San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

OCT 17 2017

Doug Lyman
The Wine Group LLC dba Almaden-Madera
22004 Road 24
Madera, CA 93638

Re: Notice of Preliminary Decision - Authority to Construct
Facility Number: C-1353
Project Number: C-C-1163204

Dear Mr. Lyman:

Enclosed for your review and comment is the District's analysis of The Wine Group LLC dba Almaden-Madera's application for an Authority to Construct for installation of two new 350,000 gallon wine storage tanks, at 22004 Road 24, Madera, CA.

The notice of preliminary decision for this project will be published approximately three days from the date of this letter. After addressing all comments made during the 30-day public notice and 45-day EPA notice comment periods, the District intends to issue the Authority to Construct. Please submit your written comments on this project within the 30-day public comment period, as specified in the enclosed public notice.

Thank you for your cooperation in this matter. If you have any questions regarding this matter, please contact Mr. Ramon Norman of Permit Services at (559) 230-5909.

Sincerely,

Arnaud Marjollet
Director of Permit Services

AM:rn

Enclosures

cc: Tung Le, CARB (w/ enclosure) via email
cc: Gerardo C. Rios, EPA (w/ enclosure) via email

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San Joaquin Valley Air Pollution Control District

Authority to Construct Application Review

Installation of Two New 350,000 Gallon Wine Storage Tanks

Facility Name:	The Wine Group LLC dba Almaden Madera	Date:	October 10, 2017
Mailing Address:	22004 Road 24 Madera, CA 93638	Engineer: Lead Engineer:	Ramon Norman Jerry Sandhu
Contact Person:	Doug Lyman – Plant Manager		
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Telephone:	(209) 599-4111	Cell Phone:	(309) 850-3702
E-Mail:	joe.porter@thewinegroup.com		
Application #:	C-1353-362-0 and -363-0		
Project #:	C-1163204		
Deemed Complete:	May 4, 2017		

I. Proposal

The Wine Group LLC dba Almaden Madera has requested Authority to Construct (ATC) permits for the installation of two new 350,000 gallon wine storage tanks (ATC permits C-1353-362-0 (Tank 2017-1) and -363-0 (Tank 2017-2)). The new wine storage tanks will be installed under an existing specific limiting condition (SLC) that limits total VOC emissions from all wine fermentation and wine storage operations at the facility to no more than 404,412 lb-VOC/year; therefore, there will be no overall increase in the potential to emit for VOC.

The Wine Group LLC dba Almaden Madera received their Title V Permit on November 1, 2004. This modification can be classified as a Title V significant modification pursuant to Rule 2520, and can be processed with a Certificate of Conformity (COC). Since the facility has specifically requested that this project be processed in that manner, the 45-day EPA comment period will be satisfied prior to the issuance of the Authority to Construct. The Wine Group LLC dba Almaden Madera must apply to administratively amend their Title V permit.

II. Applicable Rules

Rule 2201	New and Modified Stationary Source Review Rule (2/18/16)
Rule 2410	Prevention of Significant Deterioration (6/16/11)
Rule 2520	Federally Mandated Operating Permits (6/21/01)
Rule 4001	New Source Performance Standards (4/14/99)
Rule 4002	National Emissions Standards for Hazardous Air Pollutants (5/20/04)
Rule 4102	Nuisance (12/17/92)
Rule 4623	Storage of Organic Liquids (5/19/05)

Rule 4694 Wine Fermentation and Storage Tanks (12/15/05)
CH&SC 41700 Health Risk Assessment
CH&SC 42301.6 School Notice
Public Resources Code 21000-21177: California Environmental Quality Act (CEQA)
California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387: CEQA Guidelines

III. Project Location

The facility is located at 22004 Road 24, Madera, CA. The equipment is not located within 1,000 feet of the outer boundary of a K-12 school. Therefore, the public notification requirement of California Health and Safety Code 42301.6 is not applicable to this project.

IV. Process Description

The Wine Group LLC dba Almaden Madera produces both red and white table wines, as well as other specialty wine products, from the fermentation of grapes. During the "crush season," typically from late August to late November, both red and white grapes are received by truck and delivered to a crusher-stemmer which serves to crush the grapes and remove the stems. In the case of red wines, the resultant juice (termed "must" and containing the grape skins, pulp and seeds) is pumped to red wine fermentation tanks for fermentation, a batch process. The red wine fermentation tanks are specifically designed to ferment the must in contact with the skins and to allow the separation of the skins and seeds from the wine after fermentation. In the case of white wines, the must is sent to screens and presses for separation of grape skins and seeds prior to fermentation. After separation of the skins and seeds, the white must is transferred to a fermentation tank. White wine fermentation can be carried out in a tank without design provisions for solids separation since the skins and seeds have already been separated.

After transfer of the must (for red or white wine) to the fermentation tank, the must is inoculated with yeast which initiates the fermentation reactions. During fermentation, the yeast metabolizes the sugar in the grape juice, converting it to ethanol and carbon dioxide (CO_2) while releasing heat. Temperature is typically controlled by refrigeration, and is maintained at 45–65 °F for white wine fermentation and 70–95 °F for red wine fermentation. The sugar content of the fermentation mass is measured in °Brix (weight %) and is typically 22–26° for unfermented grape juice, dropping to 4° or less at the end of fermentation. Finished ethanol concentration is approximately 10 to 14 percent by volume. Batch fermentation requires 3-5 days per batch for red wine and 1-2 weeks per batch for white wine. VOCs are emitted during the fermentation process along with the CO_2. The VOCs consist primarily of ethanol along with small quantities of other fermentation byproducts.

Following the completion of fermentation, white wine is transferred directly to storage tanks. Red wine is first directed to the presses for separation of solids and then routed to the storage tanks. Tanks at a winery may be used for 1) fermentation operations, during which the tank is vented to the atmosphere to release the evolved CO_2 byproduct from fermentation; 2) storage operations, during which the tank is closed to minimize contact with air and refrigerated to preserve the wine; or 3) both fermentation and storage. The wine storage and fermentation

operations are considered separate emissions units. Post-fermentation operations such as cold stabilization, racking, and filtration are conducted in the tanks, resulting in a number of inter-tank transfers during the period between the end of fermentation and bottling or bulk shipment. Storage operations are conducted year-round. VOC emissions occur primarily as a result of the inter-tank transfers which are necessitated by the post fermentation operations.

The facility is proposing to install two new wine storage tanks under this project. The tanks will only be used for wine storage and will not be used for wine fermentation operations.

V. Equipment Listing

C-1353-362-0: 350,000 GALLON STAINLESS STEEL ENCLOSED TOP WINE STORAGE TANK (TANK 2017-1) EQUIPPED WITH INSULATION AND PRESSURE/VACUUM RELIEF VALVE

C-1353-363-0: 350,000 GALLON STAINLESS STEEL ENCLOSED TOP WINE STORAGE TANK (TANK 2017-2) EQUIPPED WITH INSULATION AND PRESSURE/VACUUM RELIEF VALVE

VI. Emission Control Technology Evaluation

Wine Storage Tanks:

VOCs (ethanol) are emitted from wine storage tanks as a result of both working losses (which occur when the liquid level in the tank changes) and breathing losses (expansion and contraction effects due to temperature variations). The proposed pressure/vacuum valve limits these emissions by requiring the maximum amount of variation in tank pressure before allowing the tank to vent to the atmosphere or allowing air admission to the tank.

VII. General Calculations

A. Assumptions

- VOC emissions from all wine fermentation and wine storage operations at the facility will continue to be limited to no more than 404,412 lb-VOC/year
- Typically, for enclosed tanks with refrigeration and/or insulation (or equivalent) and P/V valves, breathing losses from storage of wine are assumed to be negligible
- Winery tanks generally consist of two emissions units; 1) a fermentation tank emissions unit and 2) a wine storage tank emissions unit.
- The proposed tanks will be limited to wine storage only – no wine fermentation will be conducted in the tanks
- The maximum ethanol content of the wine stored in the tanks is 23.9% by volume (per applicant)
- Maximum storage throughput of each of the proposed 350,000 gallon wine storage tanks (ATC permits C-1353-362-0 and -363-0): 360,000 gal/day (approximately 1.03 tank turnovers/day based on the maximum pump rate of 250 gal/minute provided by the applicant) and 12,600,000 gal/year (36 tank turnovers/year per applicant)

- Maximum daily wine tank liquid storage temperature = 81.0 °F for locations near Fresno (Pursuant to District procedures for modeling of emissions for wine and distilled spirits storage tanks using TANKS 4.09D; See Appendix A for a description of these procedures)
- Annual average wine tank liquid storage temperature = 63.3 °F for all tanks for locations near Fresno (Pursuant to District procedures for modeling of emissions for wine and distilled spirits storage tanks using TANKS 4.09D; See Appendix A)

B. Emission Factors

Wine Storage

TANKS 4.09D Emissions Estimation Software will be used to calculate the post-project Potential to Emit from the wine storage tanks.

Per District practice, the emission estimates provided by the TANKS 4.09D model represents the combined loss of ethanol (VOC) and water vapor from each tank. To calculate the ethanol portion of the emissions, it is first necessary to determine the molar fraction of ethanol (y_a) in the vapor emissions from the tank. This can be calculated from the average molecular weight (AMW) of the vapor as listed on page 2 of the TANKS 4.09D runs in Appendix B. Pursuant to the definition of AMW for a binary mixture:

$$AMW = y_a \times MW_a + (1-y_a) \times MW_w$$

Solving for the molar fraction of ethanol,

$$y_a = \frac{AMW - MW_w}{MW_a - MW_w}$$

Where,

$AMW_{23.9\% \text{ volume ethanol content}}$ = 30.3355 lb/mole
MW_a = Molecular weight of ethanol = 46.02 lb/mole
MW_w = Molecular weight of water = 18.02 lb/mole

Therefore,

$y_a = (30.3355 - 18.02)/(46.02 - 18.02) = 0.4398$ for 23.9% ethanol mixture with water

And the daily and annual emission rates can be determined using the following equations:

$$PE_{daily} = \frac{E_d}{AMW} \times y_a \times 46.02$$

Where,

E_d = Daily Emission Rate from TANKS 4.09D Program

$$PE_{annual} = \frac{E_a}{AMW} \times y_a \times 46.02$$

Where,

E_a = Annual Emission Rate from TANKS 4.09D Program

Therefore, the daily and annual PE values will be determined using the following equations:

Daily PE = [(TANKS 4.09D Emission Rate for July / 31 days) / 30.33355] x (30.3355 – 18.02)/(46.02 – 18.02) x 46.02

Annual PE = (TANKS 4.09D Annual Emission Rate / 30.33355) x (30.3355 – 18.02)/(46.02 – 18.02) x 46.02

C. Calculations

1. Pre-Project Potential to Emit (PE1)

Since the wine storage tanks are new emissions units, PE1 = 0 for all pollutants for the wine storage tanks.

2. Post-Project Potential to Emit (PE2)

Two TANKS 4.09D runs have been performed. The daily post-project potential to emit for each tank was calculated by using a maximum daily throughput of 360,000 gallons during the month of July and dividing the emissions for the month of July by 31, the number of days in the month. The annual post-project potential to emit for each tank was calculated using a maximum annual throughput of 12,600,000 gal/year (36 tank turnovers/year). As discussed above, the combined ethanol and water vapor emissions calculated using TANKS 4.09D were adjusted to determine the daily and annual potential to emit for VOCs. See Appendix B for the TANKS 4.09D runs for the tanks.

Wine Storage Tank Daily and Annual Post-Project Potential to Emit

Permit Unit	Tank Capacity	Max Daily Throughput	Max Annual Throughput	Daily PE2	Annual PE2
	(gallon)	(gal/day)	(gal/year)	(lb/day)	(lb/year)
C-1353-362-0	350,000	360,000	12,600,000	**147.5**	**2,851**
C-1353-363-0	350,000	360,000	12,600,000	**147.5**	**2,851**
Total					**5,702**

The PE2 for each proposed tank is shown above. The tanks will also be subject to an existing specific limiting condition (SLC) that limits total VOC emissions from all wine fermentation and wine storage operations at the facility to no more than 404,412 lb-VOC/year.

3. Pre-Project Stationary Source Potential to Emit (SSPE1)

Pursuant to District Rule 2201, the SSPE1 is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of Emission Reduction Credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions (AER) that have occurred at the source, and which have not been used on-site.

SSPE1 (lb/year)					
Permit Unit	**NO_X**	**SO_X**	**PM_{10}**	**CO**	**VOC**
C-1353-1-8 (8.49 MMBtu NG Boiler)*	900	26	27	756	50
C-1353-2-11 (Dormant 16.8 MMBtu NG Boiler)*	1,080	86	90	2,220	84
C-1353-352-2 (140 bhp Emergency Engine)*	145	0	6	25	10
C-1353-353-2 (140 bhp Emergency Engine)*	145	0	6	25	10
All Existing Wine Tanks at the Facility (C-1353-16-5 to -324-3, -351-6, 354-2, and -355-2)	0	0	0	0	404,412**
SSPE1	**2,270**	**112**	**129**	**3,026**	**404,566**

* See Appendix C for the Potential to Emit Calculations for C-1353-1-8, -2-11, -352-2, & -353-2

** Facility specific limiting condition (SLC) that limits total VOC emissions from all wine fermentation and wine storage operations at the facility to no more than 404,412 lb-VOC/year.

4. Post Project Stationary Source Potential to Emit (SSPE2)

Pursuant to District Rule 2201, the SSPE2 is the PE from all units with valid ATCs or PTOs at the Stationary Source and the quantity of ERCs which have been banked since September 19, 1991 for AER that have occurred at the source, and which have not been used on-site.

The SSPE2 for the facility is shown in the table below.

SSPE2 (lb/year)					
Permit Unit	**NO_X**	**SO_X**	**PM_{10}**	**CO**	**VOC**
C-1353-1-8 (8.49 MMBtu NG Boiler)*	900	26	27	756	50
C-1353-2-11 (Dormant 16.8 MMBtu NG Boiler)*	1,080	86	90	2,220	84
C-1353-352-2 (140 bhp Emergency Engine)*	145	0	6	25	10
C-1353-353-2 (140 bhp Emergency Engine)*	145	0	6	25	10
All Existing Wine Tanks at the Facility (C-1353-16-5 to -324-3, -351-6, 354-2, and -355-2)	0	0	0	0	404,412**
ATC C-1353-362-0 (New Wine Storage Tank)	0	0	0	0	
ATC C-1353-363-0 (New Wine Storage Tank)	0	0	0	0	
SSPE2	**2,270**	**112**	**129**	**3,026**	**404,566**

* See Appendix C for the Potential to Emit Calculations for C-1353-1-8, -2-11, -352-2, & -353-2

** Facility specific limiting condition (SLC) that limits total VOC emissions from all wine fermentation and wine storage operations at the facility to no more than 404,412 lb-VOC/year.

5. Major Source Determination

Rule 2201 Major Source Determination:

Pursuant to District Rule 2201, a Major Source is a stationary source with a SSPE2 equal to or exceeding one or more of the following threshold values. For the purposes of determining major source status the following shall not be included:

- any ERCs associated with the stationary source
- Emissions from non-road IC engines (i.e. IC engines at a particular site at the facility for less than 12 months)
- Fugitive emissions, except for the specific source categories specified in 40 CFR 51.165

This source is an existing Major Source for VOC emissions and will remain a Major Source for VOC. No change in other pollutants is proposed or expected as a result of this project.

Rule 2410 Major Source Determination:

The facility or the equipment evaluated under this project is not listed as one of the categories specified in 40 CFR 52.21 (b)(1)(iii). Therefore the PSD Major Source threshold is 250 tons per day (tpy) for any regulated NSR pollutant.

PSD Major Source Determination (tons/year)						
	NO_2	VOC	SO_2	CO	PM	PM_{10}
Estimated Facility PE before Project Increase	1.1	202.3	0.1	1.5	0.1	0.1
PSD Major Source Thresholds	250	250	250	250	250	250
PSD Major Source ? (Y/N)	N	N	N	N	N	N

As shown above, the facility is not an existing PSD major source for any regulated NSR pollutant expected to be emitted at this facility.

6. Baseline Emissions (BE)

The BE calculation (in lb/year) is performed pollutant-by-pollutant for each unit within the project to calculate the QNEC, and if applicable, to determine the amount of offsets required.

Pursuant to District Rule 2201, BE = PE1 for:

- Any unit located at a non-Major Source,
- Any Highly-Utilized Emissions Unit, located at a Major Source,
- Any Fully-Offset Emissions Unit, located at a Major Source, or
- Any Clean Emissions Unit, located at a Major Source.

otherwise,

BE = Historic Actual Emissions (HAE), calculated pursuant to District Rule 2201.

ATC C-1353-362-0 & -363-0: New 350,000 Gallon Wine Storage Tanks

These new emission units are being added to the facility's existing SLC of 404,412 lb-VOC per year for wine fermentation and storage operations, and the facility is not proposing any change to the existing SLC limit as a result of this project. Pursuant to District Policy APR 1420, *NSR Calculations for Units with Specific Limiting Conditions (3/12/07)*, the Baseline Emissions (BE) for units included in an SLC shall be the maximum combined emissions allowed for those units under the SLC.

Additionally, District Policy APR 1420 states that if the SLC is for a pollutant exceeding the Major Source threshold and any single unit under the SLC is not a Highly-Utilized, Fully-Offset, or Clean Emissions Units, then the sum of the actual emissions from all units in SLC will be used to determine the pre-project BE for the units in the SLC.

As established in District Project C-1112526, all of the wine tanks at this facility satisfy the requirements of achieved-in-practice Best Available Control Technology (BACT) for wine fermentation and storage as accepted by the District during the five years

immediately prior to the submission of the complete application for the project, and are thus Clean Emission Units; therefore, the pre-project BE emissions for the units in the SLC are equal to the pre-project for the units in the SLC ($BE_{SLC} = PE1_{SLC}$).

Therefore, BE for VOC from units $BE_{SLC} = PE1_{SLC}$ = 404,412 lb-VOC/year.

7. SB 288 Major Modification

SB 288 Major Modification is defined in 40 CFR Part 51.165 as "any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act."

Since this facility is a major source for VOC, the project's PE2 is compared to the SB 288 Major Modification Thresholds in the following table in order to determine if the SB 288 Major Modification calculation is required.

SB 288 Major Modification Thresholds			
Pollutant	**Project PE2 (lb/year)**	**Threshold (lb/year)**	**SB 288 Major Modification Calculation Required?**
NO_X	0	50,000	No
SO_X	0	80,000	No
PM_{10}	0	30,000	No
VOC	5,702	50,000	No

Since none of the SB 288 Major Modification Thresholds are surpassed with this project, this project does not constitute an SB 288 Major Modification.

8. Federal Major Modification

District Rule 2201 states that a Federal Major Modification is the same as a "Major Modification" as defined in 40 CFR 51.165 and part D of Title I of the CAA.

The determination of Federal Major Modification is based on a two-step test. For the first step, only the emission *increases* are counted. Emission decreases may not cancel out the increases for this determination.

Step 1

For new emissions units, the increase in emissions is equal to the PE2 for each new unit included in this project.

The project's combined total emission increases are compared to the Federal Major Modification Thresholds in the following table.

Federal Major Modification Thresholds for Emission Increases			
Pollutant	**Total Emissions Increases (lb/yr)**	**Thresholds (lb/yr)**	**Federal Major Modification?**
NO_x*	0	0	No
VOC*	5,702	0	**Yes**
PM_{10}	0	30,000	No
$PM_{2.5}$	0	20,000	No
SO_x	0	80,000	No

* If there is any emission increases in NO_x or VOC, this project is a Federal Major Modification and no further analysis is required.

Since there is an increase in VOC emissions, this project constitutes a Federal Major Modification, and no further analysis is required.

Federal Offset quantities are calculated below.

Federal Offset Quantities:

The Federal offset quantity is only calculated only for the pollutants for which the project is a Federal Major Modification. The Federal offset quantity is the sum of the annual emission changes for all new and modified emission units in a project calculated as the potential to emit after the modification (PE2) minus the actual emissions (AE) during the baseline period for each emission unit times the applicable federal offset ratio. There are no special calculations performed for units covered by an SLC.

VOC **Federal Offset Ratio** **1.5**

Permit No.	Actual Emissions (lb/year)	Potential Emissions (lb/year)	Emissions Change (lb/yr)
C-1353-362-0	0	2,851	**2,851**
C-1353-363-0	0	2,851	**2,851**
		Net Emission Change (lb/year):	**5,702**
		Federal Offset Quantity: (NEC * 1.5)	**8,553**

9. Rule 2410 – Prevention of Significant Deterioration (PSD) Applicability Determination

Rule 2410 applies to any pollutant regulated under the Clean Air Act, except those for which the District has been classified nonattainment. The pollutants which must be addressed in the PSD applicability for source located in the San Joaquin Valley include the following (See 52.21 (b) (23) definition of significant):

- NO2 (as a primary pollutant)
- SO2 (as a primary pollutant)
- CO

- PM
- PM10

VOC is the only pollutant emitted by the units being evaluated under this project. Because the San Joaquin Valley is classified as nonattainment for the federal ozone standard, VOC is not subject to PSD in the San Joaquin Valley.

I. Project Emissions Increase - New Major Source Determination

The post-project potentials to emit from all new and modified units are compared to the PSD major source thresholds to determine if the project constitutes a new major source subject to PSD requirements.

The facility or the equipment evaluated under this project is not listed as one of the categories specified in 40 CFR 52.21 (b)(1)(i). The PSD Major Source threshold is 250 tons per year (tpy) for any regulated NSR pollutant.

PSD Major Source Determination: Potential to Emit (tons/year)					
	NO_2	SO_2	CO	PM	PM_{10}
Total PE from New and Modified Units	0	0	0	0	0
PSD Major Source threshold	250	250	250	250	250
New PSD Major Source?	N	N	N	N	N

As shown in the table above, the potential to emit for the project, by itself, does not exceed any PSD major source threshold. Therefore, Rule 2410 is not applicable and no further analysis is required.

10. Quarterly Net Emissions Change (QNEC)

The QNEC is calculated solely to establish emissions that are used to complete the District's PAS emissions profile screen.

Because the proposed wine storage tanks will be subject to the existing SLC that limits VOC emissions from all wine fermentation and wine storage operations at the facility, there will be no overall increase in the potential to emit at the facility. Therefore, the QNEC is equal to 0 for each quarter for each permit unit.

VIII. Compliance

Rule 2201 New and Modified Stationary Source Review Rule

A. Best Available Control Technology (BACT)

1. BACT Applicability

BACT requirements are triggered on a pollutant-by-pollutant basis and on an emissions unit-by-emissions unit basis. Unless specifically exempted by Rule 2201, BACT shall be required for the following actions*:

a. Any new emissions unit with a potential to emit exceeding two pounds per day,
b. The relocation from one Stationary Source to another of an existing emissions unit with a potential to emit exceeding two pounds per day,
c. Modifications to an existing emissions unit with a valid Permit to Operate resulting in an AIPE exceeding two pounds per day, and/or
d. Any new or modified emissions unit, in a stationary source project, which results in an SB 288 Major Modification or a Federal Major Modification, as defined by the rule.

*Except for CO emissions from a new or modified emissions unit at a Stationary Source with an SSPE2 of less than 200,000 pounds per year of CO.

a. New emissions units – PE > 2 lb/day

As discussed in Section VII.C.2 above, the applicant is proposing to install 2 new 350,000 gallon wine storage tanks (ATC permits C-1353-362-0 (Tank 2017-1) and -363-0 (Tank 2017-2)) that each have a PE greater than 2.0 lb/day for VOC. Therefore, BACT is triggered for VOC from the wine storage tanks.

b. Relocation of emissions units – PE > 2 lb/day

As discussed in Section I above, there are no emissions units being relocated from one stationary source to another; therefore, BACT is not triggered for relocation of an emissions unit.

c. Modification of emissions units – AIPE > 2 lb/day

As discussed in Section I above, there are no modified emissions units associated with this project. Therefore, BACT is not triggered for modification of an emissions unit.

d. SB 288/Federal Major Modification

As discussed in Sections VII.C.7 and VII.C.8 above, this project does not constitute an SB 288 and/or Federal Major Modification. Therefore, BACT is not triggered for any pollutant for an SB 288 or Federal Major Modification.

2. BACT Guideline

BACT Guideline 5.4.13 applies to wine storage tanks. (See Appendix D)

3. Top-Down BACT Analysis

Per Permit Services Policies and Procedures for BACT, a Top-Down BACT analysis shall be performed as a part of the application review for each application subject to the BACT requirements pursuant to the District's NSR Rule.

Pursuant to the attached Top-Down BACT Analyses (see Appendix D), BACT has been satisfied with the following:

Wine Storage Tanks

VOC: Insulated tank, pressure/vacuum valve set within 10% of the maximum allowable working pressure of the tank, "gas tight" tank operation and achieve and maintain a continuous storage temperature not exceeding 75 °F within 60 days of completion of fermentation

The following condition will be included on each ATC to assure compliance with the BACT requirements:

- This tank shall be equipped with and operated with a pressure-vacuum relief valve, which shall operate within 10% of the maximum allowable working pressure of the tank, operate in accordance with the manufacturer's instructions, and be permanently labeled with the operating pressure settings. [District Rules 2201 and 4694]

B. Offsets

1. Offset Applicability

Offset requirements shall be triggered on a pollutant by pollutant basis and shall be required if the SSPE2 equals to or exceeds the offset threshold levels in Table 4-1 of Rule 2201.

The facility emissions are already above the Offset and Major Source Thresholds for VOC emissions; therefore, a determination of the quantity of offsets required must be performed.

2. Quantity of Offsets Required

As discussed above, the facility is an existing Major Source for VOC and the SSPE2 is greater than the offset thresholds. Therefore offset calculations will be required for this project.

Pursuant to District Rule 2201, Sections 4.7.1 and 4.7.3, the quantity of offsets in pounds per year for VOC is calculated as follows for sources with an SSPE1 greater than the offset threshold levels before implementing the project being evaluated.

Offsets Required (lb/year) = (Σ[PE2 – BE] + ICCE) x DOR, for all new or modified emissions units in the project,

Where,
PE2 = Post Project Potential to Emit, (lb/year)
BE = Baseline Emissions, (lb/year)
ICCE= Increase in Cargo Carrier Emissions, (lb/year)
DOR= Distance Offset Ratio, determined pursuant to Rule 2201

There are no increases in Cargo Carrier emissions as result of this project; therefore,

Offsets Required (lb/yr) = Σ[PE2 – BE] x DOR

In accordance with Rule 2201, Section 4.8.1, the DOR for NO_X and VOC offsets for projects that trigger federal major modifications shall be 1.5:1. As shown in Section VII.C.8, this project triggers a federal major modification for VOC emissions. Therefore, the DOR will be 1.5:1.

Offsets Required (lb/year) = Σ (PE2 – BE) x 1.5

The facility has an existing SLC of 404,412 lb-VOC/year for wine fermentation and storage operations, and the applicant is not proposing any change to this limit as a result of this project. Pursuant to District Policy APR 1420, *NSR Calculations for Units with Specific Limiting Conditions (3/12/07)*, the quantity of ERCs for units included in an SLC shall be determined by comparing the post-project PE for the SLC to the pre-project BE for the SLC.

As discussed in Section VII.C.6 of this evaluation BE for the SLC (BE_{SLC}) = $PE1_{SLC}$ = 404,412 lb-VOC/yr. Therefore, the emissions increase to be offset for this project is calculated as follows:

Emissions Increase (lb/year) = $PE2_{SLC}$ – BE_{SLC}

Where:
$PE2_{SLC}$ = Post-project SLC. In this project, $PE2_{SLC}$ = $PE1_{SLC}$ = 404,412 lb-VOC/yr
BE_{SLC} = 404,412 lb-VOC/yr

Therefore,

Offsets Required (lb/year) = 404,412 lb-VOC/year – 404,412 lb-VOC/year
= 0 lb-VOC/year

As demonstrated in the calculation above, the amount of offsets required is zero. Therefore, offsets will not be required for this project.

C. Public Notification

1. Applicability

Public noticing is required for:
a. New Major Sources, Federal Major Modifications, and SB 288 Major Modifications,
b. Any new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any one pollutant,
c. Any project which results in the offset thresholds being surpassed, and/or
d. Any project with an SSIPE of greater than 20,000 lb/year for any pollutant.

a. New Major Sources, Federal Major Modifications, and SB 288 Major Modifications

New Major Sources are new facilities, which are also Major Sources. Since this is not a new facility, public noticing is not required for this project for New Major Source purposes.

As demonstrated in Sections VII.C.7 and VII.C.8, this project is a Federal Major Modification. Therefore, public noticing for Federal Major Modification purposes is required.

b. PE > 100 lb/day

Applications which include a new emissions unit with a PE greater than 100 pounds during any one day for any pollutant will trigger public noticing requirements.

New Wine Storage Tanks

The daily PE2 for storage in each of the proposed new 350,000 gallon wine tanks is compared to the daily PE Public Notice thresholds in the following table:

350,000 Gallon Wine Storage Tanks
PE > 100 lb/day Public Notice Thresholds

Pollutant	PE2 (lb/day)	Public Notice Threshold	Public Notice Triggered?
NO_X	0.0	100 lb/day	No
SO_X	0.0	100 lb/day	No
PM_{10}	0.0	100 lb/day	No
CO	0.0	100 lb/day	No
VOC	147.5	100 lb/day	**Yes**

Therefore, public noticing for new emission unit(s) with PE > 100 lb/day is required.

c. Offset Threshold

The SSPE1 and SSPE2 are compared to the offset thresholds in the following table.

Offset Thresholds				
Pollutant	**SSPE1 (lb/year)**	**SSPE2 (lb/year)**	**Offset Threshold**	**Public Notice Required?**
NO_X	2,270	2,270	20,000 lb/year	No
SO_X	112	112	54,750 lb/year	No
PM_{10}	129	129	29,200 lb/year	No
CO	3,026	3,026	200,000 lb/year	No
VOC	404,566	404,566	20,000 lb/year	No

As detailed above, there were no thresholds surpassed with this project; therefore, public noticing is not required for surpassing an offset threshold.

d. SSIPE > 20,000 lb/year

Public notification is required for any permitting action that results in a SSIPE of more than 20,000 lb/year of any affected pollutant. According to District policy, the SSIPE = SSPE2 – SSPE1. The SSIPE is compared to the SSIPE Public Notice thresholds in the following table.

SSIPE Public Notice Thresholds					
Pollutant	**SSPE2 (lb/year)**	**SSPE1 (lb/year)**	**SSIPE (lb/year)**	**SSIPE Public Notice Threshold**	**Public Notice Required?**
NO_x	2,270	2,270	0	20,000 lb/year	No
SO_x	112	112	0	20,000 lb/year	No
PM_{10}	129	129	0	20,000 lb/year	No
CO	3,026	3,026	0	20,000 lb/year	No
VOC	404,566	404,566	0	20,000 lb/year	No

As demonstrated above, the SSIPEs for all pollutants were less than 20,000 lb/year; therefore, public noticing is not required for SSIPE exceeding 20,000 lb/yr.

e. Title V Significant Permit Modification

As shown in the Discussion of Rule 2520 below, this project constitutes a Title V significant modification. Therefore, public noticing for Title V significant modifications is required for this project.

2. Public Notice Action

As discussed above, public noticing is required for this project for Federal Major Modification purposes, for VOC emissions from new emissions units in excess of 100 lb/day, and for a Title V significant permit modification. Therefore, public notice

documents will be submitted to the California Air Resources Board (ARB) and the US Environmental Protection Agency (EPA) and a public notice will be published in a local newspaper of general circulation prior to the issuance of the ATC for this equipment.

D. Daily Emission Limits (DELs)

DELs and other enforceable conditions are required by Rule 2201 to restrict a unit's maximum daily emissions, to a level at or below the emissions associated with the maximum design capacity. The DEL must be contained in the latest ATC and contained in or enforced by the latest PTO and enforceable, in a practicable manner, on a daily basis. DELs are also required to enforce the applicability of BACT.

Proposed Rule 2201 (DEL) Conditions

For the proposed wine storage tanks in this project, the DEL will be enforced with the following conditions:

- This tank shall be used exclusively for wine storage operations only and not for fermentation. [District Rule 2201]

- This tank shall be equipped with and operated with a pressure-vacuum relief valve, which shall operate within 10% of the maximum allowable working pressure of the tank, operate in accordance with the manufacturer's instructions, and be permanently labeled with the operating pressure settings. [District Rules 2201 and 4694]

- The pressure-vacuum relief valve and storage tank shall remain in a gas-tight condition, except when the operating pressure of the tank exceeds the valve set pressure. A gas-tight condition shall be determined by measuring the gas leak in accordance with the procedures in EPA Method 21. [District Rules 2201 and 4694]

- The temperature of the wine stored in this tank shall be maintained at or below 75 degrees Fahrenheit. The temperature of the stored wine shall be determined and recorded at least once per week. For each batch of wine, the operator shall achieve the storage temperature of 75 degrees Fahrenheit or less within 60 days after completing fermentation, and shall maintain records to show when the required storage temperature of 75 degrees Fahrenheit or less was achieved. [District Rules 2201 and 4694]

- The weighted annual average ethanol content of wine stored in this tank, calculated on a twelve month rolling basis, shall not exceed 23.9 percent by volume. [District Rule 2201]

- The daily throughput, in gallons, of wine stored in this tank shall not exceed 360,000 gallons per day. [District Rule 2201]

In addition, in order to ensure ongoing compliance with the proposed annual VOC limit for all tanks in this project, the following conditions will be included on each of the ATC permits for the wine tanks:

- The maximum annual wine storage throughput in this tank, calculated on a twelve (12) month rolling basis, shall not exceed 12,600,000 gallons per year (equivalent to 36 times the nominal tank capacity stated in the equipment description). [District Rule 2201]

- Total annual VOC emissions from all wine fermentation and wine storage operations at this facility, calculated on a rolling 12-month basis, shall not exceed 404,412 lb/yr. [District Rule 2201]

E. Compliance Assurance

1. Source Testing

Pursuant to District Policy APR 1705, source testing is not required to demonstrate compliance with Rule 2201.

2. Monitoring

No monitoring is required to demonstrate compliance with Rule 2201.

3. Recordkeeping

Recordkeeping is required to demonstrate compliance with the offsets, public notification and daily emission limit requirements of Rule 2201. Recordkeeping is also required for winery tanks pursuant to District Rule 4694, *Wine Fermentation and Storage Tanks.*

For the proposed wine storage tanks, the following conditions will be listed on the permits to ensure compliance:

- The operator shall record, on a weekly basis, the total gallons of wine contained in the tank and the maximum temperature of the stored wine. [District Rule 4694]

- Daily throughput records, including records of filling and emptying operations, the dates of such operations, a unique identifier for each batch, the volume percent ethanol in the batch, and the volume of wine transferred, shall be maintained. [District Rules 1070 and 2201]

- The permittee shall maintain the following records: red wine and white wine produced by fermentation at this facility, based on values reported to the Alcohol and Tobacco Tax and Trade Bureau (TTB), U.S. Department of the Treasury; the volume and the ethanol concentration of each wine movement; the calculated 12 month rolling wine ethanol content and throughput rate for fermentation and storage operations; and the calculated 12 month rolling VOC emission rate (lb-VOC per 12 month rolling period, calculated monthly). [District Rule 2201]

- On a monthly basis, the permittee shall calculate and record the VOC emissions, in pounds, from the wine storage operations in this tank. [District Rule 2201]

- On a monthly basis, the permittee shall calculate and record the total facility-wide wine fermentation and storage VOC emissions, in pounds, for the rolling 12-month period. The facility-wide wine fermentation and storage VOC emissions shall be calculated by summing the VOC emissions from the previous 12 months from every permitted wine tank at this facility. [District Rule 2201]

- Records of the rolling 12-month period total facility-wide fermentation and storage VOC emissions, including calculation methods and parameters used, shall be maintained. [District Rule 2201]

- Records shall be maintained that demonstrate the date of each year's start of crush season. [District Rule 2201]

- All records shall be retained on-site for a period of at least five years and made available for District inspection upon request. [District Rules 1070, 2201 and 4694]

4. Reporting

No reporting is required to demonstrate compliance with Rule 2201.

F. Ambient Air Quality Analysis (AAQA)

An Ambient Air Quality Analysis (AAQA) shall be conducted for the purpose of determining whether a new or modified Stationary Source will cause or make worse a violation of an air quality standard. However, since this project involves only VOC and no ambient air quality standard exists for VOC, an AAQA is not required for this project.

G. Compliance Certification

Section 4.15.2 of this Rule 2201 requires the owner of a new Major Source or a new major source or a source undergoing a federal major modification to demonstrate to the satisfaction of the District that all other Major Sources owned by such person and operating in California are in compliance or are on a schedule for compliance with all applicable emission limitations and standards. As discussed in Section VIII above, this facility is an existing source and this project constitutes a Federal Major Modification, therefore this requirement is applicable. The Wine Group LLC dba Almaden Madera's compliance certification is included in Appendix E.

H. Alternate Siting Analysis

District Rule 2201, Section 4.15.1 requires an alternative siting analysis for any project which constitutes a New Major Source or a Federal Major Modification. As shown above, this project triggers a Federal Major Modification. Therefore, an alternative siting analysis must be performed.

The proposed project, which includes installation of two new 350,000 gallon wine storage tanks, will occur at an existing winery with more than 300 existing wine processing tanks, located in a rural area of Madera County. In addition to winery tanks, the operation of a winery requires a large number support equipment, services and structures such as raw material receiving stations, crushers, piping, filtering and refrigeration units, warehouses, laboratories, bottling and shipping facilities, and administration buildings.

Since the current project involves the installation of two new wine storage tanks, it represents only a minimal increase in the winery's total tank volume and no change to any other facets of the operation, the existing site will result in the least possible impact from the project. Alternative sites would involve the relocation and/or construction of various support structures and facilities on a much greater scale, and would therefore result in a much greater impact.

Rule 2410 Prevention of Significant Deterioration

The prevention of significant deterioration (PSD) program is a construction permitting program for new major stationary sources and major modifications to existing major stationary sources located in areas classified as attainment or in areas that are unclassifiable for any criteria air pollutant.

As demonstrated above, this project is not subject to the requirements of Rule 2410 due to a significant emission increase and no further discussion is required.

Rule 2520 Federally Mandated Operating Permits

This facility is subject to this Rule, and has received their Title V Operating Permit. A significant permit modification is defined as a "permit amendment that does not qualify as a minor permit modification or administrative amendment."

Section 3.20.5 states that a minor permit modification is a permit modification that is not a Federal Major Modification, as defined in Rule 2201[3]. As discussed above, this project triggers a Federal Major Modification. As a result, the proposed project constitutes a Significant Modification to the Title V Permit pursuant to Section 3.29.

As discussed above, the facility has applied for a Certificate of Conformity (COC). Therefore, the facility must apply to modify their Title V permit with an administrative amendment, prior to operating with the proposed modifications. Continued compliance with this rule is expected. The facility may construct/operate under the ATCs upon submittal of the Title V administrative amendment application.

[3] District Rule 2520, Section 3.20.5 actually states that a project shall not constitute a Title I modification, as defined in Rule 2201. In a previous version of Rule 2201, the term Title I modification was replaced with Federal Major Modification. However, at that time, the terminology in Rule 2520 was not updated to reflect the new Rule 2201 terms. Therefore, although Rule 2520 references that a project triggering a Title I modification does not qualify as a Title V minor modification, it will be replaced with the term Federal Major Modification for purposes of this project.

The following conditions will be included on each ATC and will assure compliance with the requirements of Rule 2520:

- {1830} This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2201]

- {1831} Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4]

Rule 4001 New Source Performance Standards (NSPS)

This rule incorporates certain NSPS from Part 60, Chapter 1, Title 40, Code of Federal Regulations (CFR); and applies to all new sources of air pollution and modifications of existing sources of air pollution listed in 40 CFR Part 60. However, no subparts of 40 CFR Part 60 apply to wine storage tank operations.

Rule 4002 National Emission Standards for Hazardous Air Pollutants (NESHAPs)

This rule incorporates certain NESHAPs from Part 61, Chapter I, Subchapter C, Title 40, CFR and the NESHAPs from Part 63, Chapter I, Subchapter C, Title 40, CFR; and applies to all sources of hazardous air pollution listed in 40 CFR Part 61 or 40 CFR Part 63. However, no subparts of 40 CFR Part 61 or 40 CFR Part 63 apply to wine storage tank operations.

Rule 4102 Nuisance

Rule 4102 prohibits discharge of air contaminants which could cause injury, detriment, nuisance or annoyance to the public. Public nuisance conditions are not expected as a result of these operations provided the equipment is well maintained. Therefore, compliance with this rule is expected.

The following condition will be placed on the ATC permit to ensure compliance:

- {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

California Health & Safety Code 41700 (Health Risk Assessment)

District Policy APR 1905 – *Risk Management Policy for Permitting New and Modified Sources* specifies that for an increase in emissions associated with a proposed new source or modification, the District perform an analysis to determine the possible impact to the nearest resident or worksite.

Ethanol, a VOC, is the only pollutant that will be emitted by the proposed wine tanks. Ethanol is not a Toxic Air Contaminant (TAC) as defined by Section 44321 of the California Health and Safety Code. Because there are no increases in TAC emissions associated with any emission

units in this project, therefore a health risk assessment is not necessary and no further risk analysis is required.

Rule 4623 Storage of Organic Liquids

The purpose of this rule is to limit volatile organic compound (VOC) emissions from the storage of organic liquids. This rule applies to any tank with a capacity of 1,100 gallons or greater in which any organic liquid is placed, held, or stored.

However, Section 4.1.4 provides an exemption for tanks used to store fermentation products, byproducts or spirits. The tanks in this project are used solely for the storage of wine. Therefore, the requirements of this rule are not applicable to any of the proposed wine storage tanks.

Rule 4694 Wine Fermentation and Storage Tanks

The purpose of this rule is to reduce emissions of volatile organic compounds (VOC) from the fermentation and bulk storage of wine, or achieve equivalent reductions from alternative emission sources. This rule is applicable to all wineries with Baseline Fermentation Emissions in excess of 10 tons-VOC/year. This facility has Baseline Fermentation Emissions in excess of 10 tons-VOC/year; therefore the tanks at the facility are subject to this rule. The storage tank provisions of this rule apply to all tanks with capacity in excess of 5,000 gallons.

Section 5.1 requires the winery operator achieve Required Annual Emissions Reductions (RAER) equal to at least 35% of the winery's Baseline Fermentation Emissions (BFE). Per the definition of RAER in Section 3.25 of the Rule, the RAER may be achieved by any combination of Fermentation Emission Reductions (FER), Certified Emission Reductions (CER) or District Obtained Emission Reductions (DOER) as established in the facility's District-approved Rule 4694 Compliance Plan. The tanks proposed in this project will only be permitted for wine storage, not wine fermentation; therefore, this section is not applicable and no further discussion is required.

Section 5.2 places specific restrictions on wine storage tanks with 5,000 gallons or more in capacity when such tanks are not constructed of wood or concrete.

Section 5.2.1 requires these tanks to be equipped and operated with a pressure-vacuum relief valve meeting all of the following requirements:

- The pressure-vacuum relief valve shall operate within 10% of the maximum allowable working pressure of the tank,
- The pressure-vacuum relief valve shall operate in accordance with the manufacturer's instructions, and
- The pressure-vacuum relief valve shall be permanently labeled with the operating pressure settings.
- The pressure-vacuum relief valve and storage tank shall remain in a gas-tight condition except when the operating pressure of the tank exceeds the valve set pressure. A gas-tight condition shall be determined by measuring the gas leak in accordance with the procedures in EPA Method 21.

The following conditions will be listed on the permits for stainless steel tanks ≥ 5,000 gallons in capacity and used for storage to ensure compliance with the requirements of Section 5.2.1:

- This tank shall be equipped with and operated with a pressure-vacuum relief valve, which shall operate within 10% of the maximum allowable working pressure of the tank, operate in accordance with the manufacturer's instructions, and be permanently labeled with the operating pressure settings. [District Rules 2201 and 4694]

- The pressure-vacuum relief valve and storage tank shall remain in a gas-tight condition, except when the operating pressure of the tank exceeds the valve set pressure. A gas-tight condition shall be determined by measuring the gas leak in accordance with the procedures in EPA Method 21. [District Rules 2201 and 4694]

Section 5.2.2 requires that the temperature of the stored wine be maintained at or below 75° F. The following condition will be placed on the permits for stainless steel tanks ≥ 5,000 gallons in capacity and used for storage to ensure compliance with the requirements of Section 5.2.2:

- The temperature of the wine stored in this tank shall be maintained at or below 75 degrees Fahrenheit. The temperature of the stored wine shall be determined and recorded at least once per week. For each batch of wine, the operator shall achieve the storage temperature of 75 degrees Fahrenheit or less within 60 days after completing fermentation, and shall maintain records to show when the required storage temperature of 75 degrees Fahrenheit or less was achieved. [District Rules 2201 and 4694]

Every three years, Section 6.1 and 6.2 require facilities with fermentation operations to submit a Three-Year Compliance Plan and a Three-Year Compliance Plan Verification respectively. Section 6.3 requires that an Annual Compliance Plan Demonstration be submitted to the District no later than February 1 of each year to show compliance with the applicable requirements of the Rule. Section 6.4.3 requires that all monitoring be performed for any Certified Emission Reductions as identified in the facility's Three-Year Compliance Plan and that the records of all monitoring be maintained.

Although the proposed tanks evaluated under this project will only be used for storage, the facility does have fermentation operations. The following conditions listed on the facility-wide permit ensure compliance:

- This facility shall annually achieve the Required Annual Emission Reductions (RAER) as specified in the facility's APCO-approved Three-Year Compliance Plan for District Rule 4694. [District Rule 4694]

- Three-Year Compliance Plan that demonstrates compliance with the requirements of Section 5.1 of District Rule 4694 for each year of the applicable compliance period shall be submitted to the District by no later than December 1, 2006, and every three years thereafter on or before December 1. [District Rule 4694]

- A Three-Year Compliance Plan Verification that demonstrates that the Three-Year Compliance Plan elements are in effect shall be submitted to the District by no later than July 1, 2007, and every three years thereafter on or before July 1. [District Rule 4694]

- An Annual Compliance Plan Demonstration that shows compliance with the applicable requirements of this rule shall be submitted to the District by no later than March 1, 2008, and every year thereafter on or before March 1. [District Rule 4694]

Section 6.4 requires that records required by this rule be maintained, retained on-site for a minimum of five years, and made available to the APCO upon request.

The following condition will be listed on each permit to ensure on-going compliance with this section:

- All records shall be retained on-site for a period of at least five years and made available for District inspection upon request. [District Rules 1070, 2201, and 4694]

Section 6.4.1 requires that records be kept for each fermentation batch. The tanks proposed in this project will only be permitted for wine storage, not wine fermentation; therefore, this section is not applicable and no further discussion is required.

Section 6.4.2 requires that weekly records be kept of wine volume and temperature in each storage tank. The following conditions will be listed on the permit for each storage tank to ensure compliance with the requirements of Section 6.4.2:

- The operator shall determine and record, on a weekly basis, the total gallons of wine contained in the tank and the maximum temperature of the stored wine. [District Rule 4694]

Section 6.4.3 requires that all monitoring be performed for any Certified Emission Reductions as identified in the facility's Three-Year Compliance Plan and that the records of all monitoring be maintained.

Although the proposed tanks evaluated under this project will only be used for storage, the facility does have fermentation operations. The following condition listed on the facility-wide permit ensure compliance:

- Operators using Certified Emission Reductions (CER) to mitigate fermentation emissions shall perform all monitoring and recordkeeping, as established in their approved Three-Year Compliance Plan, and shall maintain all records necessary to demonstrate compliance. [District Rule 4694]

California Health & Safety Code 42301.6 (School Notice)

The District has verified that this site is not located within 1,000 feet of a school. In addition, the proposed project will not result in an increase in Toxic Air Contaminants. Therefore, pursuant to California Health and Safety Code 42301.6, a school notice is not required.

California Environmental Quality Act (CEQA)

CEQA requires each public agency to adopt objectives, criteria, and specific procedures consistent with CEQA Statutes and the CEQA Guidelines for administering its responsibilities under CEQA, including the orderly evaluation of projects and preparation of environmental documents. The District adopted its *Environmental Review Guidelines* (ERG) in 2001. The basic purposes of CEQA are to:

- Inform governmental decision-makers and the public about the potential, significant environmental effects of proposed activities;
- Identify the ways that environmental damage can be avoided or significantly reduced;
- Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible; and
- Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

The County of Madera (County) is the public agency having principal responsibility for approving the project. As such, the County served as the Lead Agency (CCR §15367). In approving the project, the Lead Agency prepared and adopted a Mitigated Negative Declaration (MND #2016-025). The Lead agency filed a Notice of Determination, stating that the environmental document was adopted pursuant to the provisions of CEQA and concluding that the project would not have a significant effect on the environment.

The District is a Responsible Agency for the project because of its discretionary approval power over the project via its Permits Rule (Rule 2010) and New Source Review Rule (Rule 2201), (CCR §15381). As a Responsible Agency the District complies with CEQA by considering the environmental document prepared by the Lead Agency, and by reaching its own conclusion on whether and how to approve the project (CCR §15096).

The District has considered the Lead Agency's environmental document and finds that it adequately characterizes the project's potential impact on air quality. In addition, all feasible and cost-effective control measures to reduce potential impacts on air quality resulting from project related stationary source emissions have been applied to the project as part of BACT. Furthermore, the District has conducted an engineering evaluation of the project, this document, which demonstrates that Stationary Source emissions from the project would be reduced. Thus, the District finds that through a combination of project design elements, compliance with applicable District rules and regulations, and compliance with District air permit conditions, project specific stationary source emissions would be reduced to lessen the impacts on air quality. The District does not have authority over any of the other project impacts and has, therefore, determined that no additional findings are required (CEQA Guidelines §15096(h)).

Indemnification Agreement/Letter of Credit Determination

According to District Policy APR 2010 (CEQA Implementation Policy), when the District is the Lead or Responsible Agency for CEQA purposes, an indemnification agreement and/or a letter of credit may be required. The decision to require an indemnity agreement and/or a letter of credit is based on a case-by-case analysis of a particular project's potential for litigation risk,

which in turn may be based on a project's potential to generate public concern, its potential for significant impacts, and the project proponent's ability to pay for the costs of litigation without a letter of credit, among other factors.

The criteria pollutant emissions and toxic air contaminant emissions associated with the proposed project are not significant. Therefore, an Indemnification Agreement and/or a Letter of Credit will not be required for this project in the absence of expressed public concern.

IX. Recommendation

Compliance with all applicable rules and regulations is expected. After successful completion of the Public Noticing period and addressing any comments received, issue ATCs C-1353-362-0 and -363-0 subject to the permit conditions on the attached draft ATCs in Appendix F.

X. Billing Information

Annual Permit Fees			
Permit Number	**Fee Schedule**	**Fee Description**	**Annual Fee**
C-1353-362-0	3020-05-E	350,000 Gallon Wine Tank	$270
C-1353-363-0	3020-05-E	350,000 Gallon Wine Tank	$270

Appendixes

A: Description of District Procedures for Modeling of Emissions for Wine and Distilled Spirits Storage Tanks Using TANKS 4.09D
B: TANKS 4.09D Wine Storage Emissions Estimation Calculations
C: Potential to Emit Calculations for C-1353-1-8, -2-11, -352-2, & -353-2
D: BACT Guideline 5.4.13 and Top-Down BACT Analysis for Wine Storage Tanks
E: Compliance Certification
F: Draft ATC Permits

APPENDIX A

Description of District Procedures for Modeling of Emissions for Wine and Distilled Spirits Storage Tanks Using Tanks 4.09D

I. OVERVIEW

Winery tank operations generally consist of two separate emissions units; 1) fermentation and 2) storage of wine and spirits. Any particular tank may be permitted to perform one or both of these operations. Emissions from storage operations are estimated by modeling the tank operation using U.S. EPA TANKS 4.09D software. Emissions from fermentation operations are estimated using emission factors that have been developed and approved by the District. The emissions from each emission unit are then appropriately combined to yield the Potential to Emit for the tank (permit unit).

The information given below summarizes the current District procedures for using TANKS 4.09D for the purposes of estimating VOC emissions from vertical fixed-roof tanks storing wine, distilled spirits, or any other wine and ethanol mixture.

II. WINE AND SPIRITS STORAGE TANKS

Emissions estimates for wine and spirits storage tanks are based on modeling the tank operation using the EPA's TANKS 4.09D software. The District modeling procedures utilize TANKS 4.09D software along with a database of ethanol/water vapor-equilibrium data developed by The Wine Institute.

Emissions from storage tanks consist of both working losses and breathing losses. The former losses occur as a result of the displacement of the vapor space of the tank into the atmosphere which occurs during tank filling operations and is primarily a function of tank throughput and the temperature and ethanol content of the wine. Breathing losses are the result of diurnal heating and cooling, caused by the effect of ambient conditions on the contents of the tank. For a well-insulated tank breathing losses are assumed to be negligible since the insulation (typically 3-4 inches polyurethane foam) significantly reduces heat gain/loss by the liquid in the tank. Installation of non-insulated tanks in a climate-controlled building is considered equivalent to insulation since the tank is isolated from solar radiation and wind effects as well as being maintained in a constant temperature environment. Thus breathing losses are considered to be negligible for this case as well.

The validity of TANKS 4.09D for emissions modeling of storage tanks is recognized by both the District and the US EPA. Although the software has been widely used for modeling VOC emissions from tanks containing organic liquids such as hydrocarbons (e.g., oilfield production and storage tanks), its use for tanks which store highly non-ideal solutions such as ethanol/water mixtures requires the development of empirical vapor-equilibrium data for the specific fluid. Ethanol water mixtures do not conform to either Raoult's Law or Henry's law (except for over limited ranges of dilute ethanol concentration) and therefore the accurate estimation of vapor-equilibrium properties of these mixtures using pure component properties is complex. The alternative is the use of empirical data along with suitable interpolation formulas.

The Wine Institute has developed a database for ethanol/water mixtures based on interpolation of empirical data given in the International Critical Tables. The database provides information on vapor pressure and other mixture properties for the two phase binary ethanol/water mixture for all concentrations from 0.1% to 99.9% alcohol. It has been put in a file format suitable for input directly into the EPA TANKS 4.09D Model. The database has been provided for use both by

the District and by wineries for purposes of estimating wine storage tank emissions. The basis and assumptions of the database have been reviewed by the District and the database was found to be both a good representation of the empirical data given in the International Critical Tables and to be in the correct format for use in TANKS 4.09D.

The following discussion describes the District procedures the use of TANKS 4.09D for modeling emissions from tanks containing ethanol/water mixtures. The discussion assumes generally familiarity with the use of TANKS 4.09D for modeling storage tanks (see the TANKS 4.0 User Manual and the EPA document "Tanks Software Frequent Questions", available at http://www.epa.gov/ttnchie1/faq/tanksfaq.html for general use of the software). The following discussion will only address the specific considerations required for ethanol-water mixtures:

A. Applicability of TANKS 4.09D:

1. Winery tanks are almost exclusively vertical tanks with fixed roofs. The discussion will be restricted to this type.

2. TANKS 4.09D will be typically used to calculate the Potential to Emit (PE) for one of the following storage tank scenarios:

   - Temperature controlled tank which is either insulated or located inside a climate controlled building: Applicable to all insulated wine and brandy storage tanks with an operating temperature limitation on the permit. Certain categories of storage tanks may be operated under continuous refrigeration such that the maximum temperature may be limited to less than ambient. Permit condition(s) that require a wine storage temperature that is less than ambient results in reduced potential emissions. The combined effect of limiting the maximum temperature and the use of insulation (or installing the tank in a temperature-controlled building) results in reduced working loss emissions and zero breathing loss emissions.

   - Non-temperature controlled tank which is either insulated or located inside a climate controlled building: Applicable to all insulated wine and brandy storage tanks without an operating temperature limitation on the permit. Although most wine storage operations utilize refrigeration at certain times to maintain wine quality, most tanks are utilized to perform certain post fermentation operations on the wine during which it is undesirable to chill the wine and the tank operation is therefore subject to ambient temperature. Although these tanks may be refrigerated at some point as required by wine processing requirements, since there is no temperature limit on the permit, it is conservatively assumed the bulk liquid temperature is set by ambient conditions. However, since the tank is insulated, it is assumed that the internal temperatures are relatively uniform such that liquid surface temperatures in the tank are approximately the same as the bulk liquid temperature. The result of this assumption is that the tank model only indicates working losses while breathing losses are calculated as zero.

   - Non-temperature controlled tank which is neither insulated nor located inside a climate controlled building (unheated tank): Applicable to all non-insulated wine and brandy storage tanks without an operating temperature limitation. Most wine storage operations utilize refrigeration to maintain quality. However, since there is no

temperature limit on the permit it is conservatively assumed the tank temperatures are set by ambient conditions. Since the tank is not insulated, both working and breathing losses will occur. Emissions calculated in this manner could represent uncontrolled emissions for any tank since the effects of insulation and temperature control would not be considered. Any tank installed in a building which is not climate-controlled is conservatively to be an outdoor installation.

3. To calculate both daily and annual PE:

   - Daily PE is based on maximum daily throughput, maximum ethanol % and the maximum temperature (if stated on the permit), occurring during July (hottest average monthly temperature for the San Joaquin Valley).

   - Annual PE is based on maximum annual throughput, maximum allowed annual average ethanol % and maximum temperature if stated on the permit. In lieu of average annual ethanol %, the maximum allowed ethanol % can be used, yielding a conservatively higher emission value. Annual storage operations are assumed to be averaged over the full year.

4. When a tank is used for multiple products and has a permit limit for each, e.g., wine and spirits storage, a separate model is prepared for each product and the sum of the emissions from all model runs represents the total PE for the tank.

B. Establish the Ethanol/Water Chemical Data Base

Before starting an emissions model for an ethanol/water tank, access to the ethanol/water chemical database must first be established.

C. TANKS 4.09D Input

For the tank model, input is required for five different tabs: 1) *Identification, 2) Physical Characteristics, 3) Site Selection, 4) Tank Contents and 5) Monthly Calculations.*

Identification: No special considerations for ethanol/water storage are required for this tab.

Physical Characteristics:

- For square or rectangular tanks which are common in some wineries, input a diameter which gives an equivalent circular cross sectional area.

- For "Net Throughput" the proposed annual throughput in gallons per year is entered for purposes of modeling annual PE for the tank. When modeling daily emissions, the maximum daily throughput x 31 at this location is entered (the model for daily emissions will assume that the maximum daily throughput occurs each day throughout July and TANKS 4.09D will directly determine monthly emissions for July on that basis. Daily PE will then be determined by dividing the July monthly emissions by the 31 days in July).

- For "Is tank heated?" select "yes" if the tank is insulated and then set the vacuum and pressure settings to zero per software recommendation. If the is not insulated, select "no" and input the pressure/vacuum settings.

- For insulated tanks, select "white/good" for both the tank walls and roof since most winery tanks are white (Note that for tanks which are insulated, the contents are assumed to be uniform in temperature and therefore the selection of the tank color and condition has no impact on the emission estimate). For non-insulated tanks, select "diffuse aluminum/good" in order to conservatively simulate a possibly unpainted stainless steel tank.

- For inputting tank roof geometries other than dome or cone, refer to the EPA FAQs document at http://www.epa.gov/ttnchie1/faq/tanksfaq.html.

- Since most wine storage operations strive to maintain the liquid height as high as possible to avoid oxygen contact with the wine, the average and maximum liquid heights may be set approximately equal to the tank wall height if no other basis is provided by the applicant (Note that if the tank is insulated, the contents are assumed to be uniform in temperature and the values for average and maximum liquid height in the tank have no impact on the emissions estimate).

Site Selection:

- Select a location corresponding to the region of the facility. For San Joaquin Valley, the TANKS 4.09D database includes only Bakersfield, Fresno, and Stockton which are assumed to adequately representative of facilities located in the District's Southern, Central, and Northern Regions respectively.

Tank Contents:

- For "Chemical Category of Liquid", select "Organic Liquids"

- For "Single or Multi-Component Liquid" select 'Multiple".

- For "Mixture Name" the entry from the database corresponding to the ethanol contents of the tank is selected. For annual PE estimates, either the allowed average annual ethanol concentration or the maximum allowed ethanol concentration, rounded to the nearest 0.1 %, is selected. For daily PE estimates, only the maximum allowed ethanol concentration is selected.

- Specify "Average Liquid Surface Temperature", "Minimum Liquid Surface Temperature", "Maximum Liquid Surface Temperature" and "Bulk Liquid Temperature" as follows:

    1. Temperature controlled tank which is either insulated or located inside a climate controlled building: Input the maximum allowed tank temperature for each entry

    2. Non-temperature controlled tank which is either insulated or located inside a climate controlled building: It is assumed that the calculated average bulk liquid temperature (for the specific site as calculated by TANKS 4.09D for an unheated

tank) is applicable for each entry (note that due to the effects of insulation, the temperature of the contents is assumed to be uniform). To determine annual emissions for locations represented by Bakersfield input 64.4 °F for all four entries; for Fresno input 63.3 °F for all four entries; for Stockton input 61.6 °F for all four entries. To determine daily emissions for locations represented by Bakersfield input 83.1 °F for all four entries; for Fresno input 81.0 °F for all four entries; for Stockton input 77.3 °F for all four entries (the mean daily temperature for July is assumed for each location).

3. Non-temperature controlled tank which is neither insulated nor located inside a climate controlled building (unheated tank): Since the tank will have been specified as not heated, TANKS 4.09D will calculate all temperatures based on the site selection. After selecting the appropriate site on the *Site Selection* tab, go to the *Tank Contents* tab and click the "Calculate Mixture Properties" button.

- Based on selection of the mixture, TANKS 4.09D will input the remaining information on vapor pressure and molecular weight per the data base for the selected mixture.

Monthly Calculations Tab:

- For Daily emissions models, check only July and click the "Distribute Throughput" button.

- For annual emissions models, check all months and click the "Distribute Throughput" button.

D. Run Annual PE Emissions Model Report

1. With the tank model configured for annual emissions (maximum annual throughput listed for "Net Throughput" on the "Physical Characteristics" tab and all months checked on the "Monthly Calculations" tab with the throughput evenly distributed in all months, click "Run Report".

2. Select "Detailed" for report type and "monthly" for time basis and click OK.

3. The last page of the emissions report will list the estimated annual emissions from the tank. The listed values are the combined emissions for ethanol and water vapor (not the ethanol emissions from the tank). The listed values must be speciated to determine the daily VOC emissions.

E. Run Daily PE Emissions Model Report

1. With the tank model configured for daily emissions (31 x maximum daily throughput listed for "Net Throughput" on the "Physical Characteristics" tab and only July checked on the "Monthly Calculations" tab with the throughput all occurring in July, click "Run Report".

2. Select "Detailed" for report type and "monthly" for time basis and click OK.

3. The last page of the emissions report will list the estimated emissions from the tank for the month of July assuming the maximum daily throughput occurs each day of July. The

listed values are the combined emissions for ethanol and water vapor (not the ethanol emissions from the tank). The listed values must be converted to a daily emission basis and then speciated to determine the daily VOC emissions.

F. Speciate the TANKS 4.0D Emissions Estimates to Determine the VOC (ethanol) Emissions:

The annual emission estimate provided by the TANKS 4.09D model working + breathing loss) represents the combined loss of ethanol and water vapor from the tank. To calculate the ethanol portion of the emissions, it is first necessary to determine the molar fraction of ethanol (y_a) in the vapor emissions from the tank. This can be calculated from the average molecular weight (AMW) of the vapor as given in the chemical database and also listed in the detailed emissions report. Per the definition of AMW for a binary mixture:

$$AMW = y_a \times MW_a + (1-y_a) \times MW_w$$

Solving for the molar fraction of ethanol,

$$y_a = \frac{AMW - MW_w}{MW_a - MW_w}$$

Where,

MW_a = Molecular weight of ethanol = 46.02 lb/mole
MW_w = Molecular weight of water = 18.02/lb/mole

The ethanol emissions may then be calculated,

$$PE_{annual} = \frac{\text{Annual Tank Loss}}{AMW} \times y_a \times MW_a$$

$$PE_{daily} = \frac{\text{July Tank Loss}}{31 \text{ days} \times AMW} \times y_a \times MW_a$$

APPENDIX B

TANKS 4.09D Wine Storage Emissions Estimation Calculations

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	C-1353-362-0 & -363-0 (Daily)
City:	Madera
State:	California
Company:	The Wine Group LLC dba Almaden-Madera
Type of Tank:	Vertical Fixed Roof Tank
Description:	Vertical Fixed Roof Tank 350,000 Gallon Stainless Steel Enclosed Top Wine Storage Tanks with Pressure-Vacuum Valve and Insulation (Tanks 2017-1 & 2017-2) - Daily

Tank Dimensions

Shell Height (ft):	45.00
Diameter (ft):	38.00
Liquid Height (ft) :	44.00
Avg. Liquid Height (ft):	43.00
Volume (gallons):	350,000.00
Turnovers:	31.89
Net Throughput(gal/yr):	11,160,000.00
Is Tank Heated (y/n):	Y

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	1.00
Slope (ft/ft) (Cone Roof)	0.05

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Fresno, California (Avg Atmospheric Pressure = 14.56 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

C-1353-362-0 & -363-0 (Daily) - Vertical Fixed Roof Tank
Madera, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Wine 23.9 % Vol Alcohol	Jul	81.00	81.00	81.00	81.00	0.8500	0.8500	0.8500	30.3355			20.45	Option 1: VP70 = .58508 VP80 = .81869

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

C-1353-362-0 & -363-0 (Daily) - Vertical Fixed Roof Tank
Madera, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):							0.0000					
Vapor Space Volume (cu ft):							2,646.2682					
Vapor Density (lb/cu ft):							0.0044					
Vapor Space Expansion Factor:							0.0000					
Vented Vapor Saturation Factor:							0.9049					
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):							2,646.2682					
Tank Diameter (ft):							38.0000					
Vapor Space Outage (ft):							2.3333					
Tank Shell Height (ft):							45.0000					
Average Liquid Height (ft):							43.0000					
Roof Outage (ft):							0.3333					
Roof Outage (Cone Roof)												
Roof Outage (ft):							0.3333					
Roof Height (ft):							1.0000					
Roof Slope (ft/ft):							0.0500					
Shell Radius (ft):							19.0000					
Vapor Density												
Vapor Density (lb/cu ft):							0.0044					
Vapor Molecular Weight (lb/lb-mole):							30.3355					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.8500					
Daily Avg. Liquid Surface Temp. (deg. R):							540.6700					
Daily Average Ambient Temp. (deg. F):							81.8500					
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):							10.731					
Liquid Bulk Temperature (deg. R):							540.6700					
Tank Paint Solar Absorptance (Shell):							0.1700					
Tank Paint Solar Absorptance (Roof):							0.1700					
Daily Total Solar Insulation Factor (Btu/sqft day):							2,551.4853					
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:							0.0000					
Daily Vapor Temperature Range (deg. R):							0.0000					
Daily Vapor Pressure Range (psia):							0.0000					
Breather Vent Press. Setting Range(psia):							0.0000					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.8500					
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):							0.8500					
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):							0.8500					
Daily Avg. Liquid Surface Temp. (deg R):							540.6700					
Daily Min. Liquid Surface Temp. (deg R):							540.6700					
Daily Max. Liquid Surface Temp. (deg R):							540.6700					
Daily Ambient Temp. Range (deg. R):							33.5000					
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:							0.9049					
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):							0.8500					
Vapor Space Outage (ft):							2.3333					

Working Losses (lb):	6,851.7786
Vapor Molecular Weight (lb/lb-mole):	30.3355
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.8500
Net Throughput (gal/mo.):	11,160,000.0000
Annual Turnovers:	31.8857
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	350,000.0000
Maximum Liquid Height (ft):	44.0000
Tank Diameter (ft):	38.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	6,851.7786

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: July

C-1353-362-0 & -363-0 (Daily) - Vertical Fixed Roof Tank
Madera, California

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Wine 23.9 % Vol Alcohol	6,851.78	0.00	6,851.78

$$\frac{46.02}{30.3355} \times \frac{30.3355 - 18.02}{46.02 - 18.02} \times \frac{6,851.78}{31 \text{ days}} = 147.5 \text{ lb-VOC/day}$$

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	C-1353-362-0 & -363-0 (Annual)
City:	Madera
State:	California
Company:	The Wine Group LLC dba Almaden-Madera
Type of Tank:	Vertical Fixed Roof Tank
Description:	Vertical Fixed Roof Tank 350,000 Gallon Stainless Steel Enclosed Top Wine Storage Tanks with Pressure-Vacuum Valve and Insulation (Tanks 2017-1 & 2017-2) - Annual

Tank Dimensions

Shell Height (ft):		45.00
Diameter (ft):		38.00
Liquid Height (ft) :		44.00
Avg. Liquid Height (ft):		43.00
Volume (gallons):		350,000.00
Turnovers:		36.00
Net Throughput(gal/yr):		12,600,000.00
Is Tank Heated (y/n):	Y	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone	
Height (ft)		1.00
Slope (ft/ft) (Cone Roof)		0.05

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Fresno, California (Avg Atmospheric Pressure = 14.56 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

C-1353-362-0 & -363-0 (Annual) - Vertical Fixed Roof Tank
Madera, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Wine 23.9 % Vol Alcohol	Jan	63.30	63.30	63.30	63.30	0.4695	0.4695	0.4695	30.3355			20.45	Option 1: VP60 = .4125 VP70 = .58508
Wine 23.9 % Vol Alcohol	Feb	63.30	63.30	63.30	63.30	0.4695	0.4695	0.4695	30.3355			20.45	Option 1: VP60 = .4125 VP70 = .58508
Wine 23.9 % Vol Alcohol	Mar	63.30	63.30	63.30	63.30	0.4695	0.4695	0.4695	30.3355			20.45	Option 1: VP60 = .4125 VP70 = .58508
Wine 23.9 % Vol Alcohol	Apr	63.30	63.30	63.30	63.30	0.4695	0.4695	0.4695	30.3355			20.45	Option 1: VP60 = .4125 VP70 = .58508
Wine 23.9 % Vol Alcohol	May	63.30	63.30	63.30	63.30	0.4695	0.4695	0.4695	30.3355			20.45	Option 1: VP60 = .4125 VP70 = .58508
Wine 23.9 % Vol Alcohol	Jun	63.30	63.30	63.30	63.30	0.4695	0.4695	0.4695	30.3355			20.45	Option 1: VP60 = .4125 VP70 = .58508
Wine 23.9 % Vol Alcohol	Jul	63.30	63.30	63.30	63.30	0.4695	0.4695	0.4695	30.3355			20.45	Option 1: VP60 = .4125 VP70 = .58508
Wine 23.9 % Vol Alcohol	Aug	63.30	63.30	63.30	63.30	0.4695	0.4695	0.4695	30.3355			20.45	Option 1: VP60 = .4125 VP70 = .58508
Wine 23.9 % Vol Alcohol	Sep	63.30	63.30	63.30	63.30	0.4695	0.4695	0.4695	30.3355			20.45	Option 1: VP60 = .4125 VP70 = .58508
Wine 23.9 % Vol Alcohol	Oct	63.30	63.30	63.30	63.30	0.4695	0.4695	0.4695	30.3355			20.45	Option 1: VP60 = .4125 VP70 = .58508
Wine 23.9 % Vol Alcohol	Nov	63.30	63.30	63.30	63.30	0.4695	0.4695	0.4695	30.3355			20.45	Option 1: VP60 = .4125 VP70 = .58508
Wine 23.9 % Vol Alcohol	Dec	63.30	63.30	63.30	63.30	0.4695	0.4695	0.4695	30.3355			20.45	Option 1: VP60 = .4125 VP70 = .58508

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

C-1353-362-0 & -363-0 (Annual) - Vertical Fixed Roof Tank
Madera, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Space Volume (cu ft):	2,646.2682	2,646.2682	2,646.2682	2,646.2682	2,646.2682	2,646.2682	2,646.2682	2,646.2682	2,646.2682	2,646.2682	2,646.2682	2,646.2682
Vapor Density (lb/cu ft):	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
Vapor Space Expansion Factor:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vented Vapor Saturation Factor:	0.9451	0.9451	0.9451	0.9451	0.9451	0.9451	0.9451	0.9451	0.9451	0.9451	0.9451	0.9451
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	2,646.2682	2,646.2682	2,646.2682	2,646.2682	2,646.2682	2,646.2682	2,646.2682	2,646.2682	2,646.2682	2,646.2682	2,646.2682	2,646.2682
Tank Diameter (ft):	38.0000	38.0000	38.0000	38.0000	38.0000	38.0000	38.0000	38.0000	38.0000	38.0000	38.0000	38.0000
Vapor Space Outage (ft):	2.3333	2.3333	2.3333	2.3333	2.3333	2.3333	2.3333	2.3333	2.3333	2.3333	2.3333	2.3333
Tank Shell Height (ft):	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000
Average Liquid Height (ft):	43.0000	43.0000	43.0000	43.0000	43.0000	43.0000	43.0000	43.0000	43.0000	43.0000	43.0000	43.0000
Roof Outage (ft):	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333
Roof Height (ft):	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Roof Slope (ft/ft):	0.0500	0.0500	0.0500	0.0500	0.0500	0.0500	0.0500	0.0500	0.0500	0.0500	0.0500	0.0500
Shell Radius (ft):	19.0000	19.0000	19.0000	19.0000	19.0000	19.0000	19.0000	19.0000	19.0000	19.0000	19.0000	19.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
Vapor Molecular Weight (lb/lb-mole):	30.3355	30.3355	30.3355	30.3355	30.3355	30.3355	30.3355	30.3355	30.3355	30.3355	30.3355	30.3355
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695
Daily Avg. Liquid Surface Temp. (deg. R):	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700
Daily Average Ambient Temp. (deg. F):	45.7500	51.1000	55.0000	61.2000	68.9500	76.5500	81.8500	80.2500	74.4500	65.2000	53.6000	45.4000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	668.1706	1,022.2439	1,488.6308	1,992.7729	2,390.9467	2,566.7143	2,551.4853	2,279.5850	1,860.7886	1,369.9719	851.5527	592.3431
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Daily Vapor Temperature Range (deg. R):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Daily Vapor Pressure Range (psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695
Daily Avg. Liquid Surface Temp. (deg R):	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700
Daily Min. Liquid Surface Temp. (deg R):	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700
Daily Max. Liquid Surface Temp. (deg R):	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700	522.9700
Daily Ambient Temp. Range (deg. R):	16.7000	21.2000	23.2000	27.8000	30.5000	32.3000	33.5000	32.9000	31.3000	29.0000	22.2000	16.6000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9451	0.9451	0.9451	0.9451	0.9451	0.9451	0.9451	0.9451	0.9451	0.9451	0.9451	0.9451
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695
Vapor Space Outage (ft):	2.3333	2.3333	2.3333	2.3333	2.3333	2.3333	2.3333	2.3333	2.3333	2.3333	2.3333	2.3333

Working Losses (lb):	356.0256	356.0256	356.0256	356.0256	356.0256	356.0256	356.0256	356.0256	356.0256	356.0256	356.0256	356.0256
Vapor Molecular Weight (lb/lb-mole):	30.3355	30.3355	30.3355	30.3355	30.3355	30.3355	30.3355	30.3355	30.3355	30.3355	30.3355	30.3355
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695	0.4695
Net Throughput (gal/mo.):	1,050,000.0000	1,050,000.0000	1,050,000.0000	1,050,000.0000	1,050,000.0000	1,050,000.0000	1,050,000.0000	1,050,000.0000	1,050,000.0000	1,050,000.0000	1,050,000.0000	1,050,000.0000
Annual Turnovers:	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	350,000.0000	350,000.0000	350,000.0000	350,000.0000	350,000.0000	350,000.0000	350,000.0000	350,000.0000	350,000.0000	350,000.0000	350,000.0000	350,000.0000
Maximum Liquid Height (ft):	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000
Tank Diameter (ft):	38.0000	38.0000	38.0000	38.0000	38.0000	38.0000	38.0000	38.0000	38.0000	38.0000	38.0000	38.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	356.0256	356.0256	356.0256	356.0256	356.0256	356.0256	356.0256	356.0256	356.0256	356.0256	356.0256	356.0256

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

C-1353-362-0 & -363-0 (Annual) - Vertical Fixed Roof Tank
Madera, California

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Wine 23.9 % Vol Alcohol	4,272.31	0.00	4,272.31

$$\frac{46.02}{30.3355} \times \frac{30.3355 - 18.02}{46.02 - 18.02} \times 4,272.31 = 2,851 \ \frac{16\text{-VOC}}{Yr}$$

APPENDIX C

Potential to Emit Calculations for C-1353-1-8, -2-11, -352-2, & -353-2

Potential to Emit (PE) Calculations for C-1353-1-8, -2-11, -352-2, & -353-2

C-1353-1-8

C-1353-1-8: 8.37 MMBTU/HR NATURAL GAS FIRED KEWANEE MODEL H3S-200 GO2 BOILER

Emission Factors for Unit C-1353-1-8:

The emission factors for NO_X, SO_X, CO, and VOC are taken from the current permit. The SO_X emission factor is based on the use of PUC-quality natural gas (sulfur content of 1 grain/100 scf). The PM_{10} emission factor in the current permit of 0.0076 lb-PM_{10}/MMBtu was based on EPA AP-42. Based on source testing data, the District has determined boilers, steam generators and process heaters fired on PUC-quality natural gas will have a PM_{10} emission factor no greater than 0.003 lb-PM10/MMBtu. Therefore, the PM_{10} emission factor will be revised to 0.003 lb-PM_{10}/MMBtu

PE Calculations (Also see Project C-1043512):

Annual PE for C-1353-1-8 (Natural Gas-Fired Boiler)					
Pollutant	Emission Factor (lb/MMBtu)	x	Maximum Annual Heat Input (MMBtu/yr)	=	PE (lb/yr)
NO_X	0.1	x	9,000	=	**900**
SO_X	0.00285	x	9,000	=	**26**
PM_{10}	0.003	x	9,000	=	**27**
CO	0.084	x	9,000	=	**756**
VOC	0.0055	x	9,000	=	**50**

C-1353-2-11

C-1353-2-11: 16.8 MMBTU/HR KEWANEE MODEL H3S-400-GO NATURAL GAS-FIRED BOILER WITH AN INDUSTRIAL COMBUSTION MODEL LND30 LOW NOX BURNER AND INDUCED FLUE GAS RECIRCULATION

Emission Factors for Unit C-1353-1-8:

The emission factors for NO_X, SO_X, CO, and VOC are taken from the current permit. The SO_X emission factor is based on the use of PUC-quality natural gas (sulfur content of 1 grain/100 scf). The PM_{10} emission factor in the current permit of 0.0076 lb-PM_{10}/MMBtu was based on EPA AP-42. Based on source testing data, the District has determined boilers, steam generators and process heaters fired on PUC-quality natural gas will have a PM_{10} emission factor no greater than 0.003 lb-PM10/MMBtu. Therefore, the PM_{10} emission factor will be revised to 0.003 lb-PM_{10}/MMBtu

PE Calculations (Also see Project C-1060054):

Annual PE for C-1353-2-11 (Natural Gas-Fired Boiler)					
Pollutant	Emission Factor (lb/MMBtu)	x	Maximum Annual Heat Input (MMBtu/yr)	=	PE (lb/yr)
NO_X	0.036	x	30,000	=	**1,080**
SO_X	0.00285	x	30,000	=	**86**
PM_{10}	0.003	x	30,000	=	**90**
CO	0.074	x	30,000	=	**2,220**
VOC	0.0028	x	30,000	=	**84**

C-1353-352-2 & 353-3

C-1353-352-2: 140 BHP JOHN DEERE MODEL 6068TF275 DIESEL-FIRED EMERGENCY IC ENGINE POWERING A FIREWATER PUMP

C-1353-353-2: 140 BHP JOHN DEERE MODEL 6068TF275 DIESEL-FIRED EMERGENCY IC ENGINE POWERING A FIREWATER PUMP

Emission Factors for Units C-1353-352-2 & 353-3:

The emission factors for NO_X, PM_{10}, SO_X, CO, and VOC are taken from the current permit. The SO_X emission factor is based on the use of California Air Resource Board (ARB) diesel fuel with a maximum sulfur content of 0.0015% by weight sulfur maximum (see equation below).

$$\frac{0.000015\ lb-S}{1\ lb-diesel\ fuel}\times\frac{7.1\ lb-diesel\ fuel}{1\ gallon\ diesel}\times\frac{2\ lb-SO_2}{1\ lb-S}\times\frac{1\ gallon\ diesel}{137{,}000\ Btu}\times\frac{1\ bhp\ input}{0.35\ bhp\ output}\times\frac{2{,}542.5\ Btu}{1\ bhp-hr}\times\frac{453.59\ g}{1\ lb}=0.0051\ \frac{g-SO_X}{bhp-hr}$$

PE Calculations (Also see Project C-1062141):

Annual PE for C-1353-352-2 & -353-2 (Diesel-Fired Emergency IC Engines)									
Pollutant	Emission Factor (g/bhp-hr)	x	Engine Rating (bhp)	x	Annual Hours of Operation (hr/yr)	÷	Conversion (g/lb)	=	PE (lb/yr)
NO_X	4.7	x	140	x	100	÷	453.59	=	**145**
SO_X	0.0051	x	140	x	100	÷	453.59	=	**0**
PM_{10}	0.18	x	140	x	100	÷	453.59	=	**6**
CO	0.82	x	140	x	100	÷	453.59	=	**25**
VOC	0.33	x	140	x	100	÷	453.59	=	**10**

APPENDIX D

BACT Guideline 5.4.13 and Top-Down BACT Analysis for Wine Storage Tanks

SJVAPCD Best Available Control Technology (BACT) Guideline 5.4.13*
Last Update 9/26/2011

Wine Storage Tank - Non-Wood Material**

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
VOC	1. Insulation or Equivalent***, Pressure Vacuum Relief Valve (PVRV) set within 10% of the maximum allowable working pressure of the tank; "gas-tight" tank operation; and continuous storage temperature not exceeding 75 degrees F, achieved within 60 days of completion of fermentation.	1. Capture of VOCs and thermal or catalytic oxidation or equivalent (98% control 2. Capture of VOCs and carbon adsorption or equivalent (95% control) 3. Capture of VOCs and absorption or equivalent (90% control) 4. Capture of VOCs and condensation or equivalent (70% control)	

** *This guideline is applicable to a wine storage tank that is not constructed out of wooden materials.*
*** *Tanks made of heat-conducting materials such as stainless steel may be insulated or stored indoors (in a completely enclosed building, except for vents, doors and other essential openings) to limit exposure ot diurnal temperature variations. Tanks made entirely of non-conducting materials such as concrete and wood (except for fittings) are considered self-insulating.*

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in s a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

***This is a Summary Page for this Class of Source**

BACT Guideline 5.4.13

Top-Down BACT Analysis for VOCs from Wine Storage Operations

Step 1 - Identify All Possible Control Technologies

The SJVUAPCD BACT Clearinghouse Guideline 5.4.13 identifies the following as Achieved in Practice BACT for wine storage tanks:

1) Insulation or Equivalent**, Pressure Vacuum Relief Valve (PVRV) set within 10% of the maximum allowable working pressure of the tank; "gas-tight" tank operation; and continuous storage temperature not exceeding 75 degrees F, achieved within 60 days of completion of fermentation. (Achieved in Practice)

   ***Tanks made of heat-conducting materials such as stainless steel may be insulated or stored indoors (in a completely enclosed building, except for vents, doors and other essential openings) to limit exposure to diurnal temperature variations. Tanks made entirely of non-conducting materials such as concrete and wood (except for fittings) are considered self-insulating.*

The SJVUAPCD BACT Clearinghouse Guideline 5.4.13 identifies the following options as Technologically Feasible BACT for wine storage tanks:

2) Capture of VOCs and thermal or catalytic oxidation or equivalent (98% control, TF)
3) Capture of VOCs and carbon adsorption or equivalent (95% control, TF)
4) Capture of VOCs and absorption or equivalent (90% control, TF)
5) Capture of VOCs and condensation or equivalent (70% control, TF)

SJVUAPCD BACT Clearinghouse guideline 5.4.13 does not identify any alternate basic equipment control alternatives.

Step 2 - Eliminate Technologically Infeasible Options

None of the above listed technologies are technologically infeasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

Rank by Control Effectiveness		
Rank	Control	Overall Capture & Control Efficiency
1	Capture of VOCs and thermal or catalytic oxidation or equivalent	98%*
2	Capture of VOCs and carbon adsorption or equivalent	95%
3	Capture of VOCs and absorption or equivalent	90%
4	Capture of VOCs and condensation or equivalent	70%
5	Insulation or Equivalent, Pressure Vacuum Relief Valve (PVRV) set within 10% of the maximum allowable working pressure of the tank; "gas-tight" tank operation; and continuous storage temperature not exceeding 75 degrees F, achieved within 60 days of completion of fermentation	Baseline (Achieved-in-Practice)

* Following recent District practice, thermal and catalytic oxidation will be ranked together.

Step 4 - Cost Effectiveness Analysis

A cost effective analysis must be performed for all control options that have not been determined to be achieved in practice in the list from Step 3 above, in the order of their ranking, to determine the cost effective option with the lowest emissions.

District BACT Policy APR 1305 establishes annual cost thresholds for imposed control based upon the amount of pollutants reduced by the controls. If the cost of control is at or below the threshold, it is considered a cost effective control. If the cost exceeds the threshold, it is not cost effective and the control is not required. Per District BACT Policy, the maximum cost limit for VOC reduction is $17,500 per ton of VOC emissions reduced.

Uncontrolled Storage Emissions

The Wine Group LLC dba Almaden Madera is proposing to install s of two new 350,000 gallon wine storage tanks (ATC permits C-1353-362-0 (Tank 2017-1) and -363-0 (Tank 2017-2)) under this project. Therefore, for the purposes of this cost effectiveness analysis, the uncontrolled wine storage tank VOC emissions will be set equal to the total VOC emissions allowed from both of the new tanks.

Uncontrolled Wine Storage PE = 5,702 lb-VOC/year

Total Capital Investment for Collection System for the two Proposed 350,000 Gallon Wine Storage Tanks (based on ductwork and clean-in-place system)

A common feature of all technically feasible options listed in SJVUAPCD BACT Clearinghouse Guideline 5.4.13 (i.e. thermal/catalytic oxidation, carbon adsorption, absorption/wet scrubber, or condensation) is that each of these technologies requires installation of a collection system to deliver the VOCs from the tanks to the common control device(s).

BACT Analysis Assumptions for the Collection System

- The costs for the ductwork and the required clean-in-place (CIP) system are based on the 2014 Update to Fermenter VOC Emissions Control Cost Estimate Winery Emissions (March 20, 2014) prepared for the Wine Institute by Eichleay Engineers (Eichleay Project No.: 4100621). Eichleay Engineers completed a similar report in 2005, which was used in development of District Rule 4694 Wine Fermentation and Storage Tanks and included substantial information on the costs and details of the potential application of VOC controls to wineries and addresses many of the technical issues of the general site specific factors for wineries. The 2014 Eichleay Engineers Report updates the information in the previous report, but the ducting cost remain similar to the 2005 Eichleay Engineers Report. The information provided by the applicant based on Eichleay Engineers Report was corrected to reflect application of the information to storage tanks.
- The collection system consists of stainless steel place ductwork (stainless steel is required due to food grade product status) with isolation valving, connecting the tanks to a common manifold system which ducts the combined vent to the common control device. The cost of dampers and isolation valving, installed in the ductwork, will be included in the cost estimate.
- The duct sizing is based on the size required for American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) recommendations for the maximum velocities.

- The District previously performed a cost survey of stainless steel ducting/piping and found that the values stated in the 2005 Eichleay Engineers Report including the cost of inflation (applied as stated below) were cheaper; therefore, as a conservative estimate. The ducting costs given in the 2014 Eichleay Engineers Report are similar to the ducting costs given in the 2005 Eichleay Engineers Report. Therefore, the District will use the cost of ducting/piping from the 2014 Eichleay Engineers Report which includes ducting, fittings, bolt up, handling, fan(s), and installation. A summary of the survey and comparison of the Eichleay Engineers Reports ducting/piping cost estimates is included in Attachment D1.
- Eichleay's cost estimate for ducting included the foundations, ducting, fittings, and bolt up. When additional costs, as allowed for in the EPA Control Cost Manual, were added onto the ducting cost estimate, the facility double counted some of the costs that the 2014 Eichleay Engineers report already accounted for in their estimate; therefore, the District did not allow the additional costs for foundation and supports, electrical, piping, or painting.
- The applicant submitted ducting cost estimates using the spreadsheets from the 2014 Eichleay Engineers Update to Fermenter VOC Emissions Control Cost Estimate Winery Emissions. However, the costs submitted by the applicant were based on flow rates for red wine fermentation in the tanks (maximum flow rate of 2,113 cfm for each tank and combined maximum flow rate of 4,226 cfm for both tanks). The cost estimate for ducting provided by the applicant based on fermentation in the tanks was $356,406 for the base equipment costs (including fans) and $677,101 for the overall capital costs. The proposed tanks are being permitted only for wine storage so the flow rates were corrected to a maximum flow rate of 35.42 cfm for each tank and a combined maximum flow rate of 70.84 cfm for both tanks. This was based on the maximum pump rate of 250 gallons per minute (33.42 cfm) for each tank provided by the applicant and approximately 2.0 cfm of ethanol and water vapor emitted from each tank during pumping.
- The ducting cost estimate submitted by the applicant, also included the cost of a duplicate secondary main header that could be used when there was a foam over event and the primary main header needed to be isolated for cleaning. The District has determined that the duplicate secondary main header is not required because the header can be isolated using valves while it is cleaned, and facility will have substantial control over operation of the wine storage tanks.
- Adjusting the flow rate to the appropriate flow rate for the wine storage tanks and removing the duplicate secondary main header resulted in a cost estimate for ducting to control emissions of only wine storage in the tanks of $65,307 for the base equipment costs (including fans) and $120,130 for the overall capital costs, as shown below. (The Ducting Base Price Summary Sheet from the 2014 Eichleay Engineers Report is also included as Attachment D2).
- The information submitted by the facility included an annual inflation rate of 5% per year from 2014 through 2017 to adjust the costs from the 2014 Eichleay report to present cost in 2017 dollars. The District found that the use of the 5% annual inflation was unfounded. The corrected cost estimate is based on a total overall inflation rate of 4.53% from January 2014 to April 2017 based on the United States Department of Labor, Bureau of Labor Statistics, Consumer Price Index (CPI) Inflation Calculator: https://data.bls.gov/cgi-bin/cpicalc.pl.
- Sales Tax: This facility is located in Madera, CA, which has a current sales tax rate of 7.75%. However, pollution control equipment may qualify for a partial tax exemption in California. According to the webpage for the Manufacturing and Research & Development Exemption on the California State Board of Equalization website, the tax exemption rate as of the time

of this evaluation is 3.9375%. (See the following web link: http://www.boe.ca.gov/sutax/manufacturing_exemptions.htm#Purchasers). Therefore, the reduced sales tax rate for Madera County equals 3.8125% (7.75% - 3.9375%).

- Project Contingency: The Association for the Advancement of Cost Engineering International recommends a contingency factor of 20% for preliminary estimates and 15% for detailed estimates, while the Electric Power Research Institute recommends a contingency of 15% to 30% for preliminary estimates and 10 to 20% for detailed estimates (ftp://ftp.repec.org/opt/ReDIF/RePEc/sip/04-005.pdf). Therefore, a conservative cost contingency of 15% based on detailed estimates will be applied to the estimates given in these cost analyses. Additionally, since both the direct and indirect costs estimates have uncertainty associated with them, the contingency will be applied to both the direct and indirect costs.

Gas Flow Rate for Proposed 350,000 Gallon Wine Storage Tanks

The maximum exhaust flowrate (air from tank + ethanol + water vapor) leaving the tanks was calculated to be 35.42 cfm for each tank and a total of 70.84 cfm for both tanks. This was based on the maximum pump rate of 250 gallons per minute (33.42 cfm) for each tank provided by the applicant and approximately 2.0 cfm of ethanol and water vapor emitted from each tank during pumping (approximately 0.1 lb-ethanol/min + 0.05 lb-water vapor/min). (See calculations below).

Maximum Daily Tank Throughput = 360,000 gal/day (48,125 ft^3/day) (per applicant)

Maximum Daily Ethanol Emissions Leaving Each Tank = 147.48 lb-EtOH/day (Based on TANKS 4.09D calculations; See Appendix A)

Maximum Daily lb-mol Ethanol Emissions Leaving Each Tank = 147.48 lb-EtOH/day ÷ 46.02 lb-EtOH/lb-mol-EtOH = 3.205 lb-mol-EtOH/day

Maximum Daily Water Vapor Emissions Leaving Each Tank = 73.55 lb-H_2O/day (Based on TANKS 4.09D calculations; See Appendix A)

Maximum Daily lb-mol Water Vapor Emissions Leaving Each Tank = 73.55 lb-H_2O/day ÷ 18.02 lb-H_2O/lb-mol-H_2O = 4.082 lb-mol-H_2O/day

Maximum Daily Total lb-mol of Ethanol and Water Vapor Leaving each Tank = 3.205 lb-mol-EtOH/day + 4.082 lb-mol-H_2O/day = 7.287 lb-mol/day

The total daily volume of ethanol emissions and water vapor leaving tank will be estimated using the Ideal Gas Law:

PV = nRT and V = nRT/P

Where:
P is the pressure of the gas (1 atm),
V is the volume of the gas,
n is the number of moles of the gas (7.287 lb-mol/day, see above),
R is the ideal gas constant (0.730241 atm-ft^3/(lbmol-°R))

T is the absolute temperature of the gas (540.67 °R, 81.0 °F pursuant to District procedures for modeling of emissions for wine and distilled spirits storage tanks using TANKS 4.09D for locations in the District Central Region, i.e. near Fresno)

Total daily volume of ethanol emissions and water vapor leaving each tank:

$V = (7.287 \text{ lb-mol/day} \times 0.730241 \text{ atm-ft}^3/(\text{lbmol-}^\circ\text{R}) \times 540.67\ ^\circ\text{R})/1 \text{ atm} = 2{,}877 \text{ ft}^3/\text{day}$

Maximum Total Exhaust Flowrate from Each Wine Storage Tank

$48{,}125 \text{ ft}^3/\text{day} + 2{,}877 \text{ ft}^3/\text{day} = 51{,}002 \text{ ft}^3/\text{day}$

$51{,}002 \text{ ft}^3/\text{day} \times 1 \text{ day}/24 \text{ hour} \times 1 \text{ hr}/60 \text{ minutes} = 35.42 \text{ cfm}$

Therefore, a maximum exhaust flowrate of 35.42 cfm will be used to estimate the ducting costs.

Capital Cost of Ductwork for the two Proposed 350,000 Gallon Wine Storage Tanks

The capital costs for the ducting based on the 2014 Eichleay Engineers Report and a maximum exhaust flowrate of 35.42 cfm for each tank is given below. Note that the ducting cost estimate given below would not change if the maximum exhaust flowrate for each tank was based on the maximum pumping rate of 250 gallons per minute (33.42 cfm).

Main Duct Headers (4" Diameter) (Costs include ducting, pipe, fittings, valves, a knockout vessel for each tank, structural support, and labor):
Count: 1
Total Ducting Length 150 feet:
Base Pricing Ducting: $17,556 ($117.04/ft)
Base Pricing Structure: $19,200 ($128/ft)
Total Base Pricing: $36,756 ($245.04/ft)

Sub Headers (4" Diameter) (Costs include ducting, pipe, fittings, valves, structural support, fans, and labor):
Count: 2
Total Ducting Length 80 feet:
Base Pricing Ducting: $9,249 ($115.6/ft)
Base Pricing Structure: $1,152 ($14.4/ft)
Base Pricing Fans: $10,400
Total Base Pricing: $20,801

Tank Area Piping (3" Diameter):
Count: 2
Total Ducting Length 260 feet:
Base Pricing Ducting: $4,920 ($18.92/ft)
Total Base Pricing: $4,920 ($18.92/ft)

Total Cost for Ducting, Supports, and Fans (2014 dollars):
$36,756 + $20,801 + $4,920 = $62,477

Capital Cost of Ductwork for the two Proposed 350,000 Gallon Wine Storage Tanks	
Cost Description	Cost ($)
Duct Estimate from Eichleay Report (2014)	$62,477
Adjusting factor from 2014 dollars to 2017 dollars (4.53% total overall inflation)	1.0453
Inflation adjusted duct cost	$65,307
The following cost data is taken from EPA Control Cost Manual, Sixth Edition (EPA/452/B-02-001).	
Direct Costs (DC)	
Base Equipment Costs (Ductwork) See Above	$65,307
Instrumentation (not estimated)	-
Sales Tax 3.8125%[1] of Base Equipment Costs	$2,490
Freight 5% of Base Equipment Costs	$3,265
Purchased Equipment Cost (PEC)	**$71,062**
Foundations & supports (Included in Base Equipment Costs)	-
Handling & Erection 14% of PEC	$9,949
Electrical 4% of PEC	$2,842
Piping (not required)	-
Painting (not required)	-
Insulation 1% of PEC	$ 711
Direct installation costs	**$13,502**
Total Direct Costs	**$84,564**
Indirect Costs (IC)	
Engineering 10% of PEC	$7,106
Construction and field expenses 5% of PEC	$3,553
Contractor fees 10% of PEC	$7,106
Start-up 2% of PEC	$1,421
Performance test 1% of PEC	$ 711
Total Indirect Costs	**$19,897**
Subtotal Capital Investment (SCI) (DC + IC)	**$104,461**
Contingencies – 15% of SCI	$15,669
Total Capital Investment (TCI) (SCI + Contingency)	**$120,130**

Capital Cost for Clean-In-Place (CIP) System

A ducting system for winery tanks must have a Clean in Place (CIP) system to maintain sanitation and quality of the product. Based on information from previous projects for wine tanks, the estimated capital cost for a clean in place system of $100,000. Operation of a CIP system,

[1] The current sales tax rate for Madera County is 7.75%. However, pollution control equipment may qualify for a partial tax exemption in California. According to the California State Board of Equalization website for the Manufacturing and Research & Development Exemption, the tax exemption rate as of the time of this evaluation is 3.9375%: http://www.boe.ca.gov/sutax/manufacturing_exemptions.htm#Purchasers. Therefore, the reduced sales tax rate for Madera County equals 3.8125% (7.75% - 3.9375%).

using typical cleaning agents, will raise disposal and wastewater treatment costs. The relevant costs of operation of the CIP system have not been estimated.

Capital Cost of Clean-In-Place (CIP) System of Ductwork for Wine Tanks	
Cost Description	Cost ($)
Cost of CIP system: $200,000	$100,000
The following cost data is taken from EPA Control Cost Manual, Sixth Edition (EPA/452/B-02-001).	
Direct Costs (DC)	
Base Equipment Costs (CIP System) See Above	$100,000
Instrumentation - 10% of Base Equipment Costs	$10,000
Sales Tax - 3.8125% of Base Equipment Costs	$3,813
Freight - 5% of Base Equipment	$5,000
Purchased Equipment Cost (PEC)	**$118,813**
Foundations & supports - 8% of PEC	$9,505
Handling & erection - 14% of PEC	$16,634
Electrical - 4% of PEC	$4,753
Piping – accounted for in ductwork cost	-
Painting - 1% of PEC	$1,188
Insulation - 1% of PEC	$1,188
Direct Installation Costs (DIC)	**$33,268**
Total Direct Costs (DC) (PEC + DIC)	**$152,081**
Indirect Costs (IC)	
Engineering - 10% of PEC	$11,881
Construction and field expenses - 5% of PEC	$5,941
Contractor fees - 10% of PEC	$11,881
Start-up - 2% of PEC	$2,376
Performance test - 1% of PEC	$1,188
Total Indirect Costs (IC)	**$33,267**
Subtotal Capital Investment (SCI) (DC + IC)	**$185,348**
Contingencies - 15% of SCI	$27,802
Total Capital Investment (TCI) (SCI + Contingency)	**$213,150**

Annualized Capital Costs of Ductwork and CIP System for the Two Proposed 350,000 Gallon Wine Storage Tanks

The total capital costs and annualized capital investment for the ducting and collection system are as follows.

Total capital costs = Ductwork + CIP System
= $120,130 + $213,150
= $333,280

Annualized Capital Investment = Initial Capital Investment x Amortization Factor

Amortization Factor = $\left[\frac{0.1(1.1)^{10}}{(1.1)^{10}-1}\right]$ = 0.163 per District policy, amortizing over 10 years at 10%

Annualized Capital Investment for ducting and CIP = $333,280 x 0.163 = $54,325/yr

Option 1 – Collection of VOCs and control by thermal or catalytic oxidation (98% collection & control for wine storage)

The following analysis demonstrates that the cost of the collection system, consisting of the ducting and fan(s) to deliver VOCs from the two new 350,000 gallon wine storage tanks to the control device(s) and a CIP system required for sanitation, alone, would cause the cost of the emission reductions from this option to exceed the District's BACT Cost Effectiveness Threshold for VOC.

Annualized Capital Cost for Ducting and Fan(s) and CIP System

As calculated above, the annualized capital cost for the required ductwork and fan(s) and CIP system = $54,325/yr.

Emission Reductions

Annual VOC Emission Reductions = PE x 0.98
= 5,702 lb-VOC/year x 0.98
= 5,588 lb-VOC/year
= 2.79 tons-VOC/year

Cost Effectiveness

Cost Effectiveness = Total Annual Cost ÷ Annual Emission Reductions

Cost Effectiveness = $54,325/year ÷ 2.79 tons-VOC/year
= $19,471/ton-VOC

The analysis above demonstrates that the annualized purchase cost of the collection ductwork and fan(s) and CIP system alone, not including the cost of the control equipment or annual operating costs, results in costs for this control option that exceed the District's BACT Cost Effectiveness Threshold for VOC of $17,500/ton-VOC. Therefore this option is not cost-effective and will not be required for the proposed project.

Option 2 – Collection of VOCs and control by carbon adsorption (95% collection and control for wine storage)

The following analysis demonstrates that the cost of the collection system, consisting of the ducting and fan(s) to deliver VOCs from the two new 350,000 gallon wine storage tanks to the control device(s) and a CIP system required for sanitation, alone, would cause the cost of the emission reductions from this option to exceed the District's BACT Cost Effectiveness Threshold for VOC.

Annualized Capital Cost for Ducting and Fan(s) and CIP System

As calculated above, the annualized capital cost for the required ductwork and fan(s) and CIP system = $54,325/yr.

Emission Reductions

Annual VOC Emission Reductions = PE x 0.95
= 5,702 lb-VOC/year x 0.95
= 5,417 lb-VOC/year
= 2.71 tons-VOC/year

Cost Effectiveness

Cost Effectiveness = Total Annual Cost ÷ Annual Emission Reductions

Cost Effectiveness = $54,325/year ÷ 2.71 tons-VOC/year
= $20,046/ton-VOC

The analysis above demonstrates that the annualized purchase cost of the collection ductwork and fan(s) and CIP system alone, not including the cost of the control equipment or annual operating costs, results in costs for this control option that exceed the District's BACT Cost Effectiveness Threshold for VOC of $17,500/ton-VOC. Therefore this option is not cost-effective and will not be required for the proposed project.

Option 3 - Collection of VOCs and Control by Absorption/Scrubber (90% collection & control for wine storage)

The following analysis demonstrates that the cost of the collection system, consisting of the ducting and fan(s) to deliver VOCs from the two new 350,000 gallon wine storage tanks to the control device(s) and a CIP system required for sanitation, alone, would cause the cost of the emission reductions from this option to exceed the District's BACT Cost Effectiveness Threshold for VOC.

Annualized Capital Cost for Ducting and Fan(s) and CIP System

As calculated above, the annualized capital cost for the required ductwork and fan(s) and CIP system = $54,325/yr.

Emission Reductions

Annual VOC Emission Reductions = PE x 0.90
= 5,702 lb-VOC/year x 0.90
= 5,132 lb-VOC/year
= 2.57 tons-VOC/year

Cost Effectiveness

Cost Effectiveness = Total Annual Cost ÷ Annual Emission Reductions

Cost Effectiveness = $54,325/year ÷ 2.57 tons-VOC/year
= $21,138/ton-VOC

The analysis above demonstrates that the annualized purchase cost of the collection ductwork and fan(s) and CIP system alone, not including the cost of the control equipment or annual operating costs, results in costs for this control option that exceed the District's BACT Cost Effectiveness Threshold for VOC of $17,500/ton-VOC. Therefore this option is not cost-effective and will not be required for the proposed project.

Option 4 - Capture of VOCs with condensation (70% collection & control for wine storage)

The following analysis demonstrates that the cost of the collection system, consisting of the ducting and fan(s) to deliver VOCs from the two new 350,000 gallon wine storage tanks to the control device(s) and a CIP system required for sanitation, alone, would cause the cost of the emission reductions from this option to exceed the District's BACT Cost Effectiveness Threshold for VOC.

Annualized Capital Cost for Ducting and Fan(s) and CIP System

As calculated above, the annualized capital cost for the required ductwork and fan(s) and CIP system = $54,325/yr.

Emission Reductions

Annual VOC Emission Reductions = PE x 0.70
= 5,702 lb-VOC/year x 0.70
= 3,991 lb-VOC/year
= 2.00 tons-VOC/year

Cost Effectiveness

Cost Effectiveness = Total Annual Cost ÷ Annual Emission Reductions

Cost Effectiveness = $54,325/year ÷ 2.00 tons-VOC/year
= $27,163/ton-VOC

The analysis above demonstrates that the annualized purchase cost of the collection ductwork and fan(s) and CIP system alone, not including the cost of the control equipment or annual operating costs, results in costs for this control option that exceed the District's BACT Cost Effectiveness Threshold for VOC of $17,500/ton-VOC. Therefore this option is not cost-effective and will not be required for the proposed project.

Option 5 - Insulation, PVRV, "Gas-Tight" Tank Operation, and Storage Temperature not Exceeding 75 deg F, Achieved within 60 days of Completion of Fermentation

The only remaining control option in step 3 above has been deemed AIP for this class and category of source and per the District BACT policy is required regardless of the cost. Therefore, a cost effectiveness analysis is not required.

Step 5 - Select BACT

All identified feasible options with control efficiencies higher than the option proposed by the facility have been shown to not be cost effective. The facility has proposed Option 1, insulated tank, pressure/vacuum valve set within 10% of the maximum allowable working pressure of the tank, "gas tight" tank operation and achieve and maintain a continuous storage temperature not exceeding 75°F within 60 days of completion of fermentation. Therefore, the BACT requirements for VOC emissions will be satisfied for the storage tanks proposed under this project.

Attachment D1
for BACT Analysis for Wine Storage Tanks
Comparison of Stainless Steel Ducting Costs

Ducting/Piping Cost Comparison

Duct Size Diameter (in.)	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"	28"
2014 Eichleay - Ducting/Piping Only $/Foot	$10.00	$13.00	$15.00	$39.00	$62.00	$79.00	$92.00	$106.00	$124.00	$129.00	$135.00	$147.00	$159.00	$185.00
2014 Eichleay - Ducting/Piping Only $/Foot Including 4.53% for Inflation	$10.45	$13.59	$15.68	$40.77	$64.81	$82.58	$96.17	$110.80	$129.62	$134.84	$141.12	$153.66	$166.20	$193.38
2005 Eichleay - Ducting/Piping Only $/Foot	--	--	--	$23.17	$38.59	$54.00	$62.00	$65.50	$69.00	$86.00	$92.00	$99.00	$106.00	$119.00
2005 Eichleay - Ducting/Piping Only $/Foot Including 21.93% for Inflation	--	--	--	$28.25	$47.05	$65.84	$75.60	$79.86	$84.13	$104.86	$112.18	$120.71	$129.25	$145.10
Average of District Cost Survey in $/Foot	$15.49	$30.85	$27.67	$44.13	$37.50	$33.13	$93.75	$181.70	$216.50	$189.02	$308.40	--	$193.99	--

Ducting/Piping Costs based on 2005 Eichleay Report

Note: Minimum of 6" Diameter for Structural Support														
Duct Size Diameter (in.)	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"	28"
Ducting/Piping Only $/Foot	--	--	--	$23.17	$38.59	$54.00	$62.00	$65.50	$69.00	$86.00	$92.00	$99.00	$106.00	$119.00
Ducting + Fittings, Bolt Up, Handling, & Install $/Foot	--	--	--	$62.17	$103.25	$144.33	$143.83	$174.17	$204.52	$251.38	$309.38	$306.44	$397.67	$476.73
Ducting + Fittings, Bolt Up, Handling, & Install $/Foot	--	--	--	$62.17	$103.25	$144.33	$143.83	$174.17	$204.52	$251.38	$309.38	$306.44	$397.67	$476.73

Supplier: Grainger (http://www.grainger.com) **Location: Fresno, CA and Ceres, CA**

Schedule 10													
Duct Size Diameter (in.)	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
Price ($)	$229.50	$387.75	$587.50	--	--	--	--		--	--	--	--	--
Length (feet)	10	10	10	--	--	--	--		--	--	--	--	--
Price/Foot ($)	$22.95	$38.78	$58.75	--	--	--	--		--	--	--	--	--

Supplier: Stockton Pipe and & Supply Inc (http://www.stocktonpipe.net) **Location: Stockton, CA**

Note: Sizes over 12" Diameter need to be ordered from Mill													
0.109" thickness tube or Schedule 10 Pipe													
Duct Size Diameter (in.)	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
Price ($)	--	--	--	--	--	$700.00	$840.00	--	--	--	--	--	$3,159.60
Length (feet)	--	--	--	--	--	20	20	--	--	--	--	--	20
Price/Foot ($)	--	--	--	--	--	$35.00	$42.00	--	--	--	--	--	$157.98

Supplier: Valley Iron Inc (http://www.stocktonpipe.net) **Location: Fresno, CA**

Note: Sch 10 T-304 20'													
Schedule 10 Pipe													
Duct Size Diameter (in.)	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
Length (feet)	--	--	20	20	20	20	--	--	--	--	--	--	--
Price/Foot ($)	--	--	$10.75	$16.90	$26.00	$33.90	--	--	--	--	--	--	--

Supplier: Del Paso Pipe & Steel Inc. (http://www.delpasopipeandsteel.com/) **Location: Sacramento, CA**

Schedule 5/10 Pipe:													
Duct Size Diameter (in.)	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
Price Quote: $9/lb												--	
Estimated Price/Foot	--	--	--	--	--	--	$217.00	$250.00	$286.00	$322.00	$432.00	--	--
												--	

Supplier: Hayward Pipe & Supply Co. Inc (http://www.haywardpipe.com/) **Location: Hayward, CA**

Note: large diamter pipe ships from Texas, FREIGHT NOT QUOTED - Additional Shipping Costs apply													
Schedule 10 Pipe													
Duct Size Diameter (in.)	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
Price ($)	--	--	--	--	--	--	$1,540.00	$2,268.00	$2,940.00	$3,276.00	$3,696.00	--	--
Length (feet)	--	--	--	--	--	--	20	20	20	20	20	--	--
Price/Foot ($)	--	--	--	--	--	--	$77.00	$113.40	$147.00	$163.80	$184.80	--	--

Supplier: OnlineMetals.com (http://www.onlinemetals.com/) **Location: Nearest Warehouse - Los Angeles, CA**

Schedule 10 Pipe													
Duct Size Diameter (in.)	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
Price ($)	$78.28	$108.97	$160.34	$288.00	$520.00	--	--	--	--	--	--	--	--
Length (feet)	8	8	8	8	8	--	--	--	--	--	--	--	--
Price/Foot ($)	$9.79	$13.62	$20.04	$36.00	$65.00	--	--	--	--	--	--	--	--
Weldeds Stainless Tube 304/304L (2" OD, 0.12" Wall; 3" OD, 0.12" Wall; 6", 0.12")													
Duct Size Diameter (in.)	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
Price ($)	$109.86	$321.34	--	$628.16	--	--	--	--	--	--	--	--	--
Length (feet)	8	8	--	8	--	--	--	--	--	--	--	--	--
Price/Foot ($)	$13.73	$40.17	--	$78.52	--	--	--	--	--	--	--	--	--

Supplier: Lone Star Supply Co **Location: Dickinson, TX**

Note: Additional shipping costs													
Schedule 10 Welded Pipe													
Duct Size Diameter (in.)	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
Price/Foot ($)	--	--	$16.45	$19.60	$21.50	$30.50	$39.00	--	--	$81.25	--	--	$230.00
												--	

Supplier: Global Technology and Engineering **Location: Excelsior Springs, MO**

Note: Additional shipping Costs													
11 Gauge Tubing													
Duct Size Diameter (in.)	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
Price ($)	--	--	$226.58	$487.40	--	--	--	--	--	--	--	--	--
Length (feet)	--	--	7	7	--	--	--	--	--	--	--	--	--
Price/Foot ($)	--	--	$32.37	$69.63	--	--	--	--	--	--	--	--	--

All suppliers	$30.85	$44.13	70%	
Only suppliers that have both 3" and 6"	$30.85	$57.26	54%	33.50034

Attachment D2
for BACT Analysis for Wine Storage Tanks
2014 Eichleay Engineers Report Ducting Base Price Summary Sheet

Ethanol Abatement Cost Summary and Cost Effectiveness Determination

Duct Price Summary Sheet

Base Duct Price Summary

	Sizes Max	Count	total length Ducting	Base Pricing Ducting	Base Pricing Structure	Base Pricing fans	Base Pricing Total
Main Header	4	1	150	$17,556	$19,200	$0	$36,756
Sub Headers	4	2	80	$9,249	$1,152	$10,400	$20,801
Tank Area Piping	3	2	260	$4,920	note 2	$0	$4,920
CIP	note 1	note 1		note 1	$0	$0	note 1
Total	--	--		$31,725	$20,352	$10,400	$62,477

Notes

1) CIP piping and installation included with the CIP estimate at this time.

2) Small size structure cost for tank area included in tank area ducting

3) The figures above will adjust for annual inflation if you enter numbers in the table below.
Enter i=0, for no adjustment. Main Header and Subheader values are in 2014 values.

Inflation Adjustment Tool

Starting Base Year	2014
Current Year	2014
Annual inflation rate (i=...)	3 %
Adjustment	1.00

APPENDIX E

Compliance Certification

San Joaquin Valley
Unified Air Pollution Control District

HEALTHY AIR LIVING

TITLE V MODIFICATION - COMPLIANCE CERTIFICATION FORM

I. TYPE OF PERMIT ACTION (Check appropriate box)

[X] SIGNIFICANT PERMIT MODIFICATION
[ ] MINOR PERMIT MODIFICATION
[ ] ADMINISTRATIVE AMENDMENT

COMPANY NAME:	FACILITY ID: -
1. Type of Organization:[X] Corporation [ ] Sole Ownership [ ] Government [ ] Partnership [ ] Utility	
2. Owner's Name: The Wine Group, LLC dba Almaden-Madera	
3. Agent to the Owner: Doug Lyman	

II. COMPLIANCE CERTIFICATION (Read each statement carefully and initial **applicable** circles for confirmation):

(9) Based on information and belief formed after reasonable inquiry, the equipment identified in this application will continue to comply with the applicable federal requirement(s).

(10) Based on information and belief formed after reasonable inquiry, the equipment identified in this application will comply with applicable federal requirement(s) that will become effective during the permit term, on a timely basis.

(9) Corrected information will be provided to the District when I become aware that incorrect or incomplete information has been submitted.

(9) Based on information and belief formed after reasonable inquiry, information and statements in the submitted application package, including all accompanying reports, and required certifications are true, accurate, and complete.

(10) For minor modifications, this application meets the criteria for use of minor permit modification procedures pursuant to District Rule 2520.

I declare, under penalty of perjury under the laws of the state of California, that the forgoing is correct and true:

Doug Lyman

Signature of Responsible Official

12/9/16

Date

Doug Lyman

Name of Responsible Official (please print)

Plant Manager

Title of Responsible Official (please print)

APPENDIX F

Draft ATC Permits

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

DRAFT

PERMIT NO: C-1353-362-0

ISSUANCE DATE: DRAFT

LEGAL OWNER OR OPERATOR: THE WINE GROUP LLC DBA ALMADEN-MADERA
MAILING ADDRESS: 22004 ROAD 24
MADERA, CA 93638

LOCATION: 22004 ROAD 24
MADERA, CA 93638

EQUIPMENT DESCRIPTION:
350,000 GALLON STAINLESS STEEL ENCLOSED TOP WINE STORAGE TANK (TANK 2017-1) EQUIPPED WITH INSULATION AND PRESSURE/VACUUM RELIEF VALVE

CONDITIONS

1. {1830} This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2201] Federally Enforceable Through Title V Permit
2. {1831} Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4] Federally Enforceable Through Title V Permit
3. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
4. This tank shall be used exclusively for wine storage operations only and not for fermentation. [District Rule 2201] Federally Enforceable Through Title V Permit
5. This tank shall be equipped with and operated with a pressure-vacuum relief valve, which shall operate within 10% of the maximum allowable working pressure of the tank, operate in accordance with the manufacturer's instructions, and be permanently labeled with the operating pressure settings. [District Rules 2201 and 4694] Federally Enforceable Through Title V Permit
6. The pressure-vacuum relief valve and storage tank shall remain in a gas-tight condition, except when the operating pressure of the tank exceeds the valve set pressure. A gas-tight condition shall be determined by measuring the gas leak in accordance with the procedures in EPA Method 21. [District Rules 2201 and 4694] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director / APCO

DRAFT

Arnaud Marjollet, Director of Permit Services

C-1353-362-0 : Sep 12 2017 3:00PM -- NORMANR : Joint Inspection NOT Required

7. The temperature of the wine stored in this tank shall be maintained at or below 75 degrees Fahrenheit. The temperature of the stored wine shall be determined and recorded at least once per week. For each batch of wine, the operator shall achieve the storage temperature of 75 degrees Fahrenheit or less within 60 days after completing fermentation, and shall maintain records to show when the required storage temperature of 75 degrees Fahrenheit or less was achieved. [District Rules 2201 and 4694] Federally Enforceable Through Title V Permit
8. The weighted annual average ethanol content of wine stored in this tank, calculated on a twelve-month rolling basis, shall not exceed 23.9 percent by volume. [District Rule 2201] Federally Enforceable Through Title V Permit
9. The daily throughput, in gallons, of wine stored in this tank shall not exceed 360,000 gallons per day. [District Rule 2201] Federally Enforceable Through Title V Permit
10. The maximum annual wine storage throughput in this tank, calculated on a twelve (12) month rolling basis, shall not exceed 12,600,000 gallons per year (equivalent to 36 times the nominal tank capacity stated in the equipment description). [District Rule 2201] Federally Enforceable Through Title V Permit
11. Total annual VOC emissions from all wine fermentation and wine storage operations at this facility, calculated on a rolling 12-month basis, shall not exceed 404,412 lb/yr. [District Rule 2201] Federally Enforceable Through Title V Permit
12. Total annual VOC emissions from wine storage operations may be determined using the total annual wine throughput and a single storage emissions factor, calculated using the equation(s) specified within this permit, based on the average ethanol content of the annual wine throughput; or using the throughputs for different batches of wine and batch-specific storage emissions factors, calculated using the equation(s) specified within this permit, based on the ethanol content of each batch. [District Rule 2201] Federally Enforceable Through Title V Permit
13. Total annual VOC emissions from wine storage operations shall be determined either as the sum of the emissions for each individual wine movement based on the volume transferred in each wine movement and the batch-specific wine storage emission factor calculated using the equation(s) specified within this permit; or as the emissions for total annual wine movements and a single storage emissions factor, calculated using the equation(s) specified within this permit, based on the average ethanol content of the total annual wine movements. [District Rule 2201] Federally Enforceable Through Title V Permit
14. The annual VOC wine storage emission factor for each wine ethanol content shall be calculated using the following equation: EF = a * P^2 + b*P + c; where EF is the VOC emission factor in pounds of VOC per 1,000 gallons of wine throughput; and P is the volume percent ethanol of the wine being transferred. For concentrations up to and including 24 volume % (when the ethanol content of wine is 20 volume %, P is equivalent to 0.20), a = -0.38194, b = 0.97917 and c = 0. [District Rule 2201] Federally Enforceable Through Title V Permit
15. The operator shall determine and record, on a weekly basis, the total gallons of wine contained in the tank and the maximum temperature of the stored wine. [District Rule 4694] Federally Enforceable Through Title V Permit
16. Daily throughput records, including records of filling and emptying operations, the dates of such operations, a unique identifier for each batch, the volume percent ethanol in the batch, and the volume of wine transferred, shall be maintained. [District Rules 1070 and 2201] Federally Enforceable Through Title V Permit
17. The permittee shall maintain the following records: red wine and white wine produced by fermentation at this facility, based on values reported to the Alcohol and Tobacco Tax and Trade Bureau (TTB), U.S. Department of the Treasury; the volume and the ethanol concentration of each wine movement; the calculated 12 month rolling wine ethanol content and throughput rate for fermentation and storage operations; and the calculated 12 month rolling VOC emission rate (lb-VOC per 12 month rolling period, calculated monthly). [District Rule 2201] Federally Enforceable Through Title V Permit
18. On a monthly basis, the permittee shall calculate and record the VOC emissions, in pounds, from the wine storage operations in this tank. [District Rule 2201] Federally Enforceable Through Title V Permit
19. On a monthly basis, the permittee shall calculate and record the total facility-wide wine fermentation and storage VOC emissions, in pounds, for the rolling 12-month period. The facility-wide wine fermentation and storage VOC emissions shall be calculated by summing the VOC emissions from the previous 12 months from every permitted wine tank at this facility. [District Rule 2201] Federally Enforceable Through Title V Permit

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CONDITIONS CONTINUE ON NEXT PAGE

20. Records of the rolling 12-month period total facility-wide fermentation and storage VOC emissions, including calculation methods and parameters used, shall be maintained. [District Rule 2201] Federally Enforceable Through Title V Permit

21. {4660} If the emissions calculated for any rolling 12-month period exceed the annual emissions limitations of this permit, in a crush season in which the start of the crush season (defined as the day on which the facility's seasonal crushing/fermentation operations commence) occurs less than 365 days after the start of the previous crush season, then no violation of the annual emissions limit for that rolling 12-month period will be deemed to have occurred so long as the calendar year emissions are below the annual emissions limitation. [District Rule 2201] Federally Enforceable Through Title V Permit

22. {4661} Records shall be maintained that demonstrate the date of each year's start of crush season. [District Rule 2201] Federally Enforceable Through Title V Permit

23. All records shall be retained on-site for a period of at least five years and made available for District inspection upon request. [District Rules 1070, 2201, and 4694] Federally Enforceable Through Title V Permit

DRAFT

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

DRAFT

PERMIT NO: C-1353-363-0 **ISSUANCE DATE:** DRAFT

LEGAL OWNER OR OPERATOR: THE WINE GROUP LLC DBA ALMADEN-MADERA
MAILING ADDRESS: 22004 ROAD 24
MADERA, CA 93638

LOCATION: 22004 ROAD 24
MADERA, CA 93638

EQUIPMENT DESCRIPTION:
350,000 GALLON STAINLESS STEEL ENCLOSED TOP WINE STORAGE TANK (TANK 2017-2) EQUIPPED WITH INSULATION AND PRESSURE/VACUUM RELIEF VALVE

CONDITIONS

1. {1830} This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2201] Federally Enforceable Through Title V Permit
2. {1831} Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4] Federally Enforceable Through Title V Permit
3. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
4. This tank shall be used exclusively for wine storage operations only and not for fermentation. [District Rule 2201] Federally Enforceable Through Title V Permit
5. This tank shall be equipped with and operated with a pressure-vacuum relief valve, which shall operate within 10% of the maximum allowable working pressure of the tank, operate in accordance with the manufacturer's instructions, and be permanently labeled with the operating pressure settings. [District Rules 2201 and 4694] Federally Enforceable Through Title V Permit
6. The pressure-vacuum relief valve and storage tank shall remain in a gas-tight condition, except when the operating pressure of the tank exceeds the valve set pressure. A gas-tight condition shall be determined by measuring the gas leak in accordance with the procedures in EPA Method 21. [District Rules 2201 and 4694] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director / APCO

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Arnaud Marjollet, Director of Permit Services
C-1353-363-0 : Sep 12 2017 3:00PM -- NORMANR : Joint Inspection NOT Required

7. The temperature of the wine stored in this tank shall be maintained at or below 75 degrees Fahrenheit. The temperature of the stored wine shall be determined and recorded at least once per week. For each batch of wine, the operator shall achieve the storage temperature of 75 degrees Fahrenheit or less within 60 days after completing fermentation, and shall maintain records to show when the required storage temperature of 75 degrees Fahrenheit or less was achieved. [District Rules 2201 and 4694] Federally Enforceable Through Title V Permit

8. The weighted annual average ethanol content of wine stored in this tank, calculated on a twelve-month rolling basis, shall not exceed 23.9 percent by volume. [District Rule 2201] Federally Enforceable Through Title V Permit

9. The daily throughput, in gallons, of wine stored in this tank shall not exceed 360,000 gallons per day. [District Rule 2201] Federally Enforceable Through Title V Permit

10. The maximum annual wine storage throughput in this tank, calculated on a twelve (12) month rolling basis, shall not exceed 12,600,000 gallons per year (equivalent to 36 times the nominal tank capacity stated in the equipment description). [District Rule 2201] Federally Enforceable Through Title V Permit

11. Total annual VOC emissions from all wine fermentation and wine storage operations at this facility, calculated on a rolling 12-month basis, shall not exceed 404,412 lb/yr. [District Rule 2201] Federally Enforceable Through Title V Permit

12. Total annual VOC emissions from wine storage operations may be determined using the total annual wine throughput and a single storage emissions factor, calculated using the equation(s) specified within this permit, based on the average ethanol content of the annual wine throughput; or using the throughputs for different batches of wine and batch-specific storage emissions factors, calculated using the equation(s) specified within this permit, based on the ethanol content of each batch. [District Rule 2201] Federally Enforceable Through Title V Permit

13. Total annual VOC emissions from wine storage operations shall be determined either as the sum of the emissions for each individual wine movement based on the volume transferred in each wine movement and the batch-specific wine storage emission factor calculated using the equation(s) specified within this permit; or as the emissions for total annual wine movements and a single storage emissions factor, calculated using the equation(s) specified within this permit, based on the average ethanol content of the total annual wine movements. [District Rule 2201] Federally Enforceable Through Title V Permit

14. The annual VOC wine storage emission factor for each wine ethanol content shall be calculated using the following equation: EF = a * P^2 + b*P + c; where EF is the VOC emission factor in pounds of VOC per 1,000 gallons of wine throughput; and P is the volume percent ethanol of the wine being transferred. For concentrations up to and including 24 volume % (when the ethanol content of wine is 20 volume %, P is equivalent to 0.20), a = -0.38194, b = 0.97917 and c = 0. [District Rule 2201] Federally Enforceable Through Title V Permit

15. The operator shall determine and record, on a weekly basis, the total gallons of wine contained in the tank and the maximum temperature of the stored wine. [District Rule 4694] Federally Enforceable Through Title V Permit

16. Daily throughput records, including records of filling and emptying operations, the dates of such operations, a unique identifier for each batch, the volume percent ethanol in the batch, and the volume of wine transferred, shall be maintained. [District Rules 1070 and 2201] Federally Enforceable Through Title V Permit

17. The permittee shall maintain the following records: red wine and white wine produced by fermentation at this facility, based on values reported to the Alcohol and Tobacco Tax and Trade Bureau (TTB), U.S. Department of the Treasury; the volume and the ethanol concentration of each wine movement; the calculated 12 month rolling wine ethanol content and throughput rate for fermentation and storage operations; and the calculated 12 month rolling VOC emission rate (lb-VOC per 12 month rolling period, calculated monthly). [District Rule 2201] Federally Enforceable Through Title V Permit

18. On a monthly basis, the permittee shall calculate and record the VOC emissions, in pounds, from the wine storage operations in this tank. [District Rule 2201] Federally Enforceable Through Title V Permit

19. On a monthly basis, the permittee shall calculate and record the total facility-wide wine fermentation and storage VOC emissions, in pounds, for the rolling 12-month period. The facility-wide wine fermentation and storage VOC emissions shall be calculated by summing the VOC emissions from the previous 12 months from every permitted wine tank at this facility. [District Rule 2201] Federally Enforceable Through Title V Permit

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CONDITIONS CONTINUE ON NEXT PAGE

20. Records of the rolling 12-month period total facility-wide fermentation and storage VOC emissions, including calculation methods and parameters used, shall be maintained. [District Rule 2201] Federally Enforceable Through Title V Permit

21. {4660} If the emissions calculated for any rolling 12-month period exceed the annual emissions limitations of this permit, in a crush season in which the start of the crush season (defined as the day on which the facility's seasonal crushing/fermentation operations commence) occurs less than 365 days after the start of the previous crush season, then no violation of the annual emissions limit for that rolling 12-month period will be deemed to have occurred so long as the calendar year emissions are below the annual emissions limitation. [District Rule 2201] Federally Enforceable Through Title V Permit

22. {4661} Records shall be maintained that demonstrate the date of each year's start of crush season. [District Rule 2201] Federally Enforceable Through Title V Permit

23. All records shall be retained on-site for a period of at least five years and made available for District inspection upon request. [District Rules 1070, 2201, and 4694] Federally Enforceable Through Title V Permit

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