Monterey Bay Air Resources District
BOARD OF DIRECTORS MEETING
WEDNESDAY, FEBRUARY 19, 2020 – 1:30 P.M.
24580 SILVER CLOUD COURT, 3RD FLOOR, MONTEREY, CA, 93940
Summary of Actions

1. CALL TO ORDER – The meeting was called to order by Chair McShane at 1:30 p.m

2. PLEDGE OF ALLEGIANCE

3. Roll Call.

4. WELCOME NEW MEMBERS TO THE BOARD OF DIRECTORS – None present

5. ELECTION OF 2020 BOARD OF DIRECTORS CHAIR AND VICE CHAIR
   Motion: Elect Steve McShane as Chair and Ryan Coonerty as Vice Chair, Action: Approve, Moved by Zach Friend, Seconded by Jane Parker. Motion passed unanimously.

6. PUBLIC COMMENT PERIOD – None

7. REPORTS BY COMMITTEE CHAIRS ON COMMITTEE MEETINGS
   a. Budget, Personnel, and Nominating Committee
   b. Advisory Committee

8. COMMENTS AND REFERRALS FROM CHAIR AND BOARD MEMBERS
   a. Director McShane is working with the City of Seaside on an Earth Day electric drive event.

9. REPORT FROM AIR POLLUTION CONTROL OFFICER
   Richard Stedman, APCO, reported on the following:
      Engineering
      • District released notice of a 30-day comment period on the preliminary decision to approve issuance of a Title V Permit significant modification to Calpine Corporation for their facility located in King City. The facility is no longer exempt from the Acid Rain program because the facility will no longer supply energy to Pacific Gas and Electric Company and steam to an industrial host. The Acid Rain Program requirements have been added to the Title V permit.
      • On February 12, the District held an Accela product orientation meeting to review test environment and begin the process of customizing the software to meet our needs.
      • A Monterey County winery has applied for a burn permit to conduct a conservation burn of approximately 150 acres of piled vineyard materials. Sonoma Ecology Center will conduct training of 2-3 piles on Thursday February 20th to demonstrate the methods of conservation burns. The remaining piles will be burned using the conservation burn methods which reduce
smoke and emissions. The end result of a conservation burn is biochar which can be used as soil amendment.

- Deadline for applications for an Inspector I/II position is February 24. Application materials are posted to District’s website.

Planning and Air Monitoring

- Phase II of the Monterey Bay Electric Vehicle Incentive Program is continuing with 250 applications received, $210,000 obligated, and $190,000 remaining.
- On February 11 the Monterey County Board of Supervisors amended the East Garrison EIR to allow expanded use of the mitigation fund. These funds had been limited to School Bus and Irrigation pump projects.
- $175,000 in grant funds have been received from CARB for the Woodstove Change-out program. A new development this year will be a system to receive applications on-line through Laserfiche, the District’s new Document Management System.

San Lorenzo Valley

- Staff is continuing to observe weather conditions and air quality in the SLV to forecast when a Spare the Air alert will be declared. No Spare the Air Alerts have been called since the program opened at the beginning of November.

Outreach

- District will be at the Salinas Valley Ag Tech Summit at Hartnell on March 18
- District will be participating in Earth Day event at the Presidio in Monterey on April 7
- Save the Date: Clean Air Leaders Awards on June 11 @ 6:30 p.m at Wedgewood in Carmel Valley. This will be the District’s 10th year of sponsoring clean air awards.

APCO

- Will be speaking tonight at the Climate Crisis & Action: A Discussion with California Leaders Keynote by Jimmy Panetta. Sponsored by Citizens’ Climate Lobby Monterey County, the Center for the Blue Economy, and the Monterey Bay Aquarium.
- Request to the Board of Directors for appointments to Hearing Board and Advisory Committee.

CONSENT AGENDA

Motion: Approve items on Consent Agenda, Action: Approve, Moved by John Phillips, Seconded by Chris Lopez. Motion passed unanimously.

10. Accepted and Filed Summary of Actions for the December 18, 2019 Board of Directors Meeting

11. Received and Filed Budget to Actual Report for the Seven Months Ended January 31, 2020

12. Accepted and Filed Report of Summary of Mutual Settlement Program Actions for December 2019 and January 2020

13. Approved Out-of-State Travel Request for the Administrative and Fiscal Specialist to Attend the 2020 Springbrook National Users Conference in Portland, Oregon in May 2020

REGULAR AGENDA

14. RESOLUTION NO. 20-001: Held a Public Hearing and Adopted a Resolution Approving Rule 441 Boilers, Steam Generators, and Process Heaters

Motion: Adopt the resolution, Action: Approve, Moved by Jane Parker, Seconded by Mary Ann Carbone. Motion passed unanimously.
**Public Comment**
- Lance Ericksen, Chevron
- John Haley, Environmental Health and Safety Committee

15. **Received** Report on Calendar Year 2019 Engineering and Compliance Activities  
   Receive the report only; no action required or taken.

16. **Accepted and Filed** a Report on Daily Eight-Hour Peak Ozone Concentrations, Hourly Peak Ozone Concentrations, and PM2.5 and PM10 Air Monitoring Data for 2019  
   Receive the report only; no action required or taken.

17. **Received** Report on Wineries and Air District Regulations and **Provided** Direction to APCO on Rule 207 Changes  
   **Motion:** Withdraw currently submitted revision of Rule 207, do another revision, and resubmit to the State per recommendation by the California Air Resources Board. **Action:** Approve, Moved by Chris Lopez, Seconded by Honor Spencer.  
   **Roll Call Vote**  
   Mary Ann Carbone – Absent  
   Zach Friend – Yes  
   Chris Lopez – Yes  
   Steve McShane – Yes  
   Jane Parker – No  
   John Phillips – Yes  
   Honor Spencer – Yes  
   **Motion carries 5/1**

**Public Comment**
- Kim Stemler, Monterey County Vintners Association

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**CLOSED SESSION**

18. The Board met in Closed Session pursuant to Government Code section 54950, relating to the following:

   a. Pursuant to Government Code section 54957.6, the Board will provide direction to negotiators. Designated representatives: Richard Stedman, APCO, Rosa Rosales, District Administrative Services Manager, and Lynn Kievlan, District Admin & Fiscal Specialist Employee Organization: SEIU Local 521.  
      **No reportable action**

19. Adjournment – The meeting was adjourned by Chair McShane at 3:30 p.m.

   *Ann O'Rourke*  
   *Executive Assistant*
Proposed Rule 441
Boilers, Steam Generators,
and Process Heaters

SEONG KIM, AIR QUALITY ENGINEER II
ADVISORY COMMITTEE
DECEMBER 2019

Outline

Background
Proposed Rule Requirements
Rule Impacts
Timeline

Background

* The Health & Safety Code requires an air district that is nonattainment for one or more criteria pollutants to adopt an expedited rule development schedule that implements Best Available Retrofit Control Technology (BARCT).
  1. Rule 441 is the first rule to implement the Board approved BARCT schedule.

* BARCT requirements only apply to industrial sources subject to the State Cap & Trade program as of January 1, 2017.
  2. There are four industrial sources located in Monterey County.

* Applies to units rated at 2+ MMBTU/hr

Outreach

* Kickoff meeting on May 23, 2019 with affected industry stakeholders.
* Site visit with affected industry stakeholders on June 12, 2019.
* Site visit with burner manufacturer on October 29, 2019
* Advisory committee meeting on December 5, 2019

Background

* Approximately 40 units in the District
  3. Located at four facilities: L’hoist North America of Arizona, Chevron USA Inc., Aera Energy LLC, and Eagle Petroleum, LLC

* Rule 441 will address controlling oxides of nitrogen (NOx) and carbon monoxide (CO) emissions from boilers, steam generators, and process heaters.
**Proposed Rule Requirements**

<table>
<thead>
<tr>
<th>Source Category</th>
<th>Total Unit Rated Heat Input/Description (MMMBTU/hr)</th>
<th>Fuel</th>
<th>NOx Limit (ppmv @ 3% O₂)</th>
<th>CO Limit (ppmv @ 3% O₂)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boilers &amp; Process Heaters</td>
<td>≥ 2 to &lt; 5</td>
<td>Gaseous</td>
<td>30</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td>≥ 5 to &lt; 20</td>
<td>Gaseous</td>
<td>15</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td>≥ 20</td>
<td>Gaseous</td>
<td>9</td>
<td>400</td>
</tr>
<tr>
<td>Oilfield Steam Generators</td>
<td>≥ 2</td>
<td>Gaseous</td>
<td>15</td>
<td>400</td>
</tr>
</tbody>
</table>

**NOx Emission Reductions Example: Oilfield Steam Generators**

- Current Permit Limits: 180 - 280 ppm
- Source Test Data: 50 - 75 ppm
- Rule 441 Limit: 15 ppm
- Calculated range of emission reductions from 50% - 75% operating capacity.

**Retrofit Control Technology**

- Ultra Low NOx Burner
  - Cost-effective
- Ultra Low NOx Burner + Selective Catalytic Reduction
  - Not cost-effective

**Compliance Schedule**

- Submit a written plan detailing the method of achieving compliance of emission limits by December 31, 2020.
- Application required by December 31, 2021
- Demonstrate final compliance of emission limits by December 31, 2023

**Exemptions to BARCT Limits**

- Low-use units, < 90,000 therms or 9 billion BTUs per year.
- Units that use < 10% of its maximum heat input capacity while meeting a NOx limit of 30 ppmv and a CO limit of 400 ppmv.
- Units that were non-operational throughout 2019.
- Operation of units during curtailment conditions, up to 200 hours per year.

Low-use and non-operational units become subject to BARCT limits if status changes, and must meet Compliance Schedule outlined in rule.
Rule Impacts

Reduces NOx by approximately 694 to 1,390 tons per year

2020 NOX EMISSION INVENTORY REDUCTION FORECAST

Cost-Effectiveness

• Cost ranges from $2,800 to $26,318/ton of NOx reduced, depending on the size of the unit
• Cost-effectiveness
  - Includes capital cost, operating cost, and maintenance cost

Timeline

Questions?

Seong Kim
Air Quality Engineer II
skim@mbard.org
Calendar Year 2019 Engineering and Compliance Activity Data

AMY CLYMO
ENGINEERING AND COMPLIANCE MANAGER
FEBRUARY 19, 2020

Outline

• Description of Engineering and Compliance
• Activity Data

Engineering

• Evaluate permit applications for compliance with federal, state, and local rules and regulations
• Issue permits with operating conditions
• Develop rules and regulations
• Report annual stationary source emission inventory

Engineering Data

<table>
<thead>
<tr>
<th>Activity</th>
<th>Calendar Year 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permit Applications Received</td>
<td>416</td>
</tr>
<tr>
<td>Authorities to Construct Issued</td>
<td>171</td>
</tr>
<tr>
<td>Startup Inspections</td>
<td>123</td>
</tr>
<tr>
<td>Permits to Operate Issued</td>
<td>344</td>
</tr>
<tr>
<td>Agricultural Diesel Engine Registrations</td>
<td>4</td>
</tr>
<tr>
<td>Title V Permits Issued</td>
<td>2</td>
</tr>
<tr>
<td>Emission Reduction Credits Issued</td>
<td>2</td>
</tr>
</tbody>
</table>

Permitted Units

Emergency Engines - 1,124
Retail Gas Stations - 225
Paint Spray Facilities - 302
Boilers – 204
Prime Engines - 150

Compliance

• Conduct inspections of permitted sources
• Ensure compliance with permit conditions
• Take enforcement action for violations
• Ensure compliance with the federal asbestos regulation
• Respond to complaints
### Compliance Data

<table>
<thead>
<tr>
<th>Activity</th>
<th>Calendar Year 2019</th>
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</thead>
<tbody>
<tr>
<td>Compliance Inspections</td>
<td>1,643</td>
</tr>
<tr>
<td>Notices to Comply</td>
<td>232</td>
</tr>
<tr>
<td>Notices of Violation</td>
<td>59</td>
</tr>
<tr>
<td>Asbestos Inspections</td>
<td>151</td>
</tr>
<tr>
<td>Complaints Received</td>
<td>285</td>
</tr>
<tr>
<td>Breakdowns Received</td>
<td>19</td>
</tr>
<tr>
<td>Source Tests Observed</td>
<td>39</td>
</tr>
<tr>
<td>Variance Orders Issued</td>
<td>1</td>
</tr>
</tbody>
</table>

### Multi-Year Activity Trends

![Multi-Year Activity Trends Graph]

### Questions?

![Questions Icon]
Air Monitoring Summary for 2019

Ambient Air Quality (Daily) Standards

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Averaging Time</th>
<th>California Standards</th>
<th>National Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Concentration</td>
<td>Primary Concentration</td>
</tr>
<tr>
<td>Ozone</td>
<td>1 hour</td>
<td>0.09 ppm</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>8 hour</td>
<td>0.070 ppm</td>
<td>0.070 ppm</td>
</tr>
<tr>
<td>PM2.5</td>
<td>24 hour</td>
<td>--</td>
<td>35 µg/m³</td>
</tr>
<tr>
<td>PM10</td>
<td>24 hour</td>
<td>50 µg/m³</td>
<td>150 µg/m³</td>
</tr>
</tbody>
</table>

Hourly Peak Ozone

Carmel Valley Salinas Instrument Rack - Front Instrument Rack - Back Partisol Sampler
AGENDA ITEM NO. 8

Daily 8-Hour Peak Ozone

PM2.5 Concentrations

PM10 Concentrations

Attainment Status

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>State Designation</th>
<th>Federal Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ozone (O₃)</td>
<td>Nonattainment-Transitional</td>
<td>Attainment</td>
</tr>
<tr>
<td>Involatile Particulates (PM₂.₅)</td>
<td>Nonattainment</td>
<td>Attainment</td>
</tr>
<tr>
<td>Fine Particulates (PM₁₀)</td>
<td>Attainment</td>
<td>Attainment</td>
</tr>
<tr>
<td>Carbon Monoxide (CO)</td>
<td>Monterey Co., Attainment</td>
<td>Attainment</td>
</tr>
<tr>
<td>Nitrogen Dioxide (NOₓ)</td>
<td>San Benito Co., Unclassified</td>
<td>Attainment</td>
</tr>
<tr>
<td>Sulfur Dioxide (SO₂)</td>
<td>Santa Cruz Co., Unclassified</td>
<td>Attainment</td>
</tr>
<tr>
<td>Lead</td>
<td>Attainment</td>
<td>Attainment</td>
</tr>
</tbody>
</table>

Discussion and Questions....
WINERY EMISSIONS AND AIR DISTRICT RULE APPLICABILITY

Mary Giraudo, Engineering Supervisor
Boards of Directors
February 19, 2020

Presentation Overview

• Wineries in District
• Winery Emissions and Emission Controls
• Rule 201 Permit Exemptions and Rule 207 New Source Review
• SB288 - Rule Revision Process
• Impact of Proposed Revisions to Rule 207

Wineries in Monterey, Santa Cruz, & San Benito Counties

• 192 Wine Producers and Blenders in MBARD Jurisdiction
  - 110 in Monterey County
  - 68 in Santa Cruz County
  - 15 in San Benito County
• 180 facilities qualify for permit exemption (94% of facilities)
• 13 wineries require local District permits
  - 11 permitted wineries
  - 2 wineries in permit application phase
• 1 winery requires a Federal Title V permit – Federal Major Source Threshold 100 tons per year

Attainment Status of Ambient Air Quality Standards (AAQS)

• MBARD is in attainment with all national AAQS
• MBARD does not meet State ozone and PM_{10} AAQS
• Volatile Organic Compound (VOC) emissions are precursors to ozone and PM_{10}

Air Emissions from Wineries

• Fermentation produces (carbon dioxide and ethanol)
• Oak barrel aging and storage (ethanol) “The Angel's Share”
• Fermentation emissions occur during peak ozone season, late summer/early fall
• Ethanol = VOC = ozone and PM_{10} precursor

<table>
<thead>
<tr>
<th>Winery</th>
<th>City</th>
<th>Fermentation VOC Emissions (lbs/day)</th>
<th>Permitted Fermentation Throughput (gallons/yard)</th>
<th>Aging &amp; Storage VOC Emissions (lbs/day)</th>
<th>Permitted Aging/Storage Throughput (gallons/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constellation Brands</td>
<td>Gonzales</td>
<td>3,808</td>
<td>30,437,585</td>
<td>326</td>
<td>4,310,000</td>
</tr>
<tr>
<td>The Wine Group</td>
<td>Soledad</td>
<td>268</td>
<td>5,500,000</td>
<td>305</td>
<td>2,283,000</td>
</tr>
<tr>
<td>Franciscan Vineyards</td>
<td>Soledad</td>
<td>258</td>
<td>4,515,957</td>
<td>143</td>
<td>2,085,000</td>
</tr>
<tr>
<td>Delicato</td>
<td>Paicines</td>
<td>499</td>
<td>9,734,176</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Kendall-Jackson</td>
<td>Soledad</td>
<td>218</td>
<td>5,906,952</td>
<td>60</td>
<td>2,655,000</td>
</tr>
<tr>
<td>Delicato</td>
<td>King City</td>
<td>234</td>
<td>4,000,000</td>
<td>45</td>
<td>990,000</td>
</tr>
<tr>
<td>Scheid Vineyards, Inc.</td>
<td>Greenfield</td>
<td>156</td>
<td>5,439,896</td>
<td>13</td>
<td>177,000</td>
</tr>
<tr>
<td>Monterey Wine Co.</td>
<td>King City</td>
<td>176</td>
<td>3,500,000</td>
<td>12</td>
<td>153,000</td>
</tr>
<tr>
<td>J. Lohr Winery</td>
<td>Greenfield</td>
<td>95</td>
<td>3,479,400</td>
<td>42</td>
<td>2,977,081</td>
</tr>
<tr>
<td>Conundrum Winery</td>
<td>Salinas</td>
<td>&lt; 25</td>
<td>1,010,000</td>
<td>&lt; 25</td>
<td>527,401</td>
</tr>
<tr>
<td>KVL Holdings Inc.</td>
<td>Soledad</td>
<td>&lt; 25</td>
<td>563,000</td>
<td>20</td>
<td>243,000</td>
</tr>
</tbody>
</table>
Stationary Source Emissions Inventory (> 10 tons per year)

- 20 sources >10 tpy, includes 5 wineries
- VOC emissions from 5 wineries = 158 tons per year
- 50% of VOC from wineries

Local Rules (201 and 207)

- Rule 201 establishes permit exemptions
- Rule 207 establishes permit emission thresholds for emission control and offsets

Rule 201 Permit Exemptions

- Wineries in operation as of May 14, 1997 with an annual production rate less than 1.25 million gallons.
- New or reconstructed, as defined in Rule 207, wineries with annual production rate less than 150,000 gallons.
**Air District Exemption Comparison**

<table>
<thead>
<tr>
<th>District</th>
<th>Reference</th>
<th>Exemption Threshold Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Santa Barbara County APCD</td>
<td>Rule 202</td>
<td>Emissions from fermentation, aging and bottling with actual emissions less than 1 ton per year (if no aging, equivalent to 322,581 gallons red wine)</td>
</tr>
<tr>
<td>San Joaquin Valley APCD</td>
<td>Certification Statement</td>
<td>Annual production rate less than 47,600 gallons</td>
</tr>
<tr>
<td>San Luis Obispo APCD</td>
<td>No Specific Rule Exemption</td>
<td>By policy wineries are not permitted but they are “registered” and pay renewal fees</td>
</tr>
<tr>
<td>Bay Area AQMD</td>
<td>Regulation 2, Rule 1:</td>
<td>Fermentation tanks for wine</td>
</tr>
<tr>
<td></td>
<td>2017 Clean Air Plan,</td>
<td>Review emissions generated by fermentation at wineries and breweries to determine if reductions can be achieved</td>
</tr>
<tr>
<td></td>
<td>Further Study Measure</td>
<td></td>
</tr>
</tbody>
</table>

**Rule 207 New Source Review**

Federal and state emission thresholds for permit review:
- Best Available Control Technology (BACT)
- Offsets

**Rule 207 BACT and Offset Thresholds**

<table>
<thead>
<tr>
<th></th>
<th>Best Available Control Technology (BACT)</th>
<th>Offsets</th>
<th>Offset Exemptions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FEDERAL</strong></td>
<td>≥ 150 lbs/day facility-wide aggregated emissions</td>
<td>≥ 150 lbs/day facility-wide aggregated emissions</td>
<td>APCD discretion upon demonstration of findings &lt; 10 tons per year (Rule revision in 2000)</td>
</tr>
<tr>
<td><strong>STATE</strong></td>
<td>≥ 25 lbs/day individual permit unit</td>
<td>25 tons/yr (Health and Safety Code)</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>≥ 137 lbs/day facility-wide aggregated emissions (Rule 207)</td>
<td>&lt; 10 tons per year (Rule revision in 2000)</td>
<td></td>
</tr>
</tbody>
</table>

**Equivalency of Tons/Year to Pounds/Day**

\[25 \text{ tons} \times 1 \text{ year} \times 2000 \text{ lbs} = 137 \text{ lbs per day}\]

**District Board Required Findings**

- If District is in attainment with all national ambient air quality standards, revisions will not impair or impede continued maintenance of national standards or progress toward achieving attainment of State ambient air quality standards.
- The revised rule will not exempt, relax or reduce the obligation of any major stationary source, as those rules existed on December 30, 2002, to obtain a permit or meet best available control technology requirements.
- Consistent with Division 26 Air Resources procedural requirements.
- Consistent with environmental justice guidance.

**Rule 207 BACT and Offset Thresholds**

<table>
<thead>
<tr>
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<th>Best Available Control Technology (BACT)</th>
<th>Offsets</th>
<th>Offset Exemptions</th>
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<tr>
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<td>≥ 137 lbs/day facility-wide aggregated emissions (Rule 207)</td>
<td>&lt; 10 tons per year (Rule revision in 2000)</td>
<td></td>
</tr>
</tbody>
</table>
Next Steps to Increase Offset Threshold to 25 Tons/Year

• Propose Revisions to Rule 207
• District Board adopt required findings
• CARB Executive Officer appoints hearing officer to conduct public hearing to review rule revisions and Board findings

Rule Impacts on Best Available Control Technology (BACT) Requirements

• RULE CHANGE WOULD NOT ALLEVIATE THE NEED TO INSTALL BACT IF THRESHOLDS EXCEEDED
• Two systems have been achieved in practice and cost effective in Santa Barbara County. Units are published in the BACT clearinghouse for closed-top tanks ≤ 30,000 gallons capacity.
• For tanks > 30,000 gallons capacity, cost analysis will be required.
• Emission controls allow wine industry to grow in CA while still achieving air quality goals.

Rule Impacts of Increased Offset Threshold to 25 Tons/Year

• Rule change would allow 6 wineries to increase the overall VOC emissions by 43.6 tons/year (87,000 lbs/year) before triggering offset requirements.
• Emissions equivalent to a production rate of either 14 million gals/year red wine, or 35 million gals/year white wine.
• Represents a 31% increase in production rates from our permitted wineries (based on an assumed average of 24.5 million gallons).
• Foresee rule change providing additional growth for the emerging cannabis and composting industries.

Questions?

Mary Giraudo
Supervising Air Quality Engineer
mgiraudo@mbard.org

<table>
<thead>
<tr>
<th>Winery</th>
<th>Facility Wide VOC Emission (tons/year)</th>
<th>Exceeds Offset Thresholds*</th>
<th>Fermentation VOC Emissions (lbs/day)</th>
<th>Exceeds BACT Thresholds</th>
<th>Allowable Fermentation Throughput (gallons/year) 2018</th>
<th>Fermentation Throughput (gallons/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constellation Brands</td>
<td>144.0</td>
<td>YES</td>
<td>3,808</td>
<td>YES</td>
<td>5,030,805</td>
<td>29,283,867</td>
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<tr>
<td>The Wine Group</td>
<td>44.8</td>
<td>YES</td>
<td>268</td>
<td>YES</td>
<td>9,510,000</td>
<td>5,030,805</td>
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<tr>
<td>Franciscan Vineyards</td>
<td>43.2</td>
<td>YES</td>
<td>250</td>
<td>YES</td>
<td>4,812,957</td>
<td>3,074,023</td>
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<tr>
<td>Delicato (SB)</td>
<td>23.0</td>
<td>YES/NO</td>
<td>499</td>
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<td>9,734,176</td>
<td>2,954,080</td>
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<tr>
<td>Kendall-Jackson</td>
<td>22.4</td>
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<td>236</td>
<td>YES</td>
<td>5,506,952</td>
<td>3,936,425</td>
</tr>
<tr>
<td>Delicato (Napa)</td>
<td>18.8</td>
<td>YES/NO</td>
<td>234</td>
<td>YES</td>
<td>4,600,000</td>
<td>2,486,522</td>
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<tr>
<td>Giralda Vineyards, Inc.</td>
<td>15.8</td>
<td>YES/NO</td>
<td>156</td>
<td>YES</td>
<td>5,430,856</td>
<td>4,973,312</td>
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<tr>
<td>Monterey Wine Co.</td>
<td>14.2</td>
<td>YES/NO</td>
<td>176</td>
<td>YES</td>
<td>3,500,000</td>
<td>2,838,390</td>
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<tr>
<td>J. Lohr Winery</td>
<td>12.2</td>
<td>YES/NO</td>
<td>95</td>
<td>YES</td>
<td>3,470,000</td>
<td>1,591,723</td>
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<tr>
<td>Constellation Winery</td>
<td>9.3</td>
<td>NO</td>
<td>&lt; 25</td>
<td>NO</td>
<td>1,010,000</td>
<td>705,460</td>
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<tr>
<td>KVL Holdings Inc.</td>
<td>6.5</td>
<td>NO</td>
<td>&lt; 25</td>
<td>NO</td>
<td>563,000</td>
<td>562,366</td>
</tr>
</tbody>
</table>

*Difference if offset threshold 137 lb/day vs. 25 tons/year
Background

- Our process captures vapors released during wine fermentation.
- These are water, ethanol, and other volatile aromatics, with CO2 as the driver and carrier gas.
- Our proprietary condensers convert these vapors into a highly aromatic wine spirit that can be used to make better wine, increase winery profits, and expand sustainability.
- Chilled condensers as air quality controls have been used for decades. For example, in 1982, Fresno County APCD identified condensation as the most cost-effective technology for winery emissions.¹

¹“Winery emission control in California,” Fresno County Air Pollution Control District, September 1982

Achieved in Practice:

Centralized or Distributed

- PAS-100 system, manifold to 24 fermenting tanks, ~200K gallons

Indoors or Out

- PAS-10, Single Tank

Smart Condenser Advantages

- Designed Specifically for Wineries
  - Condenser design to maximize capture efficiency without pressure in tank headspace
- Zero Water Use
- Zero Waste Stream
  - Aromatic wine spirits valued at up to $400/gal. (~20X annual capture cost)
- Low Energy Use
- Self Cleaning
  - CO2 and Ethanol is essentially a cleaning solvent
  - Basic engineering (check valves, foam screens, etc.) to prohibit contamination of manifolds
- Designated as Achieved in Practice BACT
- Low Cost
  - <$0.01/bottle (avg. cork cost is $0.10-0.25)

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Thank You
**Cost Model: 1.5-million Case Winery**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases Produced</td>
<td>1,500,000</td>
</tr>
<tr>
<td>Potential to Emit (tpy)</td>
<td>11.2</td>
</tr>
<tr>
<td>Capture Equipment</td>
<td>$564,691 incl. manifolding and all direct and indirect costs</td>
</tr>
<tr>
<td>Annualized CER (tpy)</td>
<td>$54,404</td>
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<tr>
<td>Annual Costs</td>
<td>$35,901</td>
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<tr>
<td>Total Annual Cost</td>
<td>$90,305</td>
</tr>
<tr>
<td>$/ton of VOC</td>
<td>$12.067</td>
</tr>
<tr>
<td>$/case</td>
<td>$0.060</td>
</tr>
<tr>
<td>$/750ml bottle</td>
<td>$0.005</td>
</tr>
</tbody>
</table>

**Independent Winemaker Taste Testing**

The following are comments extracted from a variety of recent tastings and trials using Aromatica wine spirits:

- Improved my premium wine. Turned a standard Cab into a brooding Prisoner. Made it even more ‘flawless’
- Much improved mouthfeel
- Wine nose, aromas, and bouquet improved from a relatively flatter wine and gave it new life
- Using less expensive grapes, was able to blend in Aromatica and achieve a higher target style and quality
- Improved wine that had vegetative smell and taste
- Restored aromatics to a wine damaged by aggressive RO filtration required to fix a pH problem
- ‘This could give our lower tier wines “over the top” aromatics and a more fruit forward presentation’
- ‘Possibilities are infinite’
- ‘Pretty impactful…in a nice way. Increased black fruit flavor’
- ‘Could see it being used on an older wine to bring bouquet and mouthfeel back up, lift the wine stylistically’
- ‘Added tropical fruit and butter’
- ‘Very impressive…’
Responsibility for the stewardship of our planet is a growing challenge — it's one we work hard to champion.

Conducting our business in an environmentally responsible manner to help mitigate our impact on water, air and soil.

Sustainable winegrowing is a comprehensive set of practices that are environmentally sound, socially equitable and economically viable.

A HISTORY LESSON...
Cap on VOC emissions from solvent based paints.
Water based pigment and clear coat paints.
More resilient paints reducing warranty claims.

Limit on PM10 emissions from chip fryers.
Inline stack recovery system removing oil from stack exhaust.
Reclaim of up to 5% of oil used in production.

Limit on PM10 emissions from coffee roasters.
Introduction of Catalytic Oxidizers for emissions.
Fuel savings versus thermal & heat recovery.

WINE INDUSTRY KNOWLEDGE
A WINE STORY

Regulation — SBCAPCD enforcement of daily VOC limits from wine fermentation, using AP-42 calculations.

\[ EF = (0.136T - 5.91) + [(B - 20.4)(T - 15.21)(0.00085) + C] \]

R&D spans from 2009 thru 2014 with the evolution to version 4.0, the current platform.
BAAQMD performs independent efficiency tests in 2011 & 2013 resulting in +90% capture.

- "v4.0 successfully operating for 6 consecutive harvests.
- Granted in August 2017 by SBCAPCD
- US-879170-02-US-NAT – granted August 2018
- US-879170-03-AU-NAT – granted November 2018
- US-879170-04-EU-NAT – published

AIP
BACT
Patents

CONFIGURATIONS
MOBILE or DEDICATED

- MODEL 1836, up to 60,000 gallons of actively fermenting wine
- Self contained
- Plug & Play
- Easily moved by fork truck
- Good when flexibility is required, and tank use is random
- Or a few tanks are dedicated to fermentation

NETWORKED TANK SYSTEMS

- Model 2448, up to 100,000 gallons of actively fermenting wine
- Designed to be connected to bank of tanks via exhaust piping system
- Separate slurry tank for quick changeover
- Integrated CIP (clean-in-place)

LARGE FERMENTATION TANK CLUSTER

- For tank systems with more than 100,000 gallons of actively fermenting wine
- NoMoVo units can be interconnected to provide unlimited capture capacity on tanks of any size
- Easily integrated into existing tank farm control systems

CO2 MANAGEMENT

- With an interconnected tank system to NoMoVo, it can exhaust CO2 directly outside reducing risk to employees and costly air changes
- Some facilities have CO2 exhaust systems and NoMoVo can connect directly to those systems

WASTE TO WORTH

- | From NoMoVo (gas) |
  - Uncontaminated CO2
  - Compressed as inert gas
  - Combined with compounds for sequestering

- | From NoMoVo (slurry) |
  - High Value Uses
  - Blended back into wine tanks to balance alcohol levels
  - As a standalone beverage that can be flavored (Wine Vodka)
  - In the production of liquors or blended/flavored beverages
  - As a pre-cleaning solution for winery tanks and equipment
  - As a push-in transfer pipes water between wine batches to minimize wine loss

FAQ..?

Is there an impact to the wine..?
No. The system cleans the discharged off-gases that are part of the normal fermentation process.

What happens if the tank has a foamover..?
In the rare occurrence of a foamover, the system is cleaned-in-place, recharged with process water and can immediately be put back online.

Are there specialized wear parts..?
The core system has no moving parts, so minimal wear and tear. Circulation pumps, temperature regulators, filters and sensors are all standard wine operations components.