <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> HORIZONTAL <input type="checkbox"/> ANGLE <input type="checkbox"/> (SPECIFY)			Name <u> </u>	
DRILLING METHOD Air Rotary FLUID <u> </u>			Mailing Address <u> </u>	
DESCRIPTION			CITY <u> </u> STATE <u> </u> ZIP <u> </u>	
Describe material, grain size, color, etc.			WELL LOCATION	
Address <u> </u>			Address <u>SAGE CANYON ROAD</u>	
City <u> </u>			City <u>St. Helena</u>	
County <u> </u>			County <u>Sonoma</u>	
APN Book <u>032</u> Page <u>030</u> Parcel <u>057</u>			APN Book <u>032</u> Page <u>030</u> Parcel <u>057</u>	
Township <u> </u> Range <u> </u> Section <u> </u>			Township <u> </u> Range <u> </u> Section <u> </u>	
Latitude <u> </u> NORTH Longitude <u> </u> WEST			Latitude <u> </u> NORTH Longitude <u> </u> WEST	
DEPT. OF ENVIRONMENTAL MANAGEMENT			ACTIVITY ()	
<p style="text-align: center;">RECEIVED</p> <p style="text-align: center;">OCT - 8 1998</p>			<input checked="" type="checkbox"/> NEW WELL	
			MODIFICATION/REPAIR	
			— Deepen	
			— Other (Specify) <u> </u>	
			— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")	
			PLANNED USES ()	
			WATER SUPPLY	
			Domestic <input type="checkbox"/> Public <input type="checkbox"/>	
			Irrigation <input checked="" type="checkbox"/> Industrial <input type="checkbox"/>	
			MONITORING <input type="checkbox"/>	
TOTAL DEPTH OF BORING <u>955</u> (Feet)			WATER LEVEL & YIELD OF COMPLETED WELL	
TOTAL DEPTH OF COMPLETED WELL <u>872</u> (Feet)			DEPTH TO FIRST WATER <u> </u> (FL) BELOW SURFACE	
			DEPTH OF STATIC WATER LEVEL <u>540±</u> (FL) & DATE MEASURED <u>9/21/98</u>	
			ESTIMATED YIELD <u>20</u> (GPM) & TEST TYPE <u>Air Lift</u>	
			TEST LENGTH <u>10</u> (Hrs.) TOTAL DRAWDOWN <u>Air 7, Bottom±</u>	
			* 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)	TYPE		
FL	to	FL	BLANK	SCREEN	CON-DUCTOR			FILL PIPE			FL	to	FL
0	21	11"						0	21	X			
21	825	8" HAH						21	872			X	1/8 x 1/4
825	955	7 7/8											
+2	872		X				PVC/F480	5"	CL200				
292	332			X									
532	552			X									

ATTACHMENTS ()

- Geologic Log
- Well Construction Diagram
- Geophysical Log(s)
- Soil/Water Chemical Analyses
- Other Page 2 PERFS

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 **WEEKS DRILLING AND PUMP COMPANY by Ward Thompson**

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

ADDRESS **P.O. Box 176** CITY **Sebastopol** STATE **CA** ZIP **95473**

Signed Ward Thompson DATE SIGNED **10/2/98** WELL DRILLER/AUTHORIZED REPRESENTATIVE 177681 C-57 LICENSE NUMBER



Phone: 707 823 3191 Fax: 707 317 0057 Email: rayswelltesting@gmail.com Lic#:903708
Address: 4853 Vine Hill Rd, Sebastopol Ca 95472

Date: 03/22/17
Report #: 8987 – Well #5
Report By: Cody Monday

Subject Property Address: 255 Long Ranch Rd, Saint Helena, Ca 94574
Customer Name: Jack Bittner

WELL DATA:

Location/Description of well:	Well #5
Type of Well:	Drilled
Depth of Well:	792 Feet per well log
Diameter of Well Casing:	5" PVC
Sanitary Seal (plate seal at top of well):	Yes
Annular Well Seal (in ground seal of bore hole):	23 Feet per well

PUMP DATA:

Pump HP and Type:	10 HP Grundfos submersible 40S100-30
Depth of Pump Suction:	735' per pump records
Size of Tee at Well Head:	2" Galvanized
Submersible Cable Size:	#8 – 4
Water Level Control:	520CS
Backpressure Test:	42.1 GPM @ 0 PSI @ 550.2'

WELL PRODUCTION SUMMARY (see next page for pumping log):

Length of Test:	6 hours		
Type of Test:	Draw down and constant level testing		
Static Water Level:	550.2 Feet	Starting Flow	42.1 GPM
Water Level Drawdown:	175.6 Feet		
Final Pumping Level:	725.8 Feet	Final Flow	22.5 GPM

WELL PRODUCTION DATA & PUMPING LOG:

Date	Time	Interval	Water Level	Appearance	Sulfur Odor	Sand	GPM
03/23/17	09:55 AM	0 min	550.2	Orange	No	Fine Iron	42.1
03/23/17	10:10 AM	15 min	693.4	Yellow	No	Trace Metal	26
03/23/17	10:25 AM	15 min	725.8	Yellow	No	Trace Fine Grey	23.1
03/23/17	10:40 AM	15 min	725.8	Clear	No	No	23.2
03/23/17	10:55 AM	15 min	725.8	Clear	No	No	23.2
03/23/17	11:10 AM	15 min	725.8	Clear	No	No	22.5
03/23/17	11:25 AM	15 min	725.8	Clear	No	No	22.5
03/23/17	11:40 AM	15 min	725.8	Clear	No	No	22.6
03/23/17	11:55 AM	15 min	725.8	Clear	No	No	22.6
03/23/17	12:25 PM	30 min	725.8	Clear	No	No	22.5
03/23/17	12:55 PM	30 min	725.8	Clear	No	No	22.5
03/23/17	01:25 PM	30 min	725.8	Clear	No	No	22.5
03/23/17	01:55 PM	30 min	725.8	Clear	No	No	22.5
03/23/17	02:25 PM	30 min	725.8	Clear	No	No	22.5
03/23/17	02:55 PM	30 min	725.8	Clear	No	No	22.5
03/23/17	03:25 PM	30 min	725.8	Clear	No	No	22.5
03/23/17	03:55 PM	30 min	725.8	Clear	No	No	22.5

Final Pumping Level: 725.8 Feet
Final Flow Rate: 22.5 GPM

- Water levels recorded as feet below surface.
- Water levels calculated with air tube readings from existing 1/4" air tube installed in the well.

DISCLAIMER:

Results of well production are accurate only at time of test. We cannot predict future production or water yield.

WATER QUALITY: (The following samples are being analyzed, please refer to follow up report)

Analysis Choice: Residential + Irrigation **Turnaround:** 3 day rush

QUADRUPPLICATE
For Local Requirements

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

32-030-006
DWR USE ONLY DO NOT FILL IN
STATE WELL IDENTIFICATION NO. [Handwritten: 10/10/98]
LATITUDE [Handwritten: 38° 10' 10" N] LONGITUDE [Handwritten: 122° 10' 10" W]
APN/TRS/OTHER

Page 1 of 2
Owner's Well No. _____ No. **700329**
Date Work Began 9/1/98, Ended 9/8/98
Local Permit Agency NAPA CO. ENVIRONMENTAL MGT.
Permit No. 96-10332 Permit Date 8/28/98

GEOLOGIC LOG			WELL OWNER	
ORIENTATION (≅) <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> HORIZONTAL <input type="checkbox"/> ANGLE _____ (SPECIFY)			Name _____	
DEPTH FROM SURFACE			Mailing Address _____	
DRILLING METHOD <u>Air Rotary</u> FLUID <u>n/a</u>			STATE _____	
DESCRIPTION			WELL LOCATION	
Describe material, grain size, color, etc.			Address <u>SAGE CANYON ROAD</u> Parcel <u>7</u>	
			City <u>St. Helena</u>	
			County <u>NAPA</u>	
			APN Book <u>032</u> Page <u>030</u> Parcel <u>058</u>	
			Township _____ Range _____ Section _____	
			Latitude _____ NORTH _____ WEST _____	
			DEG. MIN. SEC. LONGITUDE _____	
			LOCATION SKETCH	
			NORTH _____ SOUTH _____	
			WEST _____ EAST _____	
			ACTIVITY (≅)	
			<input checked="" type="checkbox"/> NEW WELL	
			MODIFICATION/REPAIR	
			____ Deepen	
			____ Other (Specify) _____	
			____ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")	
			PLANNED USES (≅)	
			WATER SUPPLY	
			<input checked="" type="checkbox"/> Domestic _____ Public _____	
			<input checked="" type="checkbox"/> 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 _____ (Fl.) BELOW SURFACE	
			DEPTH OF STATIC WATER LEVEL <u>300</u> (Fl.) & DATE MEASURED <u>9/8/98</u>	
			ESTIMATED YIELD <u>150+</u> (GPM) & TEST TYPE <u>Air Lift</u>	
			TEST LENGTH <u>4</u> (Hrs.) TOTAL DRAWDOWN <u>Air</u> (Fl.)	
			* May not be representative of a well's long-term yield.	
TOTAL DEPTH OF BORING <u>795</u> (Feet)				
TOTAL DEPTH OF COMPLETED WELL <u>792</u> (Feet)				

RECEIVED
SEP 16 1998
DEPT. OF ENVIRONMENTAL MANAGEMENT

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)	FL.		TO FL.	CE-MENT (≅)	BEN-TONITE (≅)	FILL (≅)	FILTER PACK (TYPE/SIZE)
0	23	11						0	23	X			
237	795	8						23	792			X	1/8 x 1/4
+2	792		X	PVC/F480	5"	CL200							
412	432		X										.032
492	512		X										.032
572	592		X										.032

- ATTACHMENTS (≅)
- ____ Geologic Log
 - ____ Well Construction Diagram
 - ____ Geophysical Log(s)
 - ____ Soil/Water Chemical Analyses
 - Other Adtnl Micro-Perfs
- ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

Continued Perf on Page 2 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 COMPANY by Ward Thompson**
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

ADDRESS **P.O. Box 176 Sebastopol CA 95473**
CITY **9/10/98** STATE **177681**

Signed _____ DATE SIGNED _____ C-57 LICENSE NUMBER _____
WELL DRILLER/AUTHORIZED REPRESENTATIVE



Phone: (707) 823-3191 **Fax:** (707) 317-0057 **Email:** rayswelltesting@gmail.com
Address: 4853 Vine Hill Rd, Sebastopol Ca 95472 **CA Lic. #:** 903708

Well Yield Pump Test for Water Supply Permit

The following capacity testing was performed on well #11 at:

Ovid Napa Valley
255 Long Ranch Rd
St Helena CA 94574

Water flow rate measurements were determined by a Seaflow water meter and verified using a container and stopwatch. Water levels were measured with the existing air tube device that is currently installed in the well.

Please contact **Ray's Well Testing Service, Inc.** with any questions: (707) 823-3191

Respectfully submitted,
Nick Brasesco

Ray's Well Testing Service Inc.
Phone Number: 707 823 3191
Address: 255 Long Ranch Rd, St Helena Ca
Well ID Well 11

Page1 8 -Hour Pump Test Form with Recovery Data

Static Level: 461.9

Date	Time	Interval	Water Level	Water color:	Odor:	Sand:	GPM
03/22/17	10:20 AM	10 Mins	461.9	Visibly Clear	No	No	75
03/22/17	10:30 AM	10 Mins	466.6	Visibly Clear	No	No	75
03/22/17	10:40 AM	10 Mins	466.6	Visibly Clear	No	No	75
03/22/17	10:50 AM	10 Mins	466.6	Visibly Clear	No	No	75
03/22/17	11:00 AM	10 Mins	466.6	Visibly Clear	No	No	75
03/22/17	11:10 AM	10 Mins	466.6	Visibly Clear	No	No	75
03/22/17	11:20 AM	10 Mins	466.6	Visibly Clear	No	No	75
03/22/17	11:30 AM	10 Mins	466.6	Visibly Clear	No	No	75
03/22/17	11:40 AM	10 Mins	466.6	Visibly Clear	No	No	75
03/22/17	11:50 AM	10 Mins	466.6	Visibly Clear	No	No	75
03/22/17	12:00 PM	10 Mins	466.6	Visibly Clear	No	No	75
03/22/17	12:10 PM	10 Mins	466.6	Visibly Clear	No	No	75
03/22/17	12:20 PM	20 Mins	466.6	Visibly Clear	No	No	75
03/22/17	12:40 PM	20 Mins	466.6	Visibly Clear	No	No	75
03/22/17	01:00 PM	20 Mins	466.6	Visibly Clear	No	No	75
03/22/17	01:20 PM	30 Mins	466.6	Visibly Clear	No	No	75
03/22/17	01:50 PM	30 Mins	466.6	Visibly Clear	No	No	75
03/22/17	02:20 PM	30 Mins	466.6	Visibly Clear	No	No	75
03/22/17	02:50 PM	30 Mins	466.6	Visibly Clear	No	No	75
03/22/17	04:20 PM	30 Mins	466.6	Visibly Clear	No	No	75
03/22/17	04:50 PM	30 Mins	466.6	Visibly Clear	No	No	75
03/22/17	05:20 PM	30 Mins	466.6	Visibly Clear	No	No	75
03/22/17	05:50 PM	30 Mins	466.6	Visibly Clear	No	No	75
03/22/17	06:20 PM	30 Mins	466.6	Visibly Clear	No	No	75

Static level: 461.9
 Water level drawdown: 4.7
 Final Pumping level: 466.6

Page 2 8 -Hour Pump Test Form with Recovery Data

Date	Time	Interval	Water Level	Recovery %
03/22/17	06:35 PM	15 Mins	462.1	95.74%
03/22/17	06:50 PM	15 Mins	461.9	100.00%

-Water levels recorded as feet below surface.

-Water levels calculated with air tube readings from existing 1/4" air tube installed in the well.



Phone: 707 823 3191 **Fax:** 707 317 0057 **Email:** rayswelltesting@gmail.com **Lic#:**903708

Address: 4853 Vine Hill Rd, Sebastopol Ca 95472

Date: 03/29/17
Report #: 8987 – Well #12
Report By: Cody Monday

Subject Property Address: 255 Long Ranch Rd, Saint Helena, Ca 94574
Customer Name: Jack Bittner

WELL DATA:

Location/Description of well:	Well # 12
Type of Well:	Drilled
Depth of Well:	930 Feet
Diameter of Well Casing:	8" I.D. Steel
Sanitary Seal (plate seal at top of well):	Yes
Annular Well Seal (in ground seal of bore hole):	52 feet cement

PUMP DATA:

Pump HP and Type:	25 HP Goulds 70J25
Depth of Pump Suction:	840 feet –according to provided records
Size of Tee at Well Head:	3 inch
Submersible Cable Size:	#4 – 3 w/#8 ground
Water Level Control:	Motorsaver MS777
Backpressure Test:	67.7 GPM @ 100 PSI @ 674.1'

WELL PRODUCTION SUMMARY (see next page for pumping log):

Length of Test:	6 hours		
Type of Test:	Drawdown and constant level testing		
Static Water Level:	674.1 Feet	Starting Flow	67.7 GPM
Water Level Drawdown:	27.7 Feet		
Final Pumping Level:	701.8 Feet	Final Flow	77.2 GPM

WELL PRODUCTION DATA & PUMPING LOG:

Date	Time	Interval	Water Level	Appearance	Sulfur Odor	Sand	GPM
03/28/17	10:20 AM	0 min	674.1	Orange	Slight Metallic	No	67.7
03/28/17	10:35 AM	15 min	692.5	Orange	Slight Metallic	No	72.6
03/28/17	10:50 AM	15 min	697.2	Orange	Slight Metallic	No	79.4
03/28/17	11:05 AM	15 min	699.47	Orange	Slight Metallic	Trace Iron	77.9
03/28/17	11:20 AM	15 min	701.8	Orange	Slight Metallic	Trace Iron	77.2
03/28/17	11:35 AM	15 min	701.8	Orange	Slight Metallic	Trace Iron	77.2
03/28/17	11:50 AM	15 min	701.8	Orange	Slight Metallic	Trace Iron	77.2
03/28/17	12:05 PM	15 min	701.8	Orange	Slight Metallic	Trace Iron	77.2
03/28/17	12:20 PM	15 min	701.8	Orange	Slight Metallic	Trace Iron	77.2
03/28/17	12:50 PM	30 min	701.8	Orange	Slight Metallic	Trace Iron	77.2
03/28/17	01:20 PM	30 min	701.8	Orange	Slight Metallic	Trace Iron	77.2
03/28/17	01:50 PM	30 min	701.8	Yellow Tint	Slight Metallic	No	77.2
03/28/17	02:20 PM	30 min	701.8	Yellow Tint	Slight Metallic	No	77.2
03/28/17	02:50 PM	30 min	701.8	Yellow Tint	Slight Metallic	No	77.2
03/28/17	03:20 PM	30 min	701.8	Yellow Tint	Slight Metallic	No	77.2
03/28/17	03:50 PM	30 min	701.8	Yellow Tint	Slight Metallic	No	77.2
03/28/17	04:20 PM	30 min	701.8	Yellow Tint	Slight Metallic	No	77.2

Final Pumping Level: 701.8 Feet
Final Flow Rate: 77.2 GPM

-Water levels recorded as feet below surface.

-Water levels calculated with air tube readings from existing 1/4" air tube installed in the well.

DISCLAIMER:

Results of well production are accurate only at time of test. We cannot predict future production or water yield.

WATER QUALITY: (The following samples are being analyzed, please refer to follow up report)

Analysis Choice: Residential + Irrigation **Turnaround:** 3 day rush

OVID WINERY

Water Availability Analysis

November 2, 2018

SUMMIT ENGINEERING, INC.

Project No. 2017079

ENCLOSURE D

TIER II ANALYSIS: WELL DRAWDOWN CALCULATION TABLES

SUMMIT ENGINEERING, INC.	OID WINERY Water Availability Tier II: Well Drawdown Analysis	PROJECT NO. 2017079 BY: SW CHK: GG
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Site Specific Parameters

Well Flow:	Low End Specific Storage:
75 gpm	1.50E-05 1/ft
Radius of Influence:	High End Specific Storage:
120 ft	3.10E-04 1/ft
Aquifer Thickness	Low Hydraulic Conductivity:
75 ft	10 ft/day
Pumping Time:	High Hydraulic Conductivity:
0.0278 day	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	5.35E-02	5.00E-02	6.00E-02	2.468	2.295	2.41	0.0192	3.69
Low S, Low h	1.50E-05	10	2.59E-03	2.00E-03	3.00E-03	5.639	5.235	5.40	0.0430	8.27
High S, High h	3.10E-04	30	1.78E-02	1.00E-02	2.00E-02	4.038	3.355	3.50	0.0093	1.79
Low S, High h	1.50E-05	30	8.63E-04	8.00E-04	9.00E-04	6.555	6.437	6.48	0.0172	3.31

OVID WINERY
Water Availability Analysis
June 21, 2018
Revised: October 22, 2018

SUMMIT ENGINEERING, INC.
Project No. 2017079

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