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Wastewater Feasibility Study

Taplin P20-00165
Planning Commission Hearing May 19, 2021

DELTA CONSULTING & ENGINEERING
OF ST. HELENA

WASTEWATER FEASIBILITY REPORT

FOR THE

TAPLIN CELLARS WINERY
USE PERMIT

PROJECT LOCATED AT

1677 LEWELLING LANE
ST. HELENA, CA 94574

COUNTY: NAPA
APN: 027-100-005

MARCH 27, 2020

PREPARED FOR REVIEW BY:

NAPA COUNTY PLANNING, BUILDING
AND ENVIRONMENTAL SERVICES
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DELTA CONSULTING & ENGINEERING
OF ST. HELENA

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I. INTRODUCTION

Taplin Cellars Winery is applying to the County of Napa for a Use Permit to operate a new small winery at their 20-acre parcel near the City of St. Helena. The parcel currently consists of approximately 17.5-acres of vineyards, an approximately 5,800 square foot agricultural building, a one-bedroom main residence, and a one-bedroom guest cottage. This infrastructure is supported with an existing well water supply system and existing conventional wastewater treatment systems for the main residence and agricultural building (combined) and the guest cottage. The project proposes to convert the existing agricultural building into a wine production and hospitality facility. There are no changes proposed for the existing residential structures.

Taplin Cellars Winery proposes the following wine production and marketing plan quantities for their use permit:

- Wine Production Capacity: 20,000 Gallons / Year
- Employees: Two full-time, Two part-time
- Daily Wine Tasting Visitation (Six Days per Week, By Appointment Only):
    - 16 people, daily maximum
    - 90 people, weekly maximum
- Marketing Events:
    - Small Events: Up to Eight events per year with up to 30 guests per event (Events shall use Off-Site Catering for any food service provided for guests)
    - Wine Auction Event: One event per year with up to 100 guests per event (Events shall use Portable Toilets and Off-Site Catering for any food service provided for guests)

Wastewater from the proposed winery will be treated with a new system. There are no proposed changes to the main residence or guest cottage, so this report assumes their existing wastewater treatment systems will continue to be used in their current condition. However, there is no mapped reserve area for these systems. Therefore, this report will include wastewater flows from the main residence and guest cottage when determining the overall required reserve area.

This feasibility report has been prepared to evaluate options for treatment and disposal of wastewater generated by the proposed winery. The following sections provide a description of the various options to treat and disperse wastewater on the parcel.

II. SITE EVALUATION

A site evaluation was conducted by Delta Consulting & Engineering and witnessed by Avi Soma from Napa County Environmental Health Division on July 24, 2019. The site evaluation excavated five (5) test pits to analyze the in-situ soils and their ability to accommodate a new wastewater treatment system. Soils consisted of a mixture between sandy loam and sandy clay loam soils. The sandy loam and sandy clay loam depth varies from 64”-68” below the surface in the areas explored on-site. Based on these findings, the site was determined to have adequate soil to treat wastewater from the proposed development. The site evaluation report denoting the test pit locations and soil findings is on file at Napa County under permit E19-00344 and can be found in Appendix 1 of this report.

III. PROPOSED WASTEWATER FLOWS AND TREATMENT OPTIONS

A. WASTEWATER GENERATION

Domestic Wastewater

The DW generated at the Taplin Cellars Winery is dependent on both the existing residential structures and the daily number of proposed employees and visitors present at the winery. The proposed marketing plan presented in the introduction determines the maximum number of guests the winery wishes to serve in one day, as well as the maximum number of permanent and temporary employees that the winery needs to functionally operate. In terms of wastewater generation, this yields the maximum number of people that will be contributing to the daily peak wastewater flow rate. Based on the proposed marketing plan and Napa County Regulations[1], the following estimates for DW design flows are:

Residential:	
Main residence	One Bedroom = 150 gallons per day
Guest cottage	One Bedroom = 150 gallons per day
Peak Daily Flow:	300 gallons per day

Winery:	
Employees (Max):	4 x 15 gallons/day = 60 gallons per day
Daily Visitors (Max):	16 x 3 gallons/day = 48 gallons per day
Marketing Event (Max):	30 x 3 gallons/day = 90 gallons per day
Peak Daily Flow:	198 gallons per day

There are no changes to the existing residential domestic wastewater daily flow rate or treatment systems. The flows are noted above for inclusion in the overall required reserve area, which is shown in the wastewater treatment options exhibits located in Appendix 3. The winery domestic wastewater peak daily flow rate is estimated to be 198 GPD. The total peak domestic wastewater flow generated on the parcel is estimated to be 498 GPD.

As noted in the introduction, off-site catering will be provided for all marketing events and portable toilets will be provided for all events with more than 30 people.

Process Wastewater

The estimated PW generated at the Taplin Cellars Winery is dependent on the proposed annual production of wine. The production plan, presented in the introduction of this report, notes that the winery proposes to produce 20,000 gallons of wine per year.

Two methods of calculation typically are used to estimate the peak daily PW flow rate based on the annual production: Napa County Method and the Industry Method. The Napa County Method uses a prescriptive equation that estimates the peak daily PW flow rate during harvest. The Industry Method considers the seasonal variations of wine production to estimate a peak daily flow rate for each month of a given winemaking year.

Although both methods were considered for this report, the Industry Method will be used for design purposes for a conservative proposed design. A detailed analysis of the peak daily PW flow rate calculations is provided in Appendix 2. The summary of results of each method is shown below:

[2] Napa County Regulations for Design, Construction, and Installation of Alternative Sewage Treatment Systems, Appendix 1, Table 4, 2006.

Napa County Method

(1.5 x 20,000 gallons wine) / 30 days crush = 1,000 gallons / day peak crush day

Industry Method

Peak Month (October) = 930 gallons / day

Based on the above calculations, this report will assume a peak process wastewater flow of 1,000 gallons per day for design purposes.

B. TREATMENT OPTIONS

Option #1 – Combined Winery PW + DW ASTS Treatment System, Pressure Distribution

1. Overview
   The primary option for the treatment and dispersal of wastewater from the winery will be a pressure distribution (PD) system. The new PD system will be designed using the estimated peak flow rate of 1,198 GPD. The DW and PW will proceed through separate primary settling tanks before being combined in the secondary treatment process. Treated effluent will enter a dosing tank for pressure distribution via trenches in the vineyards. The main goal of the treatment system will be the reduction of Total Suspended Solids (TSS) and Bio-Chemical Oxygen Demand (BOD) to below 350 mg/L and 300 mg/L, respectively, before discharge to the pressure distribution trenches. The sections below detail the proposed components of the wastewater treatment system.

2. Primary Settling - DW
   Primary settling systems for domestic wastewater are typically septic tanks sized to provide a minimum three days of hydraulic retention time at peak flow rates. Based on the estimated peak daily flow rate of 198-gallons, the minimum septic tank size is approximately 600-gallons. This report proposes a 1,000-gallon septic tank with an effluent filter be installed for primary settling.

3. Primary Settling - PW
   In advanced PW treatment systems, the primary treatment system is used to remove heavy solids from the wastewater stream. Generally, screening at the source is a key component of removing grape seeds, skins, and sediment present in raw PW prior to primary settling; if not, they can disrupt the efficiency of downstream treatment components. Primary settling can consist of a sump tank and rotary screen system or a septic tank. Septic tanks should be sized to emphasize solids screening with reduced hydraulic retention times to reduce the depletion of dissolved oxygen in the wastewater. This report proposes a septic tank sized to provide a one-day hydraulic retention time during peak loading conditions with an effluent filter to prevent solids larger than 1/16" from entering the downstream treatment equipment. Based on the daily peak flow of 1,000 gallons, a 1,000-gallon septic tank will be used for primary settling.

4. Aeration Tank with Nutrient and pH Balance Equipment
   Wastewater effluent from the primary settling tanks will flow into a single aeration tank. The aeration tank is a critical part of the treatment process. In it, dissolved oxygen is supplied to the native bacteria in the wastewater which reduce the BOD concentration by consuming pollutants in the wastewater. The aeration tank must be sized to provide adequate hydraulic retention time for biological activity to

take place (8-24 hours). The amount of oxygen to be supplied is a function of the proposed reduction in BOD through this stage of treatment. In addition to dissolved oxygen, bacteria require adequate nutrients in the form of nitrogen and phosphorous as well as effluent with a pH between 6 and 9 to increase the efficiency of the aeration treatment process.

Process wastewater is typically characterized by low pH and nitrogen concentrations. At Taplin Cellars Winery, it is anticipated that magnesium hydroxide and liquid urea will be required to facilitate optimal pH and nitrogen concentrations, respectively. The above noted substances will be added to the wastewater in the aeration tank. The substances will be stored in above ground holding tanks not to exceed 500 gallons. The equipment and chemicals for this treatment process are typically provided, operated, and monitored by Heritage Systems, Inc., a water and wastewater quality contracting firm located in Napa, California.

This report proposes a 2,000-gallon underground tank for this stage of treatment, which will provide a hydraulic retention time of approximately 1.67-days at peak loading conditions. The aeration system proposes to reduce the BOD concentration from 5,000 mg/L to 500 mg/L. Because most aerators give their oxygen supply in pounds of oxygen (lbs O_2), the desired reduction in BOD5 must be converted from mg/L to lbs O_2 in order to select the appropriate aerator configuration. The conversion is shown below:

BOD (lbs/day) = (Daily Flow MGD) x (BOD mg/L) x (Conversion Constant 8.34 lbs/gal)
BOD (lbs/day) = (0.0012 MGD) x (5,000 - 500 mg/L) x (8.34 lbs/gal)
BOD (lbs/day) = 45 lbs/day

From the calculation shown above, approximately 45 lbs O_2 / day is required for the desired reduction in BOD. Aeration can be provided by equipment placed within the tank or by an above ground blower motor placed on a pad adjacent to the tank. Either option may be used for this system and final sizing will be determined at the construction document phase.

It is assumed that there will be no reduction of TSS in the aeration tank. A summary of the wastewater strength characteristics after the aeration tank is shown below:

BOD = 500 mg/L
TSS = 300 mg/L

Wastewater from the aeration tank will flow via gravity to the secondary settling tank.

5. Secondary Settling

Secondary settling is an important part of any treatment system that involves aeration. Aeration keeps solids suspended in solution by the air bubbles that are forced through the wastewater. The secondary settling tank allows suspended solids time to settle out of solution prior to entering the filtration system. This report proposes a 2,000-gallon secondary settling tank which will provide approximately 1.67-days of hydraulic retention time. There will be no baffle, and the tank will be fitted with an effluent filter sized to screen solids larger than 1/32" in diameter. The secondary settling tank is expected to reduce the TSS by 20% through gravitational settling and filter screening. The settling tank is expected to provide an additional 10% reduction in BOD, as biological processes will continue to take place in the tank. A summary of the estimated wastewater strength characteristics after this stage of treatment are shown below:

BOD = 450 mg/L
TSS = 240 mg/L

Wastewater from the secondary settling tank will flow via gravity to the filtration system.

6. Orenco Advantex Filtration System

An additional stage of biological treatment is required to further reduce wastewater strength. The Advantex filtration system, manufactured by Orenco Systems, is a fixed media filter designed to reduce BOD and TSS in the effluent. Properly sized Orenco Advantex units can reduce up to 90% of the BOD and TSS present in wastewater.

To maximize the treatment process and prevent fouling in the filter media, Orenco recommends that a peak daily load of 0.08 pounds of BOD per square foot of filter area per day (lbs/ft^2/day) should not be exceeded. The expected loading to the filter is based on the peak daily flow rate and influent BOD concentration. The conversion to pounds of BOD is estimated using the equation described in the aeration tank section above. The ratio between the actual and recommended BOD loading provides the minimum filter area required.

Organic Loading Rate
BOD (lbs/day) = (0.0012 MGD) x (450 mg/L) x (8.34 lbs/gal)
BOD (lbs/day) = 4.5 lbs/day

Minimum Filter Area (ft^2) = Peak Daily Load lbs BOD/day / 0.08 lbs BOD/ft^2/day
Minimum Filter Area (ft^2) = 4.0 lbs BOD/day / 0.08 lbs BOD/ft^2/day
Minimum Filter Area (ft^2) = 56 ft^2

For this system, three AX-20 filters are recommended. Each AX-20 unit provides 20 ft^2 of filter area for a total of 60 ft^2 of filter area. An underground pump tank is used to circulate effluent through the media filter. This is called a recirculation tank and Orenco recommends the tank volume be sized for 80% of the peak daily flow rate. Based on the peak daily flow of 1,198-gallons, the minimum recirculation tank size is approximately 950-gallons. This report proposes a minimum recirculation tank size of 2,000-gallons to help attenuate any flow surges that may occur during peak water use days.

It is assumed that the system will provide an 80% reduction in BOD and TSS under normal operating conditions. A summary of the estimated wastewater strength characteristics after this stage of treatment are shown below:

BOD = 90 mg/L
TSS = 48 mg/L

At this point in the treatment process, the BOD and TSS constituents will be below the required threshold of 300 mg/L and 350 mg/L and can be dispersed into the pressure distribution leach field. The treated wastewater will gravity flow into the dosing tank for dispersal to the pressure distribution leach field.

7. Dosing Tank

The dosing tank stores treated wastewater prior to distribution to the proposed dispersal field. At minimum, the tank must be sized to store 1.5 times the peak daily flow rate. The minimum tank size for the wastewater system is 1,797 gallons. A 2,000-gallon underground tank equipped with duplex pumps is proposed for this project.

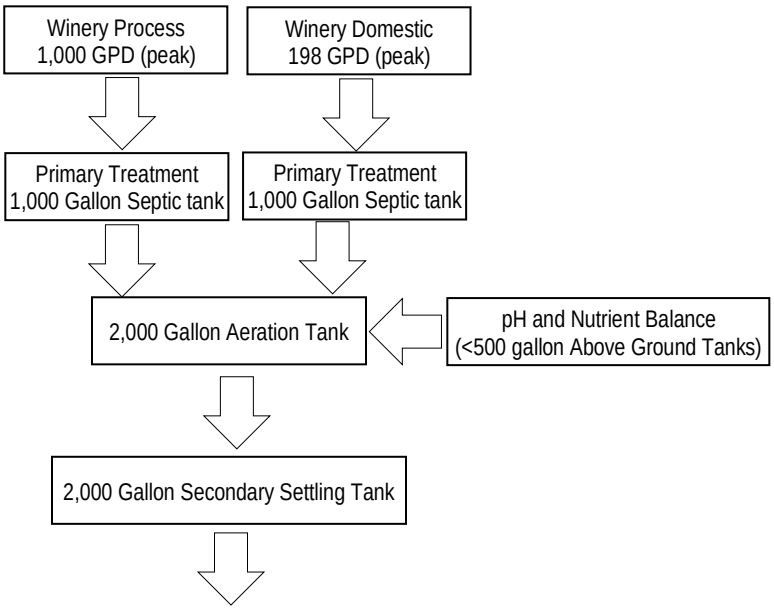
8. Pressure Distribution Field and Reserve Area

A new pressure distribution (PD) wastewater system will be used to infiltrate treated process wastewater on-site. Based on the site evaluation report, the PD field will be in Sandy Loam soil with a limiting depth of 64". The design soil application rate is 0.8 gal/ft^2/day and the primary PD field will be located over test pits #1 and #2. A 36" undisturbed soil depth below trench will be used. A 28" deep trench with a 16" gravel section and 12" native back fill to grade is proposed.

To determine the total length of PD trench required, the peak daily flow rate of 1,198-gallons is divided by the application rate of 0.8 gal/ft^2/day. This results in a minimum dispersal sidewall area of 1,498-ft^2. This must be divided by the effective infiltrative surface area (EISA) of the trench. The EISA is calculated as two times the depth of trench below the top of the distribution lateral. With a total proposed gravel section depth of 16", there will be 14" of gravel below the top of the distribution lateral. Therefore, the EISA is 2.33 ft^2/ft. Dividing 1,498 ft^2 by 2.33 ft^2/feet results in a minimum distribution lateral length of 643 linear feet (LF). Flat topography allows for the use of a minimum 5-foot trench spacing. The proposed pressure distribution system shall consist of 7 lines at 92 feet each for a total length of 644 LF.

The wastewater system is required to have a reserve area if case the primary system fails. The reserve area for the winery pressure distribution leach field system must be 100% of the primary area. The reserve field will be located over test pits #3 and #4, which have the same properties as the primary field. Therefore, the reserve area will be the same size as the primary area.

Please see the Wastewater Treatment Options Exhibits located in Appendix 3 for a site map showing the preliminary location of the proposed pressure distribution system. A general schematic of the proposed Option #1 layout is provided in Figure 2 below.



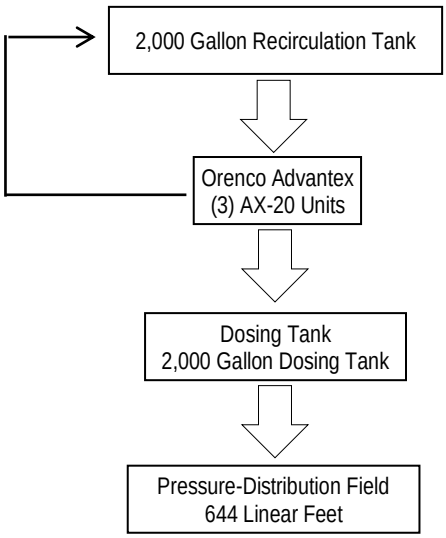


Figure 2: Proposed WWTS Option #1 Schematic

Option #2 – Combined Winery PW + DW ASTS Treatment System, Sub-Surface Drip

1. Combined Winery PW + DW Treatment System
   This option would utilize the same treatment system described in Option #1, with the addition of a second stage of Orenco Advantex Filtration. The second stage is required to meet Napa County sub-surface drip dispersal pre-treatment standards of reducing both BOD and TSS concentrations to 30 mg/L or below.

2. Orenco Advantex Filtration System – Stage Two
   The secondary stage of Advantex Treatment will follow the same design parameters as the first, including the use of an additional 2,000-gallon re-circulation tank. Effluent concentrations from the last stage of treatment described in Option #1 are used as the starting point (effluent from the recirculation tank). Utilizing the same procedure described above, the minimum square footage required for the Advantex Filtration Unit can be determined as follows:

   Organic Loading Rate
   BOD (lbs/day) = (0.0012 MGD) x (90 mg/L) x (8.34 lbs/gal)
   BOD (lbs/day) = 1.0 lbs/day

   Minimum Filter Area (ft^2) = Peak Daily Load lbs BOD/day / 0.08 lbs BOD/ft^2/day
   Minimum Filter Area (ft^2) = 1.0 lbs BOD/day / 0.08 lbs BOD/ft^2/day
   Minimum Filter Area (ft^2) = 12.5 ft^2

Through the secondary stage treatment, an estimated 12.5 ft^2 of filter area is required for the second stage of Orenco Advantex treatment. This report proposes to use one AX-20 unit. A summary of the estimated wastewater strength characteristics after this stage of treatment are shown below:

BOD = 10 mg/L
TSS = 10 mg/L

Treated wastewater will flow via gravity from the second stage of filtration to the 2,000-gallon dosing tank to distribute water to the SSD field.

3. Sub-Surface Drip Field

A sub-surface drip (SSD) system will be used to disperse treated wastewater. The new SSD field will be located over test pits #1 and #2. Based on the Sandy Loam found in the test pits, an application rate of 0.9 gal/ft^2/day was used to design the total area required for the primary dispersal area.

To determine the required dispersal area, the peak daily flow rate of 1,198 gallons is divided by the application rate of 0.9 gal/ft^2/day. This results in a minimum dispersal area of 1,332 ft^2. The flat topography on-site allows for a minimum drip line spacing of 2 feet. The minimum required length of drip lines is 666 LF. The proposed SSD system shall consist of three lines at 222 feet each for a total length of 666 LF.

The wastewater system is also required to have a reserve area in the event that the primary system fails. The reserve area for the SSD system must be 200% of the primary area. The 2,664 square foot reserve field will also be located over test pits #1 and #2.

Please see the Wastewater Field Exhibit located in Appendix 3 for the preliminary layout of the proposed SSD system.

Option #3 – Winery DW: Conventional System, Winery PW: Surface Drip Irrigation

1. Winery DW: Conventional System

This option proposes to separate the wastewater streams and treat winery DW with a conventional leach field system. Prior to the leach field, a septic tank with an effluent filter will be installed for primary treatment of the domestic wastewater per Napa County regulations. Septic tank effluent will then flow via gravity to a new conventional leach field. Based on the site evaluation report, the conventional field will be in Sandy Loam soil with a limiting depth of 64". The design soil application rate is 0.5 gal/ft^2/day and the primary PD field will be located over test pits #1 and #2. A 36" undisturbed soil depth below trench will be used. A 28" deep trench with a 16" gravel section and 12" native back fill to grade is proposed.

To determine the total length of PD trench required, the peak daily flow rate of 198-gallons is divided by the application rate of 0.5 gal/ft^2/day. This results in a minimum dispersal sidewall area of 396-ft^2. This must be divided by the effective infiltrative surface area (EISA) of the trench. The EISA is calculated as two times the depth of trench below the top of the distribution lateral. With a total proposed gravel section depth of 16", there will be 14" of gravel below the top of the distribution lateral. Therefore, the EISA is 2.33 ft^2/ft. Dividing 396 ft^2 by 2.33 ft^2/feet results in a minimum distribution lateral length of 170 linear feet (LF). Flat topography allows for the use of a minimum 5-foot trench spacing. The proposed pressure distribution system shall consist of 2 lines at 85 feet each for a total length of 170 LF.

The wastewater system is required to have a reserve area if case the primary system fails. The reserve area for the winery pressure distribution leach field system must be 100% of the primary area. The reserve field will also be located over test pits #1 and #2, which have the same properties as the primary field. Therefore, the reserve area will be the same size as the primary area.

2. Winery PW: Surface Drip Irrigation

This option proposes to separate the wastewater streams and treat winery PW with a surface drip irrigation system. For these systems, Napa County requires a pre-treatment system to reduce the BOD_5 and TSS to below 160 mg/L and 80 mg/L, respectively. Additionally, settleable soils must be reduced to 1.0 mg/L or below. This system shall utilize the same treatment system as described in Option #1. After pre-treatment, the effluent the effluent will be pumped to an above ground storage tank system. The above ground storage tank system shall be sized to allow enough volume for storage while discharge to land is prohibited for 48-hours prior to, during, or 48-hours after a rainfall event or when soils are saturated. Preliminary minimum sizing of the above ground storage tank system is 8,700-gallons. This report proposes to utilize a 10,000-gallon above ground plastic tank. A pump equipment pad will be installed immediately adjacent to the tanks for dispersal to the surface drip system.

This report proposes to utilize the parcels large vineyard area for surface drip irrigation dispersal. Based on the water balance calculations provided in Appendix 2, a minimum 2,040-linear feet of drip tubing is required, assuming the drip tube emitters are spaced at four feet. The parcel contains approximately 17.5-acres of vineyards. The vine rows on the east side of the winery are approximately 300-feet long. This report proposes a preliminary surface drip irrigation line layout of ten 204-ft long drip tubes with emitters spaced at four-foot intervals along the tubing. A preliminary layout of this system is provided in Appendix 3.

IV. CONCLUSION

Taplin Cellars Winery is applying to Napa County for a Use Permit to operate a new small winery production and hospitality facility on their 20-acre parcel near St. Helena. Based on the findings of site evaluation E19-00344 and the preliminary design options described in this report, the Taplin Cellars Winery project is feasible with regard to on-site wastewater treatment. See Appendix 3 for the proposed sizes and location of the primary and reserve areas for the various systems described in the sections above. Detailed calculations and construction plans will be submitted to the Napa County Environmental Health Division for approval prior to the construction of the final treatment and dispersal system.

V. APPENDIX

1 Site Evaluation Report
2 Wastewater Treatment Options: Calculations
3 Wastewater Treatment Options: Exhibits

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OF ST. HELENA

APPENDIX 1:
SITE EVALUATION REPORT

Napa County Department of Environmental Management

SITE EVALUATION REPORT

Please attach an 8.5" x 11" plot map showing the locations of all test pits triangulated from permanent landmarks or known property corners. The map must be drawn to scale and include a North arrow, surrounding geographic and topographic features, direction and % slope, distance to drainages, water bodies, potential areas for flooding, unstable landforms, existing or proposed roads, structures, utilities, domestic water supplies, wells, ponds, existing wastewater treatment systems and facilities.

Permit #:	E19-00344
APN:	027-100-005
(County Use Only) Reviewed by:	Date:

PLEASE PRINT OR TYPE ALL INFORMATION

Property Owner: Bill Taplin	☒ New Construction ☐ Addition ☒ Remodel ☐ Relocation ☐ Other:
Property Owner Mailing Address: P.O. Box 32	☐ Residential - # of Bedrooms: Design Flow : gpd
City: St. Helena State: CA Zip: 94574	☒ Commercial – Type: Sanitary Waste: TBD gpd Process Waste: TBD gpd
Site Address/Location: 1677 Lewelling Lane, St. Helena CA 94574	☐ Other: Sanitary Waste: gpd Process Waste: gpd

Evaluation Conducted By:

Company Name: **Delta Consulting & Engineering**	Evaluator's Name: Andrew Simpson, P.E.	Signature (Civil Engineer, R.E.H.S., Geologist, Soil Scientist)
Mailing Address: **1104 Adams Street, #203**		Telephone Number: **707/963-8456**
City: **St. Helena** State: **CA** Zip: **94574**		Date Evaluation Conducted: 07-24-2019

Primary Area	**Expansion Area**
Acceptable Soil Depth: 64 in. Test pit #'s: 1, 2, & 5	Acceptable Soil Depth: 64 in. Test pit #'s: 3 & 4
Soil Application Rate (gal. /sq. ft. /day): TBD	Soil Application Rate (gal. /sq. ft. /day): TBD
System Type(s) Recommended: TBD	System Type(s) Recommended: TBD
Slope: <3 %. Distance to nearest water source: >100 ft.	Slope: <3 %. Distance to nearest water source: >100 ft.
Hydrometer test performed? No ☒ Yes ☐ (attach results)	Hydrometer test performed? No ☒ Yes ☐ (attach results)
Bulk Density test performed? No ☒ Yes ☐ (attach results)	Bulk Density test performed? No ☒ Yes ☐ (attach results)
Percolation test performed? No ☒ Yes ☐ (attach results)	Percolation test performed? No ☒ Yes ☐ (attach results)
Groundwater Monitoring Performed? No ☒ Yes ☐ (attach results)	Groundwater Monitoring Performed? No ☒ Yes ☐ (attach results)

Site constraints/Recommendations:

This site evaluation was performed to establish primary and secondary areas for future wastewater dispersal on the subject parcel. Based on the soil encounter in the field, the soil will allow for a standard, a sub-surface, or a pressure distribution system to be installed.

Test Pit # 1

PLEASE PRINT OR TYPE ALL INFORMATION

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-7	TOP									
7-64	C	<40	SL	M/SB	M	FRB	NS	M/C	GRAPE R.	N/A

Test Pit # 2

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-7	TOP									
7-64	C	<40	SL	M/SB	S	FRB	NS	M/C	GRAPE R.	N/A

Test Pit # 3

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-7	TOP									
7-68	C	<35	SL	M/SB	M	FRB	NS	M/C	GRAPE R.	N/A

Attach additional sheets as needed

Test Pit # 4

PLEASE PRINT OR TYPE ALL INFORMATION

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-7	TOP									
7-65	C	<35	SCL	M/SB	SH	F	NS	M/C	GRAPE R	N/A

Test Pit # 5

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-7	TOP									
7-64	C	<40	SL	M/SB	SH	FRB	NS	M/C	GRAPE R.	N/A

Test Pit #

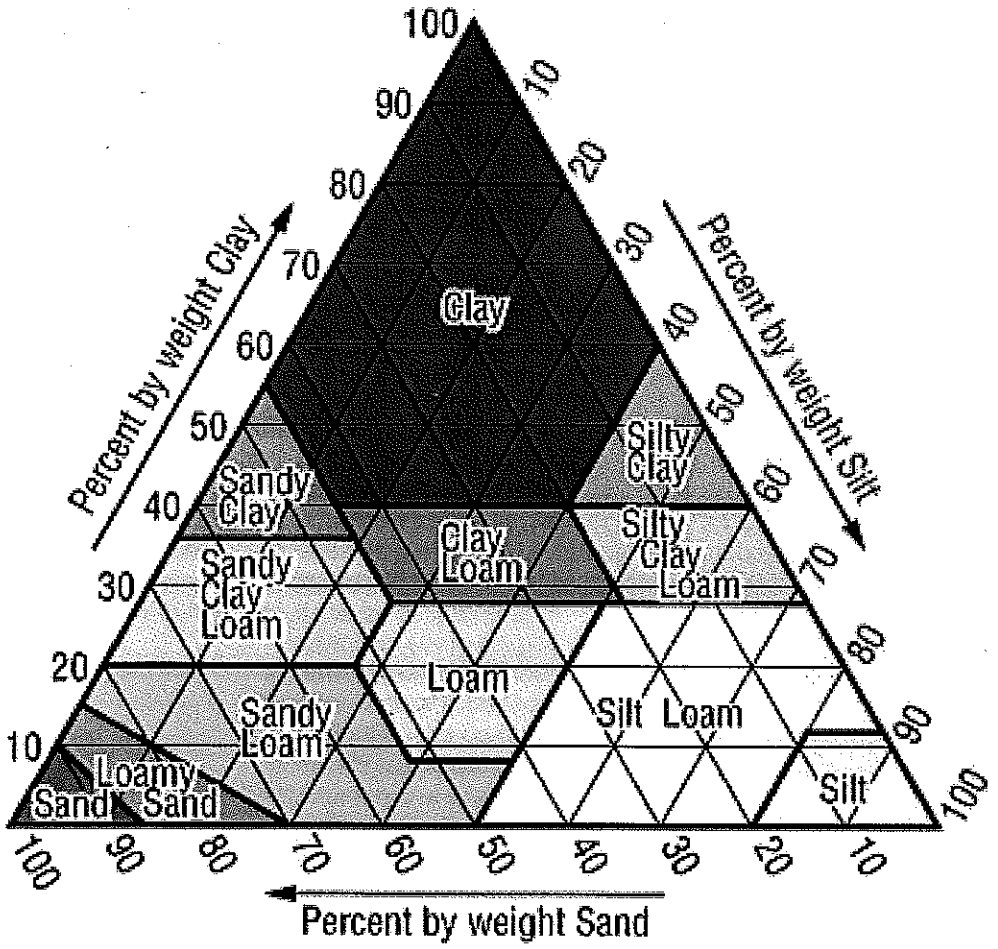
Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			

Attach additional sheets as needed

ABBREVIATIONS

Boundary	Texture	Structure	Consistence			Pores	Roots	Mottling
			Side Wall	Ped	Wet			
A=Abrupt <1"	**S**=Sand	**W**=Weak	**L**=Loose	**L**=Loose	**NS**=NonSticky	**Quantity:**	**Quantity:**	**Quantity:**
C=Clear 1"-2.5"	**LS**=Loamy Sand	**M**=Moderate	**S**=Soft	**VFRB**=Very Friable	**SS**=Slightly Sticky	**F**=Few	**F**=Few	**F**=Few
G=Gradual 2.5"-5"	**SL**=Sandy Loam	**S**=Strong	**SH**=Slightly Hard	**FRB**=Friable	**S**=Sticky	**C**=Common	**C**=Common	**C**=Common
D=Difuse >5"	**SCL**=Sandy Clay Loam	**G**=Granular	**H**=Hard	**F**=Firm	**VS**=Very Sticky	**M**=Many	**M**=Many	**M**=Many
	SC=Sandy Clay	**Pl**=Platy	**VH**=Very Hard	**VF**=Very Firm	**NP**=NonPlastic	**Size:**	**Size:**	**Size:**
	CL=Clay Loam	**Pr**=Prismatic	**ExH**=Extremely Hard	**ExF**=Extremely Firm	**SP**=Slightly Plastic	**VF**=Very Fine	**F**=Fine	**F**=Fine
	L=Loam	**C**=Columnar			**P**=Plastic	**F**=Fine	**M**=Medium	**M**=Medium
	C=Clay	**AB**=Angular Blocky			**VP**=Very Plastic	**M**=Medium	**C**=Coarse	**C**=Coarse
	SiC=Silty Clay	**SB**=Subangular Blocky				**C**=Coarse	**VC**=Very Coarse	**Contrast:**
	SiCL=Silty Clay Loam	**M**=Massive				**VC**=Very Coarse	**ExC**=Extremely Coarse	**Ft**=Faint
	SiL=Silt Loam	**SG**=Single Grain						**D**=Distinct
	Si=Silt	**C**=Cemented						**P**=Prominent

U.S.D.A. SOIL CLASSIFICATION TRIANGLE



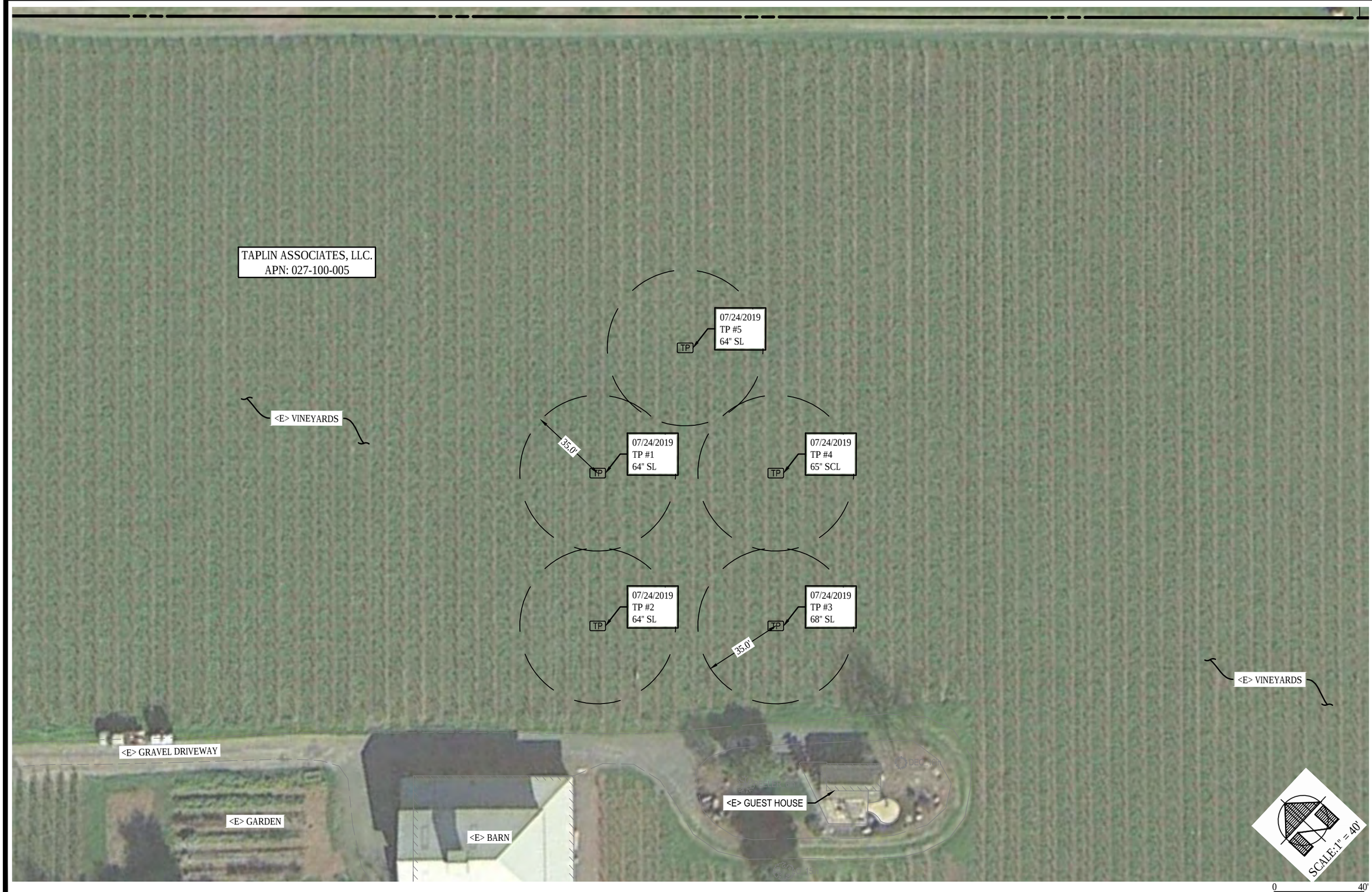
SITE EVALUATION: OVERALL SITE PLAN

TAPLIN CELLARS
OVERALL SITE PLAN

NAPA CA

DELTA CONSULTING & ENGINEERING
OF ST. HELENA
1104 ADAMS STREET, SUITE 203 - ST. HELENA, CALIFORNIA 94574
707-963-8456 + 707-963-8528 FAX

DATE:	07-24-2019
SCALE:	1"=60'
JOB #:	R-101
APN:	027-100-005



SITE EVALUATION: SITE PLAN

TAPLIN CELLARS
SITE PLAN

NAPA CA

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OF ST. HELENA
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707-963-8456 + 707-963-8528 FAX

DATE:	07-24-2019
SCALE:	1"=40'
JOB #:	R-101
APN:	027-100-005

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APPENDIX 2:
WASTEWATER TREATMENT OPTIONS: CALCULATIONS

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Taplin Cellars Winery Use Permit
1677 Lewelling Lane
St. Helena, CA 94574
NCAPN: 027-100-005

Project Description:
Taplin Cellars Winery is applying to the County of Napa for a Use Permit to operate a new small winery at their 20-acre parcel near the City of St. Helena. The parcel currently consists of approximately 17.5-acres of vineyards, an approximately 5,800 square foot agricultural building, a one-bedroom main residence, and a one-bedroom guest cottage. This infrastructure is supported with an existing well water supply system and existing conventional wastewater treatment systems for the main residence and agricultural building (combined) and the guest cottage. The project proposes to convert the existing agricultural building into a wine production and hospitality facility. There are no changes proposed for the existing residential structures. Taplin Cellars Winery proposes the wine production and marketing plan quantities shown in the design waste flows section below for their use permit.

Wastewater from the proposed winery will be treated with a new system. There are no proposed changes to the main residence or guest cottage, so these calculations assume their existing wastewater treatment systems will continue to be used in their current condition. The reserve area for these systems is shown on the site map exhibits in Appendix 3 of the Wastewater Feasibility Study.

These calculations have been prepared to evaluate options for treatment and disposal of wastewater generated by the proposed winery. The following sections provide a preliminary sizing of the various options to treat and disperse wastewater on the parcel.

Site Evaluation Summary

Performed By:	Delta		Soil Type:	(SL) Sandy Loam	
Site Evaluation Date:	7/24/2019		Structure-Grade:	(M) Moderate	
:Primary Acceptable Core Hole #'s:	1 & 2		Structure-Shape:	(SB) Subangular Blocky	
Reserve Core Hole #s:	3 & 5				
Pretreatment Credit?	Not Required			Application Rate	
		Use STE--->	Conventional:	0.5	gal/ft^2/day
Acceptable Soil to:	64	in	Pressure Distribution:	0.8	gal/ft^2/day
			Sub-Surface Drip:	0.9	gal/ft^2/day

Design Waste Flows from Proposed Winery

Winery Domestic Flows (Peak Daily)

	#	gal/person	Total GPD
Employees:	4	15	60
Daily Tasting Visitors:	16	3	48
Events*:	30	3	90
		Total:	198

** All events will be catered by an off-site company.*

Winery Process Flows (Peak Daily)

GPY of Wine	Days Crush	Total GPD
20,000	30	1,000
	Total:	1,000

Total Winery Flows =	1,198	
Total Residential Flows =	0	
Total Design Flows =	1,198	gallons per day

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Pressure Distribution System: Preliminary Trench Design

Acceptable Soil to:	64	in	
Undisturbed Soil Below Trench Bottom:	36	in	No Pretreatment Required
Remaining Soil for Trench:	28	in	No soil cap required
Gravel or Chamber Section	Gravel		

Chamber section (if applicable):

Chamber Manufacturer (if applicable):	Infiltrator Systems		
Depth of Chamber):	-	in	Use Gravel section
Width of Chamber	-	in	

Gravel section (if applicable):

Gravel over Pipe Crown:	2	in	
Pipe Crown to Trench Bottom (Gravel Depth):	14	in	Gravel depth OK

Trench Design:

Existing Ground to Top of Gravel or Chamber:	12	in	Section OK
Soil Cap above Existing Ground	0	in	Soil cap OK
Depth of Trench:	28	in	Total Trench Depth OK
Available Sidewall Area:	2.33	ft^2/ft	Sidewall OK
Average Slope-Distribution Field:	0-5%		
Trench Spacing:	5	ft	

Note: No soil cap required over distibution field

Pressure Distribution System: Preliminary Field Sizing

Trench Sidewall Required:	1498	ft^2
Total Length of Distribution Pipe:	642	ft
Number of Distribution Laterals:	7	
Average Length of Each Lateral:	92	ft
Number of Dosing Zones:	1	
Laterals per Zone:	7	

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Subsurface Drip System: Preliminary Design

Acceptable Soil to:	64		
Undisturbed Soil Below Line Bottom:	24	in	Requires Pretreatment
Remaining Acceptable Soil for Drip Hose:	40		
Required Depth of Drip Hose:	6	in	
Soil Cover above Existing Ground:	0	in	Note: No soil cap required over distibution field
Drip Hose Spacing Methond:	County		
Average Slope-Distribution Field:	0-20%		
Drip Hose Spacing:	2.0	ft	

Subsurface Drip System: Preliminary Distribution Field Sizing

Minimum Primary Area Required:	1,332	ft²
Primary Area Required with 2 ft Trench Spacing:	1,332	ft²
200% Reserve Area Required:	2,664	ft²

Subsurface Drip System: Preliminary Distribution Field Layout and Flow

Number of Zones:	1	zone(s)	
Zone Valve Type:	None		-

Flow *Per Zone*

Primary Dispersal Area *Per Zone:*	1332	square ft.
Total Linear Feet *Per Zone:*	666	ft. per zone
Average Length of Single Line:	222	ft
Minimum Number of Laterals Required *Per Zone* :	3	laterals
Spacing between WASTEFLOW emitters:	2	ft.
Total number of emitters *Per Zone* :	333	emitters per zone
Select Wasteflow dripline (16mm):	Wasteflow PC - 1gph	dripline
Pressure at the beginning of the dripfield:	40	psi
Feet of Head at the beginning of the dripfield:	92.4	ft.
Flow rate per emitter in gph:	1.02	gph
Dose flow *Per Zone* :	5.66	gpm

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Conventional System: Preliminary Trench Design, Winery Domestic Wastewater Only

Acceptable Soil to:	64	in	
Undisturbed Soil Below Trench Bottom:	36	in	No Pretreatment Required
Remaining Soil for Trench:	28	in	No soil cap required
Gravel or Chamber Section	Gravel		

Chamber section (if applicable):

Chamber Manufacturer (if applicable):	None		
Depth of Chamber):	-		Use Gravel section
Width of Chamber	-	in	

Gravel section (if applicable):

Gravel over Pipe Crown:	2	in	
Pipe Crown to Trench Bottom (Gravel Depth):	14	in	Gravel depth OK

Trench Design:

Existing Ground to Top of Gravel or Chamber:	12	in	Section OK
Soil Cap above Existing Ground	0	in	Soil cap OK
Depth of Trench:	28	in	Total Trench Depth OK
Available Sidewall Area:	2.33	ft^2/ft	Sidewall OK
Average Slope-Distribution Field:	0-5%		
Trench Spacing:	5	ft	

Note: No soil cap required over distibution field

Conventional System: Preliminary Field Sizing, Winery Domestic Wastewater Only

Trench Sidewall Area Required:	396	ft^2
Total Length of Distribution Pipe:	170	ft
Number of Distribution Laterals:	2	
Minimum Lateral Length:	85	ft

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Surface Drip Disposal & Storage Tank Volume - Option #3 (Winery PW Only)

Land Application Irrigation Data: Surface Drip System Layout Parameters

Dispersal Field Sizing		
Maximum Daily Soil Application Rate:	0.80	gal/ft^2/day
Maximum Flow Rate:	1,280	gallons/day (based on Monthly Flow/Available Application Days)
Minimum Dispersal Area Required:	1600	ft^2

Drip Emitter Soak Radius	1	ft
Drip Emitter Soak Area	3.14	ft^2
Minimum # of Emitters	510	
Drip Tube Emitter Spacing	4	ft
Minimum Drip Tube Lateral Length	2,040	ft

Irrigation Information Based on Surface Drip System

Minimum Required Wet Weather Storage Volume: 8,700 gallons
Treated Wastewater Flow Source: Process Only

	1-Jan	1-Feb	1-Mar	1-Apr	1-May	1-Jun	1-Jul	1-Aug	1-Sep	1-Oct	1-Nov	1-Dec
Days per Month:	31	28	31	30	31	30	31	31	30	31	30	31
Estimated Available Application Days:	10	10	15	20	31	30	31	31	30	25	15	10
Montly WW Application (gallons):	9,600	8,000	8,000	8,000	8,000	8,000	9,600	19,200	27,200	28,800	12,800	12,800
Daily WW Application (gallons):	960	800	533	400	258	267	310	619	907	1,152	853	1,280
WW Application Rate[1, 2] (in/day):	0.96	0.80	0.53	0.40	0.26	0.27	0.31	0.62	0.91	1.16	0.86	1.28
Plant Uptake[3] (in/day):	0.01	0.02	0.06	0.08	0.28	0.32	0.32	0.08	0.05	0.03	0.02	0.01
Infiltration Rate (in/day):	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Net Peak Daily[4] (in/day):	4.81	4.98	5.28	5.44	5.78	5.81	5.77	5.22	4.90	4.64	4.92	4.49
Uptake & Infiltration Exceed Application:	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Available Storage[5] (days):	28.1	30.5	33.7	32.6	33.7	32.6	28.1	14.0	9.6	9.4	20.4	21.1
Wet Weather Storage Met:	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

[1] Gallons converted to inches by converting gallons to cubic feet, dividing total cubic feet by Surface Drip Dispersal Area, and multiplying by 12 to convert from feet to inches
[2] WW Application Rate (in/day) based on Monthly WW application divided by the number of available application days in that particular month.
[3] Total Monthly Uptake divided by the number of days in that particular month
[4] WW Application Rate (in/day) subtracted from the sum of the Plant Uptake and Infiltration Rates. Positive value indicates capacity of plants and soil to dispose of treated wastewater without surface runoff.
[5] Available Storage assumes tank is empty at beginning of month. If the sum of Available Application Days and Available Storage Days is greater than the number of days in the month, adequate storage is

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Wastewater Flow Generation Estimates

Process Wastewater

Winery Production (WP) = 20,000 gallons/year

Industry Method

Estimated Gallons of Process Wastewater Generated per Gallon of Wine Produced= 8 gallons
Gallons of Process Waste Generated Per Year= 160,000 gallons/year

Industry Method - Seasonal Peak Flow Design

Month	Day/mo	Estimated % of PW	Monthly PW Flow (gallons)	Average Daily PW Flow (gallons)	Month
Jan	31	6%	9,600	310	Jan
Feb	28	5%	8,000	290	Feb
Mar	31	5%	8,000	260	Mar
Apr	30	5%	8,000	270	Apr
May	31	5%	8,000	260	May
Jun	30	5%	8,000	270	Jun
Jul	31	6%	9,600	310	Jul
Aug	31	12%	19,200	620	Aug
Sep	30	17%	27,200	910	Sep
Oct	31	18%	28,800	930	Oct
Nov	30	8%	12,800	430	Nov
Dec	31	8%	12,800	410	Dec
	TOTAL	100.00%	160,000		

Peak Average Daily Flow: 930 gpd
Oct

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Vineyard & Cover Crop Water Demand

Source and General Planting Information

Evapotranspiration Rate (ET_0) from[1]:	California Irrigation Management Information System		
Station Location:	Oakville, CA, Station 77		
Vineyard with Cover Crop:	Yes		
Landscape Planting Water Requirements	Low (L)	10 -30% Etc	20%

General Water Demand

		Crop Coefficient, Kc				
Month	Reference Et_o[1] (in/mo)	Landscape Et_L (in/mo)	Vines (no cover crop)[2] (in/mo)	Vines w/ Cover Crop[3] (in/mo)	Vineyard Et_c[4] (in/mo)	Total Et Uptake (in/mo)
Jan	1.28	0.26	0.06	0.09	0.12	0.37
Feb	1.96	0.39	0.06	0.09	0.18	0.57
Mar	5.25	1.05	0.10	0.15	0.79	1.84
Apr	4.75	0.95	0.20	0.30	1.43	2.38
May	6.14	1.23	0.80	1.20	7.37	8.60
Jun	6.84	1.37	0.80	1.20	8.21	9.58
Jul	7.05	1.41	0.80	1.20	8.46	9.87
Aug	6.31	1.26	0.80	1.20	7.57	2.46
Sep	4.88	0.98	0.40	0.60	2.93	1.58
Oct	3.43	0.69	0.20	0.30	1.03	0.99
Nov	1.75	0.35	0.06	0.09	0.16	0.51
Dec	1.28	0.26	0.06	0.09	0.12	0.35
Total	50.92				38.34	39.07

[1] Reference ET_0 from California Irrigation Management Information System

[2] Crop Coefficients (Kc) for vineyards Table 5-2, Irrigation and Reclaimed Municipal Wastewater-A Guidance Manual, 84-1 wr, SWRCB

[3] 50% increase in vineyard uptake due to cover crop per reference note 2.

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Historical Local Annual Average Precipitation, Evaporation, and Temperatures

	Information Source	Location
Rainfall	Western Regional Climate Center	Saint Helena
Pan Evaporation	Western Regional Climate Center	Lake Berryessa, CA
Temperatures	Western Regional Climate Center	Saint Helena

	Precipitation		Evaporation		Average Temperatures		
Month	Avg Rainfall (in)	10-Year Rainfall[a] (in)	PAN Evaporation (in)	Lake Evaporation[b] (In)	High (ºF)	Low (ºF)	Month
Jan	7.6	10.64	1.53	1.18	56.6	36.4	Jan
Feb	6.53	9.14	2.15	1.66	61.1	38.9	Feb
Mar	4.32	6.05	3.79	2.92	65.4	40.3	Mar
Apr	2.1	2.94	5.82	4.48	71.5	42.7	Apr
May	0.85	1.19	8.90	6.85	78.1	46.7	May
Jun	0.25	0.35	11.00	8.47	85	50.4	Jun
Jul	0.03	0.04	13.22	10.18	89.7	52.1	Jul
Aug	0.07	0.10	12.06	9.29	88.9	51.4	Aug
Sep	0.29	0.41	8.67	6.68	85.9	49.1	Sep
Oct	1.72	2.41	5.72	4.40	77.3	45.4	Oct
Nov	3.93	5.50	2.48	1.91	66.2	40.3	Nov
Dec	6.9	9.66	1.66	1.28	57.6	36.7	Dec
	34.59	48.43	77.00	59.29	89.7	36.4	<---Max/Min Temp (ºF)
					Jul	Jan	<---Max/Min Month

Notes:
[a]10-Year Rainfall Is the Month Average Rainfall multiplied by 1.4
[b]PAN Evaporation Rates Adjusted By A Factor Of 0.77 To Determine Lake Evaporation

Standard daily pan evaporation is measured using the four-foot diameter Class A evaporation pan. The pan water level reading is adjusted when precipitation is measure to obtain the actual evaporation. Most Class A pans are installed above ground, allowing effects such as radiation on the side walls and heat exchnges with the pan material. These effects tend to increase the evaporation totals. The amounts can then be adjusted by multiplying the totals b 0.70 or 0.80 to more closely estimate the evaporation from naturally existing urfaces such as a shallow lake, wet soil or other moist natural surfaces.

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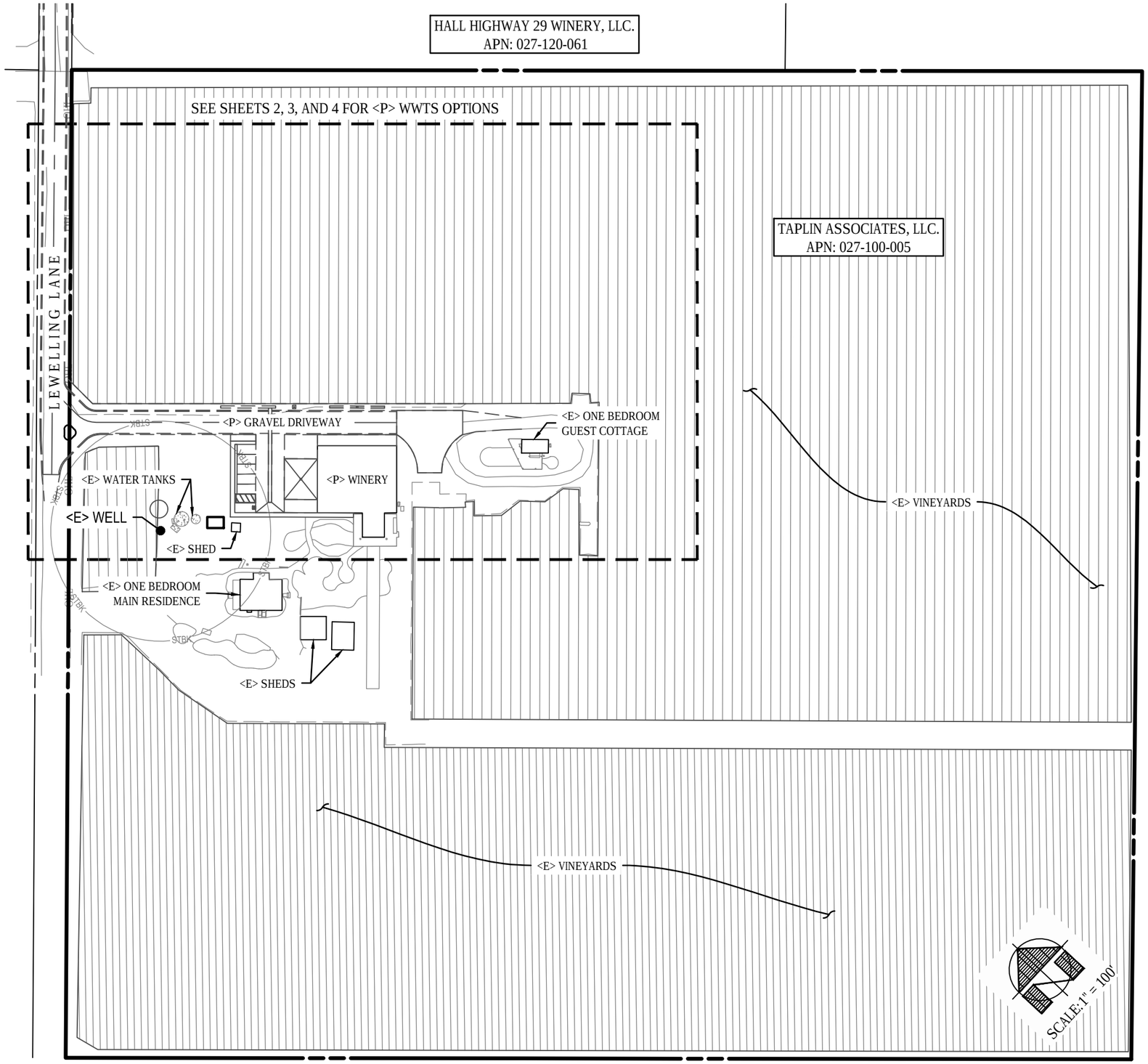
APPENDIX 3:
WASTEWATER TREATMENT OPTIONS: EXHIBITS



OVERALL SITE PLAN

TAPLIN CELLARS WINERY USE PERMIT
WASTEWATER FEASIBILITY STUDY
ST. HELENA CA

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707 963-8456 + 707-963-8528 FAX

DATE:	03-27-2020
SCALE:	AS SHOWN
JOB #:	R-101
APN:	027-100-005

TAPLIN ASSOCIATES, LLC.
APN: 027-100-005

<E> VINEYARDS

<P> 22.0' DRIVEWAY

<P> SHOULDER

OHU

<P> 50% RESERVE PD FIELD
(SEVEN LATERALS, 46-FT EACH)

07/24/2019
TP #5
64" SL

TP

<P> 100% RESERVE AREA FOR ONE BEDROOM MAIN RESIDENCE
AND ONE BEDROOM GUEST COTTAGE (300 GPD TOTAL).
CONVENTIONAL SYSTEM APPLICATION RATE = 0.33 GAL/FT^2/DAY
TRENCH DEPTH = 29" (17" GRAVEL DEPTH, 12" NATIVE BACKFILL)
SIDEWALL CREDIT = 15"/12"X2 = 2.5 FT^2 / FT
LEACH LINE LENGTH REQUIRED = 300 GPD / 0.33 / 2.5 = 364 FT
USE EIGHT LEACH LINES AT 50-FT EACH

07/24/2019
TP #1
64" SL

TP

07/24/2019
TP #4
65" SCL

TP

<P> PRIMARY PRESSURE DISTRIBUTION FIELD
(SEVEN LATERALS, 92-FT EACH)

07/24/2019
TP #2
64" SL

TP

07/24/2019
TP #3
68" SL

TP

<P> 50% RESERVE PD FIELD
(SEVEN LATERALS, 46-FT EACH)

<P> TURNAROUND

<P> GRAVEL DRIVEWAY

<P> 8,000-GALLON COMBINED PW + DW TREATMENT TANK
(AERATION, SETTLING, RE-CIRCULATION, DOSING)

<E> ONE BEDROOM
GUEST COTTAGE

<P> PARKING

<P> COVERED
CRUSH PAD

<P> WINERY

STBK

<P> ORENCO ADVANTEX AX-20 UNITS
(LIDS VISIBLE ON GROUND SURFACE)

<P> PAD (~5-FT x 8-FT) WITH ABOVE GROUND EQUIPMENT
FOR pH BALANCE & AERATION (~5-FT MAX HEIGHT)

<E> WELL

<E> CONCRETE
WATER TANKS

<P> 1,000-GALLON PW SEPTIC TANK

<P> 1,000-GALLON DW SEPTIC TANK

SCALE:1" = 40'

0 40'
Scale in feet

<P> WWTS OPTION #1 (COMBINED PW & DW) - PRESSURE DISTRIBUTION SYSTEM

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WASTEWATER FEASIBILITY STUDY
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DATE:	03-27-2020
SCALE:	1"=40'
JOB #:	R-101
APN:	027-100-005

TAPLIN ASSOCIATES, LLC.
APN: 027-100-005

<P> 22.0' DRIVEWAY

<P> SHOULDER

<E> VINEYARDS

<P> 200% RESERVE SUB-SURFACE DRIP AREA
(SIX LATERALS, 222-FT EACH, 2,664-SQFT)

<P> PRIMARY SUB-SURFACE DRIP AREA
(THREE LATERALS, 222-FT EACH, 1,332-SQFT)

TP 07/24/2019 TP #1 64" SL

TP 07/24/2019 TP #2 64" SL

TP 07/24/2019 TP #3 68" SL

TP 07/24/2019 TP #4 65" SCL

TP 07/24/2019 TP #5 64" SL

<P> 100% RESERVE AREA FOR ONE BEDROOM MAIN RESIDENCE AND ONE BEDROOM GUEST COTTAGE (300 GPD TOTAL).
CONVENTIONAL SYSTEM APPLICATION RATE = 0.33 GAL/FT^2/DAY
TRENCH DEPTH = 29" (17" GRAVEL DEPTH, 12" NATIVE BACKFILL)
SIDEWALL CREDIT = 15"/12"X2 = 2.5 FT^2 / FT
LEACH LINE LENGTH REQUIRED = 300 GPD / 0.33 / 2.5 = 364 FT
USE EIGHT LEACH LINES AT 50-FT EACH

<P> GRAVEL DRIVEWAY

<P> TURNAROUND

<P> 10,000-GALLON COMBINED PW + DW TREATMENT TANK
(AERATION, SETTLING, RE-CIRCULATION, DOSING)

<P> PARKING

<P> COVERED CRUSH PAD

<P> WINERY

<E> ONE BEDROOM GUEST COTTAGE

<P> ORENCO ADVANTEX AX-20 UNITS
(LIDS VISIBLE ON GROUND SURFACE)

<P> PAD (~5-FT x 8-FT) WITH ABOVE GROUND EQUIPMENT
FOR pH BALANCE & AERATION (~5-FT MAX HEIGHT)

<P> 1,000-GALLON PW SEPTIC TANK

<P> 1,000-GALLON DW SEPTIC TANK

<E> WELL

<E> CONCRETE
WATER TANKS

SCALE:1" = 40'

0 40'
Scale in feet

<P> WWTS OPTION #2 (COMBINED PW & DW) - SUB-SURFACE DRIP SYSTEM

TAPLIN CELLARS WINERY USE PERMIT
WASTEWATER FEASIBILITY STUDY
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DATE:	03-27-2020
SCALE:	1"=40'
JOB #:	R-101
APN:	027-100-005

TAPLIN ASSOCIATES, LLC.
APN: 027-100-005

<P> 22.0' DRIVEWAY

<P> SHOULDER

<E> VINEYARDS

<P> PW SURFACE DRIP IRRIGATION LINES
(10-LINES AT 204-FT EACH W/FOUR FOOT EMITTER SPACING)

07/24/2019
TP #1
64" SL

TP

07/24/2019
TP #5
64" SL

TP

<P> 100% RESERVE AREA FOR ONE BEDROOM MAIN RESIDENCE
AND ONE BEDROOM GUEST COTTAGE (300 GPD TOTAL).
CONVENTIONAL SYSTEM APPLICATION RATE = 0.33 GAL/FT^2/DAY
TRENCH DEPTH = 29" (17" GRAVEL DEPTH, 12" NATIVE BACKFILL)
SIDEWALL CREDIT = 15"/12"X2 = 2.5 FT^2 / FT
LEACH LINE LENGTH REQUIRED = 300 GPD / 0.33 / 2.5 = 364 FT
USE EIGHT LEACH LINES AT 50-FT EACH

07/24/2019
TP #4
65" SCL

TP

<P> 100% WINERY DW RESERVE CONVENTIONAL FIELD
(TWO LATERALS, 85-FT EACH)

07/24/2019
TP #2
64" SL

TP

07/24/2019
TP #3
68" SL

TP

<P> WINERY DW PRIMARY CONVENTIONAL FIELD
(TWO LATERALS, 85-FT EACH)

<P> GRAVEL DRIVEWAY

<P> TURNAROUND

<P> 10,000-GALLON ABOVE GROUND TANK FOR TREATED
PW STORAGE PRIOR TO SURFACE DRIP DISPERSAL

<P> 8,000-GALLON PW TREATMENT TANK
(AERATION, SETTLING, RE-CIRCULATION, DOSING)

<E> ONE BEDROOM
GUEST COTTAGE

<P> PARKING

<P> COVERED
CRUSH PAD

<P> WINERY

<P> ORENCO ADVANTEX AX-20 UNITS
(LIDS VISIBLE ON GROUND SURFACE)

<P> PAD (~5-FT x 8-FT) WITH ABOVE GROUND EQUIPMENT
FOR pH BALANCE & AERATION (~5-FT MAX HEIGHT)

<E> WELL

<E> CONCRETE
WATER TANKS

<P> 1,000-GALLON PW SEPTIC TANK

<P> 1,000-GALLON DW SEPTIC TANK

SCALE:1" = 40'

0 40'
Scale in feet

<P> WWTS OPTION #3 - CONVENTIONAL LEACH FIELD FOR WINERY DW AND SURFACE DRIP IRRIGATION FOR WINERY PW

TAPLIN CELLARS WINERY USE PERMIT
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OF ST. HELENA
1104 ADAMS STREET, SUITE 203 - ST. HELENA, CALIFORNIA 94574
707-963-8456 + 707-963-8528 FAX

DATE: 03-27-2020
SCALE: 1"=40'
JOB #: R-101
APN: 027-100-005