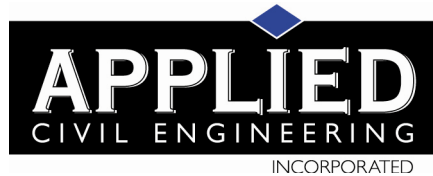


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# **Onsite Process Wastewater Disposal Feasibility Study**



April 25, 2025

Job No. 24-125

Kim Withrow, REHS  
Environmental Health Division  
Napa County Planning, Building and Environmental Services Department  
1195 Third Street, Suite 210  
Napa, CA 94559

Re: Onsite Process Wastewater Disposal Feasibility Study for the  
Piazza Del Dotto Winery Use Permit Modification Application  
7466 St. Helena Highway, Napa, California  
LLA 2106 Adjusted Parcel A (Former APNs 031-120-038 & -028)  
PI8-00143-MOD

Dear Ms. Withrow:

At the request of Del Dotto Vineyards we have evaluated the process wastewater flows associated with the proposed Use Permit Modification. A previous study was prepared by Guadalupe Chavarria. Mr. Chavarria passed away in 2024 and we are taking over as the Engineer of Record for the civil engineering portions of this project. The winery is currently serviced by a subsurface drip type domestic wastewater system and a hold and haul process wastewater system. This report focusses therefore on only the process wastewater disposal needs for the proposal. We prepared a separate report addressing the sanitary wastewater system needs for this project and therefore sanitary wastewater is not addressed in this report.

Existing development on the property includes vineyards, groundwater wells, access roads, parking, a winery tasting room building, caves and the related access and utility infrastructure typical of this type of agricultural and winery development.

The Use Permit Modification application under consideration proposes the following characteristics pertinent to the winery process wastewater analysis:

- Wine Production:
  - 75,000 gallons of wine per year (increase from 48,000 gallons per year)
  - Crushing, fermenting, aging and bottling

Please see the attached site plan for approximate locations of existing and proposed facilities. The remainder of this letter describes the process wastewater disposal system design capacities, peak flows associated with the proposed changes in use and our analysis and recommendations

related to the existing process wastewater disposal systems' ability to handle the anticipated wastewater flows.

#### Existing Winery Process Wastewater Disposal System

The current winery process wastewater system consists of a hold and haul type system with 15,000 gallons of tank storage. The tanks are located below ground, near the southerly cave portal area. The system is designed to accommodate at least seven days of peak flow for the existing 48,000 gallon, includes a 70% volume level alarm and was designed and installed under County permit in accordance with County requirements.

#### Proposed Process Wastewater Design Flows

We have used the generally accepted standard that six gallons of winery process wastewater are generated for each gallon of wine that is produced each year and that 1.5 gallons of wastewater are generated during the crush period for each gallon of wine that is produced. Based on the proposed 75,000-gallon production capacity and the expectation that both white and red wine will be produced at the winery, we have assumed a 60 day crush period. Using these assumptions, the annual, average daily and peak winery process wastewater flows are calculated as follows:

$$\text{Annual Winery Process Wastewater Flow} = \frac{75,000 \text{ gallons wine}}{\text{year}} \times \frac{6 \text{ gallons wastewater}}{1 \text{ gallon wine}}$$

$$\text{Annual Winery Process Wastewater Flow} = 450,000 \text{ gallons per year}$$

$$\text{Average Daily Process Wastewater Flow} = \frac{450,000 \text{ gallons wastewater}}{\text{year}} \times \frac{1 \text{ year}}{365 \text{ days}}$$

$$\text{Average Daily Winery Process Wastewater Flow} = 1,233 \text{ gallons per day}$$

$$\text{Peak Winery Process Wastewater Flow} = \frac{75,000 \text{ gallons wine}}{\text{year}} \times \frac{1.5 \text{ gallons wastewater}}{1 \text{ gallon wine}} \times \frac{1 \text{ year}}{60 \text{ crush days}}$$

$$\text{Peak Winery Process Wastewater Flow} = 1,875 \text{ gallons per day (gpd)}$$

#### Process Wastewater System Capacity

As noted above the existing process wastewater hold and haul capacity is 15,000 gallons. Per Napa County requirements, the hold and haul system must be designed to hold at least seven days of peak flow. This means the existing 15,000 gallon holding tank system can handle a maximum daily flow of 2,142 gpd.

#### Process Wastewater System Capacity

The predicted Peak Winery Process Wastewater Flow for the proposed winery operational characteristics (1,875 gpd) is less than the design capacity of the existing hold and haul system.

## Recommendations

The predicted Peak Winery Process Wastewater Flow is less than the capacity of the existing hold and haul system. Therefore, no design adjustments are needed to accommodate the proposed use permit modification characteristics.

However, the Applicant recognizes that at some point as they increase production within the limit of the use permit they will likely find it beneficial to install an onsite process wastewater treatment and re-use system. Therefore, we recommend that two options be considered and approved for handling the winery process wastewater.

### Option #1 – Hold and Haul

In this scenario, the winery process wastewater will continue to be collected separate from the domestic waste and will be held temporarily the existing below ground storage tanks. Periodically the process waste holding tanks will be pumped out and the waste will be hauled to the East Bay Municipal Utility District wastewater treatment plant (or other similar facility) where it will be processed. Two beneficial products are derived from the treatment process at the treatment plant including reclaimed water that can be used for irrigation and energy that is generated in the biodigestors.

Per Napa County requirements, the hold and haul system must be designed to hold at least seven days of peak flow. The required holding volume is calculated as follows:

$$\text{Required Hold and Haul Volume} = \frac{1,875 \text{ gallons}}{\text{day}} \times 7 \text{ days}$$

$$\text{Required Hold and Haul Volume} = 13,125 \text{ gallons}$$

As previously noted, the existing holding tanks provide 15,000 gallons of storage which is in excess of the required 13,125 gallons. The holding tanks are already outfitted with a water level alarm and the system is designed and constructed in accordance with the requirements outlined in the Napa County Environmental Management Department Hold and Haul for Winery Process Wastewater Management information sheet. Pumping of the holding tank, hauling and final disposal will be provided by an appropriately licensed hauler. We understand based on conversations with Dependable Septic Systems that 5,500 gallon tankers are typically used for this application. This would mean that approximately two to three truck loads of waste would need to be removed every week during periods of peak wastewater generation when the winery is operating at full capacity and approximately. On an annual basis it is expected that approximately 82 pumping events would occur (164 truck trips).

### Reserve Area

Napa County code requires that an area be set aside to accommodate a future onsite wastewater disposal system in the event that hold and haul becomes unavailable or otherwise not viable. In

this scenario the reserve area would be a pre-treatment and irrigation system that would clean the water for re-use onsite for irrigation water (also known as land application). Please refer to Option #2 below for more details.

#### Option #2 – Capture Treated PW and Re-Use for Irrigation

In this scenario the process wastewater will continue to be kept completely separate from the domestic waste stream and will be pretreated to land application strength requirements (160 mg/l BOD and 80 mg/l TSS recommended) in accordance with the Winery General Order requirements. Treatment will be provided by a bioreactor. The bioreactor can be installed in below ground in a tank in the area of existing hold and tanks. The existing hold and haul tanks can be incorporated into the design of the new bioreactor. Only a small 10' x 15' area will be needed for above ground components such as the control panel and aeration pumps.

#### Process Wastewater Disposal / Re-Use for Irrigation

We propose that disposal of the treated winery process wastewater be via irrigation of the onsite vineyard (and/or potentially landscaping as well). For the purpose of this study we have assumed that the winery process wastewater will be applied to approximately three acres of vineyard located on the winery property and outside of the well setbacks. This is a conservative assumption to simplify this analysis as more vineyard is available outside of the required setbacks and the treated water can also be used for landscape irrigation. The final irrigation area will be determined and incorporated into the final design with the installation permit application.

In order to accommodate differences in the timing of wastewater generation, irrigation demand, and limitations on wet weather application of treated wastewater a storage tank is recommended. We have prepared a water balance calculation to size a tank that will temporarily store treated wastewater generated from the winery before it is applied to the vineyard. The water balance calculations assume a monthly winery process wastewater generation rate and a monthly vineyard irrigation schedule based on our past experience with projects of this type. The water balance further assumes that during the summer the treated wastewater will be used to offset the irrigation needs of the vineyard and in the winter application of treated winery process wastewater will be very limited to ensure there is no runoff. The water balance calculations show that the proposed land application area is large enough to accept all the wastewater generated each month throughout the irrigation system and that a tank with a volume of at least 10,000 gallons may be required to capture water from the peak harvest season and store it until it can be applied to the land application area (see attached).

All land application of treated winery process wastewater must comply with the requirements of the Statewide General Waste Discharge Requirements (WDRs) for Wineries in California.

#### Summary

The calculations presented above illustrate that the process wastewater flows associated with the proposed Use Permit Modification will not exceed the capacity of the existing process wastewater hold and haul system. We also outline at least two options for how to handle the

planned increased process wastewater flow rates which include continuing to use the existing hold and haul system or treating the winery process wastewater and re-using it for irrigation.

We trust that this provides the information you need to process the subject Use Permit Modification. Please feel free to contact us at (707) 320-4968 if you have any questions.

Sincerely,

Applied Civil Engineering Incorporated

By:

*Michael R. Muelrath*

Michael R. Muelrath RCE 67435

Principal



Copy:

Dave Del Dotto and Mike Burgess, Del Dotto Vineyards (via email)

Enclosures:

Site Plan

Water Balance Spreadsheets







## Irrigation Storage Tank Water Balance

Month	Beginning Balance	Process Wastewater	Land Application Capacity	Ending Balance
January	0	27,000	65,166	0
February	0	22,500	65,166	0
March	0	18,000	65,166	0
April	0	45,000	65,166	0
May	0	22,500	48,912	0
June	0	40,500	122,279	0
July	0	45,000	122,279	0
August	0	40,500	73,367	0
September	0	51,750	73,367	0
October	0	58,500	48,912	9,588
November	9,588	51,750	65,166	0
December	0	27,000	65,166	0
		450,000	880,111	

**Notes:**

1. All values shown above for beginning balance, inflow, outflow and ending balance are in units of gallons.
2. See attached tables for detailed explanation of process wastewater and irrigation data presented in this table.
3. This water balance is based on the assumption that the tank is empty in August, just prior to crush.
4. This table is intended to illustrate waste disposal capability only. Where irrigation demand exceeds available treated wastewater availability additional irrigation water will be provided by another source.



## Winery Process Wastewater Generation Analysis

Annual Wine Production	75,000 gallons
Wastewater Generation Rate	6 gallons per gallon of wine
Annual Wastewater Generation	450,000 gallons
Crush Season Length	60 days
Wastewater Generated During Crush	1.5 gallons per gallon of wine
Peak Wastewater Generation Rate	1,875 gallons per day

Winery Process Wastewater Generation Table			
Month	Percentage of Annual Total	Monthly Flow (gallons)	Average Flow (gpd)
January	6.0%	27,000	871
February	5.0%	22,500	804
March	4.0%	18,000	581
April	10.0%	45,000	1,500
May	5.0%	22,500	726
June	9.0%	40,500	1,350
July	10.0%	45,000	1,452
August	9.0%	40,500	1,306
September	11.5%	51,750	1,725
October	13.0%	58,500	1,887
November	11.5%	51,750	1,725
December	6.0%	27,000	871
Total	100.0%	450,000	

### Notes:

1. Wastewater generation rates and monthly proportioning are based on our past experience with similar projects.

## Irrigation Schedule Analysis

### Vineyard Information:

Total acres of vines	3 acres
Vine Row Spacing (approx)	7 feet
Vine Spacing (approx)	5 feet (estimated)
Vine density	1,245 vines per acre (estimated)
Total Vine Count	3,734 vines

### Irrigation Information:

Seasonal Irrigation<sup>1</sup> 131.0 gallons per vine (May through October)

Non-Irrigation Application 0.8 inches per month November through April

Irrigation Schedule					
Month	Monthly Percentage <sup>2</sup>	Irrigation per Vine (gallons)	Seasonal Irrigation (gallons)	Non-Seasonal Irrigation Application (gallons)	Total (gallons)
January		0.0	0	65,166	65,166
February		0.0	0	65,166	65,166
March		0.0	0	65,166	65,166
April		0.0	0	65,166	65,166
May	10%	13.1	48,912	0	48,912
June	25%	32.8	122,279	0	122,279
July	25%	32.8	122,279	0	122,279
August	15%	19.7	73,367	0	73,367
September	15%	19.7	73,367	0	73,367
October	10%	13.1	48,912	0	48,912
November		0.0	0	65,166	65,166
December		0.0	0	65,166	65,166
Total	100%	131.0	489,117	390,995	880,111

### Notes:

1. Irrigation per vine is based on 0.5 acre-feet per acre of vines per WAA.
2. Monthly vineyard irrigation percentages are based on our past experience with projects of this type.
3. Non-Irrigation Application is for managing tank levels and assumes a maximum of 5 operational days per month based on historic weather data (Summit Engineering NBRID Capacity Study, 1996) and a saturated soil infiltration rate of 0.1 gallons per square foot per day uniformly over the entire area.