State of California
AIR RESOURCES BOARD

Resolution 87-29

March 27, 1987

Agenda Item No.: 87-5-1

WHEREAS, the Air Resources Board ("Board") and the Environmental Protection Agency have established health-based ambient air quality standards for oxidant and ozone, respectively, and these standards are frequently violated in many of the state's air basins;

WHEREAS, Health and Safety Code Sections 39003, 39500, 39602, and 41500 authorize the Board to coordinate, encourage, and review efforts to attain and maintain state and national ambient air quality standards;

WHEREAS, Health and Safety Code Sections 39600 and 39605 authorize the Board to act as necessary to execute the powers and duties granted to and imposed upon the Board and to assist the air pollution control districts;

WHEREAS, the statewide Technical Review Group for Suggested Control Measure Development (TRG) has approved a proposed Suggested Control Measure for Control of Ethanol Emissions from Winery Fermentation Tanks (the "Suggested Control Measure") and has forwarded the Suggested Control Measure to the Board for consideration;

WHEREAS, a commitment has been made by at least one district in California to consider the control of ethanol emissions from winery fermentation tanks as part of its Nonattainment Area Plan;

WHEREAS, the California Environmental Quality Act and Board regulations require that no project having significant adverse environmental impacts be adopted as proposed if feasible alternatives or mitigation measures are available;

WHEREAS, the Board has held a duly noticed public meeting to consider approval of the Suggested Control Measure and has heard and considered the comments presented by representatives of the Board, TRG, districts, affected industries, and other interested persons and agencies; and

WHEREAS, the Board finds that:

> Methods to reduce emissions of ethanol from winery fermentation tanks potentially include ducting the fermentation exhaust gases to a pollution control device which removes ethanol from the exhaust stream;

There is a need for further evaluation of these methods as applicable to wineries;

A demonstration program to evaluate further the methods to reduce emissions of ethanol from winery fermentation tanks, as set forth in Attachment A, "Plan for a Demonstration Program to Determine the Technical Feasibility, Availability, and Cost to Control Ethanol Emissions from Winery Fermentation Tanks," will provide the information necessary to evaluate further the technological feasibility, the cost, and the cost-effectiveness of the proposed Suggested Control Measure;

The Wine Institute has submitted a letter (Attachment B) indicating to the Board its intent to carry out the demonstration program to evaluate the methods to reduce emissions of ethanol from winery fermentation tanks as set forth in Attachment A; and

No significant adverse environmental impacts associated with the proposed demonstration program have been identified, and no potentially significant adverse environmental effects are likely to result from the implementation of the proposed demonstration program.

NOW, THEREFORE, BE IT RESOLVED that the Board approves the demonstration program as set forth in Attachment A and that the Board defers taking action on the Suggested Control Measure for control of ethanol emissions from winery fermentation tanks forwarded to the Board by the TRG pending the outcome of the demonstration program.

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to notify the TRG of its action with respect to the Suggested Control Measure.

BE IT FURTHER RESOLVED that the Board directs the Executive Officer and/or his designees to serve as representatives on an Ad Hoc Advisory Committee to participate with the Wine Institute in carrying out the "Plan for a Demonstration Program to Determine the Technical Feasibility, Availability, and Cost to Control Ethanol Emissions from Winery Fermentation Tanks" as set forth in Attachment A. The Executive Officer shall invite representatives of the TRG to participate on the committee.

BE IT FURTHER RESOLVED that at least one Board staff member appointed to the Ad Hoc Advisory Committee (or his/her designee) shall participate in a study of wineries in the Fresno area during the 1987 fermentation season to monitor tank usage as set forth in Attachment A, and that the Board shall provide source testing support for testing fermentation tank exhaust gases as set forth in Attachment A.

BE IT FURTHER RESOLVED that the Executive Officer shall schedule for the Board a public meeting to consider the report of the Ad Hoc Advisory Committee as set forth in Attachment A and to determine, in light of the results of the demonstration program, the availability and appropriate level of control and applicability and an implementation schedule for the Suggested Control Measure for the control of ethanol emissions from winery fermentation tanks, and the Executive Officer shall forward the Board's recommendation to the TRG.

I hereby certify that the above is a true and correct copy of Resolution 87-29, as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

PLAN FOR A DEMONSTRATION PROGRAM TO DETERMINE THE TECHNICAL FEASIBILITY, AVAILABILITY, AND COST TO CONTROL ETHANOL EMISSIONS FROM WINERY FERMENTATION TANKS

This plan for a demonstration program to determine the technical feasibility, availability, and cost to control ethanol emissions from winery fermentation tanks specifies the functions and procedures which shall apply to the California Air Resources Board (ARB or Board) and the Wine Institute. It also details the procedures through which the proposed demonstration program shall be implemented.

Ad Hoc Advisory Committee

1. An Ad Hoc Advisory Committee will be created to develop and implement the demonstration program. The committee shall consist of two representatives of the ARB staff (the Executive Officer and/or his designees) and two members appointed by the Wine Institute. The Executive Officer of the Board will invite up to two members of the TRG to participate on the committee. The committee shall operate by consensus and shall be governed by rules that it establishes itself.

2. The committee shall select a contractor and the location for the demonstration program, review and approve the design of the fermentation tank exhaust ducting systems and control equipment, and develop a detailed workplan and schedule for the demonstration program. The committee shall meet periodically during the course of the program to evaluate the progress of the work and to approve any procedural changes that the committee determines are necessary.

3. The committee shall evaluate the results of the demonstration program and present the results to the TRG and to the Air Resources Board.

Demonstration Program

1. The demonstration program shall consist of two phases. Phase I shall be conducted during the 1987 fermentation season, and Phase II during the 1988 fermentation season, if Phase II is found to be necessary. If the Ad Hoc Advisory Committee determines that the above schedule cannot be reasonably achieved, or that additional work is necessary to complete Phase I, the committee may revise the schedule accordingly.

2. Phase I of the demonstration program shall consist of the following: (1) a pilot program to evaluate scrubbing, carbon adsorption, and catalytic incineration as technologies to reduce the ethanol content of the fermentation tank exhaust gases; (2) an evaluation of tank usage at three operating wineries; and (3) preparation of conceptual cost estimates for the three operating wineries based on the results of the pilot program and tank usage evaluation.

3. Phase I of the demonstration program shall be conducted as follows:

(a) Three tanks, each greater than 1,000 gallons in capacity, shall be modified to incorporate exhaust ducting and control equipment. An unmodified tank shall be used to monitor product and process differences between uncontrolled and controlled tanks.

(b) An open ducting system shall be installed on the three modified tanks. The committee shall determine how the tanks are to be ducted - singly or grouped. Three types of controls shall be evaluated - scrubbing, carbon adsorption and catalytic incineration.

(c) The Ad Hoc Advisory Committee shall determine the number of cycles, type of wine, and fermentation temperature to be used in the tanks. At least one low temperature, white wine fermentation cycle shall be tested in each tank.

(d) The parameters to be monitored and/or tested shall include, but not be limited to: (1) exhaust gas flow rate; (2) pressure changes within the tank; (3) ethanol, hydrogen sulfide, carbon dioxide, and water concentration in the exhaust gases; and (4) density of the exhaust gases. The method and frequency of testing shall be determined by the Ad Hoc Advisory Committee.

(e) Each of the control devices shall be designed to achieve at least a 90 percent reduction in the ethanol content of the exhaust gases. The actual control efficiency of the control devices shall be determined by measuring the ethanol concentration in the exhaust gases before they enter the control device and after they exit the control device.

(f) The operating costs shall be determined for each type of control. In addition, the following technical questions specific to each control device shall be evaluated: (1) scrubber - the amount of water usage, the amount of water/ethanol product (wastewater) generated, and the evaporation of ethanol from the wastewater when land disposed; (2) carbon adsorption - the concentration of ethanol in the condensate created by regeneration of the carbon, the storage time and capacity required for the condensate, the steam requirement of the regeneration system, and the efficiency of the regeneration system; and (3) catalytic incineration - the fuel requirement, and the attrition and poisoning of the catalyst. The methods of evaluation of the control devices shall be developed by the Ad Hoc Advisory Committee.

(g) Product quality shall be evaluated by comparing wine produced in the unmodified tank with wine produced in tanks equipped with ducting and controls. Quality parameters shall include taste (determined by a trained panel of testers), wine composition, and a gas chromatographic profile of wine volatiles, and any other parameters recommended by the Ad Hoc Advisory Committee.

(h) The kinds of bacteria, molds, fungi and other microorganisms, and the amount and rate of bacterial

growth, if any, in the ducting system shall be identified, and the effect of simulated or actual foam-over events on bacterial growth shall be evaluated.

(i) One of the Ad Hoc Advisory Committee's ARB staff representatives, or his/her designee, shall participate in a study of three wineries in the Fresno area (Gallo, Christian Brothers, and Guild-Cribari) during the 1987 fermentation season to monitor tank usage and study tank usage patterns and requirements. In addition, the Wine Institute shall provide the committee with tank usage data from those three wineries for the 1984-1986 fermentation seasons. The data will be used to reconcile the discrepancy between the cost estimates obtained by the Wine Institute and those presented in the Technical Support Document to the SCM. The committee shall evaluate the tank usage data and the 1987 tank monitoring data to estimate the number of tanks that would have to be ducted and controlled for each of the three wineries.

(j) Based upon the results of the pilot program and tank usage evaluation, and in consultation with the contractor, the Ad Hoc Advisory Committee shall develop conceptual cost estimates for each of the three wineries. Those estimates will take into account the results of the pilot program, but shall ultimately be based on concepts appropriate for full-scale application.

(k) The Ad Hoc Advisory Committee shall review the results of the pilot program, the tank usage evaluation, and the cost estimates, and prepare a report evaluating those results. Based on the committee's findings, the committee shall determine by consensus whether Phase II of the demonstration program shall be conducted.

4. If the Ad Hoc Advisory Committee determines that the demonstration program shall conclude with Phase I, the committee's written report and any minority report shall be presented to the Air Resources Board with a copy to the TRG. The Executive Officer shall schedule a public meeting of the Board to determine the availability and appropriate level of control and applicability, and an implementation schedule, based on the results of the Phase I study.

5. Phase II of the demonstration program, if conducted, shall consist of the following: (1) evaluation of exhaust ducting and one of the three control technologies evaluated in Phase I, using one or more fermentation tanks at an operating winery; and (2) preparation of refined cost estimates for the three operating wineries evaluated in Phase I based on the installation of controls on large fermentation tanks.

6. Phase II of the demonstration program shall be conducted as follows:

(a) The details of this program, including the number and location of tank(s) to be controlled, the type of control device, the design of the ducting and capture system, and the type and number of fermentation cycles, shall be developed by the Ad Hoc Advisory Committee after the

completion of Phase I and shall be based on the results obtained in Phase I. Phase II shall be designed to address any technical questions not adequately resolved during the pilot program. Particular emphasis shall be placed on evaluating sanitation, capture efficiency, control efficiency, and safety considerations.

(b) Based on the information obtained in the full-scale demonstration program, the Ad Hoc Advisory Committee shall prepare revised conceptual cost estimates for the same three wineries evaluated in Phase I - the Gallo, Christian Brothers, and Guild-Cribari Wineries in the Fresno area.

(c) The Ad Hoc Advisory Committee shall review the results of the full-scale demonstration program and the revised conceptual cost estimates and prepare a report evaluating those results. Any committee member who chooses not to support any portion of the committee report may submit a minority report.

7. The Ad Hoc Advisory Committee's written report and any minority report shall be presented to the Air Resources Board with a copy to the TRG. The Executive Officer shall schedule a public meeting of the Board to determine the availability and appropriate level of control and applicability, and an implementation schedule, based on the results of the demonstration program.

Funding of the Demonstration Program

1. Funding for the demonstration program shall be provided by the Wine Institute.

ATTACHMENT B

WINE INSTITUTE

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TELEPHONE 415/986-0878

JOHN A. DE LUCA
PRESIDENT

Air Resources Board
RECEIVED
MAR 19 1987
LEGAL BRANCH

March 12, 1987

Mr. James Boyd
Executive Officer
California Air Resources Board
1102 Q Street
Sacramento, California 95814

Re: Proposed Demonstration Program for Winery Fermentation Tanks

Dear Mr. Boyd:

On behalf of the Wine Institute and our member companies I wish to confirm our intent, subject to your Board's adoption of the plan and accompanying resolution, to carry out the demonstration program outlined in the "Plan to Develop A Suggested Control Measure for Control of Ethanol Emissions from Winery Fermentation Tanks."

Our association deeply appreciates the opportunity to work with the ARB staff and the Technical Review Group to implement the demonstration program. Our goal is to determine the technological feasibility and economic reasonableness of controlling ethanol emissions from winery fermentation tanks and, if warranted, the appropriate level of control.

We look forward to working with you and your colleagues.

Sincerely,

John A. De Luca

John A. De Luca
President