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Water Availability Analysis & Financial Capacity Analysis

**WATER AVAILABILITY ANALYSIS FOR
DARMS LANE WINERY
1150 DARMS LANE, NAPA COUNTY, CA
APN 034-190-034 & -035**

As required by Napa County Planning, Building & Environmental Services (PBES), this analysis outlines the availability of groundwater for a potential winery and tasting room on the subject parcel referenced above and located at 1150 Darms Lane, Napa, CA 94558.

PROJECT DESCRIPTION

Currently, the subject parcels (APN 034-190-034 & -035) are 2.32± acres and 46.94± acres respectively and contain a residence with an associated Home Occupancy Business Permit¹ with some minor landscaped areas, vineyards as well as miscellaneous structures associated with vineyard operations. Parcel APN 034-190-035 currently has an approved Track II Vineyard Erosion Control Plan² for 13.50± acres of vineyard that will primarily remain in production.

It is our understanding that the project proposes to construct a full crush winery on parcel APN 034-190-035 with the intent of the facility having the capability of producing 30,000 gallons of wine per year. Along with the proposed wine production at the site, the project proposes a moderate staffing and marketing plan. The project proposes four (4) full-time employees, two (2) part-time employees, and two (2) seasonal (harvest) employees. The project also proposes to offer private tour and tasting appointments for a maximum number of twenty-four (24) guests per day and 150 guests per week. Furthermore, the Applicant plans to offer two (2) food and wine pairing events per month for parties up to 12 persons and two (2) food and wine pairing events per month for parties up to 24 persons. Additionally, the Applicant intends to host four (4) wine club/release events per year for groups of up to 75 persons and two (2) 125 person auction related event at the winery. A paved driveway is also proposed on parcels APN 034-190-034 & -035.

Under the proposed development, the existing residence would be demolished and approximately 0.88± acres (net) of vineyard would be removed³ that was approved under the Track II permit (01107-ECPA).

EXHIBITS

The associated USGS "Topographic Site Location Map" shows the project site and approximate property line locations. Information regarding the location of the existing wells and structures are shown on the associated Use Permit Drawings and attached "Groundwater Subarea & Well Location Map". Geological materials that underlay the

¹ Home Occupancy Business Permit issued by PBES on 06/05/2003. Refer to PBES permit #03187 and application #60-15153.

² Refer to Bartelt Engineering's Track II Vineyard Erosion Control Plan prepared for Crichton Hall Vineyards dated September 2001. Napa County 01107-ECPA.

³ Includes proposed future vineyard after winery development (see Use Permit Plans)

parcels are shown on the attached “Geological Site Location Map”. All exhibits and drawings mentioned above were prepared by Bartelt Engineering.

WATER USE CRITERIA

TABLE 1: SCREENING CRITERIA	
Parcel Zoning	Agricultural Preserve (AP)
Project Parcel Location	Varies
Parcel Size	2.32± acres (APN 034-190-034) 46.94± acres (APN 034-190-035)
Water Use Criteria	13.58± acres (located in Napa Valley Floor) 35.68± acres (located in All Other Areas)
Well and Spring Interference	No
Groundwater/Surface Water Interaction	No
Screening Tier	Tier 1

As summarized in Table 1, both parcels are located in the Agricultural Preserve (AP) Zoning District and have a combined area of 49.26± acres. Parcel APN 034-190-034 is entirely located in the Napa Valley Floor. Parcel APN 034-190-035 is partially located in the Napa Valley Floor and partially located in All Other Areas. Refer to the attached “Geological Site Map” for the approximate boundary of the Napa Valley Floor relative to the project site.

Per the PBES Water Availability Analysis (WAA) Guidance Document dated May 12, 2015 the water use criteria for a parcel located in the Napa Valley Floor and/or All Other Areas that are not designated as a groundwater deficient area without any well or spring interference must follow Tier 1 requirements. The water use criteria for the area of the project located in the Napa Valley Floor is defined as 1 acre-feet per acre per year. The water use criteria for the area of the project located in All Other Areas is parcel specific and must be considered in relation to the average annual recharge available to the project property.

WATER DEMAND

Estimated Water Use

Based on the *Guidelines for Estimating Residential and Non-residential Water Use* from the WAA Guidance Document (2015), the total water demand for the existing and proposed uses for the project is calculated below:

TABLE 2A: EXISTING WATER DEMAND	
Description	Estimated Water Usage (acre-feet/year)
Winery (0 gallons per year)	
Process Water	0
Domestic and Landscaping Water	0
Primary Residence	0.75
Vineyard (13.50± acres)	
Irrigation	6.75
Heat and Frost Protection	0
Total Existing Water Demand =	7.50

TABLE 2B: PROPOSED WATER DEMAND	
Description	Estimated Water Usage (acre-feet/year)
Winery (30,000 gallons per year)	
Process Water	0.65
Domestic Water	0.34
Landscaping	0.70
Primary Residence	0
Vineyard (12.62± acres)	
Irrigation	6.31
Heat and Frost Protection	0
Total Proposed Water Demand =	8.00

As shown in Table 2A and Table 2B, the water demand is estimated to increase from 7.50 acre-feet per year to 8.00 acre-feet per year as part of the proposed development, which includes demolition of the primary residence and the removal of portions of the existing vineyard. The greatest water demand for the proposed project results from vineyard irrigation. The project proposes the option to beneficially reuse treated winery wastewater for vineyard irrigation⁴. This option would further reduce the proposed water demand to

⁴ Refer to the Onsite Wastewater Dispersal Feasibility Study prepared by Bartelt Engineering submitted in conjunction with the winery Use Permit Application.

below existing (pre-development) water usage. Refer to the attached Table I and Table II for existing and proposed water demand calculations.

SOURCE WATER INFORMATION

The subject parcel currently contains three (3) existing groundwater wells. The following is a summary description of each well:

- The existing “new” well is located on the subject parcel (APN 034-211-035) and currently provides domestic water to the existing residence as well as vineyard irrigation water.
- The existing “vineyard” well is located on a neighboring parcel (APN 034-211-055) and provides irrigation water under an existing water rights easement⁵.
- The existing “old” well is currently used as a domestic water source and is proposed to be destroyed per PBES requirements.
- An existing “abandoned” well is also located on the subject parcel (APN 034-211-035). This well is also proposed to be destroyed per PBES requirements.

The project well is proposed to be the “new” well which would provide domestic and supplemental irrigation water. The “vineyard” well would continue to provide only irrigation water. Both the “new” well and “vineyard” well are capable of meeting the water demand shown in Table 2B.

Prior to use, domestic water is proposed to be stored in one (1) 10,000 gallon storage tank and irrigation water is stored in one (1) 50,000 gallon storage tank. Furthermore, fire protection water is stored in one (1) proposed 75,000 gallon storage tank.

Well Description

Per the Well Completion Report, the “new” well was constructed in 2009 by Pulliam Well Exploration⁶ and has a recorded state well number of 0940799. The well is reported to be constructed of 5 inch diameter PVC F480 casing to a completed depth of 435 feet with a 55 foot cement annular seal. The static water level was observed to be 50 feet below ground surface at the time of drilling. The driller reported to encounter clay, rock, basalt and Serpentine rock during the time of drilling. Refer to the attached Well Completion Report for more information.

A Well Completion Report for the “vineyard” well could not be located prior to submittal of this WAA.

Yield Test

The yield test results available for the “new” well were performed during the time of drilling. Prior to the start of the yield test, static water level was recorded at 50 feet below surface. A sustained yield in excess of 70 gallons per minute (gpm) was recorded after four (4) hours of continuous air lift pumping.

⁵ Refer to the attached Easement Agreement for more information.

⁶ Refer to Well Construction Application under permit number E09-00007.

Yield test results for the “vineyard” well were not available prior to submittal of this Water Availability Analysis.

Water System Classification

Per PBES guidelines, the water system may be regulated as a transient noncommunity water system (TNCWS). A TNCWS is identified as a water system that has less than five (5) connections, serves less than 25 yearlong residents, and serves 25 people per day at least 60 days per year. Refer to the Technical, Managerial, and Financial (TMF) Capacity Worksheet included with the Use Permit Application for further information regarding the TNCWS.

Neighboring Water Source(s)

Based on review of neighboring property records at Napa County PBES and discussions with PBES staff, there does not appear to be any neighboring or active wells located within the zone of influence (500 feet) of the proposed project well. The existing wells located on the subject parcel that are located within the zone of influence are proposed to be destroyed per PBES requirements. Refer to the attached “Groundwater Subarea and Well Location Map” for location of the existing onsite wells and neighboring wells.

Water Quality

Water quality results were not available prior to the submittal of this WAA. A complete water analysis will need to be performed on the project well prior to permitting of the TNCWS and in conjunction with Napa County PBES requirements.

GROUNDWATER OVERVIEW

According to the Napa County Watershed Information & Conservation Council (WICC), the entire parcel APN 034-190-034 and a portion of parcel APN 034-190-035 are located in the Napa Valley Floor – Yountville subarea. The remainder of parcel APN 034-190-035 is located in the Western Mountains Groundwater Subarea of Napa County. Refer to the attached “Groundwater Subarea & Well Location Map” for the groundwater subarea relative to the project site.

The Napa Valley Floor - Yountville subarea is reported to have geology primarily consisting of alluvial sediments, such as clay, silt and sand. Groundwater levels in 14 wells were monitored by WICC and observed in the spring to be less than 10 feet below the ground surface. Groundwater levels towards the mountainous regions were observed to fluctuate seasonally as much as 25 to 35 feet. Groundwater quality was observed to be generally good with some well samples exceeding constituent standards including various metals and minerals.

The Western Mountain Subarea includes some volcanic rocks with additional exposures of the sedimentary Great Valley Sequence and metamorphic Franciscan Complex. The Napa County Groundwater Monitoring Program tested wells in this area in 2014 and 2015. The observed groundwater depth in these wells ranged from 44 feet to 240 feet from ground surface. Ground elevations range from 390 feet to 1,660 feet, mean sea level. The groundwater quality available in this subarea is reported to be generally of good quality.

Elevated levels of iron and manganese occur, along with lower than average pH indicating more acidity than the groundwater in the Napa Valley Floor.

GEOLOGICAL FEATURES

The attached “Geological Site Location Map” shows the parcel boundaries, approximate project well location, and surrounding geologic materials. The background for the exhibit is sourced from the “USGS Geological Map and Map Database of Eastern Sonoma and Western Napa Counties, California” by Graymer et al. (2007). The prominent geological materials in the project area appear to be predominantly Surficial Deposits (map unit Qf) and Sonoma Volcanics (map unit Tsa)

Per the Napa County Baseline Data Report (2005), Sonoma Volcanics consist of dacite, rhyolite, and andesite rock types. These rocks are exposed over much of Napa Valley and are the second most commonly exposed rocks in Napa County. In terms of groundwater resources, tuffaceous units within the Sonoma Volcanics host significant volumes of groundwater under both confined and unconfined conditions. Furthermore, surficial deposits consist of the formation of stream channel deposits, alluvium, terrace deposits, alluvial fan deposits, landslide deposits, basing deposits, bay mud, and artificial fill. In term of groundwater resources, surficial deposits are reported to be typical pathways for groundwater recharge and, depending on the properties and depths of the surficial deposits, may hold groundwater to varying capacity. Within the Napa Valley Floor, the majority of the groundwater is hosted within these deposits.

NAPA VALLEY FLOOR ALLOWABLE WATER ALLOTMENT

Per *Table 2A: Water Use Criteria* from the WAA Guidance Document (2015), the water use criteria for a parcel located in the Napa Valley Floor is defined as 1 acre-feet per acre per year. The area of the subject parcels located in the Napa Valley Floor – Yountville Groundwater Subarea is 13.58± acres. The remaining area of the subject parcels located in the Western Mountains Groundwater Subarea is 35.68± acres. The delineation in groundwater subareas is based on the Napa County WICC Map Data. The allowable water allotment for the applicable area is calculated below.

Allowable Water Allotment (acre-ft/yr) =

$$\begin{aligned} & \text{Napa Valley Floor parcel area (acres)} \times \text{Water use criteria (acre-ft/acre-yr)} \\ & = 13.58 \text{ acres} \times 1.0 \text{ acre-ft/acres-yr} = 13.58 \text{ acre-ft/yr} \end{aligned}$$

The allowable water allotment for the area of the subject parcel located in the Napa Valley Floor is estimated to be 13.58 acre feet per year.

ALL OTHER AREAS ESTIMATED GROUNDWATER RECHARGE

The allowable water allotment for the area of the parcel located in All Other Areas is determined by estimating groundwater recharge in the Western Mountains Groundwater Subarea. Groundwater recharge can be estimated by understanding the soil properties and geological materials present and their ability to percolate groundwater to the saturated zone of the aquifer. Water flowing into the ground consists primarily of recharge from precipitation, surface water seepage, and artificial recharge. Water flowing out of the ground

primarily involves extraction from wells, spring discharge, and evapotranspiration. In Napa County, precipitation has been primarily established as the primary source of groundwater (Kunkel and Upson, 1960). Since the subject parcel is partially located in the Napa Valley Floor - Yountville and the Western Mountains Groundwater Subarea with an unnamed blueline stream primarily located at a lower elevation than the project site, direct infiltration from rainfall is likely to be the most significant factor for groundwater recharge. Without having site recorded data showing the change in groundwater, this analysis models groundwater recharge as a percent of rainfall. The amount of rainfall that is estimated to recharge groundwater is impacted by a number of factors. Some of these factors include precipitation, soil properties, and underlain geological materials.

Precipitation

Precipitation, or rainfall, data used in this analysis is taken from two (2) sources: the PRISM Climate Group at Oregon State University and the National Climate Data Center (NCDC). The PRISM Climate Group provides spatial climate datasets for selected 800 meter or 400 kilometer (km) spatial grid cell(s). The average annual recorded rainfall data from 1981-2010 (30-year normals) for the project location⁷ selected from one (1) 800 meter spatial grid cell is 30.34 inches. The NCDC rainfall data collected rainfall from the Napa State Hospital cooperative weather station from 1917-1995. The average recorded rainfall over this time period was 25.0 inches.

Average rainfall data from PRISM recorded over the past 10 years provides more recent rainfall data and shows variation between drier and wetter years. The 10-year average (2014 to 2004) taken from a 400 km spatial grid cell which includes the project location is shown in the table below.

Table 3: 10-yr Average Rainfall	
Year	PRISMRainfall (inches)
2014	33.3
2013	6.1
2012	34.3
2011	25.1
2010	38.2
2009	23.4
2008	21.3
2007	15.5
2006	30.7
2005	39.6
2004	31.0
AVERAGE	27.1

⁷ Location selected has a corresponding latitude of 38.3640, longitude of -122.3485 and an elevation of 167 feet.

This analysis uses the most conservative average rainfall data, which in this case is the NCDC rainfall data collected rainfall from the Napa State Hospital cooperative weather station from 1917-1995 of 25.0 inches. Refer to the attached Rainfall Data (Table III) for a summary of rainfall data from all sources.

Hydrologic Soil Groups

Per the USDA, hydrologic soil groups (HSG) are based on estimated potential for runoff. Soils are assigned four (4) groups (A, B, C and D) depending on the ability of water to infiltrate the soil. Group A soils have a high infiltration rate (low runoff potential) and group D has very slow infiltrative rates (high runoff potential). The infiltration rate is also affected by site slopes; higher slopes limit the time water is available for infiltration.

A custom soils report was generated by the NRCS Web Soil survey for the subject parcel. The survey shows that several soil types, HSGs, and land slopes are present. Applying a weighted total to the infiltrative properties, the subject parcel has an overall "Slow" infiltrative rate of 0.09 inches per hour and a corresponding "C" HSG. Refer to the attached Custom Soil Report for more information regarding soil properties.

Average Year Groundwater Recharge Rate

Based on review of several groundwater publications and WAA prepared for similar type projects, a percent of precipitation is assumed to be available for groundwater recharge. These publications include studies for the City of Santa Rosa watershed as well as Environmental Impact Reports (EIR) for large scale projects. Below is a summary of these references and comparison to the geological materials and HSGs present on the subject parcel:

- The "Groundwater Study" for the 2009 Napa Pipe Project EIR prepared by others, estimates 10.5% of precipitation is available for groundwater recharge in Sonoma Volcanics.
- The "Santa Rosa Plan Watershed Groundwater Management Plan 2014" prepared by the Santa Rosa Plan Basin Advisor Panel includes a specified yield of 0-15% for Sonoma Volcanics. Specified yield refers to the amount of water contained in the saturated zone that flows by gravity and is available to wells (Johnson 1967).
- WAA prepared for the Wools Ranch Winery by Luhdorff & Scalmanini (L&S) dated 2014 includes a 10% recharge rate for a parcel with primarily slow and some moderate infiltrative soil properties.

Based on the methodology utilized in these studies, a conservative groundwater recharge could be 10% of annual precipitation. A conservative estimate for the project site recharge area is assumed to be equal to the area of the subject parcel located in All Other Areas as well as underlain with Sonoma Volcanics. Per the attached "Geological Location Site Map" the entire portion of the Western Mountain Subarea located on parcel APN 034-190-035 appears to be entirely underlain with Sonoma Volcanics. The following calculation provides the volume of rainwater that is estimated to be available for groundwater recharge in this area:

$$\begin{aligned}\text{Annual recharge (acre-ft/yr)} &= \text{Recharge area (acres)} \times \text{Precipitation (ft)} \times \text{Recharge rate} \\ &= 35.68 \text{ acres} \times (25.0 \text{ in} \times 1 \text{ ft}/12 \text{ in}) \times 10\% \\ &= 7.43 \text{ acre-ft/yr}\end{aligned}$$

The estimated annual recharge for the area of the subject parcel located in All Other Areas is estimated to be 7.43 acre-feet per year.

Dry Year Recharge Rate(s)

When modeling groundwater recharge as a percentage of rainfall, dry rainfall years should also be evaluated. A drought year occurred in 2013 with only 6.1 inches of recorded precipitation near the project area according to the PRISM Database (see Table 3). This is a significantly low rainfall year and is not considered to represent historical rainfall patterns. A typical dry year appears to have occurred in 2007 with 15.5 inches of rainfall. Applying the recharge rate to the recharge area discussed above as a percentage of rainfall, the potential groundwater available during a typical dry year (2007) is 4.61 acre-feet.

SUMMARY

The groundwater demand generated as a result of the proposed development is estimated to increase from 7.50 acre-feet per year (see Table 2A) to 8.00 acre-feet per year (see Table 2B). The groundwater domestic source is proposed to be sourced from the existing onsite “new” well which has a yield rate in excess of 70 gpm observed during the time of drilling. The existing “vineyard” well is proposed to continue providing irrigation water to the subject parcel(s).

The available water for the subject parcel(s) is the combination of the allowable water allotment for the area located in the Napa Valley Floor and the estimated groundwater recharge for the area located in All Other Areas. The available water for the subject parcel(s) is estimated to be between 18.19 acre-feet per year and 21.02 acre-feet per year during dry to normal rainfall years which is greater than the estimated proposed groundwater demand of 8.00 acre-feet per year.

CONCLUSION

The above analysis shows that the proposed groundwater demand can feasibly be sourced by the existing project well(s). Furthermore, the estimated available water for the subject parcels satisfies the Tier 1 Water Use Criterion of the Napa County Water Availability Analysis.

ATTACHMENTS

Groundwater Subarea & Well Location Map

Geological Site Location Map

Table I – Existing Water Demand

Table II – Proposed Water Demand

Table II – Rainfall

Table III – Soil Group Properties

Table IV – Water Availability

Well Completion Report

Custom Soil Report

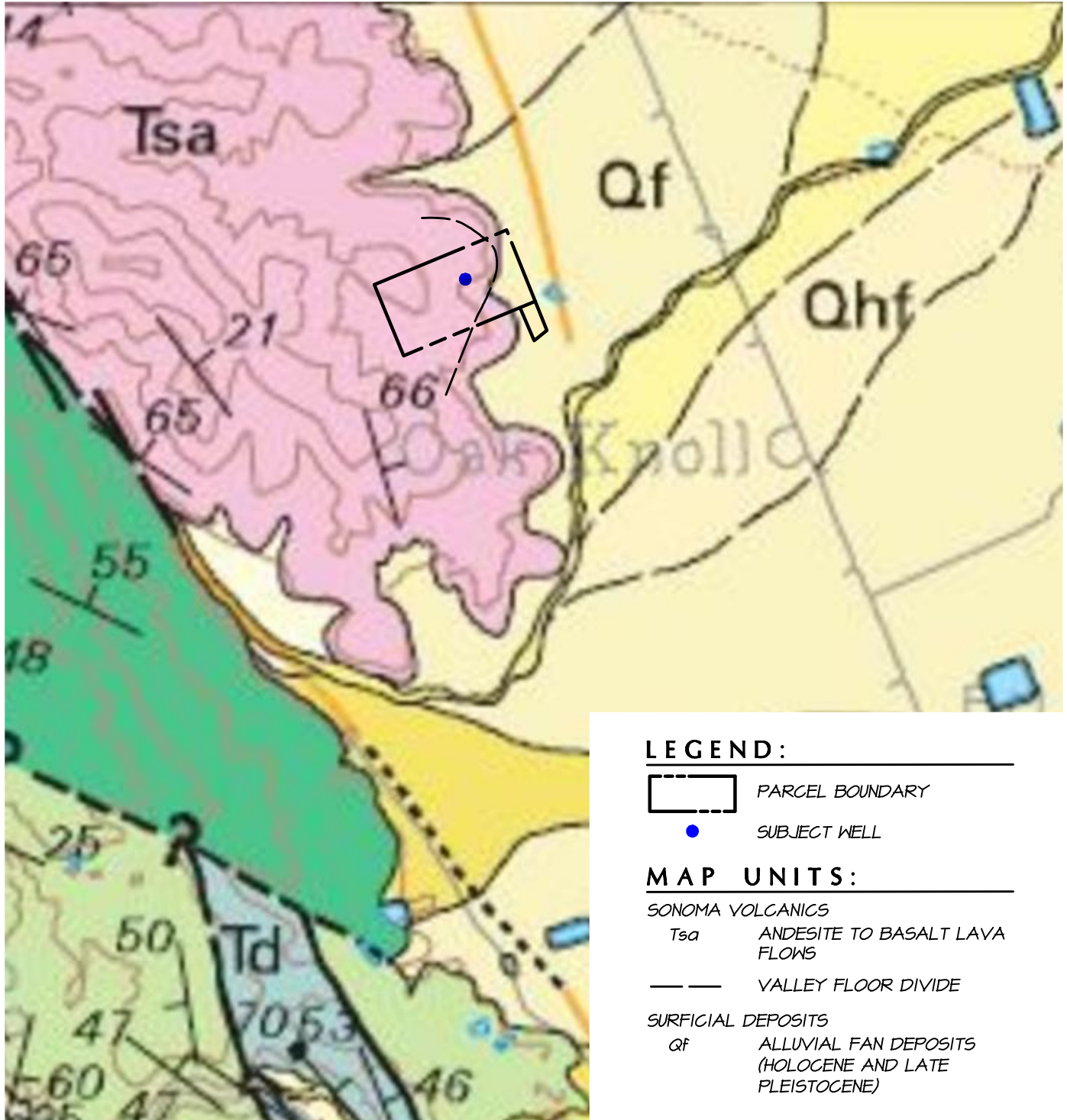
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GEOLOGICAL SITE LOCATION MAP

FROM USGS GEOLOGICAL MAP AND MAP DATABASE OF
EASTERN SONOMA AND WESTERN NAPA COUNTIES, CALIFORNIA

Scale: 1" = 2000'



LEGEND:

- PARCEL BOUNDARY
- SUBJECT WELL

MAP UNITS:

- SONOMA VOLCANICS
- Tsa ANDESITE TO BASALT LAVA FLOWS
- VALLEY FLOOR DIVIDE
- SURFICIAL DEPOSITS
- Qf ALLUVIAL FAN DEPOSITS (HOLOCENE AND LATE PLEISTOCENE)

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Darms Lane Winery
1150 Darms Lane
Napa, CA 94558
APN 034-190-034 & -035

Job No. 98-55

December 2018

Darms Lane Winery Existing Water Demand Table I

Winery Production Limit:
 Vineyard Area:

0 gallons/year
 13.50 acres

EXISTING WATER DEMAND		
Description	Water Usage Rate¹	Water Demand (acre-feet/year)
<u>Residential</u>		
Primary Residence	0.75 acre-feet/acre-year	0.75
Secondary Residence or Farm Labor Dwelling	0.5 acre-feet/acre-year	-
<u>Agricultural</u>		
Vineyards		
Irrigation Only	0.5 acre-feet/acre-year	6.75
Heat Protection	0.25 acre-feet/acre-year	-
Frost Protection	0.25 acre-feet/acre-year	-
Irrigated Pastures	4 acre-feet/acre-year	-
Orchards	4 acre-feet/acre-year	-
Livestock (sheep or cows)	0.01 acre-feet/acre-year	-
<u>Winery</u>		
Process Water	2.15 acre-feet/100,000 gallon of wine	-
Domestic & Landscaping	0.5 acre-feet/100,000 gallon of wine	-
<u>Industrial</u>		
Food Processing	31 acre-feet/employee-year	-
Printing/Publishing	0.06 acre-feet/employee-year	-
<u>Commercial</u>		
Office Space	0.01 acre-feet/employee-year	-
Warehouse	0.05 acre-feet/employee-year	-

Estimated Proposed Water Demand (acre-feet/year): 7.50
Estimated Proposed Water Demand (gallons/year): 2,443,883

1) Water usage rates referenced from *Appendix B: Estimated Water Use of Specified Land Use* from Napa County WAA-Guidance Document (2015)

Darms Lane Winery Proposed Water Demand Table II

Winery Production Limit:
 Vineyard Area:

30,000 gallons/year
 12.62 acres

PROPOSED WATER DEMAND		
Description	Water Usage Rate¹	Water Demand (acre-feet/year)
<u>Residential</u>		
Primary Residence	0.75 acre-feet/acre-year	-
Secondary Residence or Farm Labor Dwelling	0.5 acre-feet/acre-year	-
<u>Agricultural</u>		
Vineyards		
Irrigation Only	0.5 acre-feet/acre-year	6.31
Heat Protection	0.25 acre-feet/acre-year	-
Frost Protection	0.25 acre-feet/acre-year	-
Irrigated Pastures	4 acre-feet/acre-year	-
Orchards	4 acre-feet/acre-year	-
Livestock (sheep or cows)	0.01 acre-feet/acre-year	-
<u>Winery</u>		
Process Water	2.15 acre-feet/100,000 gallon of wine	0.65
Domestic	per Wastewater Feasibility Report	0.34
Landscaping	per L0.02 WELO ETWU	0.70
<u>Industrial</u>		
Food Processing	31 acre-feet/employee-year	-
Printing/Publishing	0.06 acre-feet/employee-year	-
<u>Commercial</u>		
Office Space	0.01 acre-feet/employee-year	-
Warehouse	0.05 acre-feet/employee-year	-

Estimated Proposed Water Demand (acre-feet/year): 8.00
Estimated Proposed Water Demand (gallons/year): 2,605,179

1) Water usage rates referenced from *Appendix B: Estimated Water Use of Specified Land Use* from Napa County WAA-Guidance Document (2015), except where noted

**Darms Lane Winery
 Rainfall
 Table III**

AVERAGE MONTHLY RAINFALL RATES		
Month	PRISM Rainfall¹ (inches)	NCDC Rainfall² (inches)
September	0.3	0.4
October	1.5	1.7
November	3.9	3.9
December	5.7	3.9
January	5.6	5.4
February	5.9	3.9
March	4.5	3.7
April	1.7	1.6
May	1.1	0.3
June	0.1	0.1
July	0.0	0.0
August	0.1	0.1
TOTALS	30.4	25.0

- 1) PRISM 30-year normal rainfall data from 1981-2010 averaged one (1) 800 m² spatial grid that encompass the total project area; see <http://prism.oregonstate.edu/>
- 2) Site rainfall from the Napa State Hospital, Napa County, CA (NCDC Cooperative Stations 1917-1995); see www.worldclimate.com

10-YR AVERAGE RAINFALL	
Year	PRISM Rainfall¹ (inches)
2014	33.3
2013	6.1
2012	34.3
2011	25.1
2010	38.2
2009	23.4
2008	21.3
2007	15.5
2006	30.7
2005	39.6
2004	31.0
AVERAGE	27.1

- 1) PRISM yearly rainfall data from 2007-2014 from one (1) 400 km spatial grids which encompass the total project area; see <http://prism.oregonstate.edu/>

**Darms Lane Winery
 Soil Group Properties
 Table IV**

HYDROLOGIC SOIL GROUP									
Map Unit	Map Unit Name	Slope Range	Hydrologic Rating Group	Acres in AOI (acres)	Percent of AOI (%)	Infiltration Rate		Estimated Infiltration Rate (in/hr)	Weighted Infiltration Rate (in/hr)
							(in/hr)		
104	Forward gravelly loam	0-2%	B	5.6	11.4%	Moderate	0.15-0.30	0.23	0.026
114	Forward gravelly loam	30-50%	C	8.2	16.7%	Slow	0.05-0.15	0.10	0.017
116	Forward gravelly loam	0-2%	D	4.0	8.1%	Very Slow	< 0.05	0.05	0.004
140	Hambright-Rock outcrop complex	30-75%	B	3.0	6.1%	Moderate	0.15-0.30	0.23	0.014
146	Henneke gravelly loam	2-9%	D	1.2	2.3%	Very Slow	< 0.05	0.05	0.001
151	Maxwell clay	2-30%	D	27.3	55.3%	Very Slow	< 0.05	0.05	0.028
TOTALS				49.3	100%	Slow	0.05-0.15		0.09

- 1) Hydrologic Soil Groups (HSGs) are based on USDA/NRCS Web Soil Survey for the project Area of Interest (AOI)
- 2) Infiltration Rates for each HSG is referenced from the USDA Urban Hydrology for Small Watersheds, Technical Release 55, June 1986.

Darms Lane Winery Water Availability Table V

Total Parcel Size:	49.26 acres
Napa Valley Floor Parcel Size	13.58 acres
All Other Areas Parcel Size	35.68 acres

ALLOWABLE WATER ALLOTMENT - NAPA VALLEY FLOOR		
Applicable Parcel Size (acres)	Water Use Criteria (acre-feet/acre-year)	Water Allotment (acre-feet/year)
13.58	1.0	13.58

GROUNDWATER RECHARGE - ALL OTHER AREAS					
Scenario	Rainfall ¹		Sonoma Volcanics	Sonoma Volcanics	Estimated Recharge (acre-ft/year)
	(inches)	(feet)	Recharge Area ² (acres)	Recharge Rate (%)	
NCDC Weather Station	25.0	2.1	35.68	10%	7.43
PRISM 10-year Average	27.1	2.3	35.68	10%	8.07
Typical Dry Year (2007)	15.5	1.3	35.68	10%	4.61

- 1) Refer to Table I - Rainfall Data
- 2) Portion of All Other Areas that appears to be underlain with Sonoma Volcanics, refer to attached Geological Site Location Map for more information

TOTAL WATER AVAILABILITY				
Scenario	Water Allotment (acre-feet/year)	Estimated		Total Water Availability (gallons/year)
		Recharge (acre-ft/year)	Total Water Availability (acre-ft/year)	
NCDC Weather Station	13.58	7.43	21.02	6,848,064
PRISM 10-year Average	13.58	8.07	21.65	7,055,228
Typical Dry Year (2007)	13.58	4.61	18.19	5,927,629

WHEN RECORDED RETURN TO:

JONES, BENNETT & COX
Attorneys at Law
Howard Building
1424 1/2 Lincoln Avenue
Calistoga CA 94515

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RECORDED AT REQUEST OF
JAMES M. HARRIS
NAPA COUNTY RECORDS
OFFICE
4-13-88

EASEMENT AGREEMENT

ELIZABETH K. KILGORE
COUNTY RECORDER

FEB 9 8:00

Documentary Transfer Tax: \$None.

 Computed on full value of property conveyed.

 Computed on full value less liens & encumbrances
remaining thereon at time of sale.

James M. Harris
Signature of Declarant or Agent Determining Tax

Send Tax Bill To: Cook Road
Yountville, CA
94599

THIS AGREEMENT is made between JAMES M. HARRIS and HELEN HARRIS, husband and wife, and BENJAMIN J. BENSON, hereinafter referred to as "grantors", and RENNICK J. HARRIS and MARILYN L. HARRIS, husband and wife, hereinafter referred to as "grantees".

THE PARTIES HAVE AGREED WITH REFERENCE TO THE FOLLOWING FACTS:

Grantors are the owners of certain real property located in an unincorporated area of the County of Napa, State of California, on Darms Lane, presently bearing Assessor's Parcel number 34-211-52, and more particularly described in Exhibit A, attached hereto and made a part hereof. Said real property is hereinafter referred to as the "servient tenement".

Grantees are the owners of certain real property located in an unincorporated area of the County of Napa, presently bearing Assessor's Parcel number 34-19-01. Said real property is hereinafter referred to as the "dominant tenement."

Grantees, as previous owners of the servient tenement, caused a water well to be dug and constructed upon the servient tenement.

CG8882

lands, and to reconstruct, repair, maintain and inspect the well lying upon grantors' lands.

6. Grantees shall take and maintain reasonable measures so that the well and related equipment, the location of the pipeline, and any power lines are visible upon the lands of grantors, such reasonable measures intended to protect the well and related equipment, the pipeline, and any power lines from negligent and non-intentional injury caused by the acts or omissions of grantors, their visitors, invitees, employees and agents.

7. Grantors reserve the right to use the land described herein for any and all purposes except as might interfere with grantees' use, occupation or enjoyment of the easement, or as might cause a hazardous condition.

8. This instrument contains the entire agreement between the parties relating to the rights herein granted and the obligations herein assumed. Any oral representations or modifications concerning this instrument shall be of no force and effect excepting a subsequent modification in writing and signed by the party to be charged.

This instrument shall bind and inure to the benefit of the respective heirs, personal representatives, successors and assigns of the parties hereto.

DATED: 27 December 1978.

James M. Harris

JAMES M. HARRIS

Rennick J. Harris

RENNICK J. HARRIS

Helen Harris

HELEN HARRIS

Marilyn L. Harris

MARILYN L. HARRIS

Benjamin J. Benson

BENJAMIN J. BENSON

- Grantees -

- Grantors -

EXHIBIT A

Being a portion of the tract of land conveyed to Frank E. Soderholm by deed recorded July 2, 1947 in Book 271 at page 334, Napa County Records, described as follows:

Commencing at a point on the Southern line of said Soderholm Tract said point also being the most Southern corner of the 10.58 acre tract of land described in the deed to Howard W. Cliff, et ux, recorded March 1, 1956 in Book 505 at page 275, Napa County Records, thence along the South line of said Soderholm Tract South 67° 30' West 155.00 feet; thence North 22° 30' West 315.00 feet; thence South 67° 30' West 140.00 feet; thence North 22° 30' West 267.67 feet; thence South 67° 30' West 496 feet to the Western line of said Soderholm Tract; thence along said Western line North 22° 30' West 420 feet to the Northwest corner thereof; thence along the Northern line of said Soderholm Tract North 67° 30' East 791 feet to the Northwestern corner of the above mentioned 10.58 acre tract; thence along the Western line of said 10.58 acre tract South 22° 30' East 1002.21 feet to the point of commencement.

compared



**TECHNICAL, MANAGERIAL, AND FINANCIAL CAPACITY
ANALYSIS FOR
DARMS LANE WINERY
1150 DARMS LANE, NAPA COUNTY, CA 94558
APN 034-190-034 & -035**

As required by Napa County Planning, Building & Environmental Services (PBES), the following Technical, Managerial, and Financial Capacity (TMF) worksheet outlines the potential requirements associated with the development of a new Transient Noncommunity Water System (TNCWS) associated with providing onsite water for a proposed winery and tasting room on the above referenced parcel for the Darms Lane Winery Use Permit Application.

PROJECT DESCRIPTION

It is our understanding that the project proposes to construct a full crush winery on the above referenced parcel with the intent of the facility having the capability of producing 30,000 gallons of wine per year. Along with the proposed wine production at the site, the project proposes a moderate staffing and marketing plan. The project proposes four (4) full-time employees, two (2) part-time employees, and two (2) seasonal (harvest) employees. The project also proposes to offer private tour and tasting appointments for a maximum number of twenty-four (24) guests per day and 150 guests per week. Furthermore, the Applicant plans to offer two (2) food and wine pairing events per month for parties up to 12 persons and two (2) food and wine pairing events per month for parties up to 24 persons. Additionally, the Applicant intends to host four (4) wine club/release events per year for groups of up to 75 persons and two (2) 125 person auction related event at the winery.

Table 1 summarizes the proposed marketing plan:

TABLE 1: MARKETING PLAN SUMMARY		
Guest Experience Proposed	Frequency Proposed	Number of Persons Proposed
Private Tours & Tasting	Daily	24 per day
Food & Wine Pairings	2 per month	12 per event
	2 per month	24 per event
Wine Club / Release Events	4 per year	75 per event
Auction Related Events	2 per year	125 per event

It is our understanding that the Darms Lane Winery may be required to install a TNCWS as a result of the proposed Use Permit Application. The following TMF worksheet outlines the potential requirements associated with the development of the new TNCWS.

WATER SYSTEM OVERVIEW

TABLE 1: WATER SYSTEM OVERVIEW	
Water System Name	Darms Lane Winery
Location/Address	1150 Darms Lane, Napa County, CA 94558, APN 034-190-034 & -035
Application Type	New System
Water System ID	CA2800007 (Pending)
Water System Classification	Transient Noncommunity (TNCWS)
Name of Person(s) Who Prepared the Report	Michael G. Grimes, P.E. Project Engineer Bartelt Engineering
Water Source	Well

TECHNICAL CAPACITY

System Description

Under PBES guidelines, Darms Lane Winery may be required to operate and maintain a transient noncommunity water system (TNCWS). A transient noncommunity water system is identified as a system that has less than five (5) connections, serves less than 25 yearlong residents¹, serves 25 people per day at least 60 days per year, and serves not more than 25 of the same people at least six (6) months out of the year. The two (2) seasonal employees (harvest season) are not considered yearlong residents.

According to well construction records, the most recently constructed onsite “new” well is capable of producing a flow rate in excess of 70 gallons per minute² (gpm). There are two (2) other onsite wells, one (1) that supplies domestic water to the home office (“old” well), and another that is abandoned (“abandoned” well). The “new” well is currently used to satisfy vineyard irrigation demands. Under this Use Permit, the “new” well will be transitioned to satisfy future domestic water demands to the winery and tasting room and landscape irrigation demands. The “old” well and “abandoned” well will be destroyed following County of Napa requirements. Vineyard irrigation is also supplied by an existing offsite well (“vineyard” well) on the neighboring parcel (APN 034-211-055) to the east through a recorded agreement³.

This project is also considering reusing wastewater as an additional source for vineyard, and/or native grasses, and/or oak woodlands irrigation. The most recently constructed “new” well⁴ has an appropriate annular seal and therefore will be utilized as the water source for the proposed public water system. Groundwater will be extracted from the “new” well, treated at the source to the required level for potable water, and then stored

¹ Yearlong resident is considered an individual served by the water system for 183 or more days annually.

² Pulliam Hall Exploration. *Well Completion Report*; see Napa County permit #E09-00007.

³ Easement Agreement, Document ID 1978-0025218, Book 1110 Page 0, Harris, Marilyn, L. & Harris, Rennick J. Recorded 12/29/1978.

⁴ Constructed in 2009 under Napa County permit number E09-0007

in onsite water storage tank(s) before being conveyed to the proposed winery facility, offices, tasting room building, and all other service connections serving the public.

It is anticipated that the water service connection will be at the proposed winery building, caves, offices, and tasting room building all of which will be located on the above referenced parcel. The water treatment equipment will most likely include micron filters, calcite filter, water softener, storage tanks, booster pumps, pressure tanks, and ultraviolet radiation treatment. Equipment requirements may vary based on water sample testing. The location of water system structures will be shown on the forthcoming improvement plans if a water treatment system is found to be required during the Use Permit process.

Vineyard irrigation and fire protection water will be provided by the offsite "vineyard" well. If it becomes necessary to utilize the "new" well for irrigation and/or fire protection applications, the potable water portion of the non-community water system will be isolated utilizing a backflow prevention device or double check valve.

One Year Projection

Based on the number of employees and proposed marketing events that are anticipated to be served by the noncommunity water system; the annual water demand is estimated to be 514,217 gallons with an averaged annual daily demand of 1,409 gallons and an averaged daily peak demand of 2,689 gallons. Based on the Well Completion Report⁵, the estimated water yield from the "new" well that meets the annular seal depth is in excess of 70 gallons per minute (gpm); therefore, the proposed water system should have more than adequate capacity to meet projected domestic water demands. Refer to the Water Availability Analysis (WAA) for Darms Lane Winery, prepared by Bartelt Engineering and submitted to Napa County for additional information on estimated production and domestic water demands. The projected water system service area, water demand, and the number of users are expected to remain constant over the next several years with no future plan for expansion.

SOURCE ADEQUACY

Groundwater

The most recently constructed "new" well was constructed with an appropriate 55 foot annular seal which meets minimum standards for a community water system and therefore could be utilized to serve as the supply capacity for the public water system.

Surface Water Treatment

The water system source water will be a groundwater well; therefore, no surface water treatment is anticipated or required.

Water Supply Capacity

It is anticipated that any required noncommunity water system will be able to supply the minimum 3 gallons per minute for at least 24 hours for each service connection. It is anticipated that the water system may contain three (3) separate water service connections

⁵ Pulliam Hall Exploration. *Well Completion Report*, signed 8/06/2009. See Napa County permit #E09-00007.

(winery building, offices and tasting room, and caves). To assist in offsetting peak water demand periods, all treated potable water will be stored in tank(s) in the vicinity of the water treatment area.

Water Quality

Groundwater sample results from the “new” well proposed to be the source for the TNCWS are not yet available. Any results of samples taken for the purpose of a noncommunity water system will be forwarded to Napa County PBES - Environmental Health Division.

CONSOLIDATION WITH OTHER WATER SYSTEMS

The closest large scale municipal water systems are operated by the City of Napa and the Town of Yountville. These municipal systems are not within the vicinity of the proposed water system for the Darms Lane Winery project. It is infeasible to consolidate with any existing water systems at this time. If municipal water service becomes available in the future, it is possible that the onsite well would continue to be utilized for wine production and any municipal water service would be utilized for domestic purposes. There is no anticipated consolidation with other (existing) water systems near the site.

MANAGERIAL

Organizational Ability

The Owner of the water system is primarily responsible for the review and overseeing of all winery financial and business decisions to ensure financial stability of the winery, in addition to allocating appropriate staffing levels and assigning responsibilities to ensure continuous water system quality. The water system will be primarily managed by the winery Facilities Manager. The Facilities Manager is responsible for managing the day-to-day operations of the winery including periodic inspection of the water system and will obtain sufficient training to inspect, operate, and maintain the water system equipment within specified parameters to meet state water quality standards; in addition, the Facilities Manager will also take groundwater samples as necessary and submit the samples to a local laboratory for testing. If necessary, the Facilities Manager and any other employees working with the water system will attend classes in water distribution systems for certification at Solano Community College (or other suitable school) and will maintain a working knowledge of changes in codes and requirements associated with the water system. The Facilities Manager will obtain support from a Certified Operator if it becomes necessary to make modifications to the water system. Approximately five percent (5%) of the Facilities Manager’s time will be dedicated to inspecting, monitoring, and quality sampling of the water system.

The Facilities Manager will typically perform visual inspections, routine operation and maintenance of the well head, storage, and pressure tanks, booster pumps, pressure gauges, meters and valves checking for signs of leaks or damage, proper operation, maintain lubricant levels, eliminate potential electrical or chemical hazards, clean storage tanks, etc.; in addition to bacteriological and chemical monitoring and reporting.

Water Rights

The existing groundwater well identified as “new” well is located on the parcel associated with the proposed winery (APN 034-190-035).

Financial

The water system will generate no revenue of its own. The water system expenses are covered as part of the general fund for winery operations. Most of the capital expenditures over a ten (10) year period will be minor. Annual maintenance and repair will be accomplished by onsite winery personnel, assisted by a private contractor (such as Oakville Pump) and will be covered in the winery general fund. The expenses associated with water testing will also be covered as part of the winery general fund. Tests will be conducted by a private testing company (such as CalTest or Brelje and Race Laboratory).

General item costs associated with the water system are estimated as follows:

- Onsite water system personnel: Approximately 20 hrs/month or \$800 per month.
- Contractors (as needed): Average \$500 per month.
- Sampling and testing: \$200 per quarter (twice annual testing spread over one year)
- Total Operating Costs: Approximately \$700 per month or \$8,400 per year

It is estimated that the total operating and installation costs associated with the water system for the first year will be approximately \$20,000 including employee allocated time, training, facilities, and maintenance.

CONCLUSION

The water system for the proposed project is anticipated to be regulated by the State of California and Napa County PBES. Following approval of the Use Permit, the Applicant understands that all permit requirements for the public water system will be submitted prior to issuance of any building permits associated with the proposed development.

Water Demand Calculations - Transient - Non-Community Water System

Project Name: Darms Lane Winery
Project #: 98-55
Project Address: 1150 Darms Lane
Napa, CA 94558
APN: 034-190-035
Date: December-2018

Description of Item	No. of Items	Annual / Peak	Water use per Item [gpd/item]	Water Demand [gpd]
Tasting Room & Winery¹				
Number of Employees (Full-Time & Part-Time)	6	A & P	15.0	90
Number of Guest for Private Tours & Tastings w/ Food	24	A	6.0	144
Number of Guest for Food and Wine Pairings - Lunch	12	A	11.0	132
Number of Guest for Food and Wine Pairings - Dinner	24	A	11.0	264
Number of Guest for Wine Club / Release Events	75	A	11.0	825
Number of Guest for Auction Related Events	125	A& P	11.0	1,375
Annual Wine Production [gal]	30,000			
Permitted to Crush [gal]	30,000			
Averaged Annual Water Demand per Day	30,000	A	6.0	493
Averaged Peak Water Demand per Day	30,000	P	4.5	416
Tasting Room Landscape Irrigation				
Area [acres]	0.561	A & P	1,103	619
Averaged Annual Site Water Demand per Day				1,409
Averaged Peak Site Water Demand per Day ⁵				2,689

Annual Allowable Water Allotment ^{2,3}	23.45	ac-ft	7,641,205.95	gallons
Average Daily Allowable Water Allotment based on number of working days per year	365	days	20,934.81	gpd
	260	days	29,389.25	gpd

Site Hours of Operation	[hours]		8	12
Flow Rate based on Averaged Annual Site Demand	[gpm]		2.94	1.96
Flow Rate based on Averaged Peak Site Demand	[gpm]		5.60	3.73
Treatment Flow Peak Factor			1.5	1.5
Peak Flows for Averaged Annual Demands	[gpm]		4.4	2.9
Peak Flows for Averaged Peak Demands	[gpm]		8.4	5.6
Estimated Peak Flow Demand Duration	[hours]		4	5
Estimated Water Demand for Peak Flow Duration based on Averaged Annual Demands	[gallons]		1,057	881
Estimated Water Demand for Peak Flow Duration based on Averaged Peak Demands	[gallons]		2,017	1,680

Estimated Well Yield (Existing)	[gpm]			70
Estimated Water Treatment Rate	[gpm]			33
Water Treatment Hours of Operation	[hours]			2
Daily Volume of Treated Water	[gallons]			3,960

Notes:

1. Water Demand Calculations are based on proposed winery facility and tasting room marketing plan.
2. Annual Allowable Water Allotment from Water Availability Analysis.
3. One (1) Acre-Foot = 325,851 gallons based on Napa County Water Availability Analysis Form.
4. Average Peak demand is during non-harvest season, which excludes harvest season employees
5. Refer to Onsite Wastewater Feasibility Study Table 3B for Peak Day Marketing Event flow.