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CITY OF CALISTOGA

BARTELI ENGINEERING

April 2016
September 2016 - Revised
Job #14-41

ONSITE WASTEWATER DISPERSAL FEASIBILITY STUDY FOR AUBERT WINERY 333 SILVERADO TRAIL, CALISTOGA, CA 94515 APN 011-050-031

As required by Napa County Planning, Building and Environmental Services (PBES) and the City of Calistoga, this study outlines the feasibility of providing onsite wastewater dispersal for Aubert Winery located on the above reference parcel.

PROJECT DESCRIPTION

The project proposes an increase in wine production from 23,700 gallons annually (10,000 cases) to 35,550 gallons annually (15,000 cases) along with modification to the existing onsite wastewater dispersal system serving the existing tasting room and full crush winery located on the 2.0± acre subject parcel. Refer to the associated Use Permit Drawings prepared by Bartelt Engineering for the existing conditions and proposed improvements.

The project proposes an increase in wine production only and does not propose a modification to the existing marketing plan, which includes private tour and tasting appointments for a maximum number of 25 guests per day. Furthermore, a modification to the existing winery events schedule and staffing plan, which includes five (5) full-time employees and four (4) part-time employees without any seasonal (harvest) employees, is not proposed at this time.

Table 1 summarizes the staffing plan:

TABLE 1: STAFFING PLAN SUMMARY

Description	Staff Members Existing/Proposed
Full-Time Employee	5
Part-Time Employee	4
Harvest Season Employee	0

Table 2 summarizes the marketing plan:

TABLE 2: MARKETING PLAN SUMMARY

Description	Existing		Proposed	
	Frequency	Number of Guests	Frequency	Number of Guests
Private Tours & Tasting	Daily	25 per day	Daily	25 per day
Winery Events	Annually	0 per event	Annually	0 per event

CIVIL ENGINEERING • LAND PLANNING
1303 Jefferson Street, 200 B, Napa, CA 94559
www.barteltengineering.com Tel: 707-258-1301 Fax: 707-258-2926

As part of our services, representatives from Bartelt Engineering have reviewed the planned operational methods for the winery with our Client, reviewed the parcel files at PBES and the City of Calistoga's Planning, Building and Public Works Department, held conversations with PBES and City of Calistoga staff, performed a reconnaissance of the site to view existing conditions and conducted several site visits to evaluate the feasibility of replacing the existing onsite wastewater treatment system.

This study and the associated Use Permit Drawings demonstrate that the proposed winery improvements and wine production increase can feasibly be developed and that all wastewater can be adequately disposed of.

WASTEWATER ANALYSIS

All plumbing fixtures in the winery production facility and tasting room will be water saving fixtures per the California Plumbing Code as adopted by the City of Calistoga Building Department.

Winery Production Process Wastewater Flow

The winery production process wastewater (PW) flow rates for harvest and non-harvest seasons can be calculated as follows:

Harvest Peak Winery PW Flow=

$$\left(\frac{35{,}550\ \text{gallons of wine}}{\text{year}}\right)\times\left(\frac{1.5\ \text{gallons of water}}{1\ \text{gallon of wine}}\right)\times\left(\frac{1\text{year}}{40\ \text{days of crush}}\right)=$$

Harvest Peak PW Flow = 1,333 gallons per day (gpd)

Non-Harvest Peak PW Flow=

$$\left(\frac{35{,}550\ \text{gallons of wine}}{\text{year}}\right)\times\left(\frac{4.5\ \text{gallons water}}{1\ \text{gallon of wine}}\right)\times\left(\frac{1\ \text{year}}{325\ \text{days}}\right)=$$

Non-Harvest Peak PW Flow = 492 gpd

Winery Sanitary Wastewater Flow

The sanitary wastewater (SW) generated at the winery production facility and tasting room including full-time employees, part-time employees and guests can be itemized as follows:

Employees:

- 5 Full-Time Employees x 15.0 gpd per employee = 75 gpd
- 4 Part-Time x 15.0 gpd per employee = 60 gpd
- 0 Harvest Season x 15.0 gpd per employee = 0 gpd

Guests[1]:

- Tours and Tasting:
  - (25 guests per day) x (3 gpd per guest) = 75 gpd

The proposed peak flow is the combination of SW generated from employees and tasting room guests. Since harvest employees are not being proposed, SW flows are likely to be consistent year round.

Design Wastewater Flows

The greatest practical harvest and non-harvest season peak daily process and sanitary wastewater flows are summarized in the following table:

TABLE 3: HARVEST AND NON-HARVEST SEASON PEAK DAILY FLOW SUMMARY

Wastewater Source	Harvest (gpd)	Non-Harvest (gpd)
Winery Sanitary Wastewater (SW)	210	210
Winery Process Wastewater (PW)	1,333	492

The greatest wastewater flow from each stream is used for sizing the wastewater improvements. As summarized in the above table, the PW treatment system is proposed to have a peak design flow of 1,333 gpd and SW is proposed to have a peak discharge flow rate of 210 gpd.

Portable toilets will be utilized onsite during any temporary events to prevent sanitary wastewater flows from exceeding the peak daily amount shown in the above table.

WASTEWATER TREATMENT AND DISPERSAL METHODS

The PW and SW streams are currently treated and dispersed in an existing combined onsite wastewater treatment system (OWTS). As part of proposed improvements the PW and SW streams are proposed to be handled separately. The proposed improvements are discussed further in the following sections as well as summarized in the attached wastewater treatment diagrams.

Existing Wastewater System

The existing OWTS was originally designed in 2003 by Sterk Engineering, Inc. for a peak design flow of 950 gpd. The existing OWTS is reported to disperse PW and SW septic tank effluent (STE) through a pressure distribution (PD) dispersal field. The existing dispersal field consists of 560 lineal feet of PD laterals. A 6,210 square foot replacement area is also designated on the parcel for an evapotranspiration-infiltration (ETI) bed.

[1] Volume rate accounts for 3 gpd for restroom use

Proposed Process Wastewater System Options

Bartelt Engineering proposes to abandon and remove the existing OWTS. Several options for treatment and dispersal of winery process wastewater are proposed. An option will be selected for installation following approval of the Use Permit modification.

The winery facility's PW system is proposed to consist of several steps. The floors of the expanded winery and work area would be sloped so that all PW is collected in trench drains and floor drains. The drains would be fitted with baskets to collect a majority of the larger debris. PW collected in the existing winery building would combine with PW collected in the expanded winery building and flow by gravity to the proposed pretreatment system or holding tank.

Subsurface Drip Dispersal System with Pretreatment and Replacement System

Under this preferred option, PW collected from the winery would be pretreated prior to dispersal through a subsurface drip field. Examples of a pretreatment system include (but not limited to) Cloacina, AdvanTex or Lyve Systems. The pretreatment system selected for installation is anticipated to include a pH adjustment system, primary treatment tank equipped with an aeration system and a membrane or media filtration system.

Sizing of the subsurface drip field is based on a reported soil condition of Sandy Loam (SL) with acceptable soil to 72 inches as documented in the attached site evaluations[2]. Soil hydraulic loading rates are based on Napa County Standards and dripline manufacturer's requirements. For SL soil, Napa County recommends a soil hydraulic loading rate of 1.0 gallons per square feet per day[3]. The proposed dripline manufacturer GeoFlow Incorporated, recommends a hydraulic loading rate of 0.9 gallons per square feet per day[4]. The subsurface drip field area is calculated based on the design flow and lower hydraulic loading rate, as shown below:

$$\text{Subsurface Drip Dispersal Field Area} = \frac{\text{design flow rate}}{\text{hydraulic loading rate}} = \frac{1{,}333\ \frac{\text{gal}}{\text{day}}}{0.9\ \frac{\text{gal}}{\text{day/ft}^2}} = 1{,}482\ \text{ft}^2$$

Site slopes in the proposed subsurface drip field area are greater than 20%. Therefore, three (3) foot spacing is recommended between drip lines per Napa County Standards. Total subsurface drip area recommended is 2,223 square feet.

Per Napa County standards, a 200% subsurface drip replacement area is provided and calculated below:

Replacement Area = 200% x 1,482 ft^2 = 2,964 ft^2

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[2] Site evaluations performed by Bruce Sakai General Engineering on April 2002 and October 25, 2002 and recorded by Napa County Environmental Health staff.

[3] Hydraulic loading rate is based on *Table III-2 Soil Hydraulic Loading Rates* from Napa County Onsite Wastewater Treatment Systems (OWTS) Technical Standards, Final Draft

[4] Hydraulic loading rate is based on *Table 1 Drip Loading Rates Considering Soil Structure* from The Subsurface Drip Dispersal and Reuse Design, Installation and Maintenance Guidelines prepared by GeoFlow Incorporated, October 2007.

Based on site slopes in the proposed replacement area exceeding 20%, a minimum replacement subsurface drip field area of 4,446 square feet is recommended.

Refer to the associated Use Permit Drawings for location of the proposed subsurface drip dispersal field and replacement area.

Surface Drip Irrigation with Pretreatment

Under this alternate option, PW collected from the winery would also be pretreated prior to being beneficially reused for surface drip irrigation on designated areas where ground slopes do not exceed 30%. A PW flow balance was determined by estimating the monthly PW produced (see Table I), the average irrigation flow based on estimated turf grass irrigation demands (see Table II) and sizing a storage tank to be able to store excess treated PW effluent until it can be properly dispersed via surface drip irrigation throughout designated landscaped/turf areas (see Table IV).

The combined treated PW storage tank(s) have a minimum required volume of 78,000 gallons. Actual volume recommended is 90,000 gallons, which consists of three (3) new 30,000 gallon tanks and two (2) repurposed existing 10,500 gallon tanks (see attached Table III). These tanks provide storage of treated effluent through the winter months when surface drip land application is minimal and to equalize differences between the wastewater generation rate and the irrigation application rate. In the months where the irrigation demand exceeds the amount of treated effluent that is available for irrigation, it is assumed that the entire irrigation requirement for the landscape/turf areas is not met or that another water source (existing onsite well) is used to supply additional irrigation water.

Landscaped/turf areas where treated PW is dispersed through surface drip irrigation is based on 0.25 minimum acres located on the subject parcel. The surface dispersal area will be verified once all dispersal field setbacks are determined and a final landscape plan is provided by the Landscape Architect/Designer. Furthermore, all surface dispersal field areas are proposed to be labeled with signage indicating the use of treated wastewater for irrigation in accordance with PBES and City of Calistoga standards.

City of Calistoga Sewer Connection Replacement Option

Connection to the City of Calistoga sewer main is another recommended replacement option. Following pretreatment, PW would connect into the existing City of Calistoga sewer main that is just south of the eastern property line and within a 15 foot wide easement. An application for the proposed connection would be filed separately with the City of Calistoga. All fees and necessary monitoring requirements would be fulfilled under this replacement option.

Hold & Haul System and Replacement Area

Under this proposed alternative option, PW from the winery would be collected and stored onsite prior to being hauled offsite to an approved wastewater treatment plant (East Bay MUD or equivalent) by a Napa County PBES approved septage hauler. As summarized in Table 3, the PW Hold & Haul system is proposed to be designed for a peak daily flow of 1,333 gpd. As part of the Hold & Haul system, an approved onsite dispersal

system must be designated for winery PW as a replacement area. Options for the replacement area include the subsurface drip dispersal system and surface drip irrigation These replacement options are all discussed in more detail in the above sections.

Proposed Sanitary Wastewater System

Bartelt Engineering proposes to abandon the existing combined OWTS and discharge SW to the existing City of Calistoga municipal wastewater system. SW from the winery and tasting room building would connect to the existing City of Calistoga sewer main that is just south of the eastern property line and within a 15 foot wide easement. An application for the proposed connection would be filed separately with the City of Calistoga.

TANK SIZING

Existing Tanks

Existing collection and processing tanks include one (1) 1,500 gallon process wastewater tank, one (1) 1,200 gallon sanitary wastewater septic tank and one (1) 1,200 gallon sump tank. The existing tanks could either be incorporated into the proposed PW treatment system if feasible during the design phase, abandoned in place per Napa County Standards or removed and disposed properly offsite.

Additional tanks onsite include one (1) designated 10,500 gallon irrigation storage tank and one (1) designated 10,500 gallon fire protection tank. Both tanks are currently fed from the existing well. The existing tanks are proposed to be repurposed for landscape/turf irrigation storage.

Process Wastewater Proposed Tanks

Sizing for the proposed PW treatment tanks are based on typical tank sizing requirements for pretreatment systems. The configuration and sizing requirements may change upon selection of a manufacturer for installation. One or more of the treatment tanks could be combined into one larger compartmentalized tank if desired during the design phase.

Equalization Tank

The pretreatment system is proposed to be preceded by an equalization (EQ) tank for buffering of peak flows. The proposed EQ tank is sized to provide a minimum of three (3) days of hydraulic retention time and available volume to store decanted sludge during peak flow conditions. A fine bubble diffused air system should also be provided to keep PW adequately mixed prior to entering the primary treatment tank.

Screen or Settling Tank

A screen or settling tank may be added (if recommended by the pretreatment system manufacturer) for removal and/or settling of solids prior to entering the primary treatment tank.

Primary treatment tank

The pretreatment system manufacturer selected for installation will size the primary treatment tank, aeration system, membrane filtration system and effluent pump. The pretreatment system manufacturer may also use chemical additions for pH adjustment and nutrient additions to promote biological growth and improve treatment removal rates.

Hold & Haul Tank

Per Napa County PBES requirements, the Hold & Haul tank system must be able to store a minimum of seven (7) days of peak PW flows. The tank can be either an above ground or below grade holding tank. If an above ground tank is selected for installation, secondary containment complying with PBES requirements must be provided.

Hold & Haul Storage Tank	= 7 days x 1,333 gpd
	= 9,331 gallons, 10,000 gallons recommended

Operation and Maintenance

Per Napa County requirements, all alternative sewage treatment systems (ASTS) including winery wastewater treatment systems with pretreatment are required to have a Service Provider. The Service Provider can be a Registered Civil Engineer, Registered Environmental Health Specialist or Licensed Contractor. The PW pretreatment system manufacturer can also provide operation and maintenance services for their own system. The Service Provider would be assigned prior to operation and final approval of the installed PW system.

Surrounding Features

Based on research and knowledge of the surrounding area, there does not appear to be any caves located within 400 feet from the proposed PW dispersal areas. The City of Calistoga 1.5 million gallon municipal water storage tank is located on Mount Washington which is located at a higher elevation and 600± feet from the proposed PW dispersal area.

Conclusions

Process wastewater generated as a result of the proposed improvements, which includes expansion of the existing winery and tasting room building as well as an increase in wine production, can feasibly be treated and dispersed onsite in accordance with Napa County PBES and City of Calistoga standards. Sanitary wastewater, which is not projected to increase as a result of the proposed improvements, can feasibly be discharged to the existing City of Calistoga sewer main to be treated at the municipal wastewater treatment plant.

Full design calculations and construction plans will be completed after approval of the Use Permit Modification under consideration.

ATTACHMENTS

Proposed Wastewater Treatment Diagrams
Table I – Process Wastewater Flow
Table II – Monthly Rainfall Rates
Table III – Process Wastewater Irrigation
Table IV – Process Wastewater Irrigation Storage Tank Balance
Site Evaluations

REFERENCES

California Onsite Wastewater Association (COWA). "Pumping and Pressure Distribution Systems." May 1998.

Geoflow, Inc. "Wastewater Design, Installation and Maintenance Guidelines." v1, 2007.

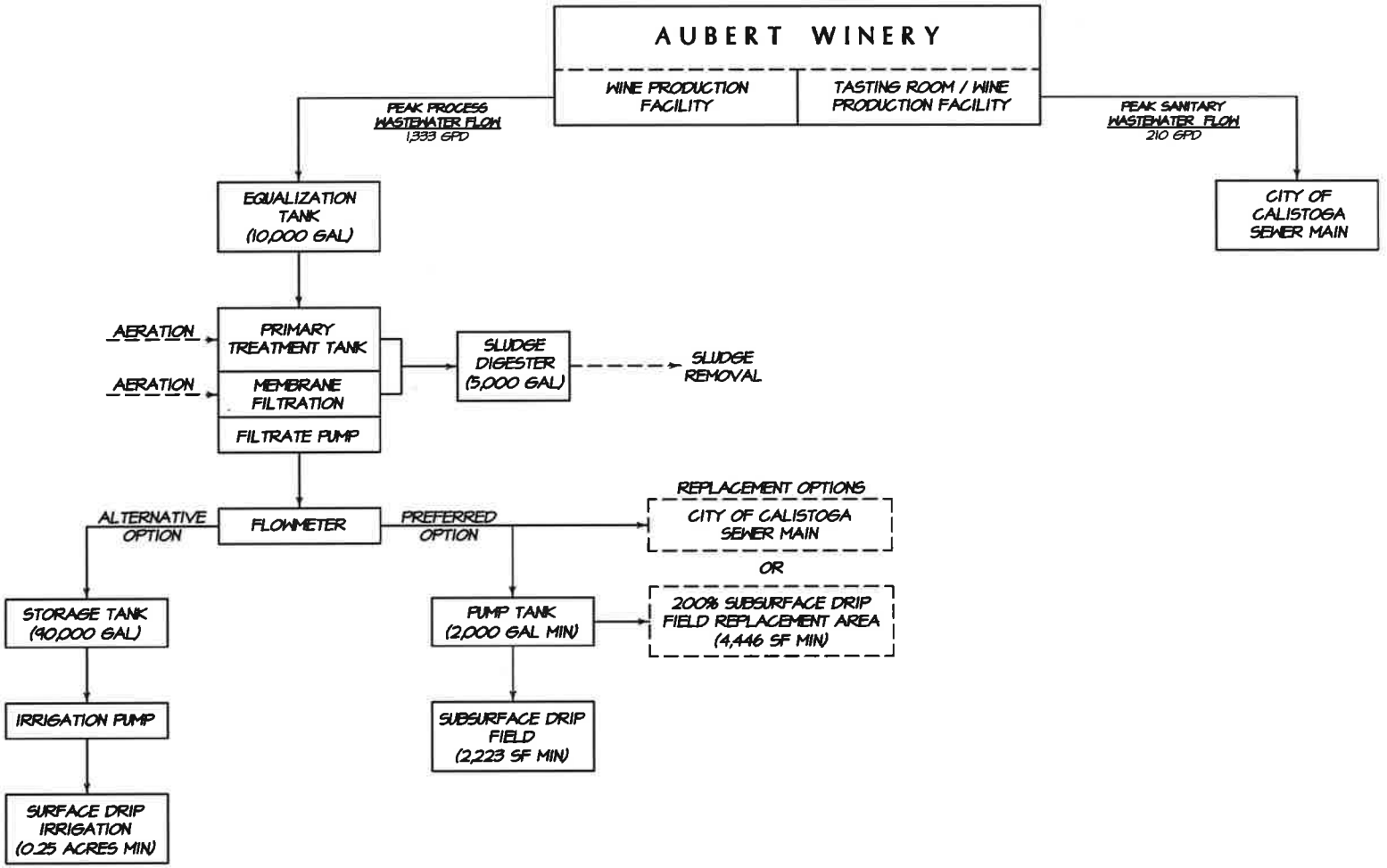
Napa County Department of Environmental Management. "Design, Construction and Installation of Alternative Sewage Treatment Systems." April 12, 2010.

Telsco Industries. "Turf Irrigation Manual." By James A. Watkins. 1987.

U.S. Department of Health, Education and Welfare, Public Health Service Publication. *Manual of Septic-Tank Practice.* 1967.

U.S. Environmental Protection Agency. "Onsite Wastewater Treatment Systems Manual." April 2002.

Napa County Planning, Building and Environmental Services, "Napa County Onsite Wastewater Treatment Systems (OWTS) Technical Standards." Final Draft.

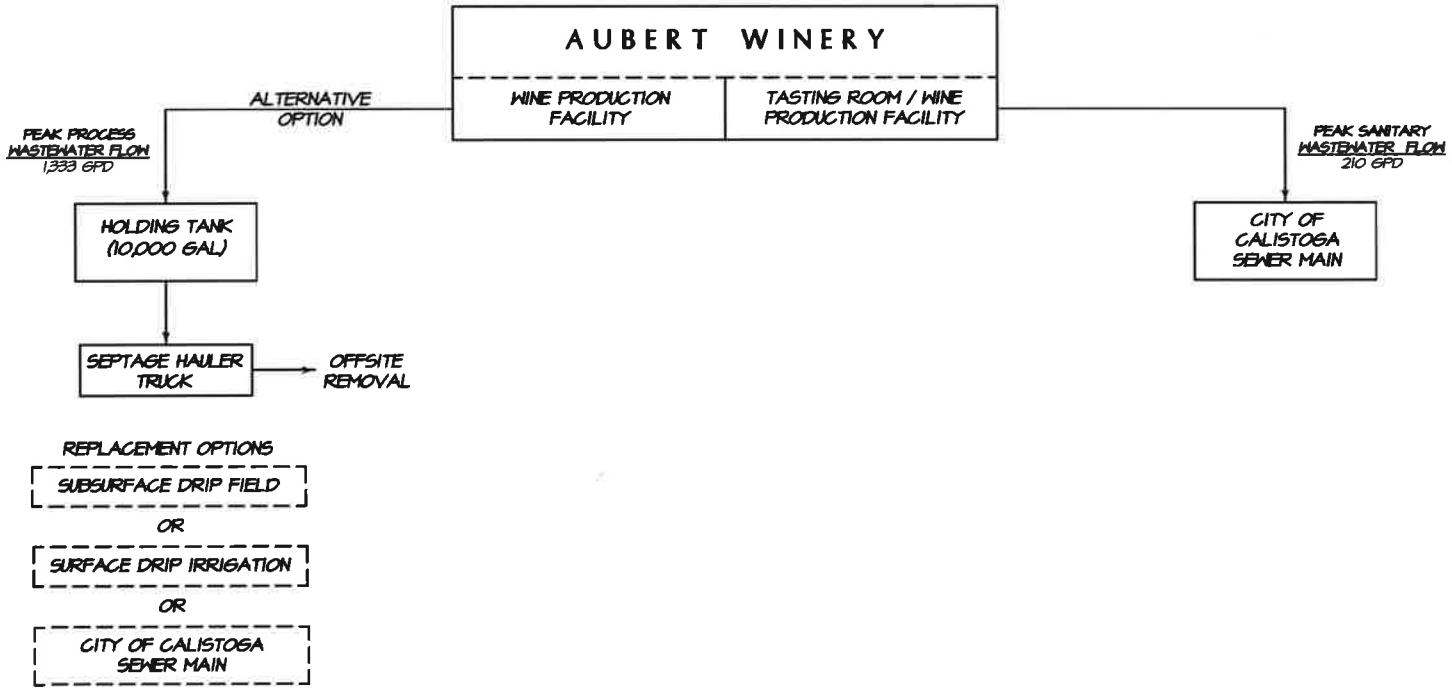


BARTELT ENGINEERING
CIVIL ENGINEERING · LAND PLANNING
1303 Jefferson Street, 200 B, Napa, CA 94559
www.barteltengineering.com
· Telephone: 707-258-1301 ·

PROPOSED WASTEWATER TREATMENT DIAGRAM

NOT TO SCALE

Aubert Winery
333 Silverado Trail
Calistoga, CA 94515
APN 011-050-031
Job No. 14-41
September 2016
Sheet 1 of 2



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NOT TO SCALE

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APN 011-050-031
Job No. 14-41
September 2016
Sheet 2 of 2

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Aubert Winery
Process Wastewater Flow
Table I

BARTELT ENGINEERING

Total annual wine production (cases):	15,000
Gallons per case of wine:	2.37
Total annual wine production (gallons):	**35,550**
Annual water usage per gallon of wine (gallons):	**6**
Annual process wastewater flow (gallons):	**213,300**
Average annual process wastewater flow (gpd):	**584**
Harvest water usage per gallon of wine (gallons):	1.5
Duration of Harvest (days):	40
Harvest process wastewater flow (gallons per day):	**1,333**
Non-harvest water usage per gallon of wine (gallons):	4.5
Duration of Non-Harvest (days):	325
Non-harvest process wastewater flow (gallons per day):	**492**

MONTHLY PROCESS WASTEWATER FLOW (gallons/month):

ESTIMATED PROCESS WASTEWATER FLOW		
Month	**Percent**	**Wastewater Flow**
September (Harvest Month)	19.6%	41,807
October (End of Harvest Season)	14.3%	30,502
November	4.3%	9,172
December	6.6%	14,078
January	2.1%	4,479
February	1.8%	3,839
March	2.6%	5,546
April	3.6%	7,679
May	7.0%	14,931
June	10.6%	22,610
July	11.6%	24,743
August (Start of Harvest Season)	15.9%	33,915
TOTALS	**100.0%**	**213,300**

Notes:

> Wastewater monthly proportioning is based on winery water usage data from 2012-2014 provided by Aubert Winery

> The annual water usage per gallon of wine is assumed to be 6 gallons

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Aubert Winery
Monthly Rainfall Rates
Table II

BARTELT ENGINEERING

Monthly Rainfall Rates		
Month	**Site Rainfall[1] (in)**	**10-year Rainfall[2] (in)**
September	0.5	0.70
October	2.0	2.80
November	4.6	6.44
December	6.3	8.82
January	8.2	11.48
February	6.7	9.38
March	5.6	7.84
April	2.2	3.08
May	1.0	1.40
June	0.3	0.42
July	0.1	0.14
August	0.1	0.14
TOTALS	**37.6**	**52.64**

1) Site rainfall from Calistoga, CA (NCDC Cooperative Stations 1990-1995); see www.worldclimate.com
2) 10 year rainfall = Site rainfall x 1.4

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Aubert Winery
Process Wastewater Irrigation
Table III

BARTELT ENGINEERING

Irrigation Method: **Surface Drip**
Ladscape/turfgrass Area (acres): **0.25**

Estimated Orchard Process Wastewater Irrigation							
Month	**Days**	**Evapotranspiration, ETo[1] (in)**	**Turfgrass Coefficient, Kc[2]**	**Turfgrass Evapotranspiration, ETc[3] (in)**	**Precipitation 10-year, $i_{10\text{-}YR}$[4] (in)**	**Crop Irrigation Demand[5] (in)**	**Total Irrigation[(6)] Available (gallons)**
September	30	5.1	0.80	4.08	0.70	3.38	22,945
October	31	3.4	0.80	2.73	2.80	0.00	0
November	30	1.8	0.80	1.44	6.44	0.00	0
December	31	0.9	0.80	0.74	8.82	0.00	0
January	31	1.2	0.80	0.99	11.48	0.00	0
February	28	1.7	0.80	1.34	9.38	0.00	0
March	31	3.4	0.80	2.73	7.84	0.00	0
April	30	4.8	0.80	3.84	3.08	0.76	5,159
May	31	6.2	0.80	4.96	1.40	3.56	24,167
June	30	6.9	0.80	5.52	0.42	5.10	34,622
July	31	7.4	0.80	5.95	0.14	5.81	39,455
August	31	6.5	0.80	5.21	0.14	5.07	34,405
TOTALS	**365**	**49.4**	**9.60**	**39.54**	**52.64**	**24**	**160,754**

1) Reference evapotranspiration (ETo) data for Napa County (Zone 8) is referenced from the Department of Water Resources California Irrigation Management Information Systems (website: www.cimis.water.ca.gov)
2) K_c coefficients for warm-season turfgrasses in California from University of California, Division of Agriculture and Natural Resources
3) $ET_c = ET_o \times K_c$
4) 10-year precipitation = Average precipitation x 1.4. See Rainfall Rates, Table II
5) Irrigation Demand = ET_c - 10-year precipitation
6) Total irrigation available (gallons/month) = (No. of acres) x irrigation demand (inches/month) / 12 (inches/foot) x 325,853 (gallons/acre-feet)

References:
> University of California, Division of Agriculture and Natural Resources, Center for Landscape & Urban Horticulture
> California Irrigation Management Information System (CIMIS)

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Aubert Winery
Process Wastewater Irrigation Storage Tank Balance
Table IV

BARTELT ENGINEERING

ESTIMATED PROCESS WASTEWATER IRRIGATION TANK BALANCE						
Month	Beginning Balance (gallons)	Wastewater Flow[1] (gallons)	Total Volume (gallons)	Minimum Irrigation Needed[2] (gallons)	Additional Irrigation (gallons)	Tank Volume (gallons)
September	0	41,807	41,807	22,945	11,012	7,849
October	7,849	30,502	38,351	0	0	38,351
November	38,351	9,172	47,523	0	0	47,523
December	47,523	14,078	61,601	0	0	61,601
January	61,601	4,479	66,080	0	0	66,080
February	66,080	3,839	69,920	0	0	69,920
March	69,920	5,546	75,465	0	0	75,465
April	75,465	7,679	83,144	5,159	0	77,985
May	77,985	14,931	92,916	24,167	8,500	60,248
June	60,248	22,610	82,858	34,622	11,012	37,224
July	37,224	24,743	61,967	39,455	11,012	11,500
August	11,500	33,915	45,415	34,405	11,012	0
	TOTALS	**213,300**		**160,754**	**52,548**	
	AVERAGE	**17,775**		**13,396**		**46,146**

Minimum Tank Volume (gallons):	78,000
Reccomended Tank Volume (gallons):	90,000
Reccomended Tank Volume (acre-feet):	0.28

1) Refer to Table I for Wastewater Flows
2) Refer to Table III for Total Irrigation Available

SER

NAPA COUNTY DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
REQUEST FOR SITE EVALUATION INSPECTION

ENVIRONMENTAL HEALTH DEPT. USE ONLY

FEE: 348.00

DATE: 2-7-02

RECEIPT: 21135

BY: PJ

rec. # 92-1390

PARCEL NUMBER: 011-050-031

JOB ADDRESS: MT. WASHINGTON SILVERADO TRAIL

OWNER: JOE BRIGGS CALISTOGA, CA RESORT DEV. CO.

TEST CONDUCTED BY: BRUCE SAKAI GENERAL ENG. 942-0578

TYPE OF TEST: FIELD ANALYSIS X 10:30

To be run on ~~2-11-02~~ MON. FRI. 3/1/02 CANCELLED at ~~PM~~ am/pm

PERCOLATION TEST _____

To be run on _____ from _____ am/pm to _____ pm

PURPOSE OF TEST: HOUSE: _____ WINERY: X OTHER: 24,000 x 15 / 45 = 800 gpd.

PROJECTED WASTEWATER FLOWS: 24,000 SPY ~~20,000 SPY~~ A/C gpd

****

PERCOLATION TEST INSPECTION RESULTS

Pre-soak checked? yes ____ no ____ Length of pre-soak: _____

Checked by: _____ Date: _____

Rate at time of inspection: _____ Stabilized perc rate: _____

Gravel and Pipe Used? yes ____ no ____ If so, take the perc rate _____ x .6 = _____ in/hr

****

TYPE OF SYSTEM APPROVED

STANDARD SYSTEM

Acceptable soil to: 72" 66" - RESERVE AREA / Assigned perc range: 1-3 / (3-6) / 6-12

Depth of trenches: 36 / Rock under pipe: 18 / Cover over rock: 12"

Lineal feet of leachline required: 600 / Plot plan received: ~~Need A/C~~

Slope: 0-15% / Surface drainage problems: (800 Req for Reserve Area w/ 30" trenches and 12" rock under the pipe.)

Additional information: _____

SPECIAL DESIGN SYSTEM DUE TO THE FOLLOWING - Size constraints: _____

Perc rate too slow: _____ /Perc rate too fast: _____ /Steep slope: _____

Insufficient soil depth: _____ /High seasonal groundwater: _____

Acceptable soil for special design: _____ /Other problems: _____

E.H. Specialist _____ Date 3/1/02

FIELD ANALYSIS

TEXTURE (In the proposed trench zone)

CLAY CONTENT

Core Hole	1	2	3	4	5	6
Low (<12)						
Mod (12-27)	X	X		X		
High (27-40)			X?			
High (>40)						

SAND CONTENT

Core Hole	1	2	3	4	5	6
High (>50)	X	X		X		
Mod (20-50)			X?			
Low (<20)						

GRAVEL, COBBLE, STONE CONTENT

Core Hole	1	2	3	4	5	6
Very High (>60)						
High(35-60)						
Mod (15-35)						
Low (<15)	X	X	X	X		

* *

STRUCTURE

SOIL DENSITY WHEN PICKED (Circle whether wet or dry)

Core Hole	1	2	3	4	5	6
pick sluffs or caves soil in			?			
pick bites and soil sluffs	X	X		X		
pick bites/ little or no soil sluffs			o			

CONSISTENCE (Circle w or d)

Core Hole	1	2	3	4	5	6
Easy	X	X		X		
Moderate						
Hard						

STRUCTURE

Core Hole	1	2	3	4	5	6
Granular						
Blocky	X	X	X	X		
Prism						
Platy						
Massive						
Cemented						

MODIFIER CHARACTERISTICS

1) Soil Survey Name: ______
2) Horizon Boundaries: Diffuse X Gradual ___ Abrupt ___
3) Topography: Concave ___ Convex ___ / Aspect: ___
4) Vegetation: Type Grass Condition: ___

* *

CORE HOLE RECORD

HOLE #1 — EST. PERC

0 to 72" — 3-6
Sandy clay loam / Sandy loam
72 to Wet soil
___ to ___

Roots: SY
Color: (bright) / dull
Water Table: 72
Dug: (easy) / hard / dusty / smear
Acceptable Soil To: 72

HOLE #2 — EST. PERC

___ to Same
___ to as
___ to #1

Roots: SY
Color: (bright) / dull
Water Table: 72
Dug: (easy) / hard / dusty / smear
Acceptable Soil To: 72

HOLE #3 — EST. PERC

___ to Too wet to sieve.
___ to More clay
___ to Possibly <1"/hr ?

Roots:
Color: bright / dull
Water Table:
Dug: easy / hard / dusty / smear
Acceptable Soil To: ?

RESERVE AREA

CORE HOLE RECORD

HOLE #4 — EST. PERC

0 to 66 — 3-6
SCL / SL
66 to Water table →
___ to ___

Roots:
Color: (bright) / dull
Water Table: 66
Dug: (easy) / hard / dusty / smear
Acceptable Soil To: 66

HOLE #5 — EST. PERC

___ to ___
___ to ___
___ to ___

Roots:
Color: bright / dull
Water Table:
Dug: easy / hard / dusty / smear
Acceptable Soil To:

HOLE #6 — EST. PERC

___ to ___
___ to ___
___ to ___

Roots:
Color: bright / dull
Water Table:
Dug: easy / hard / dusty / smear
Acceptable Soil To:

011-050-031

NAPA COUNTY DEPARTMENT OF ENVIRONMENTAL MANAGEMENT 92-13910 SP
REQUEST FOR SITE EVALUATION INSPECTION

Site eval

ENVIRONMENTAL HEALTH DEPT. USE ONLY

FEE: CONTINUATION

DATE:

RECEIPT:

BY:

PARCEL NUMBER: 011-050-031

JOB ADDRESS: MT. WASHINGTON / S. TRAIL

OWNER: BRIGGS

TEST CONDUCTED BY: SAKAI

TYPE OF TEST: FIELD ANALYSIS X

To be run on 10/25/02 at _____ am/pm

PERCOLATION TEST _____

To be run on _____ from _____ am/pm to _____ pm

PURPOSE OF TEST: HOUSE: _____ WINERY: X OTHER: _____

PROJECTED WASTEWATER FLOWS: 24,000 GPY 800 gpd

****

PERCOLATION TEST INSPECTION RESULTS

Pre-soak checked? yes ___ no ___ Length of pre-soak: _____

Checked by: _____ Date: _____

Rate at time of inspection: _____ Stabilized perc rate: _____

Gravel and Pipe Used? yes ___ no ___ If so, take the perc rate _____ x .6 = _____ in/hr

****

TYPE OF SYSTEM APPROVED

STANDARD SYSTEM

Acceptable soil to: 60" / Assigned perc range: (1-3) / 3-6 / 6-12

Depth of trenches: _____ / Rock under pipe: _____ / Cover over rock: _____

Lineal feet of leachline required: _____ / Plot plan received: 10/29/02

Slope: _____ / Surface drainage problems: _____

Additional information: HOLE # 1 (10/25/02) & HOLE # 2 (3/1/02) OK FOR STAND. SYS. HOLE # 4 (3/1/02) OK FOR RES. AREA IF MEETS WELL SETBACK. HOLES # 3 & 5 OK FOR ENG. RES. AREA.

SPECIAL DESIGN SYSTEM DUE TO THE FOLLOWING - Size constraints: _____

Perc rate too slow: _____ /Perc rate too fast: _____ /Steep slope: _____

Insufficient soil depth: ✓ /High seasonal groundwater: _____

Acceptable soil for special design: VARIES /Other problems: HOLE # 1 OK FOR STANDARD SYSTEM — HOLES # 2 & # 5 OK FOR ENG. SYS. W/O SAND. # 3 & # 4 NOT ACCEPTABLE FOR WINERY WASTE.

E.H. Specialist _____ Date 10/25/02

FIELD ANALYSIS

TEXTURE (In the proposed trench zone)

CLAY CONTENT

Core Hole	1	2	3	4	5	6
Low (<12)						
Mod (12-27)	X	X	X		X	
High (27-40)				X		
High (>40)						

SAND CONTENT

Core Hole	1	2	3	4	5	6
High (>50)	X	X	X		X	
Mod (20-50)						
Low (<20)				X		

GRAVEL, COBBLE, STONE CONTENT

Core Hole	1	2	3	4	5	6
Very High (>60)						
High (35-60)						
Mod (15-35)						
Low (<15)	X	X	X	X	X	

* *

STRUCTURE

SOIL DENSITY WHEN PICKED (Circle whether wet or dry) (dry circled)

Core Hole	1	2	3	4	5	6
pick sluffs or caves soil in						
pick bites and soil sluffs						
pick bites/ little or no soil sluffs	X	X	X	X	X	

CONSISTENCE (Circle w or d) (d circled)

Core Hole	1	2	3	4	5	6
Easy						
Moderate						
Hard	X	X	X	X	X	

STRUCTURE

Core Hole	1	2	3	4	5	6
Granular						
Blocky	X	X	X		X	
Prism						
Platy						
Massive				X		
Cemented		X	X			

MODIFIER CHARACTERISTICS

1) Soil Survey Name: BALE LOAM, CUBAR LAKE CLAY OVERWASHED ~~FORWARD KIDD COMPLEX~~

2) Horizon Boundaries: Diffuse ___ Gradual ___ Abrupt X

3) Topography: Concave ___ Convex ___ VARIES / Aspect: ___

4) Vegetation: Type GRASSES Condition: DRY

* *

CORE HOLE RECORD

HOLE #1 (EST. PERC)
- 0 to 12" VERY TIGHT SANDY LOAM — 1<3
- 12" to 48" TIGHT SANDY LOAM — 1-3
- 48" to 66" VERY TIGHT SANDY LOAM — 1<3

Roots: 42"
Color: bright (circled) / dull
Water Table: NO
Dug: easy (circled) / hard / dusty / smear
Acceptable Soil To: 66"

HOLE #2 (EST. PERC)
- 0 to 36" VERY TIGHT SANDY LOAM — 1<3
- 36" to 48" CEMENTED SAND & GRAVEL — <1"
- 48" to 66" CEMENTED SANDY CLAY — <1"

Roots: FEW / FINE
Color: bright (circled) / dull
Water Table: NO
Dug: easy (circled) / hard / dusty / smear
Acceptable Soil To: 36"

HOLE #3 (EST. PERC)
- 0 to 24" VERY TIGHT SANDY LOAM — 1<3
- 24" to 54" CEMENTED SANDY ORANGE & GRAY CLAY
- ___ to ___

Roots: 24"
Color: bright / (circled) dull
Water Table: NO
Dug: easy / hard (circled) / dusty / smear
Acceptable Soil To: 24"

CORE HOLE RECORD

HOLE #4 (EST. PERC)
- 0 to 20" VERY TIGHT SANDY LOAM — 1<3
- 20" to 42" DRY MASSIVE CLAY (SHRUNK) — <1"
- 42" to 54" LOOSE SAND & GRAVEL — >12"

Roots: FEW / FINE
Color: bright / (circled) dull
Water Table: NO
Dug: easy / hard (circled) / dusty / smear
Acceptable Soil To: 20"

HOLE #5 (EST. PERC)
- 0 to 40" VERY TIGHT SANDY LOAM — 1<3
- 40" to 60" CEMENTED ORANGE & GRAY SAND — <1"
- ___ to ___

Roots: 40"
Color: bright (circled) / dull
Water Table: NO
Dug: easy (circled) / hard / dusty / smear
Acceptable Soil To: 40"

HOLE #6 (EST. PERC)
- ___ to ___
- ___ to ___
- ___ to ___

Roots:
Color: bright / dull
Water Table:
Dug: easy / hard / dusty / smear
Acceptable Soil To: ___

Briggs
APN 011-050-031