Santa Barbara County
Air Pollution Control District

Our Vision Clean Air

MEMORANDUM

TO: Michael Goldman, Manager, Engineering Division
FROM: David Harris, Supervisor, Engineering Division
SUBJECT: Achieved in Practice Determination for Wine Fermentation Emission Control Technologies
DATE: August 18, 2017
Revised June 1, 2018

Summary:

This memo provides the Santa Barbara County Air Pollution Control District's (District's) analysis of the achieved in practice status of wine fermentation emission control technologies[1] currently in use in Santa Barbara County. As of the date of this memo, the packed bed scrubber system in use at Terravant Wine Company is achieved in practice emission control technology for indoor wine fermentation operations at new wineries, and the NoMoVo and EcoPAS control systems in use at Central Coast Wine Services are achieved in practice emission control technologies for closed-top wine fermentation tanks 30,000 gallons in capacity or less.

Background:

The wine fermentation process results in the release of reactive organic compound (ROC) (mainly ethanol) emissions. New wineries and modifications to existing wineries with an ROC potential to emit of 25 pounds per day or more trigger the nonattainment review (NAR) Best Available Control Technology (BACT) requirements of Rule 802. Rule 802.D.2 defines NAR BACT as the more stringent of:

a. The most effective emission control device, emission limit, or technique which has been achieved in practice for the type of equipment comprising such stationary source; or

b. The most stringent limitation contained in any State Implementation Plan; or

c. Any other emission control device or technique determined after public hearing to be technologically feasible and cost-effective by the Control Officer.

In April 2017, Central Coast Wine Services (CCWS) submitted an Authority to Construct permit application (ATC 15044) to remove operational restrictions and authorize the fermentation of red and white wines in all of their previously installed 400 series tanks. The potential to emit of this project exceeded the 25 pound per day NAR BACT threshold, therefore BACT was triggered for this project. In

[1] As used throughout this document, the term "emission control system" refers to both the emission capture and emission control functionality of the system.

light of this permit application, the question has arisen as to whether any of the emission control systems currently in use at wineries in Santa Barbara County have been achieved in practice. The purpose of this memo is to analyze the achieved in practice status of each emission control technology currently in use at wineries in Santa Barbara County.

Most Effective Control Achieved in Practice Definition:

District Policy and Procedure No. 6100.064.2017 *Best Available Control Technology* provides the following guidance on the definition of the "most effective emission control device, emission limit, or technique that has been achieved in practice for the type of equipment comprising such stationary source":

> Most Effective Control Achieved in Practice: There are three important elements to this part of the definition. The first element refers to the *most effective control device, technique, or emission limit.* This element is defined in a broad fashion to allow for the appropriate selection criteria for the specific equipment or process in question. Examples include:
>
> - Concentration limits of 5 ppmv NOx from the stack of a small boiler using a low-NOx burner
> - Mass destruction rate efficiency of 98.0 percent for a regenerative thermal oxidizer
> - Selective catalytic reduction with a concentration limit of 2 ppmv NOx for a 10 MW combined-cycle/cogeneration combustion gas turbine.
>
> The second element is achieved-in-practice. This element indicates that the technology has a proven "track-record" of reliability. For example, take a biogas fired spark ignited IC engine using SCR controls located at Facility X. This engine meets an emission standard of 9 ppmvd (at 15% O_2) and has done so for a reasonable time period. Next, if Facility Z (in our jurisdiction) triggers BACT for a similar proposed project, then it would need to meet this achieved-in-practice BACT standard. Facility X could be located anywhere in the USA.
>
> The third element of the definition refers to the type of equipment comprising the stationary source (i.e., class or category of source). This could be as large as a group of basic equipment units that provide the same function (e.g., the combination of motors, turbines, or reciprocating engines to provide torsional drive). On the other hand, it could be a more specific size segment or subtype within an equipment type (e.g., boilers over 33 MMBtu/hr heat input, or lean-burn engines).

This analysis will focus on the second element, "achieved in practice," of the definition discussed above. The emission control technologies being analyzed comprise the first element, and wine fermentation tanks comprise the third element of the definition. The term "achieved in practice" is not defined in federal, state or District rules or regulations. District Policy and Procedure No. 6100.064.2017 defines achieved in practice as a "proven 'track-record' of reliability." To determine if a control device has a proven track-record of reliability, the historical operations of the equipment must be evaluated. This analysis includes the frequency and duration of equipment operation, as well as the track-record of the equipment to successfully achieve its intended purpose (i.e. control ethanol emissions from wine fermentation). It is also important to note that the guidance in District Policy and Procedure No. 6100.064.2017 only considers whether an emission control technology has been operated successfully at a source for a reasonable period of time. This policy does not require a technology to have been installed to meet an NAR BACT requirement in order to be defined as achieved in practice.

In an August 25, 1997 letter from David Howekamp of the U.S. Environmental Protection Agency (EPA), Region IX to Mohsen Nazemi of the South Coast Air Quality Management District (SCAQMD), the U.S. EPA established a position that the successful operation of a new control technology for six months

constitutes achieved in practice. Due to the seasonal nature of the winemaking industry, fermentation activities only occur for approximately 60 to 80 days per year. Therefore, the EPA six month criteria must be adjusted to reflect the seasonality of the source type. In this case, the District believes the successful operation of the control equipment for at least one full fermentation season to be an appropriate criterion to demonstrate a technology has been achieved in practice. For equipment that is not operated continuously, the cumulative operation of the equipment for at least 80 days (one full fermentation season) is appropriate.

Finally, the "achieved-in-practice" component of the NAR BACT definition only considers the most stringent control achieved in practice for the category of source being considered. Thus, no discussion of costs is necessary or appropriate for sources that are already using a level of control considered achieved in practice. The fact that a particular control technology is achieved in practice implies its inherent economic feasibility. Since the technologies evaluated by this memo are already installed and in use at wineries in Santa Barbara County, cost is not evaluated in this analysis.

Achieved In Practice Analysis:

The following analysis evaluates the achieved in practice status of each wine fermentation emission control technology currently in use in Santa Barbara County.

1. Packed Bed Scrubber Technology - Terravant Wine Company:
   Terravant Wine Company (Terravant) provides custom winemaking services to the wine industry. Red and white wine grapes are crushed, fermented and stored at the facility, located at 35 Industrial Parkway in Buellton. Authority to Construct (ATC) 12364 was issued for the facility on February 21, 2008, and the facility began operations in fall 2008. Potential emissions from the new winery triggered BACT requirements for the project, however the District determined that BACT, while technically feasible for the new facility, was not cost effective. Due to other regulatory demands (e.g., offsets), the applicant moved forward with the design and installation of an emission control system.

   A packed bed scrubber emission control system was designed to control ethanol emissions to the atmosphere during the wine fermentation process. All of the fermentation tanks are indoors at Terravant, located within a temperature controlled building. An active ventilation system, utilizing ducting and blowers, continuously evacuates the air from the fermentation room and two additional storage rooms and routes the airflow to the control system. The building design has fast opening and closing doors to ensure that the rooms are maintained at a negative pressure. The ethanol emissions from wine fermentation and storage activities are routed to a packed bed scrubber control device. Scrubbing liquid, in this case water, is introduced at the top of the scrubber and flows down through the packed bed tower. Ethanol is absorbed into the scrubbing liquid due to ethanol's affinity to water. Once absorbed in the water, the ethanol is oxidized to carbon dioxide and water chemically using hydrogen peroxide. To oxidize the ethanol completely and rapidly, the liquid is passed through a UV reactor to speed the oxidation process. The operating permit for the facility requires the packed bed scrubber emission control system to be operated at all times during wine fermentation activities.

   While the packed bed scrubber control system at the Terravant winery is a custom system designed specifically for the facility, the system is comprised of components that are commercially available "off the shelf" (e.g. packed bed scrubber tower, tanks, pumps, UV lamp, etc.). Packed bed scrubbers are widely used to control ROC emissions throughout many industries. The vendor that designed the Terravant control system, or any other vendor familiar with the design of packed bed

scrubber control systems, would be able to design and build a similar control system for another winery.

ATC 12364 required the packed bed scrubber system to achieve a 95% control efficiency. Initial inlet/outlet source testing of the control system during the 2008 fermentation season showed the system was only achieving a 64% control efficiency. At the request of Terravant, the Permit to Operate (PTO) for the control system lowered the control efficiency requirement to 75%. The packed bed scrubber control system was subsequently re-engineered, and a source test during the 2009 fermentation season showed the control system achieved 91% control efficiency. The control system failed to meet the 75% control efficiency requirement during the 2011 – 2014 fermentation seasons. The lowest achieved control efficiency of the system was 47.6% during the 2013 fermentation season. Terravant and the control system vendor attributed the performance issues to improper maintenance of the system during times of non-operation between fermentation seasons.

In the spring of 2015, Terravant applied to modify their permit to eliminate the red and white wine production limits, increase the wine fermentation and aging ROC emission limits, and eliminate the minimum required scrubber control efficiency. This permit included daily recordkeeping requirements and biannual source testing requirements to demonstrate compliance with the daily emission limits. Terravant also implemented an enhanced control system maintenance program during this time. Since that permit was issued, four inlet/outlet source tests conducted during the 2015 and 2016 fermentation seasons have shown the system to achieve 83.7%, 86.3%, 80.9% and 83.5% control efficiencies, respectively. Looking at all eight years of source test data, the system has always achieved control of wine fermentation emissions at the Terravant facility. After improvements to the maintenance program, the control system has demonstrated two full fermentation seasons of reliable and consistent emission control.

In summary, the packed bed scrubber emission control system has been successfully operated to control wine fermentation emissions at the Terravant facility for eight full fermentation seasons. While the control system experienced issues related to maintenance during the initial years of operation, these issues have been addressed, and the control system has achieved an average control efficiency of 83.6% during the most recent two full fermentation seasons. Based on this analysis, it is clear that the Terravant packed bed scrubber control system has achieved a proven track-record of reliability for controlling ethanol emissions from wine fermentation. Therefore, the control system is designated achieved in practice emission control technology for indoor wine fermentation operations at new wineries. Since the building housing the wine fermentation activities must be able to accommodate the active ventilation system that collects vapors for the packed bed scrubber, this system may not be technically feasible at existing wineries.

2. <u>NoMoVo Technology - Central Coast Wine Services</u>:
Central Coast Wine Services (CCWS) provides custom winemaking services to the wine industry. Red and white wine grapes are crushed, fermented and stored at the facility, located at 2717 Aviation Way in Santa Maria. The facility was constructed and operated without a District permit, and Authority to Construct/ Permit to Operate 12733 was issued on June 5, 2009 to bring the facility into compliance with District rules and regulations. Potential emissions from the winery triggered BACT requirements for the project, however the District determined that BACT, while technically feasible for the new facility, was not cost effective. The winery operated for several years with emission limits set just below offset thresholds and implemented daily recordkeeping requirements to ensure the emission limits were not exceeded. In August 2013, CCWS submitted an application to voluntarily install and operate the NoMoVo emission capture and control system

at their winemaking facility as needed to maintain emissions below the permitted limits. An ATC permit for the control system was issued on September 23, 2013, and the system was installed and operated as necessary for the remainder of the 2013 fermentation season. A second NoMoVo system was permitted in 2014 and installed prior to the 2015 fermentation season.

CCWS has 143 closed-top wine fermentation tanks at their facility, ranging in size from 450 gallons to 21,232 gallons in capacity. The NoMoVo system has not been used on tanks less than 1,100 gallons in size at CCWS and, because the District did not do and is not required to do a technical feasibility and cost effectiveness analysis for any part of the "achieved in practice" determination for the CCWS project subject to BACT, such an analysis has not been done for these tanks. All of the fermentation tanks are indoors at CCWS, located within a temperature controlled building, with tanks equipped with glycol jackets for additional temperature control.

The NoMoVo system uses a piping manifold connected to closed-top fermentation tanks to capture and route fermentation exhaust gases to the control system. The system is entirely passive, whereby the release of gas from wine fermentation is used to drive the exhaust toward the control system. In the NoMoVo control system, fermentation exhaust gases pass through a wet scrubber, which absorbs ethanol in water that is recirculated countercurrent through the system. The cleaned exhaust gases are then released to the atmosphere. Prior to ethanol saturation, and at least once per day, the ethanol/water slurry is drained from the scrubber and shipped offsite in an airtight container to a District-approved facility for treatment or disposal. Each NoMoVo control system is capable of being connected to and controlling several fermentation tanks at one time.

The NoMoVo system has been in use at the CCWS facility for one partial fermentation season (2013) and three full fermentation seasons (2014 – 2016) on an as-needed basis. During the three full seasons of operation, the NoMoVo system was operated for 147 cumulative days out of the 223 days of wine fermentation activities (67%). Historically, the NoMoVo system was not operated during the beginning and end of the fermentation season, when wine fermentation volumes were lower and the use of emission controls was not necessary to comply with the daily emission limits. Excluding the days before the system was first operated each season and the days after the system was last operated each season, the NoMoVo system operated on 147 of 151 days (97%). Additionally, the NoMoVo system was operated for 30 consecutive days in 2014, 47 consecutive days in 2015, and 37 consecutive days in 2016 at the CCWS facility. The cumulative usage of the NoMoVo system at the CCWS facility meets the District's 80 cumulative days of operation criteria for qualifying the technology as achieved in practice. Moreover, the historical system usage demonstrates a clear track-record of frequent operation, with near continuous operation during the bulk of each fermentation season.

Due to the nature of operation of the NoMoVo system, the amount of ethanol captured and controlled by the system can readily be determined by measuring the ethanol content and volume of the NoMoVo slurry. The operating permit for CCWS requires the NoMoVo slurry to be measured for ethanol content and volume, and replaced with fresh water on a daily basis. A review of the annual reports from CCWS show that each NoMoVo system successfully captured and controlled ethanol emissions from wine fermentation on every day they were operated. During the three full seasons of operation, the NoMoVo systems captured and controlled 3,849 pounds of ethanol that would have otherwise been emitted to the atmosphere. Based on this operational data, the NoMoVo systems achieved an average of 26.2 pounds of ethanol capture and control per day. This data shows the NoMoVo system has positively achieved the control of ethanol emissions from wine fermentation operations.

In summary, the NoMoVo emission control system has been successfully operated to control wine fermentation emissions indoors at the CCWS facility for three full fermentation seasons. The control system has been operated on a frequent basis, with nearly continuous operation during the majority of fermentation operations. When the control systems were operated, they achieved an average of 26.2 pounds of ethanol capture and control per day. Based on this information, the NoMoVo control system has achieved a proven track record of reliability for controlling ethanol emissions from wine fermentation indoors. Therefore, the NoMoVo control system is considered achieved in practice emission control technology for closed-top wine fermentation tanks. Additionally, because wine fermentation tanks up to 30,000 gallons in capacity are similar in operational characteristics, this achieved in practice determination is applicable to closed-top fermentation tanks of up to 30,000 gallons in capacity.

3. <u>EcoPAS Technology - Central Coast Wine Services</u>:
On July 24, 2015, CCWS was issued an ATC permit to install and operate the EcoPAS emission control system to control emissions from the 400 series fermentation tanks on an as-needed basis. The control equipment was installed in August 2015 and was operated on an as-needed basis for the 2015 and 2016 fermentation seasons.

CCWS has 143 closed-top wine fermentation tanks at their facility, ranging in size from 450 gallons to 21,232 gallons in capacity. The EcoPAS system has not been used on tanks less than 1,100 gallons in size at CCWS and, because the District did not do and is not required to do a technical feasibility and cost effectiveness analysis for any part of the "achieved in practice" determination for the CCWS project subject to BACT, such an analysis has not been done for these tanks. All of the fermentation tanks are indoors at CCWS, located within a temperature controlled building, with tanks equipped with glycol jackets for additional temperature control.

The EcoPAS system uses a piping manifold connected to closed-top fermentation tanks to capture and route fermentation exhaust gases to the control system. The system is entirely passive, whereby the release of gas from wine fermentation is used to drive the exhaust toward the control system. In the EcoPAS control system, the fermentation exhaust gases make multiple passes through a glycol chilled tube-in-shell condenser. Ethanol and water vapors in the exhaust gases condense into liquid phase due the decreased temperature. The condensate is collected in airtight stainless steel vessels at three locations in the system. The condensate is stored onsite and then shipped offsite to a District-approved facility for treatment or disposal. The EcoPAS control system is capable of being connected to and controlling several fermentation tanks at one time.

The EcoPAS system has been in use at the CCWS facility for two full fermentation seasons (2015 – 2016) on an as-needed basis. During the two seasons of operation, the EcoPAS system was operated on 108 cumulative days out of the 145 days of wine fermentation activities (74%). Historically, the EcoPAS system was not operated during the beginning and end of the fermentation season, when wine fermentation volumes were lower and the use of emission controls was not necessary to comply with the daily emission limits. Excluding the days before the system was first operated each season, and the days after the system was last operated each season, the EcoPAS system was operated on 108 of 117 days (92%). Additionally, the EcoPAS system was operated for 34 consecutive days in 2015 and 37 consecutive days in 2016 at the CCWS facility. The cumulative usage of the EcoPAS system at the CCWS facility meets the District's 80 cumulative days of operation criteria for qualifying the technology as achieved in practice. Moreover, the

historical system usage demonstrates a clear track-record of frequent operation, with near continuous operation during the bulk of each fermentation season.

Due to the nature of operation of the EcoPAS system, the amount of ethanol captured and controlled by the system can be readily determined by measuring the ethanol content and volume of the EcoPAS condensate. The operating permit for CCWS requires the EcoPAS condensate be measured for ethanol content and volume on a daily basis. A review of the annual reports from CCWS show that the EcoPAS system successfully captured and controlled ethanol emissions from wine fermentation on every day that is was operated. During the two seasons of operation, the EcoPAS system captured and controlled 501 pounds of ethanol that would have otherwise been emitted to the atmosphere. Based on this operational data, the EcoPAS system achieved an average of 4.6 pounds of ethanol capture and control per day. This data shows the EcoPAS system has positively achieved the control of ethanol emissions from wine fermentation operations at CCWS.

It is important to note that the EcoPAS system was only connected to series 400 tanks used for white wine fermentation during the 2015 and 2016 seasons. Ethanol emissions from white wine fermentation are approximately 60% lower than ethanol emissions from red wine fermentation (2.5 lb/1000 gallon vs. 6.2 lb/1000 gallon). The EcoPAS system would be expected to capture and control more ethanol if connected to tanks used for red wine fermentation.

In summary, the EcoPAS emission control system has been successfully operated to control wine fermentation emissions indoors at the CCWS facility for two full fermentation seasons. The control system has been operated on a frequent basis, with nearly continuous operation during the majority of fermentation operations. When the control system was operated, it system achieved an average of 4.6 pounds of ethanol capture and control per day. Based on this information, the EcoPAS control system has achieved a proven track record of reliability for controlling ethanol emissions from wine fermentation indoors. Therefore, the EcoPAS control system is considered achieved in practice emission control technology for closed-top wine fermentation tanks . Additionally, because wine fermentation tanks up to 30,000 gallons in capacity are similar in operational characteristics, this achieved in practice determination is applicable to closed-top fermentation tanks of up to 30,000 gallons in capacity.

Oversight Agency Input:

On September 30, 2016, the U.S. EPA Region IX sent a letter to the San Joaquin Valley Air Pollution Control District (SJVAPCD) providing comments on four proposed winery permitting actions within the SJVAPCD jurisdiction. These permitting actions triggered BACT requirements under SJVAPCD's new source review regulations. SJVAPCD's BACT requirements are essentially equivalent to the federal requirements for Lowest Achievable Emission Rate (LAER). In their letter, the U.S. EPA states: "EPA believes the District's analyses for the four proposed permits identified above do not satisfactorily demonstrate LAER. Please see Enclosures 1 and 2 for more details. Consequently, EPA believes the District's proposed permits do not implement LAER as required by Rule 2201."

Enclosure 1 of the U.S. EPA's September 30, 2016 letter includes the following comments regarding the achieved in practice status of the emission control technologies in use in Santa Barbara County:

> "The fact that the source was not required to achieve emission reductions to satisfy a new source review (NSR) requirement and instead used the controls to avoid an applicable requirement, does not factor into the evaluation of whether a specific emission reduction rate has been achieved in practice."
>
> "EPA has reviewed the records from CCWS regarding their wine fermentation operations and using mass balance calculations have determined that the use of add-on controls during portions of the fermentation process have resulted in emission reductions of 76.6%. The demonstrated use of add-on controls to reduce emissions by 76.6% represents the lowest achievable emission rate for wine fermentation operations."
>
> "The Terravant Winery was issued a permit to construct and operate a packed bed water scrubber in 2008 to control emissions from their wine fermentation operations… The facility has been able to achieve a minimum control efficiency of at least 47.6% over the seven seasons it has been in use. Therefore, for wine fermentation tanks, EPA believes that the lowest achievable emission rate which has been AIP, based on the demonstrated emission reductions achieved at the Terravant facility, is a 47.6% control efficiency, as measured by Santa Barbara County APCD source testing."

Based on these comments, it is clear that the U.S. EPA considers the three technologies analyzed in this memo to be achieved in practice emission control technologies for wine fermentation. The comments also support the guidance from District Policy and Procedure No. 6100.064.2017 that an emission control technology does not need to have been a previous NAR BACT requirement to be achieved in practice. These determinations made by the U.S. EPA, an oversight agency of the District, are in agreement with the determinations made by this memo.

Conclusion:

Based on the above analyses and oversight agency input, the packed bed scrubber system in use at Terravant Wine Company is achieved in practice emission control technology for indoor wine fermentation operations at new wineries, and the NoMoVo and EcoPAS control systems in use at Central Coast Wine Services are achieved in practice emission control technologies for closed-top wine fermentation tanks 30,000 gallons in capacity or less.

Attachments:

1. Terravant Packed Bed Scrubber Pictures
2. Terravant Packed Bed Scrubber 2015 - 2016 Source Test Results
3. NoMoVo Pictures
4. EcoPAS Pictures
5. CCWS Control System Operation Calendars
6. September 30, 2016 U.S. EPA Letter to SJVAPCD

Attachment 1 – Terravant Packed Bed Scrubber Pictures

Packed bed scrubber

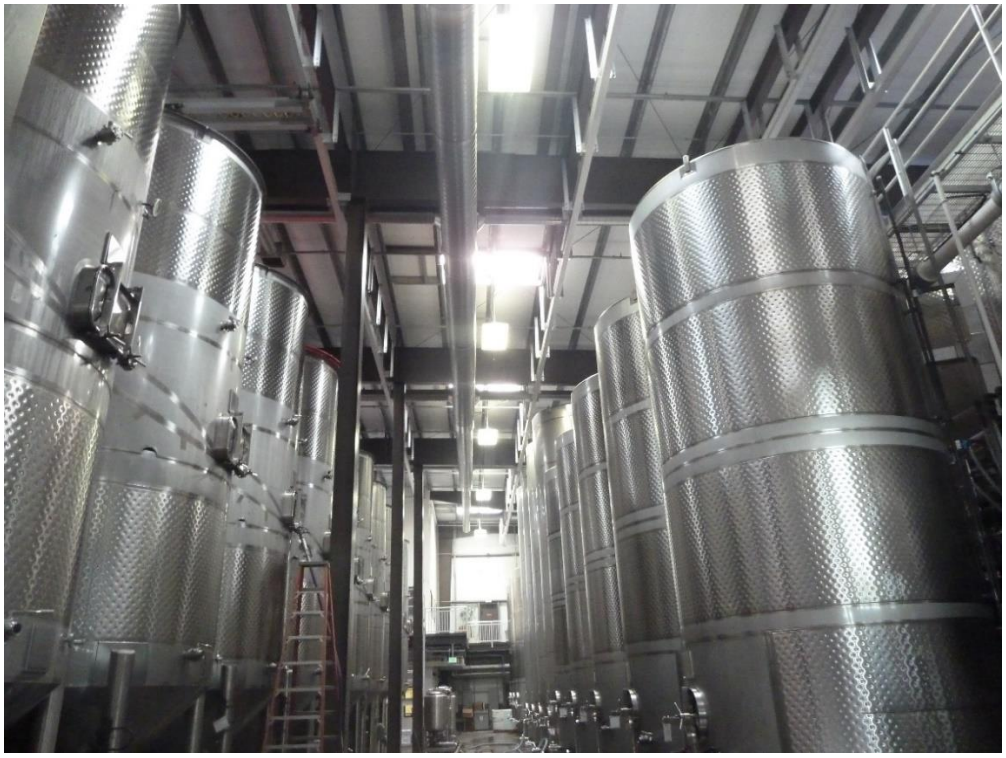
Packed bed scrubber and UV treatment lamp

Attachment 1 – Terravant Packed Bed Scrubber Pictures

Packed bed scrubber blower

Packed bed scrubber control panel

Attachment 1 – Terravant Packed Bed Scrubber Pictures



Wine fermentation tanks and fermentation room ventilation ducting

Wine fermentation tanks and fermentation room ventilation ducting

Attachment 2 – Terravant Source Test Results

Terravant Winery
Buellton Facility ID 10918
Inlet & Outlet

Project 228-9302A
September 4, 2015

Pollutant	ppmv	lb/hr	lb/day	tons/year	Permit Limits
ROC	23.98	1.44	34.63		
Scrubber	25.99	1.56	37.50		
Outlet	24.41	1.45	34.69		54.53 lb/day
Mean	**24.79**	**1.48**	**35.60**	**1.77**	9.89 tons/year
Ethanol	20.00	1.19	28.59		
Scrubber	22.17	1.33	31.83		
Outlet	20.83	1.23	29.59		
Mean	**21.00**	**1.25**	**30.00**		
Ethanol	162.79	9.70	232.73		
Scrubber	138.85	8.31	199.34		
Inlet	101.45	6.00	144.09		
Mean	**134.36**	**8.00**	**192.05**		
	Inlet lb/hr	Outlet lb/hr		% Removal	
Ethanol	9.70	1.19		87.7	
Scrubber	8.31	1.33		84.0	
Efficiency	6.00	1.23		79.5	
Mean	**8.00**	**1.25**		**83.7**	

Terravant Winery
Lompoc Facility
Inlet & Outlet

Project 228-9302B
September 25, 2015

Pollutant	ppmv	lb/hr	lb/day	tons/year	Permit Limits
ROC	33.23	2.06	49.40		
Scrubber	34.42	2.03	48.75		
Outlet	33.60	2.02	48.44		54.53 lb/day
Mean	**33.75**	**2.04**	**48.87**	**2.31**	9.89 tons/year
Ethanol	27.36	1.59	38.13		
Scrubber	30.88	1.81	43.33		
Outlet	29.99	1.77	42.47		
Mean	**29.41**	**1.72**	**41.31**		
Ethanol	231.06	13.42	321.97		
Scrubber	212.47	12.42	298.11		
Inlet	202.17	11.93	286.29		
Mean	**215.23**	**12.59**	**302.12**		
	Inlet lb/hr	Outlet lb/hr		% Removal	
Ethanol	13.42	1.59		88.2	
Scrubber	12.42	1.81		85.5	
Efficiency	11.93	1.77		85.2	
Mean	**12.59**	**1.72**		**86.3**	

Attachment 2 – Terravant Source Test Results

Terravant Wine Company
Buellton Facility ID 10918
Inlet & Outlet

Project 228-9789A
September 13, 2016
PTO No. 14626

Pollutant	ppmv	lb/hr	lb/day	tons/year	Permit Limits
ROC	10.63	0.53	12.80		
Scrubber	13.72	0.69	16.52		
Outlet	13.99	0.70	16.75		54.53 lb/day
Mean	**12.78**	**0.64**	**15.35**	**4.29**	**9.89 tons/year**
Ethanol	7.77	0.41	9.78		
Scrubber	9.87	0.52	12.44		
Outlet	9.97	0.52	12.53		
Mean	**9.20**	**0.48**	**11.58**		
Ethanol	43.97	2.30	55.32		
Scrubber	50.24	2.64	63.33		
Inlet	50.12	2.63	63.01		
Mean	**48.11**	**2.52**	**60.55**		
	Inlet lb/hr	Outlet lb/hr		% Removal	
Ethanol	2.30	0.41		82.3	
Scrubber	2.64	0.52		80.4	
Efficiency	2.63	0.52		80.1	
Mean	**2.52**	**0.48**		**80.9**	

Terravant Wine Company
Buellton Facility ID 10918
Inlet & Outlet

Project 228-9789B
October 4, 2016
PTO No. 14626

Pollutant	ppmv	lb/hr	lb/day	tons/year	Permit Limits
ROC	22.28	1.00	23.98		
Scrubber	21.11	1.04	24.88		
Outlet	33.32	1.63	39.14		54.53 lb/day
Mean	**25.57**	**1.22**	**29.34**	**5.42**	**9.89 tons/year**
Ethanol	14.61	0.71	16.93		
Scrubber	16.55	0.84	20.09		
Outlet	27.15	1.36	32.72		
Mean	**19.44**	**0.97**	**23.25**		
Ethanol	101.46	4.90	117.55		
Scrubber	142.39	7.20	172.88		
Inlet	115.13	5.78	138.74		
Mean	**119.66**	**5.96**	**143.06**		
	Inlet lb/hr	Outlet lb/hr		% Removal	
Ethanol	4.90	0.71		85.6	
Scrubber	7.20	0.84		88.4	
Efficiency	5.78	1.36		76.4	
Mean	**5.96**	**0.97**		**83.5**	

Attachment 3 – NoMoVo Pictures

NoMoVo control systems (2)

NoMoVo control systems (2)

Attachment 3 – NoMoVo Pictures

NoMoVo control system with NoMoVo piping manifold

Closed top fermentation tanks with NoMoVo piping manifold

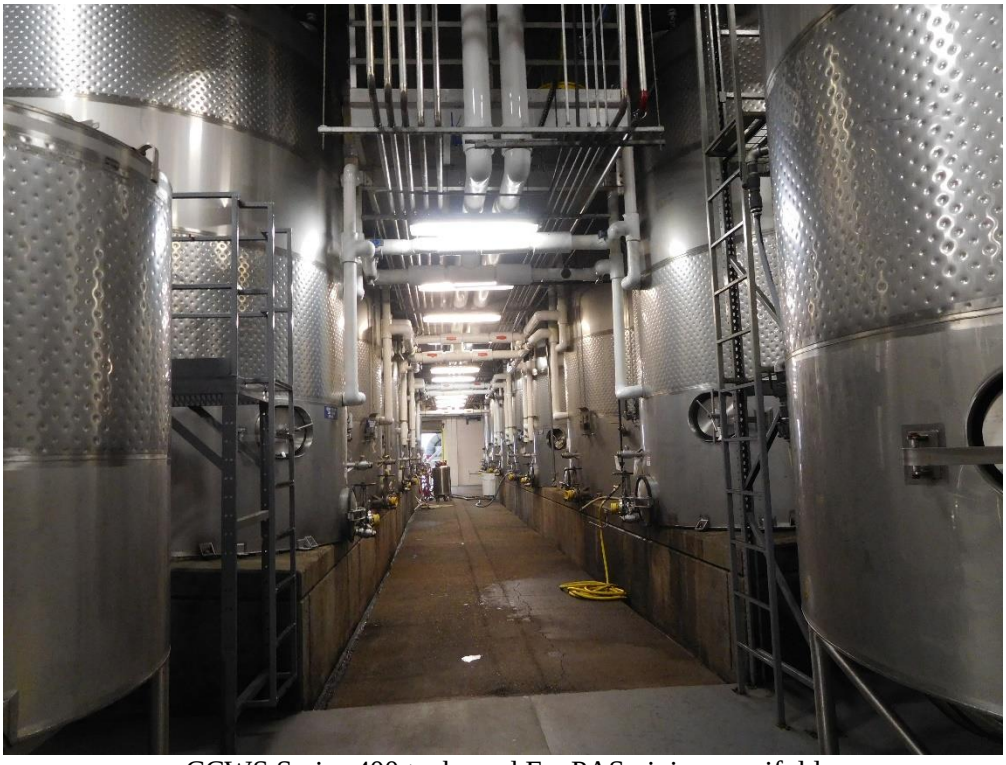
Attachment 4 – EcoPAS Pictures

EcoPAS control system

EcoPAS control system and condensate storage tanks

Attachment 4 – EcoPAS Pictures

CCWS Series 400 tanks and EcoPAS piping manifold



CCWS Series 400 tanks and EcoPAS piping manifold

Attachment 4 – EcoPAS Pictures

Closed top fermentation tanks with EcoPAS piping manifold

Closed top fermentation tank with EcoPAS piping

Attachment 5 – CCWS Control System Use Calendars

2013 Fermentation Season

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				August 1	2	3
4	5	6	7	8	9	10
11	12	13	14 Fermentation Start	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
September 1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30 NoMoVo 1	October 1 NoMoVo 1	2 NoMoVo 1	3 NoMoVo 1	4 NoMoVo 1	5 NoMoVo 1
6 NoMoVo 1	7 NoMoVo 1	8 NoMoVo 1	9 NoMoVo 1	10 NoMoVo 1	11 NoMoVo 1	12 NoMoVo 1
13 NoMoVo 1	14 NoMoVo 1	15 NoMoVo 1	16 NoMoVo 1	17 NoMoVo 1	18 NoMoVo 1	19 NoMoVo 1
20 NoMoVo 1	21 NoMoVo 1	22 NoMoVo 1	23 NoMoVo 1	24 NoMoVo 1	25 NoMoVo 1	26
27	28 NoMoVo 1	29	30	31	November 1	2
3	4	5	6	7	8	9
10	11	12 Fermentation End	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

2014 Fermentation Season

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					August 1	2
3	4	5	6	7 Fermentation Start	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	September 1	2	3	4	5 NoMoVo 1	6 NoMoVo 1
7 NoMoVo 1	8 NoMoVo 1	9 NoMoVo 1	10 NoMoVo 1	11 NoMoVo 1	12 NoMoVo 1	13 NoMoVo 1
14 NoMoVo 1	15 NoMoVo 1	16 NoMoVo 1	17 NoMoVo 1	18 NoMoVo 1	19 NoMoVo 1	20 NoMoVo 1
21 NoMoVo 1	22 NoMoVo 1	23 NoMoVo 1	24 NoMoVo 1	25 NoMoVo 1	26 NoMoVo 1	27 NoMoVo 1
28 NoMoVo 1	29 NoMoVo 1	30 NoMoVo 1	October 1 NoMoVo 1	2 NoMoVo 1	3 NoMoVo 1	4 NoMoVo 1
5	6 NoMoVo 1	7 NoMoVo 1	8 NoMoVo 1	9 NoMoVo 1	10 NoMoVo 1	11 NoMoVo 1
12 NoMoVo 1	13 NoMoVo 1	14 NoMoVo 1	15 NoMoVo 1	16 NoMoVo 1	17 NoMoVo 1	18 NoMoVo 1
19 NoMoVo 1	20 NoMoVo 1	21 NoMoVo 1	22 NoMoVo 1	23 Fermentation End	24	25
26	27	28	29	30	31	

Attachment 5 – CCWS Control System Use Calendars

2015 Fermentation Season

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						August 1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17 Fermentation Start	18	19	20	21	22
23 NoMoVo 2 EcoPAS	24 NoMoVo 2 EcoPAS	25 NoMoVo 2 EcoPAS	26 NoMoVo 2 EcoPAS	27 NoMoVo 2 EcoPAS	28 NoMoVo 2 EcoPAS	29 NoMoVo 2 EcoPAS
30 NoMoVo 2 EcoPAS	31 NoMoVo 2 EcoPAS	September 1 NoMoVo 1 NoMoVo 2 EcoPAS	2 NoMoVo 1 NoMoVo 2 EcoPAS	3 NoMoVo 1 NoMoVo 2 EcoPAS	4 NoMoVo 1 NoMoVo 2 EcoPAS	5 NoMoVo 1 NoMoVo 2
6 NoMoVo 1 NoMoVo 2 EcoPAS	7 NoMoVo 1 NoMoVo 2 EcoPAS	8 NoMoVo 1 NoMoVo 2 EcoPAS	9 NoMoVo 1 NoMoVo 2 EcoPAS	10 NoMoVo 1 NoMoVo 2 EcoPAS	11 NoMoVo 1 NoMoVo 2 EcoPAS	12 NoMoVo 1 NoMoVo 2 EcoPAS
13 NoMoVo 1 NoMoVo 2 EcoPAS	14 NoMoVo 1 NoMoVo 2 EcoPAS	15 NoMoVo 1 NoMoVo 2 EcoPAS	16 NoMoVo 1 NoMoVo 2 EcoPAS	17 NoMoVo 1 NoMoVo 2 EcoPAS	18 NoMoVo 1 NoMoVo 2 EcoPAS	19 NoMoVo 1 NoMoVo 2 EcoPAS
20 NoMoVo 1 NoMoVo 2 EcoPAS	21 NoMoVo 1 NoMoVo 2 EcoPAS	22 NoMoVo 1 NoMoVo 2 EcoPAS	23 NoMoVo 1 NoMoVo 2 EcoPAS	24 NoMoVo 1 NoMoVo 2 EcoPAS	25 NoMoVo 1 NoMoVo 2 EcoPAS	26 NoMoVo 1 NoMoVo 2 EcoPAS
27 NoMoVo 1 NoMoVo 2 EcoPAS	28 NoMoVo 1 NoMoVo 2 EcoPAS	29 NoMoVo 1 NoMoVo 2 EcoPAS	30 NoMoVo 1 NoMoVo 2 EcoPAS	October 1 NoMoVo 1 NoMoVo 2 EcoPAS	2 NoMoVo 1 NoMoVo 2 EcoPAS	3 NoMoVo 1 NoMoVo 2 EcoPAS
4 NoMoVo 1 NoMoVo 2 EcoPAS	5 NoMoVo 1 NoMoVo 2 EcoPAS	6 NoMoVo 1 NoMoVo 2 EcoPAS	7 NoMoVo 1 NoMoVo 2 EcoPAS	8 NoMoVo 1	9	10
11	12 NoMoVo 1 NoMoVo 2 EcoPAS	13 NoMoVo 1 EcoPAS	14 NoMoVo 1 EcoPAS	15	16	17
18	19	20	21 Fermentation End	22	23	24
25	26	27	28	29	30	31

Attachment 5 – CCWS Control System Use Calendars

2016 Fermentation Season

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	August 1	2	3	4	5	6
7	8	9	10	11	12	13
14	15 Fermentation Start	16	17	18	19	20
21	22	23	24 EcoPAS	25 EcoPAS	26 EcoPAS	27
28	29 EcoPAS	30 EcoPAS	31 EcoPAS	**September** 1 EcoPAS	2 EcoPAS	3 EcoPAS
4	5 EcoPAS	6 EcoPAS	7 EcoPAS	8 EcoPAS	9 EcoPAS	10 EcoPAS
11	12 EcoPAS	13 NoMoVo 1 EcoPAS	14 NoMoVo 1 EcoPAS	15 NoMoVo 1 EcoPAS	16 NoMoVo 1 EcoPAS	17 NoMoVo 1 EcoPAS
18 NoMoVo 1 EcoPAS	19 NoMoVo 1 EcoPAS	20 NoMoVo 1 NoMoVo 2 EcoPAS	21 NoMoVo 1 NoMoVo 2 EcoPAS	22 NoMoVo 1 NoMoVo 2 EcoPAS	23 NoMoVo 1 NoMoVo 2 EcoPAS	24 NoMoVo 1 NoMoVo 2 EcoPAS
25	26 NoMoVo 1 NoMoVo 2 EcoPAS	27 NoMoVo 1 NoMoVo 2 EcoPAS	28 NoMoVo 1 NoMoVo 2 EcoPAS	29 NoMoVo 1 NoMoVo 2 EcoPAS	30 NoMoVo 1 NoMoVo 2 EcoPAS	**October** 1 NoMoVo 1 NoMoVo 2 EcoPAS
2 NoMoVo 1 NoMoVo 2 EcoPAS	3 NoMoVo 1 NoMoVo 2 EcoPAS	4 NoMoVo 1 NoMoVo 2 EcoPAS	5 NoMoVo 1 NoMoVo 2 EcoPAS	6 NoMoVo 1 NoMoVo 2 EcoPAS	7 NoMoVo 1 NoMoVo 2 EcoPAS	8 NoMoVo 1 NoMoVo 2 EcoPAS
9 NoMoVo 1 NoMoVo 2 EcoPAS	10 NoMoVo 1 NoMoVo 2 EcoPAS	11 NoMoVo 1 NoMoVo 2 EcoPAS	12 NoMoVo 1 NoMoVo 2 EcoPAS	13 NoMoVo 1 NoMoVo 2 EcoPAS	14 NoMoVo 1 NoMoVo 2 EcoPAS	15 NoMoVo 1 NoMoVo 2 EcoPAS
16 NoMoVo 1 NoMoVo 2 EcoPAS	17 NoMoVo 1 NoMoVo 2 EcoPAS	18 NoMoVo 1 NoMoVo 2 EcoPAS	19 NoMoVo 1 NoMoVo 2 EcoPAS	20 NoMoVo 1 NoMoVo 2 EcoPAS	21 NoMoVo 1 NoMoVo 2 EcoPAS	22 NoMoVo 1 NoMoVo 2 EcoPAS
23 NoMoVo 1 NoMoVo 2 EcoPAS	24 NoMoVo 1 NoMoVo 2 EcoPAS	25 NoMoVo 1 NoMoVo 2 EcoPAS	26 NoMoVo 1 NoMoVo 2 EcoPAS	27 NoMoVo 1 NoMoVo 2 EcoPAS	28 NoMoVo 1 NoMoVo 2 EcoPAS	29 NoMoVo 1 NoMoVo 2 EcoPAS
30 NoMoVo 1 NoMoVo 2 EcoPAS	31 NoMoVo 1 NoMoVo 2 EcoPAS	**November** 1 NoMoVo 1 NoMoVo 2 EcoPAS Fermentation End	2	3	4	5

Attachment 6 – September 30, 2016 U.S. EPA Letter to SJVAPCD

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 9
75 Hawthorne Street
San Francisco, CA 94105

9-30-16

Arnaud Marjollet
Director of Permit Services
San Joaquin Valley Air Pollution Control District
1990 East Gettysburg Avenue
Fresno, CA 93726

Dear Mr. Marjollet,

Thank you for the opportunity to provide comments on proposed permit actions for the following four winery facilities:

1. Bear Creek Winery, located in Lodi, CA (Project No. N-1153192): The proposed permits are for the installation of four 160,000 gallon and four 51,000 gallon stainless steel, insulated wine tanks to be used to ferment and store white and red wines.

2. CBUS Ops Inc. (dba Woodbridge Winery), located in Woodbridge, CA (Project No. N-1143210): The proposed permits are for the installation of twenty-four 108,000 gallon stainless steel, enclosed top, insulated wine fermentation and storage tanks.

3. Delicato Vineyards, located in Manteca, CA (Project No. N-1152244): The proposed permits are for the installation of 128 new insulated, stainless steel wine fermentation and storage tanks, ranging in size from 50,000 to 154,000 gallons.

4. E&J Gallo Winery, located in Livingston, CA (Project No. N-1142303): The proposed ATC is to modify the permits by establishing a combined specific limiting condition for VOC emissions as well as incorporate some permit units with existing ATCs into the existing Title V permit.

For each of these projects, the District has determined that the project will result in a federal major modification, and therefore triggers the requirement to use Best Available Control Technology under the District's regulations (SJV BACT), as defined in Rule 2201, which is equivalent to the federal requirement for Lowest Achievable Emission Rate (LAER). SJV BACT requires "the most stringent emission limitation which is achieved in practice by such class or category of source." The District has provided its BACT analysis in the Appendices of each evaluation and concludes that maintaining the average fermentation temperature below 95°F satisfies the SJV BACT requirement for wine fermentation tanks. Each evaluation also references the District's Achieved in Practice Analysis Memo, revised on May 9, 2016, which evaluates wine fermentation operations at other wineries to determine if any are using an achieved in practice (AIP) technology to reduce emission reductions from wine fermentation operations.

The District's LAER (SJV BACT) determinations for these proposed permits are essentially the same as the District's determinations for winery permits EPA has previously reviewed. Specifically, EPA provided detailed comments to the District regarding the availability of add-on controls for wine fermentation tanks in four letters dated October 21, 2013, May 5, 2014, June 16, 2014 and May 8, 2015. For the reasons discussed in our previous comment letters, EPA believes the District's analyses for the four proposed permits identified above do not satisfactorily demonstrate LAER. Please see Enclosures 1 and 2 for more details. Consequently, EPA believes the District's proposed permits do not implement LAER as required by Rule 2201.

Because we are concerned that the proposed permits may not ensure compliance with LAER, we are evaluating whether it is necessary to issue a formal objection to the permits. The comment period for the Bear Creek Winery permit closes on October 9, 2016, by which time EPA will decide whether to object. Therefore, EPA requests that the District confer with EPA, regarding LAER for the wine fermentation, to discuss options that could resolve this issue without a formal objection by EPA. Please contact me at your earliest convenience but no later than October 6, 2016 to discuss this matter. I can be reached at 415 972-3974 or at rios.gerardo@epa.gov.

Sincerely,

Gerardo C. Rios
Chief, Permits Office
Air Division

Enclosures

cc: Tung Le, CARB

Enclosure 1 EPA Comments

Bear Creek Winery, Project No. N-1153192; CBUS Ops Inc. (dba Woodbridge Winery), Project No. N-1143210; Delicato Vineyards, Project No. N-1152244; E&J Gallo Winery, Project No. N-1142303

While the District evaluates the use of add-on controls at several winery facilities throughout the state, our comments are focused on the use of controls at two specific wineries, Central Coast Winery Services (CCWS) and Terravant Winery, both located in Santa Barbara, California.

The Central Coast Winery Service (CCWS) was issued a permit to construct and operate a (will insert name of control device from SB permit, rather than name vendor) in 2013 to control emissions from a portion of their wine fermentation operations. This equipment has been leased by the facility and has been in use during each crush season since 2103 (three seasons). The facility proposed use of this control equipment, not to meet any applicable BACT/LAER requirements, but instead to ensure their daily emissions remained below 55 lbs/day, which is the emission threshold for triggering BACT and offset requirements in the Santa Barbara County Air Pollution Control District (APCD). The fact that the source was not required to achieve emission reductions to satisfy a new source review (NSR) requirement and instead used the controls to avoid an applicable requirement, does not factor into the evaluation of whether a specific emission reduction rate has been achieved in practice. Similarly, the fact that the source only used the equipment as needed to comply with their 55 lb/day emission limit, does not affect whether a certain control rate has been AIP. EPA has reviewed the records from CCWS regarding their wine fermentation operations and using mass balance calculations have determined that the use of add-on controls during portions of the fermentation process have resulted in emission reductions of 76.6%. The demonstrated use of add-on controls to reduce emissions by 76.6% represents the lowest achievable emission rate for wine fermentation operations. The District has raised a concern that an ATC issued by the Santa Barbara County APCD to require the use of add-on controls to satisfy a BACT requirement was cancelled by the source, and thus cannot be relied on when considering whether the use of add-on controls at this facility have been AIP. While it is correct that an ATC allowing emissions at the facility to exceed 55lbs/day (thus triggering BACT) was cancelled, this did not affect the use of otherwise permitted control devices to reduce emissions from their wine fermentation operations. Lastly, EPA wants to address the District's concern that the control equipment at this facility has not been formally source tested. First we note that this control equipment was previously source tested by the Bay Area Air Quality Management District while in use at another facility and was able to achieve a control efficiency of greater than 99% using a direct measurement inlet and outlet source test. Second, due to the batch nature of the operation and the non-steady state of the wine fermentation process, source testing may not be the best way to accurately measure achieved emission reductions. Instead, emission calculations using mass-balance may be a better way to measure the actual emissions reductions achieved by the control device. Mass-balance calculations were used to determine the overall control efficiency of 76.6% for the batch wine fermentation process at this facility. Therefore, this same approach should be used to apply LAER to each of the proposed permits for wine fermentation operations.

The Terravant Winery was issued a permit to construct and operate a packed bed water scrubber in 2008 to control emissions from their wine fermentation operations. This custom designed control equipment is owned by the facility and has been in use during every crush season since 2008 (7 seasons). Similar to the Terravant facility, the control equipment was not installed to meet any applicable BACT/LAER requirements, but to comply with a daily emission limit of 55 lbs/day. As stated above in our summary of the Terravant operation, the fact that these controls were not required to meet BACT/LAER, or

required to be used at all times does not affect a determination of whether the use of such controls has been achieved in practice. While the installed control equipment was expected to achieve a 95% control efficiency, the source has only been able to maintain a 49% control efficiency on a consistent basis according to source test reports. The Santa Barbara County APCD has indicated that most issues related to the achieved control efficiency are likely due to operator error, given that water scrubbers are a well-established, high-efficiency control device for controlling ethanol emissions. For the purposes of evaluating whether the use of this control equipment can be considered AIP, the evaluation criteria is whether a source was able to achieve a certain level of control over a reasonable operating period. The District and EPA have already agreed that the reasonable operating period is a complete crush season. The facility has been able to achieve a minimum control efficiency of at least 47.6% over the seven seasons it has been in use. Therefore, for wine fermentation tanks, EPA believes that the lowest achievable emission rate which has been AIP, based on the demonstrated emission reductions achieved at the Terravant facility, is a 47.6% control efficiency, as measured by Santa Barbara County APCD source testing.