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**Water Availability Analysis / Water System
Feasibility Study
Staglin Family Vineyards Major
Modification
P18-00253-MOD**

WATER AVAILABILITY ANALYSIS

STAGLIN FAMILY VINEYARD

1570 Bella Oaks Lane
Rutherford, CA 94574
APN 027-250-063, 027-250-064 & 027-
250-065

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PROJECT SUMMARY

Staglin Family Vineyard is applying for a Use Permit Modification for the Staglin Family Vineyard winery located at 1570 Bella Oaks Lane, in Rutherford (APN:027-250-063, 027-250-064, 027-250-065). The Use Permit Application includes increased marketing events, but no significant changes to the overall water use. The winery will require 11 full-time employees, with a maximum of 5 part-time employees during crush. Staglin Family Vineyard anticipates 44 maximum tasting room visitors per day. Additional visitors are anticipated from 32 marketing events with up to 12 visitors, 16 marketing events with up to 32 visitors, 4 marketing events with up to 100 people, and 1 marketing event with up to 250 visitors. It is acknowledged that no tasting will occur on days when marketing events are held. Summit has prepared the following Water Availability Analysis, which provides a comparison between the proposed water use and the estimated available water allotment on the property.

SITE DESCRIPTION

Staglin Family Vineyard is made up of three parcels with a total area of 60.32 acres, approximately 42 acres of which are existing vineyard. The winery consists of a production facility, tasting room, a single family residence, and several offices. The facility is located with agricultural areas to the north, south, east, and west.

The water source for the property consists of one well which currently supplies domestic water for the winery and residence, irrigation, and process water for winemaking activities. Refer to the Overall Site Plan attached for a general layout of the project components.

WATER DEMAND

EXISTING WATER DEMAND

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

- Winery domestic demand
- Existing single family residence domestic demand
- Irrigation of 42 acres of vineyard
- Irrigation of residential and winery landscaping
- 36,000 gallons per year wine production

WINERY DOMESTIC WATER DEMAND

The existing winery domestic water demand from the winery facility is determined based on a maximum of 8 full-time (FT) employees, 10 daily visitors, and marketing events. Sanitary sewage (SS) generation and winery domestic water demand are expected to be equivalent, except for water demand from marketing events. The SS generation from marketing events will be served by portable toilets. The existing annual domestic water demand for the winery is outlined in Table 1.

Table 1. Existing domestic water use at Staglin Family Vineyard.

Use Type	Maximum Quantity (persons/day)	Water Demand (gal/person)	Daily Demand (gal/day)	Number of Days (days/year)	Annual Water Use (gal/year)
FT Employee ^a	8	15	120	365	43,800
Tasting Visitors ^b	10	3	30	156	4,680
Event Visitors ^c	45	6	270	4	1,080
Total Water Use (gal)					49,560
Average Water Use (gpd)					135
Peak Water Use (gpd) ^d					390
Total Water Use (ac-ft/yr)					0.15

^a Peak number of employees assumed every day to be conservative.

^b Tasting is assumed to occur three days per week. Per capita water demand is based on Napa County PBES's "Regulations for Design, Construction, and Installation of Alternative Sewage Treatment Systems," Table 4: Wine Tasting Facility.

^c Per capita water demand is based on Napa County PBES's "Regulations for Design, Construction, and Installation of Alternative Sewage Treatment Systems," Table 4: Wine Tasting Facility with an additional 3 gpcd due to the extended duration of marketing events.

^d It is assumed that no tasting occurs on days with marketing events.

The expected annual domestic water use for the existing winery marketing and visitation plan is 49,560 gallons per year, or 0.15 ac-ft per year.

RESIDENTIAL DOMESTIC WATER DEMAND

Residential domestic water demand is from an existing single family residence. Per the Napa County Water Availability Analysis (WAA) - Guidance document, annual residential water demand includes landscaping, and is calculated as follows:

$$\begin{aligned} \text{Primary Residence*} &= 0.75 \text{ ac-ft/yr} \\ &= \mathbf{0.75 \text{ ac-ft/yr}} \end{aligned}$$

*Note: Napa County WAA Guidelines offer a water use range of 0.5-0.75 ac-ft/yr for a primary residence. This estimate includes associated landscape irrigation.

Peak and average daily water demand is based on 150 gpd/BR for 4 bedrooms. The total existing domestic peak and average daily water demand (winery domestic and residential domestic) is calculated as follows:

$$\begin{aligned} \text{Average Domestic Water Demand} &= 135 \text{ gpd} + (150 \text{ gpd/BR} \times 4 \text{ BR}) \\ &= 735 \text{ gpd} \\ \text{Peak Domestic Water Demand} &= 390 \text{ gpd} + (150 \text{ gpd/BR} \times 4 \text{ BR}) \\ &= 990 \text{ gpd} \end{aligned}$$

LANDSCAPE IRRIGATION WATER DEMAND

The existing landscape irrigation water demand is calculated according to Napa County WAA guidelines for estimating non-residential water usage. The expected water demand for all winery landscape irrigation is:

$$36,000 \text{ gal/year} \times 0.50 \text{ ac-ft/100,000 gal wine} = \mathbf{0.18 \text{ ac-ft/yr}}$$

VINEYARD IRRIGATION WATER DEMAND

Water from the existing well is used to irrigate 42 acres of on-site vineyards. Napa County WAA guidelines for vineyard irrigation are 0.2 to 0.5 ac-ft/acre/year. The vineyard irrigation demand calculation below expresses the most conservative value possible. The expected water demand for 42 acres of vineyard is:

$$42 \text{ acres} \times 0.5 \text{ ac-ft/acre/year} = \mathbf{21 \text{ ac-ft/yr}}$$

Vineyard irrigation will typically begin in June when onsite soils begin to dry and continue until October, with the peak irrigation period between July and August. All vineyard irrigation water is supplied by the existing well. Well water is not used for frost protection.

WINERY PROCESS WATER DEMAND

Water demand for wine production is expected to correlate to the process wastewater (PW) generated at the facility. The existing wine production capacity is 36,000 gallons per year, with the projected process wastewater generation calculated as follows:

Proposed Annual Peak production	=	36,000 gal wine/year
PW generation rate	=	6 gal PW/gal wine ^a
Annual PW Flow	=	36,000 gal wine x 6 gal PW/gal wine
	=	216,000 gal PW/year
Average PW Flow	=	(216,000 gal PW/year) / (365 days)
	=	592 gal PW/day
Peak PW Flow	=	(216,000 gal PW/year x 16.4 ^b %)/(30 days)
	=	1,181 gal PW/day ≈ 1,200 gal PW/day
Annual Production Water Demand	=	<u>(216,000 gal water/yr) / (325,851 gal/ac-ft)</u>
	=	0.66 ac-ft water/yr

^a Generation rate based on industry standards

^b Percentage of flows accounted for during the harvest month of September, based on water data from similar wineries

Process wastewater generation is expected to be equivalent to the process water demand for wine production. The expected annual water use associated with the proposed production capacity is 216,000 gallons per year, or 0.66 ac-ft per year. Winery process water demand will continue to be provided by the existing well.

PROPOSED WATER DEMAND

Proposed additional water demand will be required to supply the 36,000 gallon per year winery facility with 11 full time employees, 5 seasonal employees, and increased marketing events. All existing water demand will continue, with additional demand required by winery employees and winery visitors.

DOMESTIC WATER DEMAND

Expected domestic water demand at the winery facility is determined based on a maximum of 11 full-time employees, 5 part-time (PT) employees, 44 daily visitors, and marketing events. The domestic and process water supply will still be provided by existing on-site wells. The proposed annual domestic water demand for the winery is outlined in Table 2.

Table 2. Proposed domestic water use at Staglin Family Vineyard.

Use Type	Maximum Quantity (persons/day)	Water Demand (gal/person)	Daily Demand (gal/day)	Number of Days (days/year)	Annual Water Use (gal/year)
FT Employee ^a	11	15	165	365	60,225
PT Employee	5	15	75	90	6,750
Tasting Visitors ^b	44	3	132	350	46,200
Event Visitors ^c	12	6	72	10	720
Event Visitors ^c	100	6	600	4	2,400
Event Visitors	250	6	1,500	1	1,500
Total Water Use (gal)					117,795
Average Water Use (gpd)^d					297
Peak Water Use (gpd)^e					1,740
Total Water Use (ac-ft/yr)					0.36

^a Peak number of full-time employees assumed every day to be conservative.

^b Tasting is assumed to occur on all days without marketing events. Per capita water demand is based on Napa County PBES's "Regulations for Design, Construction, and Installation of Alternative Sewage Treatment Systems," Table 4: Wine Tasting Facility.

^c Per capita water demand is based on Napa County PBES's "Regulations for Design, Construction, and Installation of Alternative Sewage Treatment Systems," Table 4: Wine Tasting Facility with an additional 3 gpcd due to the extended duration of marketing events.

^d Average water use is calculated based on peak full-time employees and peak visitation with no events.

^e Peak daily domestic water use is based on the estimated peak sanitary sewage generation which includes employees and a peak marketing event.

The expected annual domestic water use for the proposed winery marketing and visitation plan is 117,795 gallons per year, or 0.36 ac-ft per year. Winery domestic water demand will continue to be provided by the existing well.

TOTAL WATER DEMAND

The total expected water demand of the property with the new winery facility is expected to be 22.95 ac-ft per year, compared to an existing water demand of 22.74 ac-ft per year. Please see Table 3 for a summary of existing and proposed annual water demand.

Table 3. Summary of existing and proposed annual water demand.

	Annual Water Demand (ac-ft/yr)
<u>Existing Water Demand</u>	
Winery Domestic	0.15
Domestic (Residential)*	0.75
Landscape Irrigation	0.18
Vineyard Irrigation	21.0
Winery Process	0.66
Total Existing Water Demand	22.74
<u>Proposed Water Demand</u>	
Winery Domestic	0.36
Domestic (Residential)*	0.75
Landscape Irrigation	0.18
Vineyard Irrigation	21.0
Winery Process	0.66
Total Proposed Water Demand	22.95
<u>Total Proposed Additional Water Demand</u>	<u>0.21</u>

* Includes residential landscaping irrigation demand.

TIER I ANALYSIS: ESTIMATED AVERAGE ANNUAL GROUNDWATER RECHARGE

Per Napa County WAA guidelines, a Tier I analysis is required of all parcels located within the “Napa Valley Floor”. Because Staglin Family Vineyard is located primarily within the “Napa Valley Floor” the Tier I analysis estimating annual recharge during average and dry years is not required and is instead completed using a 1 ac-ft/ac/yr allotment.

WATER AVAILABILITY

Two out of the three parcels owned by Staglin Family Vineyard are located with some portion of the parcel outside of the “Napa Valley Floor” as defined by Napa County. For this reason, only the area of land located within the “Napa Valley Floor” is considered for the total water allotment, while the area of land located in “All Other Areas” is assumed to provide no additional water allotment. The total parcel area within the “Napa Valley Floor” is approximately 57.7 acres. The typical allotment for Napa Valley Floor Areas is 1 ac-ft/ac/year; therefore, the Staglin Family Vineyard parcel would be allotted 57.7 ac-ft/year. The total estimated water demand for process, domestic, and landscape uses of 22.95 ac-ft/year represents 40% of the water allotment. The proposed net increase in water demand for the proposed winery is 0.21 ac-ft/yr, or 0.4% of the water allotment.

TIER II ANALYSIS: WELL INTERFERENCE

Per the WAA guidelines, a Tier II analysis is not required for parcels located within the "Napa Valley Floor" per the WAA guidelines, unless substantial evidence indicates a potentially significant impact. As these parcels are located on the border of the “Napa Valley Floor” with some sections of land stretching over the border, this analysis is included to estimate any 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 well could be affected by the drawdown from the project. 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 500 feet of the existing well.

• 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 low range of 30 to 50 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.

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

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

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

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

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

$$u = \frac{(360 \text{ ft})^2 \times (1.50 \times 10^{-5})}{4 \times 30 \frac{\text{ft}}{\text{day}} \times 75 \text{ ft} \times 1 \text{ day}} = 2.16 \times 10^{-4}$$

With this value of u, $W(u) = 7.88$

$$\text{Drawdown} = \frac{30 \frac{\text{gal}}{\text{min}} \times 0.1337 \frac{\text{cuft}}{\text{gal}} \times 1,440 \frac{\text{min}}{\text{day}}}{4\pi \times 30 \frac{\text{ft}}{\text{day}} \times 75 \text{ ft}} \times 7.88 = 1.61 \text{ ft}$$

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

Table 2. Well Drawdown Calculations

	Well Flow Rate (gpm)	Distance to Property Line (ft)	Estimated Drawdown (ft)
Domestic Well	30	360	1.61

Results

Using very conservative estimates for aquifer thickness, specific storage, and hydraulic conductivity, the domestic well does not 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 estimated drawdown of the well is less than 10 feet, no significant impact is expected to existing or future wells on adjacent parcels.

CONCLUSION

The total annual water demand of Staglin Family Vineyard for process, domestic and irrigation uses is projected to be 22.95 ac-ft/yr, which is well below the assumed water allocation of 57.7 ac-ft/yr. The anticipated peak daily potable water demand for the parcel should be met by the existing 30 gpm on-site well.

Staglin Family Vineyard
Water Availability Analysis
June 12, 2018

SUMMIT ENGINEERING, INC.
Project No.: 2018041

Jason M. Roberts, P.E.
Project Manager
jason@summit-sr.com
(707) 978-5747

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

SUMMIT ENGINEERING, INC.	STAGLIN FAMILY VINEYARDS Water Availability Tier II: Well Drawdown Analysis	PROJECT NO. 2018041 BY: NM CHK: JR
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Site Specific Parameters

Well Flow:	Low End Specific Storage:
30 gpm	1.50E-05 1/ft
Radius of Influence:	High End Specific Storage:
360 ft	3.10E-04 1/ft
Aquifer Thickness	Low Hydraulic Conductivity:
75 ft	30 ft/day
Pumping Time:	High Hydraulic Conductivity:
1 day	50 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	30	4.46E-03	4.00E-03	5.00E-03	4.948	4.726	4.84	0.0051	0.99
Low S, Low h	1.50E-05	30	2.16E-04	2.00E-04	3.00E-04	7.94	7.535	7.88	0.0084	1.61
High S, High h	3.10E-04	50	2.68E-03	2.00E-03	3.00E-03	5.639	5.235	5.36	0.0034	0.66
Low S, High h	1.50E-05	50	1.30E-04	1.00E-04	2.00E-04	8.633	7.94	8.43	0.0054	1.03

Notes:

- 1) Adjust parameters highlightd in yellow for site specific aquifer/well conditions
- 2) Retrieve hydraulic conductivity from Napa WAA map; Specific Storage from well drilling lithology/soil type
- 3) 4 Extreme conditions (varying specific storage and hydraulic conductivity) are considered
- 4) Low specific storage and low hydraulic conductivity typically will result in max drawdown (highlighted in green)
- 5) Drawdown < 10 ft to eliminate significant impacts
- 6) Min and max Specific storage and conductivity values can be adjusted to be site specific

SUMMIT ENGINEERING, INC.	Staglin Family Vineyards Water Availability Analysis Estimated Annual Recharge	PROJECT NO. 2018041 BY: NM CHK:
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Estimated Annual Recharge

Parcel Size	=	60.32 acres	
Annual Typical Rainfall	=	30.74 inches/year	--> avg of Napa St hospital and yountville
Recharge Percentage	=	14%	--> L&S Napa River at St. Helena
Typical Annual Recharge	=	21.63 acre-feet/year	
Annual Low Rainfall	=	12.16 inches/year	
Low Rainfall Annual Recharge	=	8.56 acre-feet/year	

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Napa County Planning, Building
& Environmental Services

WATER SYSTEM FEASIBILITY REPORT

STAGLIN FAMILY VINEYARD

1570 Bella Oaks Lane, Rutherford, CA

APNs: 027-250-063, 027-250-064, 027-250-065

SUMMIT 

CIVIL STRUCTURAL ELECTRICAL WATER|WASTEWATER

Project No. 2018041

June 12, 2018

Revised October 16, 2018

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LIST OF ENCLOSURES

- Enclosure A: Overall Site Plan
- Enclosure B: Wastewater Generation and Water Demand

SYSTEM DESCRIPTION

Staglin Family Winery is applying for a Use Permit (UP) Modification for the existing winery facility to increase employees, visitation and marketing events. Summit has prepared the following Water System Feasibility Analysis, which evaluates the capacity of the existing water system to provide sufficient water to meet the facility demands. The existing water system is capable of meeting the facility demands and consolidation with another existing water system is not required because this water system is not a new application.

The existing winery parcels (APN: 027-250-063, 027-250-064, 027-250-065) consist of winery, hospitality, and office buildings, onsite vineyards, a 4-bedroom residence, landscaping, and a combined sanitary sewage and process wastewater pressure distribution leach field. Since the existing water system was permitted under a California Uniform Food Facilities Law (CURFFL) exemption, Staglin Family Vineyards will have to apply for a Public Water System Permit.

The water source for the project consists of one groundwater well (Well 03) located on the south side of the main winery parcel (APN: 027-250-064), near the main entrance to the winery caves. The existing well was constructed in 1997 to a depth of 615 feet with a grouted seal to 51 feet. Initial testing at the time of drilling yielded 200 gpm with no drawdown over a 3-hour period. Please see the enclosed well log for details. Staglin Family Vineyards has indicated that the current, long-term yield of the well is approximately 30 gpm. The well is installed in an underground vault to protect it from vehicle traffic. As part of the Use Permit Modification, Staglin Family Vineyards will be required to apply for a Public Water System Permit. As a result, Well 03 must be improved so the well head terminates at least 18 inches above ground.

The existing water treatment system includes four raw water storage tanks (10,500 gallons each) and one treated water storage tank (10,500 gallons), one Kinetico sedimentation filter, two Kinetico water softener units, one Sanitron 2400B UV disinfection unit, and pressure tanks for separate domestic, irrigation, and well treatment sources.

With the proposed Use Permit modifications, the facility has an estimated water demand of 592 gpd average and 1,200 gpd peak process water, and 897 gpd average and 2,340 gpd peak domestic water. The total combined water demand is 1,489 gpd average and 3,540 gpd peak (see Enclosure B). The anticipated water demand for the facility can be met with the existing domestic well operating for 12 hours per day at 2.1 gpm, to meet the average demand, and by operating the well for 12 hours per day at 4.9 gpm to meet the peak demand.

The existing system has five 10,500 gallon storage tanks. Three tanks (31,500 gallons total) serve irrigation demand and fire protection storage. One tank stores raw well water prior to process use within the winery, or prior to water treatment and disinfection. One tank stores treated and disinfected well water prior to domestic uses. To meet the Maximum Day Demand requirement of 8,850 gallons, the existing 10,500 gallons of treated water storage will be utilized.

WATER DEMAND

The proposed UP modifications are to increase the number of employees, tasting visitors, and marketing events. The water demand increase is expected to correlate to the estimated wastewater generation flows for sanitary sewerage. Additionally, Staglin Family Vineyards will have to apply for a Public Water System permit for a Transient Non-community Water System.

Proposed Water Uses

Domestic water use at the facility will be based on the following needs:

- Process needs for production capacity of 36,000 gallons of wine per year
- Full Time Employees = 11 per day
- Part Time Employees = 5 per day, during harvest (90 days)
- Tasting Visitors = 44 peak per day
- Marketing Event = 32 peak per event, 16 events per year
- Marketing Event = 12 peak per event, 32 events per year
- Special Event = 100 peak per event, up to 4 events per year
- Annual Special Event = 250 peak per event, up to 1 event per year
- Irrigation of 42 acres of vineyard (estimated based on Napa County WAA guidelines)
- Irrigation of landscape (estimated based on Napa County WAA guidelines)
- 4 – Bedroom residence (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 projected process wastewater generation for wine production is calculated as follows:

Proposed Annual production	=	36,000 gal wine/year
PW generation rate	=	6 gal PW/gal wine ^a
Annual PW Flow	=	36,000 gal wine x 6 gal PW/gal wine
	=	216,000 gal PW/year
Average PW Flow	=	(216,000 gal PW/year) / (365 days)
	=	592 gal PW/day
Peak PW Flow	=	(216,000 gal PW/year x 16.4 ^b %)/(30 days)
	=	1,181 gal PW/day ≈ 1,200 gal PW/day

a) Generation rate based on industry standards and water data for similar wineries

b) Percentage of flows accounted for during the harvest month of September, based on water data from similar wineries.

The expected annual water use for the proposed 36,000 gallons of wine per year production capacity is 216,000 gallons per year, with an average demand of 592 gpd and a peak demand of 1,200 gpd. Winery process water demand will be provided by the existing domestic well installed on the winery parcel.

Domestic Water Demand

Domestic water use at the facility is determined based on the total number of employees, daily visitors and event guests. Sanitary Sewage generation is expected to be equivalent to the water demand for domestic uses. Sanitary sewage generated at all marketing events will be managed using portable toilets and offsite catering and meal preparation. Using Napa County standards, the proposed domestic water demand for the winery facility is estimated as follows:

Average Day w/o Event - Non-harvest

Employee (full-time)	11	x	15 gpcd	=	165 gal/day
Tasting Visitors	44	x	3 gpcd	=	132 gal/day
4 – Bedroom Residence	4	X	150 gpbd	=	600 gal/day
Total				=	297 gal/day
				=	<u>897 gal/day</u>

Peak Tasting Day Harvest W/Event

Employee (full-time)	11	x	15 gpcd	=	165 gal/day
Employee (part-time)	5	x	15 gpcd	=	75 gal/day
Marketing Event ¹	250	X	6 gpcd	=	1,500 gal/day
4 – Bedroom Residence	4	X	150 gpbd	=	600 gal/day
Total				=	<u>2,340 gal/day</u>

- 1) For all events, the assumed water usage is 6 gpcd. The sanitary sewage is disposed of by the portable toilets. Multiple/large private events will not be held on the same day.

The expected water use for the proposed increase in employees and visitors is 897 gpd for an average day and 2,340 gpd on a peak day with the largest event. Domestic water demand will be provided by the existing domestic well on the winery parcel.

MAXIMUM DAILY DEMAND (MDD)

The MDD will occur during the facility's peak months (September – October) and is determined based on the peak projected water demand for process and domestic water as follows:

Table 1. GROUNDWATER MDD

DEMAND	FLOW (GPD)	12-HR DEMAND (GPM)
Domestic Water	2,340	3.2
Process Water	1,200	1.7
TOTAL	3,540	4.9

MAX DAY DEMAND

$$\begin{array}{rcl}
 3,540 \text{ GPD} \times 2.5 & = & 8,850 \text{ GPD} \\
 \text{Existing Domestic Storage Onsite} & = & 10,500 \text{ Gallons}
 \end{array}$$

The existing domestic well on the winery parcel with a yield of 30 gpm, should have sufficient capacity to adequately provide water to meet the existing and projected peak water demand of 4.9 gpm (based on 12 hours). In addition, the 10,500 gallon treated water storage tank is more than adequate to provide the required MDD storage volume.

MANAGEMENT

The Staglin Family owns and operates Staglin Family Vineyard and is responsible for all finances, operations, compliance requirements, and establishment of policies. The facility's public water system will be classified as transient, non-community and will be managed by employees of the winery. Maintenance personnel at the winery are responsible for routine inspection and operations of the water system and treatment equipment. The winery supervisor/operator will continue to have direct responsibility for operation and maintenance of the water system. Major repairs, replacements and other engineering and professional services are contracted out.

FINANCIAL

Staglin Family Vineyard is not currently encumbered by any judgements, liens, or other financial liability that would prevent the operation of the Staglin Family Vineyard water system. The current annual operation and maintenance cost of the winery water treatment system is approximately \$10,000 per year. The operating and maintenance costs of the system are covered by the income from retail wine sales and marketing events. No upgrades are expected for the treatment system, and are therefore excluded from the winery expense budget estimate.

Staglin Family Vineyard
Water System Feasibility
June 12, 2018
Revised October 16, 2018

SUMMIT ENGINEERING, INC.
Project No. 2018041

ENCLOSURE A

OVERALL SITE PLAN

Staglin Family Vineyard
Water System Feasibility
June 12, 2018
Revised October 16, 2018

SUMMIT ENGINEERING, INC.
Project No. 2018041

ENCLOSURE B

WASTEWATER GENERATION AND WATER DEMAND

SUMMIT ENGINEERING, INC.	Staglin Family Vineyard Wastewater Feasibility Study Proposed Process Wastewater Flows	2018041 JMR GG
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PROCESS WASTEWATER GENERATION

<u>Annual Volume</u>		Value	Units
Annual Production (projected)	=	15,000	cases wine/year
Gallons of Wine Per Case	=	2.4	gal wine/case of wine
Annual Production	=	36,000	gal wine/year
Generation Rate (assumed) ¹	=	165	gal wine/ton grapes
Tons Crushed ²	=	218	tons grapes/year
Process Wastewater (PW) Generation Rate ³	=	6.00	gal PW/gal wine
<u>Annual PW Flow</u>	=	<u>216,000</u>	<u>gal PW/year</u>

<u>Average Day Flow</u>	=	<u>592</u>	<u>gal PW/day</u>
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<u>Napa County Peak Day Flow</u>			
Peaking Factor	=	1.5	
Harvest Length	=	45	days
<u>Peak Harvest Day Flow</u>	=	<u>1,200</u>	<u>gal PW/day</u>

<u>Average, Day Peak Harvest Month Flow</u>			
Assume 16.4% of annual PW flow is generated in September	=	16.4	%
Monthly PW Generation	=	35,424	<u>gal PW</u>
<u>Peak Harvest Day Flow</u>		<u>1,181</u>	<u>gal PW/day</u>
		1,200	

2002 Design Calc			
Assume 4 week processing period	=	55	tons/week
	=	8	tons/day
PW Generated	=	120	gal PW/ton
	=	935	

1. Gal wine per ton of grapes is used as a wine industry standard
2. Peak week tonnage was based on input from winery (for existing production)
3. Gal of PW per gallon wine produced over the course of 1 year is based on average data from approximately 16 wineries

SUMMIT ENGINEERING, INC. Consulting Civil Engineers	STAGLIN FAMILY VINEYARD WATER SYSTEM FEASIBILITY Water Demand	PROJECT NO. 2018041 BY: NM CHK: JR
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PEAK DOMESTIC WATER DEMAND

Average Day w/o Event - Non-harvest

					Notes
Employee (full-time)	11	x	15 gpcd	=	165 gal/day
Employee (part-time)	0	x	15 gpcd	=	0 gal/day
Tasting Visitors	44	x	3 gpcd	=	132 gal/day
4 - Bedroom Residence	4	x	150 gpcd	=	600 gal/day
Total				=	897 gal/day
				=	897 gal/day

Peak Tasting Day Harvest W/Event

Employee (full-time)	11	x	15 gpcd	=	165 gal/day	
Employee (part-time)	5	x	15 gpcd	=	75 gal/day	
Largest Open House Event	250	x	6 gpcd	=	1500 gal/day	6 gpcd assumed for water use
4 - Bedroom Residence	4	x	150 gpcd	=	600 gal/day	
Total				=	2,340 gal/day	
				=	2,340 gal/day	

PROCESS WATER DEMAND

Average Day Flow	=	592 gal/day
Average, Day Peak Harvest Month Flow	=	1,200 gal/day

TOTAL WATER DEMAND

	<u>Average</u>		<u>Peak</u>	
	gal/day	gal/min ²	gal/day	gal/min ²
Domestic Water	897	0.6	2,340	1.6
Process Water	592	0.4	1,200	0.8
Total	1,489	1.0	3,540	2.5

Peaking Factor	=	2.5
MDD (based on peak demand)	=	8,850 gal/day

Contact:
Jason Roberts
jason@summit-sr.com
(707) 495-5254

SUMMIT 

SUMMIT ENGINEERING, INC.

463 Aviation Blvd., Suite 200

Santa Rosa, CA 95403

707 527-0775

sfo@summit-sr.com