



PUBLIC MEETING AGENDA

November 18-19, 2004

9:00 a.m./8:30 a.m.

Agenda Items to be heard;

04-10-1, 04-10-2, 04-10-3

04-10-A, 04-10-4, 04-10-5

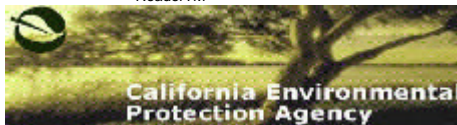
04-10-6, 04-10-7, 04-10-8

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ELECTRONIC BOARD BOOK

LOCATION:

Air Resources Board
Central Valley Auditorium, Second Floor
1001 I Street
Sacramento, California 95814

California Environmental Protection Agency

 Air Resources Board

PUBLIC MEETING AGENDA

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November 18 - 19, 2004

9:00 a.m./8:30 a.m.

04-10-1 Report to the Board on a Health Update - Recent California Studies on Indoor and Personal Exposure to Particulate Matter

Staff will report on the contributions of indoor and outdoor Particulate Matter (PM) to total personal exposure, especially in sensitive subpopulations, which have major implications for exposure assessment and risk assessment. To investigate this question, ARB and USEPA co-funded two studies by Harvard University in the Los Angeles area. The first study measured the levels and composition of indoor, outdoor, and personal PM among COPD patients. Investigators also collected information on household activities and home characteristics, and analyzed the data to identify likely indoor and outdoor sources of PM. The second study used a similar methodology to study healthy subjects. Investigators also made continuous indoor and outdoor measurements of PM size distribution, nitrate levels, black carbon levels, and home air exchange rates in order to examine diurnal patterns in indoor-outdoor relationships. Staff will discuss the findings and discuss how they help us understand the ways that particles affect human exposure and health.

04-10-2 Public Meeting to Consider Research Proposals

1. "Effects of Ozone and Nitrogen Dioxide Exposure on Cardiovascular Responses in Healthy and Susceptible Humans," University of California, San Francisco, Proposal No. 2555-245.
2. "Effects of Wood Smoke Exposure on Cardio-Pulmonary Responses in Healthy and Susceptible Humans," University of California, San Francisco, Proposal No. 2556-245.
3. "The Role of Inhaled Particles in the Pathophysiology of Cardiovascular Disease," University of California, Irvine, Proposal No. 2557-245.
4. "Determination of the Spatial and Temporal Variability of Size-Resolved PM_{2.5} Composition in Multiple Regions in California," University of California San Diego, Proposal No. 2558-245.
5. "Particle Phase Peroxides: Concentrations, Sources, Behavior and Health Effects," University of California Los Angeles, Proposal No. 2559-245.

TO SUBMIT WRITTEN COMMENTS ON AN AGENDA ITEM IN ADVANCE OF THE MEETING:

CONTACT THE CLERK OF THE BOARD, 1001 I Street, 23rd Floor, Sacramento, CA 95814

(916) 322-5594

FAX: (916) 322-3928

ARB Homepage: www.arb.ca.gov

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- TTY/TDD/Speech-to-Speech users may dial 7-1-1 for the California Relay Service.
- Assistance for Disability-related accommodations, please go to <http://www.arb.ca.gov/html/ada/ada.htm> or contact the Air Resources Board ADA Coordinator, at (916) 323-4916.
- Assistance in a language other than English, please go to <http://www.arb.ca.gov/as/eo/languageaccess.htm> or contact the Air Resources Board Bilingual Coordinator, at (916) 324-5049.

SMOKING IS NOT PERMITTED AT MEETINGS OF THE CALIFORNIA AIR RESOURCES BOARD

04-10-3 Public Hearing to Consider Proposed Regulatory Amendments Extending the California Standards for Motor Vehicle Diesel Fuel to Diesel Fuel Used by Harborcraft and Intrastate Locomotives

Pursuant to ARB Board direction, staff has developed proposed regulatory amendments, which would extend the ARB's motor vehicle diesel fuel requirements to diesel fuel used in harborcraft and intrastate locomotives.

04-10-A Ceremony: Renaming of the Central Valley Auditorium (starting at 11:00 a.m.)

04-10-4 Public Hearing to Consider the Amendments Refining the California Phase 3 Reformulated Gasoline Regulations

The ARB administers the California Phase 3 Reformulated Gasoline (CaRFG3) regulations, which were adopted in June 2000, following a December 1999 Board hearing. As subsequently amended, the CaRFG3 regulations prohibit California gasoline produced with oxygenate methyl tertiary-butyl ether (MTBE) or other specified oxygenates other than ethanol starting December 31, 2003. The staff is proposing a series of relatively minor amendments to the CaRFG3 regulations that would clarify current requirements, provide additional flexibility, correct errors, and generally improve enforceability of the regulations.

04-10-5 Public Hearing to Consider Amendments to the Nonvehicular Source, Consumer Products, and Architectural Coatings Fee Regulations

In this rulemaking, staff is proposing amendments to the existing fee regulations, which implemented the provisions of sections 39612 and 39613 of the Health and Safety Code. The proposal provides for the assessment of supplemental fees in excess of \$17.4 million to be assessed and collected from facilities. The remaining \$17.4 million would continue to be collected on a uniform basis as specified in the existing regulations.

04-10-9 Request for Delegation to Executive Officer to Consider and Adopt Emergency Amendment Delaying Start of Diesel Fuel Lubricity Standard From January 1, 2005 to May 1, 2005

A common carrier pipeline operator very recently stopped accepting shipments of diesel fuel containing lubricity additive at higher than historic levels due to concerns about the contamination of shipments of jet fuel. A 120-day delay in implementing the Board's diesel fuel lubricity standard is needed to provide time for additive injection equipment to be installed at terminals while lubricity additives in pipeline shipments are limited to historic levels. The delay would not increase emissions.

04-10-6 Public Hearing to Consider Amendments to the Effective and Operative Dates for Enhanced Vapor Recovery Standards (including ORVR Compatibility) for Certification of Vapor Recovery Systems of Gasoline Dispensing Facilities (Service Stations)

Staff will propose amendments to the Enhanced Vapor Recovery (EVR) program implementation schedule. Deadline extensions are requested as it has taken longer than expected to certify vapor recovery systems meeting all EVR requirements. Additional time will allow service station operators more options to upgrade existing equipment in a cost-effective manner.

04-10-7 Report to the Board on an Overview of Particulate Matter (PM) in California

Staff will provide the Board with an overview of particulate matter (PM) in California. This will include information on the health effects of PM, the nature and severity of California's PM problems, and the progress being made in reducing PM concentrations.

04-10-8 Public Meeting to Consider the Proposed List of Measures to Reduce Particulate Matter (PM10 and PM2.5) - Implementation of Senate Bill 656, Sher, 2003

Staff will recommend Board adoption of a list of measures that can be adopted by air districts to reduce PM10 and PM2.5. As required by SB 656, the proposed control measures are based on rules, regulations, and programs existing in California as of January 1, 2004, to reduce directly emitted PM and PM precursor gases.

OPEN SESSION TO PROVIDE AN OPPORTUNITY FOR MEMBERS OF THE PUBLIC TO ADDRESS THE BOARD ON SUBJECT MATTERS WITHIN THE JURISDICTION OF THE BOARD.

Although no formal Board action may be taken, the Board is allowing an opportunity to interested members of the public to address the Board on items of interest that are within the Board's jurisdiction, but that do not specifically appear on the agenda. Each person will be allowed a maximum of five minutes to ensure that everyone has a chance to speak.

THOSE ITEMS ABOVE THAT ARE NOT COMPLETED ON NOVEMBER 18 WILL BE HEARD BEGINNING AT 8:30 A.M. ON NOVEMBER 19.

THE AGENDA ITEMS LISTED ABOVE MAY BE CONSIDERED IN A DIFFERENT ORDER AT THE BOARD MEETING.

LOCATION:

Air Resources Board
Central Valley Auditorium, Second Floor
1001 I Street
Sacramento, California 95814

PUBLIC MEETING AGENDA

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November 18 - 19, 2004

9:00 a.m./8:30 a.m.

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TITLES 13 and 17. CALIFORNIA AIR RESOURCES BOARD

**NOTICE OF PUBLIC HEARING TO CONSIDER REGULATORY AMENDMENTS
EXTENDING THE CALIFORNIA STANDARDS FOR MOTOR VEHICLE DIESEL FUEL
TO DIESEL FUEL USED IN HARBORCRAFT AND INTRASTATE LOCOMOTIVES**

The Air Resources Board (ARB or Board) will conduct a public hearing at the time and place noted below to consider the proposed adoption of a fuels regulation and an airborne toxics control measure (ATCM) that would extend the applicability of the California standards for motor vehicle diesel fuel regulations to diesel fuel used in commercial and recreational harborcraft and intrastate diesel-electric locomotives. The proposed fuels regulation and ATCM would apply to diesel fuel sold for use in commercial and recreational harborcraft within the boundaries of the South Coast Air Quality Management District (SCAQMD) beginning January 1, 2006. They would apply statewide to diesel fuel sold for use in commercial and recreational harborcraft and intrastate diesel-electric locomotives beginning January 1, 2007. Operators of intrastate diesel-electric locomotives would be permitted to use an Alternative Emission Control Plan if approved by the ARB's Executive Officer.

DATE: November 18, 2004

T I M E : 9:00 a.m.

PLACE: California Environmental Protection Agency
Central Valley Auditorium
Air Resources Board
1001 I Street
Sacramento, California 95814

This item will be considered at a two-day meeting of the Board, which will commence at 9:00 a.m. on Thursday, November 18, 2004, and may continue at 8:30 a.m. on Friday, November 19, 2004. This item may not be considered until Friday, November 19, 2004. Please consult the agenda for the meeting, which will be available at least ten days before November 18, 2004, to determine the day on which this item will be considered.

If you have a disability-related accommodation need, please go to <http://www.arb.ca.gov/html/ada/ada.htm> for assistance or contact the ADA Coordinator at (916) 323-4916. If you are a person who needs assistance in a language other than English, please contact the Bilingual Coordinator at (916) 324-5049. TTY/TDD/Speech-to-Speech users may dial 7-1-1 for the California Relay Service.

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW

Sections Affected: Proposed adoption of section 2299, and amendments to sections 2281, 2282, and 2284, title 13, California Code of Regulations (CCR); proposed adoption of section 93116, title 17, CCR.

Background

ARB administers regulations that since 1993 have limited statewide the allowable sulfur content of motor vehicle diesel fuel to 500 parts per million by weight (ppmw) and the aromatic hydrocarbon content to 10 percent with a 20 percent limit for small refiners. The regulation limiting aromatic hydrocarbon content allows refiners to comply by selling a certified alternative formulation that has an aromatic hydrocarbon content greater than the basic limits. Most refiners have taken advantage of the regulation's flexibility to produce alternative diesel formulations that provide the required air quality benefits at a lower cost. Diesel fuel meeting the ARB's standards is often referred to as "CARB diesel."

The California diesel fuel regulations are a necessary part of the state's strategy to reduce air pollution through the use of clean fuels and lower emitting motor vehicles and off-road equipment. The use of ultra-low sulfur diesel fuels reduces emissions for in-use engines and enables the use of sophisticated after-treatment devices necessary to reduce the public exposure to diesel particulate matter. The most recent proposed and adopted standards for diesel engines will require the use of ultra-low sulfur diesel fuel to be effective.

In July 2003, the Board approved amendments – now in effect-which lowered the allowable sulfur content of motor vehicle diesel fuel to 15 ppmw starting June 2006 and retained the existing aromatic hydrocarbon content limit for motor vehicle diesel fuel. California's motor vehicle diesel fuel regulations were already applicable to on-road and off-road vehicular sources and, as part of the July 2003 regulatory amendments, a separate ATCM was adopted making diesel fuel used for most nonvehicular sources subject to the standards for motor vehicle diesel fuel. Further, provisions were included to ensure there were adequate standards for diesel fuel lubricity. However, diesel fuel for locomotives and marine vessels was specifically exempted from the July 2003 amendments. At the July 2003 public hearing, the Board directed staff to evaluate the feasibility, and if appropriate, develop recommendations to extend applicability of California's motor vehicle diesel fuel regulations to locomotives and marine vessels.

As discussed below, the U. S. Environmental Protection Agency (U.S. EPA) administers a 500 ppmw sulfur standard for on-road motor vehicle diesel fuel. In addition this fuel is to have a **cetane** index of at least 40 or have an aromatic hydrocarbon content of no greater than 35 percent by volume (vol. %). Starting June 2006, the federal sulfur standard for diesel fuel for on-road motor vehicles will be 15 ppmw. Diesel fuel meeting

U.S. EPA's sulfur standards for on-road motor vehicles but not ARB's low-aromatics standard is often referred to as "EPA diesel."

In August 1998, ARB identified particulate matter emitted from diesel engines (diesel PM) as a Toxic Air Contaminant (**TAC**) and in September 2001, approved the Diesel Risk Reduction Plan to reduce public exposure to diesel particulate matter. The plan identified air toxic control measures and regulations that will set more stringent emissions standards for new diesel-fueled engines and vehicles, establish retrofit requirements for existing engines and vehicles where determined to be technically feasible and cost-effective.

Although **ARB's** vehicular diesel fuel standards currently do not apply to diesel fuel used in intrastate diesel-electric locomotives and most marine diesel engines, most diesel fuel currently used in those engines has a sulfur content under 500 ppmw. Because of fuel availability and other factors, almost all of the diesel fuel used in intrastate diesel-electric locomotive engines in California is either CARB diesel or EPA diesel, with a majority of it being **CARB** diesel. Passenger-fleet (i.e., ferries and excursion marine vessels) marine diesel engines are required by statute to use CARB diesel fuel. However, harborcraft that generally operate within California coastal waters primarily use EPA diesel, with lesser amounts of CARB diesel.

The Proposed Amendments

The proposed amendments would apply to persons selling or supplying diesel fuel for use in intrastate diesel-electric locomotives and both commercial and recreational harborcraft. An intrastate diesel-electric locomotive would be defined as a **diesel**-electric locomotive that annually operates at least 90 percent of the time within the borders of the California, based on hours of operation, miles traveled, and fuel consumption. Harborcraft are marine vessels with characteristics that distinguish them from large oceangoing ships – they would be defined as marine vessels meeting all of the following criteria: (1) less than 400 feet in length; (2) less than 10,000 gross tons; (3) propelled by engines with a cylinder displacement less than 30 liters per cylinder; and (4) neither a foreign-flagged vessel, nor documented as a foreign trade vessel by the United States Coast Guard.

Diesel fuel sold, supplied, or offered for sale for use in commercial or recreational harborcraft within the SCAQMD be required to be CARB diesel beginning January 1, 2006. This earlier implementation date for the SCAQMD is proposed to satisfy emission reduction commitments for harborcraft in the 2003 Statewide Strategy of the California State Implementation Plan.

Diesel fuel sold, supplied, or offered for sale for use in intrastate diesel-electric locomotive and harborcraft operators throughout the state would be required to be CARB diesel beginning January 1, 2007. To provide flexibility to affected diesel-electric locomotive operators, staff is also proposing that operators of intrastate diesel-electric locomotives be permitted to participate in an Alternative Emission Control Plan. The

owner or operator of an intrastate diesel-electric locomotive could submit, for approval by the Executive Officer, a substitute fuel and/or emission control strategy that achieves equivalent or greater reductions than those achieved solely through the use of CARB diesel and that has adequate enforcement provisions. It is expected that operators could propose any combination of fuels, equipment, or operational changes at one or more of their rail facilities in the State. Any plan would have to contain adequate protections for individuals living in areas that have existing local air pollution or localized air toxic impacts.

Under the approach proposed by staff, the Board would adopt a regulation applicable to diesel fuel used in intrastate locomotives and harborcraft pursuant to its Health and Safety Code section 43013 authority to adopt standards and regulations for locomotives and marine vessels. The Board would also adopt identical provisions as an ATCM which would complement and enable the use of high-efficiency emission control devices for non-vehicular diesel engines to reduce emissions of diesel PM.

ARB staff has estimated that the proposed amendments, when fully implemented in 2007, will provide statewide emission reductions of about 2 tons per day (tpd) NO_x, about 1.7 tpd of oxides of sulfur (SO_x), and about 0.6 tpd of diesel PM (both directly and indirectly emitted). Staff has calculated that the cost-effectiveness of the proposed regulatory action ranges between \$1.10 and \$1.60 per pound of NO_x plus particulate matter reduced. This is in the range of other recent criteria pollutant control measures approved by the Board.

COMPARABLE FEDERAL REGULATIONS

Since 1993, a U.S. EPA regulation – 40 C.F.R. §§ 80.29 – has imposed a maximum sulfur content limit of 500 ppmw on diesel fuel sold or supplied for use in on-road motor vehicles. In addition, on-road motor vehicle diesel fuel is required to have either a cetane index of at least 40 or an aromatic hydrocarbon content of no greater than 35 percent by volume. In January 2001, U.S. EPA published a final rule requiring refiners to meet a maximum sulfur standard of 15 ppmw for highway diesel fuel beginning June 1, 2006. (66 F.R. 5002; 40 C.F.R. §§ 80.500 et seq.). All 2007 and later model year diesel fueled vehicles must be fueled with this new low sulfur diesel.

On June 29, 2004, U.S. EPA published a final rule imposing a 500 ppmw maximum sulfur standard for diesel fuel used in nonroad, locomotive, and marine engines, starting in June 2007 (69 F.R. 38958, 40 C.F.R. §§ 80.510 et seq.). The federal sulfur standard drops to 15 ppm starting June 2010 for diesel fuel used in most nonroad engines, and starting June 2010 for diesel fuel used in locomotives and marine vessels.

Under the proposed amendments, California would receive the benefits of five years of use of ultra-low sulfur (15 ppmw) diesel fuel before the U.S. EPA regulations become applicable to diesel fuel used in locomotives and marine vessels. In addition, the U.S. EPA diesel fuel programs do not achieve the NO_x and particulate matter emission reductions provided by the aromatic hydrocarbon requirements for CARB diesel.

AVAILABILITY OF DOCUMENTS AND AGENCY CONTACT PERSONS

The ARB staff has prepared a Staff Report: Initial Statement of Reasons (ISOR) for the proposed regulatory action, which includes a summary of the environmental and economic impacts of the proposal and supporting technical documentation. The report is entitled "Proposed Amendments to Extend the Applicability of the California Motor Vehicle Diesel Fuel Regulations to Commercial and Recreational Harbor Craft and Intrastate Locomotives."

Copies of the ISOR and the full text of the proposed regulatory language, in underline and strikeout format to allow for comparison with the existing regulations, may be accessed on the ARB's web site listed below, or may be obtained from the Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, First Floor, Sacramento, CA 95814, (916) 322-2990 at least 45 days prior to the scheduled hearing (November 18, 2004).

Upon its completion, the Final Statement of Reasons (FSOR) will also be available and copies may be requested from the agency contact persons in this notice, or may be accessed on the ARB's web site listed below.

Inquiries concerning the substance of the proposed regulations may be directed to the designated agency contact persons: Mr. Erik C. White, Manager, Engineering Evaluation Section, (916) 324-8029, or Mr. Dean C. Simeroth, Chief, Criteria Pollutants Branch, Stationary Source Division, at (916) 322-6020.

Further, the agency representative and designated back-up contact persons to whom nonsubstantive inquiries concerning the proposed administrative action may be directed are Artavia Edwards, Manager, Board Administration & Regulatory Coordination Unit, (916) 322-6070, or Amy Whiting, Regulations Coordinator, (916) 322-6533. The Board staff has compiled a record for this rulemaking action, which includes all the information upon which the proposal is based. This material is available for inspection upon request to the contact persons.

This notice, the ISOR and all subsequent regulatory documents, including the FSOR, when completed, are available on the ARB Internet site for this rulemaking at <http://www.arb.ca.gov/regact/carblohc/carblohc.htm>.

COSTS TO PUBLIC AGENCIES AND TO BUSINESSES AND PERSONS AFFECTED

The determinations of the Board's Executive Officer concerning the costs or savings necessarily incurred by public agencies, private persons and businesses in reasonable compliance with the proposed regulations are presented below.

Pursuant to Government Code sections 11346.5(a)(5) and 11346.5(a)(6), the Executive Officer has determined that the proposed regulatory action will not create costs or

savings to any state agency or in federal funding to the state, costs or mandate to any local agency or school district whether or not reimbursable by the state pursuant to Part 7 (commencing with section 17500), Division 4, Title 2 of the Government Code, or other nondiscretionary savings to state or local agencies.

In developing this regulatory proposal, the ARB staff evaluated the potential economic impacts on representative private persons or businesses. The ARB is not aware of any cost impacts that a representative private person or business would necessarily incur in reasonable compliance with the proposed action.

The Executive Officer has made an initial determination that the proposed regulatory action will not have a significant statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states, or on representative private persons.

It is expected that the proposed amendments may have a small impact and modify existing diesel production and consumption patterns in California. In evaluating the potential costs of the proposed amendments, staff has considered the likely diesel fuels expected to be generally available in California in 2007. Based on the fact that diesel-electric intrastate locomotive and harborcraft operators would in any event likely use, at a minimum, EPA diesel meeting a 15 ppmw sulfur limit, staff has determined the costs of the proposed amendments based on the incremental cost in 2007 to produce CARB diesel relative to EPA diesel. Staff estimates that the incremental cost to produce CARB diesel relative to EPA diesel beginning in 2007 will be about 3 cents per gallon. This cost represents the incremental diesel fuel production cost to reduce the aromatic hydrocarbon content of U.S. EPA on-road diesel fuel from a limit of 35 volume percent to a limit of 10 volume percent (or an equivalent formulation limit). Staff expects that the total incremental cost increase will be \$2-3 million annually.

Staff has also identified several cost benefits to diesel fuel end users from the proposed amendments that have not been quantified in the above production cost estimates. These benefits will be felt both initially and over the course of the life of the program. Initially, diesel fuel users are expected to see a decrease in engine wear as a result of low sulfur diesel fuel. In addition, lower sulfur fuels should increase the life of diesel engine lubrication oil, as fuel sulfur tends to increase the acidification of engine lubricating oils resulting in loss of pH control. By reducing the diesel fuel sulfur content, it is expected that the interval between oil changes can be extended, leading to a cost saving to diesel engine operators.

The overall economic impacts on operators of intrastate diesel-electric locomotives and harborcraft were also evaluated. For large intrastate diesel-electric locomotive operators (Class I railroads), the use of CARB diesel could reduce operating income by less than 0.02 percent. For smaller (Class III railroads), the use of CARB diesel could reduce operating costs by up to one percent. For commercial fishing operations and tugboat operations, the use of CARB diesel fuel could reduce the average return on

owners' equity by less than one percent and four to seven percent, respectively. These are not expected to be significant adverse economic impacts.

In accordance with Government Code section 11346.3, the Executive Officer has determined that the proposed regulatory action will not affect the creation or elimination of jobs within the State of California, the creation of new businesses or elimination of existing businesses within the State of California, or the expansion of businesses currently doing business within the State of California. A detailed assessment of the economic impacts of the proposed regulatory action can be found in the Staff Report (ISOR).

The Executive Officer has also determined, pursuant to title 1, CCR, section 4, that the proposed regulatory action will affect small businesses. The proposed amendments are expected to result in an increase in the cost of producing diesel fuel for use in intrastate diesel-electric locomotives and harborcraft. This increase in diesel fuel production costs may translate into an increase in the price intrastate diesel-electric locomotives and harborcraft operators pay for diesel fuel. Smaller Class III railroad operators, commercial fishing operators and tugboat operators represent the small businesses affected by the proposed amendments. Staff's economic analysis showed that the proposed amendments are not expected to have a significant adverse economic impact on these operations.

Before taking final action on the proposed regulatory action, the Board must determine that no alternative considered by the agency or that has otherwise been identified and brought to the attention of the agency would be more effective in carrying out the purpose for which the action is proposed or would be as effective and less burdensome to affected private persons than the proposed action.

SUBMITTAL OF COMMENTS

The public may present comments relating to this matter orally or in writing at the hearing, and in writing or by e-mail before the hearing. To be considered by the Board, written submissions not physically submitted at the hearing must be received **no later than 12:00 noon, November 17, 2004**, and addressed to the following:

Postal mail is to be sent to:

Clerk of the Board
Air Resources Board
1001 I Street, 23rd Floor
Sacramento, California 95814

Electronic mail is to be sent to: carblohcc@listserv.arb.ca.gov and received at the ARB **no later than 12:00 noon, November 17, 2004**.

Facsimile transmissions are to be transmitted to the Clerk of the Board at (916) 322-3928 and received at the ARB no later than 12:00 noon, November 17, 2004.

The Board requests, but does not require, that 30 copies of any written statement be submitted and that all written statements be filed at least 10 days prior to the hearing so that ARB staff and Board Members have time to fully consider each comment. The ARB encourages members of the public to bring to the attention of staff in advance of the hearing any suggestions for modification of the proposed regulatory action.

STATUTORY AUTHORITY AND REFERENCES

This regulatory action is proposed under that authority granted in sections 39600, 39601, 39650, 39658, 39659, 39666, 39667, 41511, 43013, 43018, 43101, Health and Safety Code, and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975). This regulatory action is proposed to implement, interpret, and make specific sections 39000, 39001, 39002, 39003, 39500, 39515, 39516, 39650, 39658, 39659, 39666, 39667, 41511, 43000, 43013, 43016, 43018, and 43101, Health and Safety Code; title 17, CCR section 93000; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975).

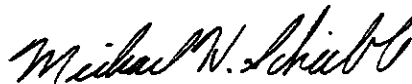
HEARING PROCEDURES

The public hearing will be conducted in accordance with the California Administrative Procedure Act, Title 2, Division 3, Part 1, Chapter 3.5 (commencing with section 11340) of the Government Code.

Following the public hearing, the Board may adopt the regulatory language as originally proposed, or with non substantial or grammatical modifications. The Board may also adopt the proposed regulatory language with other modifications if the text as modified is sufficiently related to the originally proposed text that the public was adequately placed on notice that the regulatory language as modified could result from the proposed regulatory action; in such event the full regulatory text, with the modifications clearly indicated, will be made available to the public, for written comment, at least 15 days before it is adopted.

The public may request a copy of the modified regulatory text from the ARB's Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, 1st Floor, Sacramento, CA 95814, (916) 322-2990.

CALIFORNIA AIR RESOURCES BOARD



for Catherine Witherspoon
Executive Officer

Date: September 21, 2004

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs see our Web -site at www.arb.ca.gov.

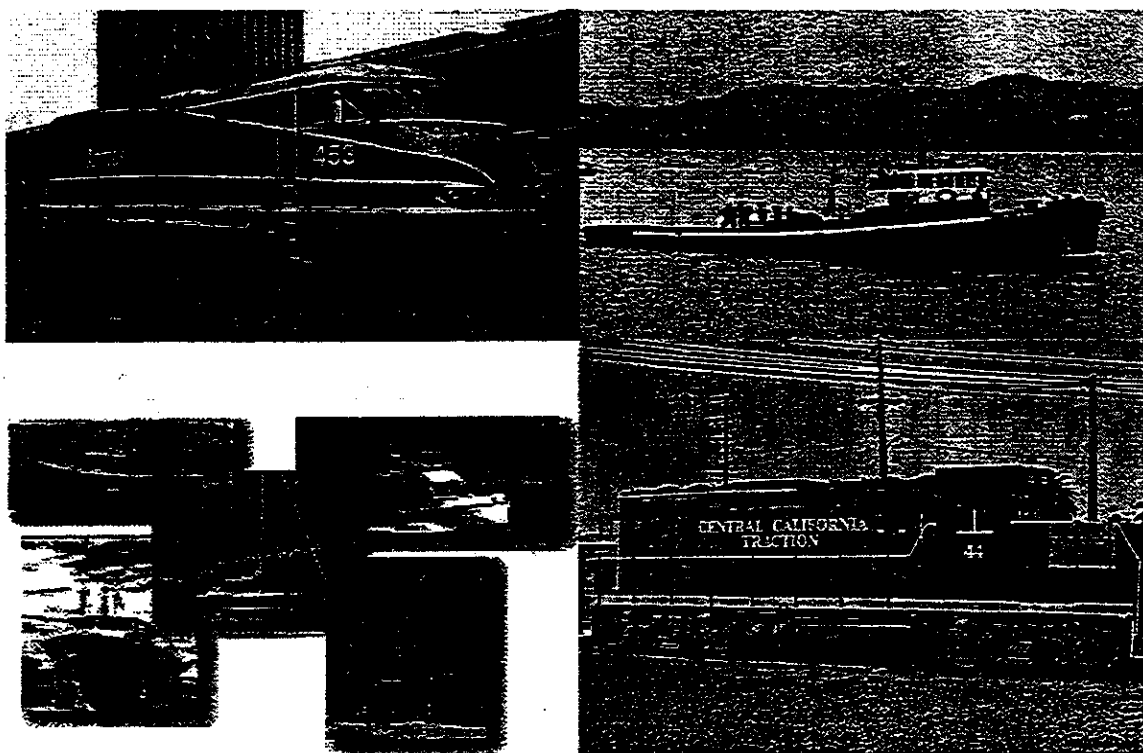
California Environmental Protection Agency



Air Resources Board

**STAFF REPORT: INITIAL STATEMENT OF REASONS FOR
PROPOSED RULEMAKING**

**Proposed Regulatory Amendments Extending the California Standards for
Motor Vehicle Diesel Fuel to Diesel Fuel Used in Harborcraft and Intrastate
Locomotives**



Release Date: October 1, 2004

**State of California
California Environmental Protection Agency
AIR RESOURCES BOARD
Stationary Source Division**

STAFF REPORT: INITIAL STATEMENT OF REASONS

**Public Hearing to Consider Proposed Regulatory Amendments
Extending the California Standards for Motor Vehicle Diesel Fuel
to Diesel Fuel Used in Harborcraft and Intrastate Locomotives**

**Date of Release: October 1, 2004
Scheduled for Consideration: November 18-19, 2004**

Location:

**California Air Resources Board
Central Valley Auditorium, Second Floor
1001 I Street
Sacramento, California 95814**

This report has been reviewed by the staff of the Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use. This report is available for viewing or downloading from the Air Resources Board's Internet site:

<http://www.arb.ca.gov/regact/carblohc/carblohc.htm>

Acknowledgments

This report was prepared with the assistance and support from the other divisions and offices of the Air Resources Board. In addition, we would like to acknowledge the assistance and cooperation that we have received from many individuals and organizations.

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Joann Lu, Health and Ecosystems Assessment Section

Andrew Panson, SIP Development Section

Win Setiwan, Fuels Section

James Guthrie, Fuels Section

Cherie Rainforth, Industrial Section

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I. INTRODUCTION AND SUMMARY

In this chapter, staff provides a summary and background for the proposed amendments.

A. Introduction

The California diesel fuel regulations, administered by the Air Resources Board (ARB or Board), have resulted in significant reductions in emissions from diesel-powered motor vehicles and equipment: greater than 80 percent for oxides of sulfur (SO_x), 25 percent for PM (PM) (a toxic air contaminant), and 7 percent for oxides of nitrogen (NO_x). Diesel fuel meeting ARB's requirements - often called CARB diesel - also results in reductions of emissions of several toxic substances other than diesel PM, including benzene and polynuclear aromatic hydrocarbons.

Diesel-electric locomotives and commercial and recreational harborcraft (harborcraft) are not currently required to use diesel fuel meeting the ARB's diesel fuel regulations. Currently, these regulations only apply to on- and off-road motor vehicles and, by December 12, 2004, non-vehicular sources other than locomotives and marine vessels.

This report is the initial statement of reasons to support the ARB staff's (staff) proposed amendments to extend the requirements to use CARB diesel fuel to intrastate diesel-electric locomotives and commercial and recreational harborcraft.

1. What are Intrastate Diesel-Electric Locomotives?

Diesel-electric locomotives (locomotives) are defined as those locomotives that use electric power provided by a diesel engine that drives a generator or alternator; the electrical power produced then drives the wheels using electric motors. For the purposes of this rulemaking, intrastate locomotives are defined as those locomotives that operate 90 percent or more of the time within the boundaries of the state of California which can be measured by fuel consumption, hours of operation, or annual rail miles travelled. This definition provides some flexibility for locomotives primarily headquartered and operating in California, but that may leave the state occasionally for business or maintenance - up to 36 days per year.

Intrastate locomotives include, but are not limited to, locomotives used in the following operations:

- passenger intercity and commuter,
- short haul,
- short line,
- switch, and
- industrial, port, and terminal operations.

These locomotives are typically operated by:

- National Class 1 freight railroads¹ (Union Pacific and Burlington Northern Santa Fe),
- Local, regional and switching & terminal shortline railroads (Class III) operating in California,
- national passenger rail companies under state contract (Amtrak), and
- local government transportation authorities (including CalTrain and MetroLink).

These four primary groups of railroads operate over 700 intrastate locomotives (see Table I-1 below). California's Class I freight railroads¹ (i.e., Union Pacific Railroad (UP) and Burlington Northern Santa Fe (BNSF)), have over 380 intrastate locomotives that operate as short haul, switcher, terminal, or manifest locomotives within different regions of California. California's passenger railroads provide inter-city passenger services within the state and have 111 intrastate passenger locomotives (e.g., Metrolink in Southern California and CalTrain on the San Francisco Peninsula) and two additional switcher locomotives. Currently, there are twenty Class III railroads² that are headquartered and operate within California and which operate 120 intrastate locomotives as either short haul operators (e.g., San Joaquin Valley Railroad and California Northern Railroad) or switcher-terminal operators (e.g., Pacific Harbor Lines at Los Angeles/Long Beach Harbors and Modesto Empire Traction in Modesto). Also, there are about 120 locomotives operated by individual companies and the military services. These locomotives are typically less than 1,000 horsepower diesel-electric engines and generally are limited to operating in small company yards or on military bases.

Table I-1: Number of California Intrastate Locomotives

| Category | Number of Locomotives | Percentage |
|-----------------------|-----------------------|-------------|
| Class I - Freight | 383 | 52% |
| Class III - Shortline | 120 | 16% |
| Passenger | 113 | 16% |
| Industrial-Military | 117 | 16% |
| Total * | 733 | 100% |

* Based on May 2004 ARB Intrastate Locomotive Survey, and other sources.

2. What are Commercial and Recreational Harborcraft?

Commercial and recreational harborcraft (harborcraft) are marine vessels that operate primarily along California's coastline, and in inland waterways. They include a wide variety of vessels such as tug/tow boats, commercial fishing vessels, commercial passenger fishing vessels ("party boats"), pilot boats, work boats, crew/supply boats, ferries/excursion vessels, military vessels, and diesel powered recreational vessels.

¹ A Class I railroad is defined by the Surface Transportation Board as a railroad with annual operating revenues of \$250 million or more.

² A Class III railroad is defined by the Surface Transportation Board as a railroad with annual operating revenues of \$20 million or less.

Harborcraft are defined as all marine vessels except oceangoing ships. Oceangoing ships are distinct from harborcraft because they travel internationally, and would not have access to CARB diesel fuel at ports outside of California. However, these vessels are being addressed by other ARB rulemaking efforts currently under development.

Harborcraft are defined in the proposed amendments as any marine vessel that meets all of the following criteria:

- (1) The vessel does not carry a "registry" (foreign trade) endorsement on their United States Coast Guard certificate of documentation, and is not registered under the flag of a country other than the United States;
- (2) The vessel is less than 400 feet in length overall (LOA) as defined in 50 Code of Federal Regulations (CFR) § 679.2, as adopted June 19, 1996;
- (3) The vessel is less than 10,000 gross tons (GT ITC) per the convention measurement (international system) as defined in 46 CFR 69.51 - 61, as adopted September 12, 1998; and
- (4) The vessel is propelled by a marine diesel engine with a per-cylinder displacement of less than 30 liters.

Table I-2 below provides a breakdown by the number of vessels and percent of diesel fuel consumed for each sector of commercial harborcraft. As can be seen, commercial fishing vessels account for the largest number of vessels.

Table I-2: Number of California Commercial Harborcraft

| Type of Vessel | Number of Vessels | Percent of Total |
|--------------------------|-------------------|------------------|
| Commercial Fishing Boats | 2,520 | 64% |
| Charter Fishing Boats | 512 | 13% |
| Ferry/Excursion Boats | 412 | 11% |
| Tug Boats | 128 | 3% |
| Other | 136 | 3% |
| Work Boats | 87 | 2% |
| Crew Boats | 70 | 2% |
| Tow Boats | 35 | 1% |
| Pilot Boats | 24 | 1% |
| Total * | 3,924 | 100% |

* Based on December 2002 ARB Commercial Harborcraft Survey, USCG, CDFG and other sources.

B. What are the Specifications for Diesel Fuel in California?

In this section, staff discusses the California Air Resources Board (CARB) diesel fuel specifications.

1. Sulfur and Aromatic Hydrocarbon Standards

California diesel fuel used in motor vehicles must meet specifications approved by the Board in 1988 limiting sulfur and aromatic contents. The requirements for "CARB diesel," which became applicable in October 1993, consists of two basic elements:

- A limit of 500 parts per million by weight (ppmw) on sulfur content to reduce emissions of both sulfur dioxide and directly emitted PM.
- A limit on aromatic hydrocarbon content of 10 volume percent for large refiners and 20 percent for small refiners to reduce emissions of both PM and NO_x.

At a July 2003 hearing, the Board approved changes to the California diesel fuel regulations that, among other things, lowered the maximum allowable sulfur levels in California diesel fuel to 15 ppmw beginning in June 2006. Thus, ARB's specifications for sulfur and aromatic hydrocarbons are shown in Table I-3.

Table I-3: California Diesel Fuel Standards

| Implementation Date | Sulfur (ppmw) | Aromatic Hydrocarbon (Volume %) | Small Refiner (Volume %) |
|---------------------|---------------|---------------------------------|--------------------------|
| 1993 | 500 | 10 | N/A |
| 2006 | 15 | 10 | N/A |

The regulation limiting aromatic hydrocarbons also includes a provision that enables producers and importers to comply with the regulation by qualifying a set of alternative specifications of their own choosing. The alternative formulation must be shown, through emissions testing, to provide emission benefits equivalent to that obtained with a 10 percent aromatic standard (or in the case of small refiners, the 20 percent standard). Most refiners have taken advantage of the regulation's flexibility to produce alternative diesel formulations that provide the required emission reduction benefits at a lower cost.

2. Lubricity Standard

At the July 2003 hearing, ARB also approved new requirements for minimum lubricity levels. The diesel fuel lubricity standard is designed to ensure that California diesel fuel provides adequate lubrication for fuel systems of existing and future diesel engines. Diesel fuel lubricity can be defined as the ability of diesel fuel to provide surface contact lubrication. The CARB diesel fuel first phase standard, a High Frequency Reciprocating Rig (HFRR) maximum scar diameter (WSD) of 520 microns, is appropriate for protecting existing hardware and is to be implemented on January 1, 2005. The American Society for Testing and Materials (ASTM) has approved an identical lubricity standard for the ASTM D-975 diesel fuel specifications that will

become effective January 1, 2005. When Division of Measurement and Standards (DMS) adopts and begins enforcing the ASTM standard, the CARB diesel fuel first-phase standard will no longer apply.

The Board further directed staff to return in 2005 with a proposed 2006 lubricity standard if a technology assessment determines that a HFRR WSD of 460 microns at 60 degrees Celsius, or a more appropriate standard, should be implemented on the same schedule as the proposed 15-ppmw sulfur limit for diesel fuel on June 1, 2006.

C. What are the Specifications for Diesel Fuel in the Rest of the Nation?

The United States Environmental Protection Agency (U.S. EPA) has established separate diesel fuel specifications for on-road diesel fuel and off-road (nonroad) diesel fuel.

1. On-Road Diesel Fuel

The current U.S. EPA diesel fuel standards have been applicable since October 1993. The U.S. EPA regulation prohibits the sale or supply of diesel fuel for use in on-road motor vehicles, unless the diesel fuel has a sulfur content no greater than 500 ppmw. In addition, the regulation requires on-road motor-vehicle diesel fuel to have a cetane index of at least 40 or have an aromatic hydrocarbon content of no greater than 35 percent by volume (vol. %). All on-road motor-vehicle diesel fuel sold or supplied in the United States, except in Alaska, must comply with these requirements. Diesel fuel, not intended for on-road motor-vehicle use, must contain dye solvent red 164.

On January 18, 2001, the U.S. EPA published a final rule which specifies that, beginning June 1, 2006, refiners must begin producing highway diesel fuel that meets a maximum sulfur standard of 15 ppmw. All 2007 and later model year diesel-fueled vehicles must be fueled with this new low sulfur diesel. Both the current and future U.S. EPA on-road diesel fuel standards are shown in Table I-4.

Table I-4: U.S. EPA Diesel Fuel Standards

| Applicable | Implementation Date | Maximum Sulfur Level (ppmw) | Maximum Aromatic by Volume | Cetane Index Minimum |
|---|---------------------|-----------------------------|----------------------------|----------------------|
| On-road | 1993 | 500 | 35 | 40 |
| On-Road | 2006 | 15 | 35 | 40 |
| Nonroad * | 1993 | 5,000 | 35 | 40 |
| Nonroad * | 2007 | 500 | 35 | 40 |
| Nonroad, <i>excluding loco/marine</i> * | 2010 | 15 | 35 | 40 |
| Nonroad, <i>loco/marine</i> * | 2012 | 15 | 35 | 40 |

* Nonroad diesel fuels must comply with ASTM No. 2 diesel fuel specifications for aromatics and cetane.

2. Nonroad Diesel Fuel

On June 29, 2004, the U.S. EPA published a final rule for the control of emissions from nonroad diesel engines and fuel. The U.S. EPA rulemaking requires that sulfur levels for nonroad diesel fuel be reduced from current uncontrolled levels ultimately to 15 ppmw, though an interim cap of 500 ppmw is contained in the rule. Beginning June 1, 2007, refiners would be required to produce nonroad, locomotive, and marine diesel fuel that meets a maximum sulfur level of 500 ppmw. This does not include diesel fuel for stationary sources. In 2010, nonroad diesel fuel will be required to meet the 15 ppmw standard except for locomotives and marine vessels. In 2012, nonroad diesel fuel used in locomotives and marine applications must meet the 15 ppmw standard. The nonroad diesel fuel standards are shown above in Table I-4.

D. What are the Emission Benefits of California Diesel Fuel?

The NO_x emission benefits associated with the use of CARB diesel compared to U.S. EPA on-road and nonroad diesel fuels are due to the CARB aromatic hydrocarbon limit of 10 percent by volume or an emission equivalent alternative formulation limit. ARB staff estimates that use of CARB diesel provides a 6 percent reduction in NO_x and a 14 percent reduction in particulate emissions compared with the use of U.S. EPA on-road and nonroad diesel fuels. In addition, CARB diesel fuel will provide over a 95 percent reduction in fuel sulfur levels in 2007 compared to U.S. EPA nonroad diesel fuel. This reduction in diesel fuel sulfur levels will provide SO_x emission reductions, and additional PM emission reductions by reducing indirect (secondary formation) PM emissions formed from SO_x.

E. Are there Any Current Diesel Fuel Requirements for Intrastate Diesel-Electric Locomotives and Harborcraft?

Currently, intrastate locomotives and marine vessels use diesel fuel meeting the minimum specifications for Number 2 diesel fuel, as specified by ASTM D-975.

F. What are the Current Properties of In-Use Diesel Fuel?

Table I-5 shows average values for sulfur and four other properties for motor vehicle diesel fuel sold in California before and after the current diesel fuel regulation became effective in 1993. The corresponding national averages are shown for the same properties for on-road diesel fuel only since the U.S. EPA sulfur standard does not apply to off-road or nonvehicular diesel fuel.

Table I-5: Average 1999 Properties of Reformulated Diesel Fuel

| Property | California | EPA |
|------------------|--------------------|-----|
| Sulfur, ppmw | 140 ⁽²⁾ | 360 |
| Aromatics, vol.% | 19 | 35 |
| Cetane No. | 50 | 45 |
| PNA, wt.% | 3 | NA |
| Nitrogen, ppmw | 150 | 110 |

1 U.S. EPA, December 2000.

2 About 20 % of total California volume is less than 15 ppmw.

G. What Type of Diesel Fuel are Intrastate Diesel-Electric Locomotives and Harborcraft Currently Using?

California intrastate locomotives and harborcraft are currently using varying amounts of the three types of diesel fuel as discussed in this section.

1. Fuel Consumption by Fuel Type for Intrastate Locomotives

California's intrastate locomotives consumed an estimated 47 million gallons of diesel fuel in 2003 (as shown in Table I-6). Class I railroads consumed about 23.3 million gallons, or about 50 percent of California intrastate locomotive diesel fuel. California's passenger trains consumed an estimated 20.4 million gallons of diesel fuel, or 43 percent of the state's intrastate locomotive diesel fuel. Class III railroads in California consumed an estimated 3.3 million gallons, or 7 percent of the intrastate locomotive diesel fuel. CARB staff also estimates that 117 industrial and military intrastate locomotives may consume an additional 1 to 3 million gallons of diesel fuel.

Table I-6: Intrastate Locomotive Diesel Fuel Consumption by Type of Railroad (Millions of Gallons)

| Type of Railroad | CARB | | U.S. EPA | | Total |
|--------------------|------------|-------------|-------------|------------|-------------|
| | Low Sulfur | CARB | On-road | Nonroad | |
| Class I Freight | 0 | 6.4 | 16.9 | 0 | 23.3 |
| Passenger/Commuter | 5.8 | 14.1 | 0.5 | 0 | 20.4 |
| Class III | 0 | 2.1 | 0.9 | 0.3 | 3.3 |
| Total | 5.8 | 22.6 | 18.3 | 0.3 | 47.0 |

Currently, of the diesel fuel consumed by intrastate locomotives, about 60 percent is either CARB diesel or low sulfur CARB diesel fuel (CARB diesel fuel already meeting the new 15 ppmw sulfur cap) and about 39 percent of the diesel fuel consumed is U.S. EPA on-road highway diesel fuel. Staff estimates that less than 1 percent of the diesel fuel now consumed by California's intrastate locomotives is U.S. EPA nonroad diesel fuel with in-use sulfur levels of 3,000 ppmw or higher.

As can be seen in Table I-7, the South Coast Air Quality Management District (SCAQMD) accounts for about 40 percent (19 million gallons) of the intrastate locomotive diesel fuel consumption. However, the SCAQMD's diesel fuel consumption is nearly split in half between CARB and low sulfur CARB diesel fuels, and U.S. EPA on-road diesel fuel. The other air districts with large proportions of the intrastate locomotive diesel fuel consumption are the Bay Area with 18 percent (8.5 million gallons), the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) with 17 percent (8 million gallons), Mojave Desert with 8 percent (4 million gallons), and the Sacramento Area with 6 percent (2.9 million gallons). These five air districts combined account for about 90 percent of the intrastate locomotive diesel fuel consumption statewide.

**Table I-7: Intrastate Locomotives Diesel Fuel Consumption by Region
(Millions of Gallons)**

| | | | | | |
|-----------------|------------|-------------|-------------|------------|-------------|
| South Coast | 5.0 | 3.9 | 10.1 | 0 | 19.0 |
| Bay Area | 0 | 8.1 | 0.4 | 0 | 8.5 |
| San Joaquin | 0 | 4.3 | 3.5 | 0.2 | 8.0 |
| Mojave Desert | 0 | 0.6 | 3.3 | 0 | 3.9 |
| Sacramento Area | 0 | 2.9 | 0 | 0 | 2.9 |
| San Diego | 0.8 | 0.1 | 0 | 0 | 0.9 |
| Rest of State | 0 | 2.7 | 1.0 | 0.1 | 3.8 |
| Total * | 5.8 | 22.6 | 18.3 | 0.3 | 47.0 |

* may not add due to rounding.

2. Fuel Consumption by Fuel Type for Harborcraft

Harborcraft are estimated to consume nearly 90 million gallons of diesel fuel annually, as shown in Table I-8. Ferries and excursion passenger boats account for the largest amount (36 percent) of the harborcraft statewide diesel fuel consumption, and an existing state law already requires ferries to use CARB diesel fuel. The next largest harborcraft category for diesel fuel consumption is commercial fishing (20 percent), followed by tugboats (14 percent), and charter fishing boats (11 percent). Combined, these four harborcraft categories are responsible for over 80 percent of the harborcraft diesel fuel consumed statewide.

**Table I-8: Harborcraft Fuel Consumption by Type of Vessel
(Millions of gallons)**

| Type of Vessel | U.S. EPA | | Total |
|-----------------------------|----------|---------|-------|
| | CARB | On-Road | |
| Commercial (CHC)* | | | |
| Ferry/Excursion | 31.5 | 0 | 31.5 |
| Commercial Fishing | 4.5 | 12.9 | 17.4 |
| Tugs | 0.2 | 12.4 | 12.6 |
| Charter Fishing | 0.5 | 9.3 | 9.8 |
| Tow Boats | 0.0 | 4.7 | 4.7 |
| Crew and Supply | 0.3 | 3.4 | 3.7 |
| Work Boats | 0.1 | 1.4 | 1.5 |
| Pilot | 0 | 0.7 | 0.7 |
| Other | 0 | 0.5 | 0.4 |
| Recreational Craft** | 0.1 | 4.9 | 4.9 |
| Total *** | 37 | 50 | 87 |

* Commercial fuel consumption estimates based on 2002 ARB Commercial Harborcraft Survey.

** Recreational fuel consumption estimates based on 2003 ARB Emissions Inventory (See Appendix D)

*** Numbers may not add due to rounding.

As Table I-9 illustrates, most of the state's harborcraft diesel fuel occurs in the Bay Area (32 percent) and the SCAQMD (29 percent). Combined, these two air districts account for over 60 percent of the state's harborcraft diesel fuel consumption. Staff estimates that about 43 percent of the harborcraft diesel fuel consumption consists of CARB diesel, with the other 57 percent being U.S. EPA on-road diesel fuel.

**Table I-9: Harborcraft Fuel Consumption by Region
(Millions of gallons)**

| | CARB | U.S. EPA On-Road | U.S. EPA Nonroad |
|--------------------------------------|-------------|------------------|------------------|
| Commercial Harborcraft (CHC)* | | | |
| S.F. Bay Area Air Basin | 10.2 | 16.8 | 27.0 |
| South Coast Air Basin | 10.8 | 13 | 23.8 |
| North Coast Air Basin | 6.0 | 0 | 6.0 |
| All Other Areas | <u>10.0</u> | <u>15.5</u> | <u>25.5</u> |
| Total CHC | 37.0 | 45.3 | 82.3 |
| Recreational Craft** | | | |
| S.F. Bay Area Air Basin | 0 | 0.4 | 0.4 |
| South Coast Air Basin | 0 | 1.8 | 1.8 |
| North Coast Air Basin | 0.1 | 0 | 0.1 |
| All Other Areas | <u>0</u> | <u>2.7</u> | <u>2.7</u> |
| Total Recreational Craft | 0.1 | 4.9 | 5 |
| Harborcraft Total*** | 37 | 50 | 87 |

* Commercial fuel consumption estimates based on 2002 ARB Commercial Harborcraft Survey.

** Recreational fuel consumption estimates based on 2003 ARB Emissions Inventory (See Appendix D).

*** Numbers may not add due to rounding.

3. Total Fuel Consumption and Fuel Type for Both Intrastate Locomotives and Harborcraft

As can be seen in Table I-10, intrastate locomotives and harborcraft combined consumed an estimated 134 million gallons of diesel fuel annually. Of the diesel fuel consumed by intrastate locomotives and harborcraft, an estimated 51 percent is U.S. EPA on-road diesel fuel, and nearly 49 percent is CARB or CARB low sulfur diesel fuel, and less than 1 percent is U.S. EPA nonroad diesel fuel. In 2003, the California Energy Commission (CEC) estimates that California consumed approximately 3 billion gallons of diesel fuel. The combined intrastate locomotive and harborcraft diesel fuel consumption represents about 4.5 percent of the total 2003 diesel fuel consumption in California.

**Table I-10: Fuel Consumption for Intrastate Locomotives and Harborcraft
(Millions of gallons)**

| TYPE OF OPERATION | CARB | U.S. EPA On-Road | U.S. EPA Nonroad | Total |
|---|-------------|------------------|------------------|------------|
| Intrastate Locomotives | 28.4 | 18.3 | 0.3 | 47.0 |
| Commercial and Recreational Harborcraft | 37.0 | 50.0 | 0 | 87.0 |
| Total* | 65.4 | 68.3 | 0.3 | 134 |

* Numbers may not add due to rounding.

H. What are the Proposed Amendments?

ARB staff is proposing that, beginning January 1, 2007, diesel fuel sold, supplied, or offered for sale to California intrastate locomotive and harborcraft operators statewide be required to meet the specifications for vehicular diesel fuel, as specified in title 13, California Code of Regulations (CCR), sections 2281, 2282, and 2284.

Staff is also proposing that diesel fuel sold, supplied, or offered for sale to harborcraft operators within the South Coast Air Quality Management District (SCAQMD) be required to meet California motor vehicle diesel fuel standards beginning January 1, 2006. This control measure would satisfy commitments contained in the SCAQMD SIP.

For the proposed amendments, staff is proposing that California intrastate locomotives be defined as those locomotives that operate at least 90 percent of the time within the borders of the state, based on hours of operation, miles traveled, or fuel consumption. Staff is proposing to not include in the definition of California intrastate locomotives those line-haul locomotives meeting the U.S. EPA's "Tier II" locomotive emission standards (for both NO_x and PM) which primarily move freight into and out of the SCAQMD. In addition, staff is investigating means to encourage the early introduction of Tier II locomotives in the rest of the state and may propose additional recommendations to the Board at the hearing. Staff is also proposing that harborcraft be defined as those marine vessels that purchase diesel fuel in California and which do not meet prescribed "oceangoing vessel" definitions.

To provide additional flexibility to affected intrastate locomotive operators, operators of intrastate locomotives would have the option of participating in an alternative emission control plan (AECPP). The AECPP provisions would allow the owner or operator of an intrastate diesel-electric locomotive to submit for approval by the Executive Officer a substitute fuel and/or emission control strategy. The substitute fuel and/or emission control strategy must achieve equivalent or greater reductions than those achieved solely through compliance with California reformulated diesel fuel standards, and adequate enforcement provisions would be required. Further, there must be a detailed analysis to ensure adequate environmental protections have been provided for environmentally sensitive and impacted areas (e.g., Los Angeles Harbor area).

Staff is also presenting the proposed amendments to the Board for consideration as an airborne toxic control measure (ATCM) for applicability through the non-vehicular diesel fuel standards.

I. Why are These Regulations Being Proposed?

The proposed amendments to the California diesel fuel regulations are based on a number of actions, programs, and commitments undertaken by the Board and Governor Schwarzenegger.

1. *Need for Emission Reductions*

Over 90 percent of Californians breathe unhealthy air. California's mobile source and fuels programs, more than any other pollution control effort, have helped to move the state's nonattainment areas closer to meeting federal and state air quality standards. The combination of fuels and vehicle emissions regulations provide significant statewide reductions in emissions of

carbon monoxide (CO), fine particulates or PM₁₀, SO_x, and ozone precursors – NO_x and volatile organic compounds (VOCs). Nevertheless, significant additional reductions in mobile source emissions are essential if the state is to attain and maintain the state and national ambient air quality standards.

Diesel PM is a major contributor to potential ambient risk levels. In 2000, the average potential cancer risk associated with diesel PM emissions was estimated at over 500 potential cases per million. This diesel PM cancer risk accounted for approximately 70 percent of the ambient air toxics cancer risk.

The SCAQMD Multiple Air Toxics Exposure Study II (MATES II) estimated that the average potential cancer risk in the South Coast Air Basin from diesel PM was about 1,000 excess cancers per million people, or 71 percent of the average cancer risk from all air toxics in the South Coast Air Basin. Localized or near-source exposures to diesel exhaust, such as might occur near busy roads and intersections, will present much higher potential risks.

2. ARB Board Direction

The CARB diesel fuel regulations currently apply to all on-road and off-road diesel engines except stationary engines, locomotives, and marine vessels. In July 2003, the Board approved amendments to the CARB diesel fuel regulations lowering the allowable sulfur levels to a maximum of 15 ppmw effective June 1, 2006. Approval of the CARB low sulfur diesel fuel regulations included extending the existing CARB diesel (sulfur limit - 500 ppmw) requirements to nonvehicular (i.e., stationary) sources beginning December 12, 2004. In addition, the low sulfur (15 ppmw) CARB diesel fuel regulations will apply to all diesel engines (i.e., mobile and stationary) beginning on June 1, 2006. However, locomotives and marine vessels will continue to be exempted from the CARB diesel fuel regulations in 2006. Based on a number of public comments received at the July 2003 hearing, the Board directed staff to evaluate and report back on the feasibility of requiring the use of CARB diesel fuel in locomotives and marine vessels.

At the October 2003 hearing, staff reported to the Board that while interstate locomotives and oceangoing vessels consume much of the fuel dispensed into them from facilities outside of the country or in other states, intrastate locomotives and harborcraft are typically a captive fleet. As such, intrastate locomotives and harborcraft would be good candidates for the use of CARB diesel fuel, as the emission benefits derived from the fuel would be realized within the state. As a result of this hearing, the Board directed staff to develop a regulatory proposal targeting the use of CARB diesel fuel by intrastate locomotives and harborcraft.

3. Diesel Risk Reduction Plan

In August 1998, the ARB identified PM emitted from diesel engines (diesel PM) as a Toxic Air Contaminant (TAC). Because of the considerable potential health risks posed by exposure to diesel PM, ARB staff recommended a comprehensive plan, the Diesel Risk Reduction Plan (DRRP), to further reduce diesel PM emissions and the health risks associated with such emissions. This plan seeks to reduce Californians' exposure to diesel PM and associated cancer risks from baseline levels in 2000 by 85 percent by 2020.

In October 2000, the DRRP was approved by the ARB. The plan identified air toxic control measures and regulations that will set more stringent emissions standards for new diesel-fueled engines and vehicles, establish retrofit requirements for existing engines and vehicles where determined to be technically feasible and cost-effective, and require the sulfur content of diesel fuel to be reduced to no more than 15 ppmw. The proposed regulation is an important component towards meeting the diesel risk reduction goals set out in the DRRP.

The emission reductions obtained from the proposed amendments will result in lower ambient PM levels and significant reductions of exposure to primary and secondary diesel PM. Lower ambient PM levels and reduced exposure, in turn, would result in a reduction of the prevalence of the diseases attributed to PM and diesel PM, including hospitalizations for cardio-respiratory disease, and premature deaths. ARB staff estimates approximately 71 premature deaths would be avoided by 2010 and cumulatively 233 deaths by 2020 as a result of the emission reductions of primary and secondary PM obtained through the proposed regulations.

4. State Implementation Plan - 2003 State and Federal Strategy and 2003 South Coast State Implementation Plan

On October 23, 2003, ARB adopted *the Proposed 2003 State and Federal Strategy for the California State Implementation Plan* (Statewide Strategy). The Statewide Strategy identifies the Board's near-term regulatory agenda to reduce ozone and PM by establishing enforceable targets to develop and adopt new measures for each year from 2003 to 2006, including commitments for the Board to consider 19 specific measures. In addition to meeting federal requirements, the Statewide Strategy ensures continued progress towards California's own health-based standards.

ARB and local air districts are in the process of updating the California State Implementation Plan (SIP) to show how each region in the state will meet the federal air quality standards. The measures outlined in the adopted Statewide Strategy are being incorporated into these SIP revisions. The South Coast's 2003 Air Quality Management Plan was adopted by the SCAQMD Governing Board on August 1, 2003. ARB approved the local SIP element on October 23, 2003, and on January 9, 2004, ARB submitted to U.S. EPA both the Statewide Strategy and the 2003 SCAQMD SIP as revisions to the California SIP. As part of the Statewide Strategy, the ARB committed to:

- The use of cleaner fuels for harborcraft in *Measure Marine-1: Pursue Approaches to Clean Up the Existing Harborcraft Fleet – Cleaner Engines and Fuels*. One element of this SIP measure would require the use of cleaner diesel fuel in harborcraft operating in California.
- While no new defined controls for locomotives are included in the 2003 South Coast SIP, Board Resolution 03-22 directs staff to evaluate approaches to reduce emissions from in-use locomotives, passenger rail, and switcher and short haul locomotives.

5. Governor's Action Plan for California's Environment

As part of Governor Schwarzenegger's action plan for California's environment, he has committed to protecting and restoring California's air quality through an initiative to cut air pollution statewide by up to 50 percent. Through this initiative, the Governor has stated:

*"Breathing clean and healthy air is a right of all Californians, especially our children, whose health suffers disproportionately when our air is polluted. The future health of California's environment and economy depend on our taking action now."*³

One component of the Governor's action plan for California's environment includes expediting the use of clean fuel transportation in the state. This includes the early introduction of cleaner, low-sulfur diesel fuels. Staff's proposed amendments meet this commitment through the introduction of low-sulfur CARB diesel fuel for use by the California intrastate locomotive and harborcraft marketplace, nearly six years earlier than mandated by the U.S. EPA.

J. What Alternatives Were Considered?

Staff evaluated five alternatives to the proposed amendments for intrastate locomotives and commercial and recreational harborcraft that included:

- Not extending CARB diesel fuel requirements to diesel fuel for use by intrastate locomotives (in which case the fuel would still be subject to U.S. EPA nonroad diesel fuel standards).
- Not requiring any diesel fuel for use by Class III railroads locomotives to have to comply with the CARB diesel fuel requirements.
- Not requiring diesel fuel for use by certain rural Class III railroads locomotives, not operating in ozone non-attainment areas, to have to comply with the CARB diesel fuel requirements until June 1, 2012.
- Requiring diesel fuel for use by all intrastate locomotives in the SCAQMD to meet the CARB diesel fuel standards by January 1, 2006, with diesel fuel for use by intrastate locomotives and harborcraft in the rest of the state to be subject to the CARB diesel fuel standards by January 1, 2007.
- Making diesel fuel for use by all harborcraft and all interstate and intrastate locomotives subject to the CARB diesel fuel requirements.

In considering the alternatives identified above, staff concluded that the first three would not provide needed emission reductions, for both the SIP and overall improvements in air quality, above those that would be realized through implementation of only the U.S. EPA nonroad diesel fuel program.

Staff believes that the additional CARB diesel fuel demand created by the fourth alternative could put excessive strain on the diesel fuel supply in the SCAQMD in 2006, during the transition to 15 ppmw CARB and U.S. EPA on-road diesel fuels. The fifth alternative would not

³ <http://www.joinarnold.com/en/agenda/#D1>

assure emission reductions as interstate locomotives have the potential to change existing fuel patterns. This might increase the purchase of U.S. EPA nonroad diesel fuel prior to entering California, reducing the potential benefits of this option.

A discussion of the cost and emission impacts of these alternatives is provided in Chapter XIII.

K. Do the Proposed Amendments Satisfy Commitments in the State Implementation Plan?

In this section, staff examines the impacts of the proposed amendments on the SIPs for both the SCAQMD and SJVUAPCD.

ARB staff estimates that the proposed amendments would reduce NO_x emissions by about 0.4 tons per day from harborcraft in the SCAQMD in 2010. The harborcraft NO_x emission reductions would provide the first increment of progress toward fulfilling ARB's commitment for *Measure Marine-1: Pursue Approaches to Clean Up the Existing Harborcraft Fleet – Cleaner Engines and Fuels* in the 2003 SCAQMD SIP. Under measure Marine-1, ARB anticipates reducing 2010 South Coast harborcraft NO_x emissions by a total of 2.7 tons per day. In addition to providing immediate NO_x emission reductions, the low sulfur (15 ppmw) CARB diesel fuel will enable the use of exhaust treatment devices on harborcraft engines, another element of measure Marine-1.

ARB staff also estimates that the proposed amendments would reduce NO_x emissions by about 0.3 tons per day from intrastate locomotives in the SCAQMD in 2010 and 0.2 tons per day in the San Joaquin Valley. However, these new NO_x emission reductions, except for those from passenger trains and the Class III railroads, are not directly creditable towards ARB's commitments in the 2003 SCAQMD SIP due to commitments in the Memorandum of Understanding between the SCAQMD and railroads. However, in areas outside of the SCAQMD (e.g., San Joaquin Valley), these emission reductions would be creditable.

L. What Are the Emission Impacts of the Proposed Amendments?

As illustrated in Table I-11, intrastate locomotives and harborcraft combined generate over 57 tons per day of NO_x emissions and about 2 tons per day each of PM and SO_x emissions statewide.

Table I-11: 2003 Statewide NO_x, SO_x, and PM Emissions from Intrastate Locomotives and Commercial and Recreational Harborcraft (tons per day)

| Source | NO _x | SO _x | PM |
|---|-----------------|-----------------|------------|
| Intrastate Locomotives | 38.4 | 0.3 | 0.9 |
| Commercial and Recreational Harborcraft | 19.8 | 1.9 | 1.1 |
| Total * | 58.2 | 2.2 | 2.0 |

* Numbers may not add due to rounding.

With staff's proposed amendments, the use of CARB diesel fuel will provide significant reductions in NO_x, PM (both directly emitted and secondary), and SO_x. The reduction of diesel PM will also provide a reduction in the risk associated with the general public's exposure to diesel PM. However, the net emission reduction benefits derived from the use of CARB diesel is somewhat reduced due to intrastate locomotives and harborcraft currently using a significant level (approximately half of their existing fuel consumption) of CARB diesel or CARB low sulfur diesel fuels.

Table I-12: 2007 Anticipated Statewide NO_x, SO_x, and PM Emissions Reductions from Intrastate Locomotives and Harborcraft (tons per day)

| Source | NO _x | SO _x | PM | |
|---|-----------------|-----------------|------------|------------|
| | | | Direct | Indirect |
| Intrastate Locomotives | 1.0 | 0.3 | 0.1 | 0.1 |
| Commercial and Recreational Harborcraft | 1.0 | 1.5 | 0.1 | 0.3 |
| Total * | 2.0 | 1.8 | 0.2 | 0.4 |

* numbers may not add due to rounding.

As can be seen in Table I-12, NO_x emissions would be reduced by about 3.5 percent, or about 2 tpd, for those sources not currently using CARB diesel fuel. Direct diesel PM emissions would be reduced by, on average, about 9 percent, or about 0.2 tpd in 2007. SO_x emissions will be reduced by nearly 1.8 tpd, or by about 95 percent. This reduction in SO_x will provide a corresponding reduction of about 0.4 tpd of indirectly emitted PM.

M. What are the Environmental Impacts of the Proposed Amendments?

1. Air Quality

Sulfur in diesel fuel contributes to ambient levels of fine PM through the formation of sulfates both in the exhaust stream of the diesel engine and later in the atmosphere. Therefore, reducing the sulfur limit of CARB diesel fuel from 500 ppmw to 15 ppmw will have a positive air quality impact by reducing ambient levels of PM. In addition, the aromatic hydrocarbon specification in the CARB diesel fuel regulations provides significant reductions in the emissions of NO_x and PM. As NO_x emissions are a precursor to ozone emissions, reduction of NO_x emissions will reduce ozone levels. In addition, reducing NO_x emissions will help to reduce secondary PM formation (i.e., nitrate aerosols). Reductions in emissions of diesel PM mean reduced ambient levels of the toxic air contaminants found in diesel exhaust and reduced public exposure to those TACs.

2. Greenhouse Gas Emissions

Implementation of the proposed amendments could have a small effect on global warming. The production of lower sulfur, lower aromatic diesel is expected to increase slightly emissions of greenhouse gases. To the extent that CARB diesel fuel will displace U.S. EPA on-road diesel fuel used in intrastate locomotives and harborcraft, emissions of CO₂ from refineries may increase slightly due to the increased demand for energy for additional hydrogen production and

additional processing to produce lower aromatic diesel fuel. Emissions from refineries of other greenhouse gases like methane and nitrous oxide will be very small compared to other carbon dioxide emissions.

3. Refinery Modifications

The proposed amendments are not expected to require any additional refinery modifications beyond those already anticipated by refiners to comply with the CARB low sulfur (15 ppmw) diesel fuel standards on June 1, 2006.

N. What are the Anticipated Impacts of the Proposed Amendments on California Diesel Fuel Supply?

The proposed regulations should not affect the ability of California refiners to supply sufficient quantities of diesel fuel to the California diesel fuel market. Based on recent refinery surveys by the ARB and CEC, as well as with conversations with California refiners, it appears that sufficient California diesel fuel refinery capacity already exists. In considering the impact of the proposed amendments on diesel fuel supply, it should be noted that a significant quantity of diesel fuel meeting the California diesel fuel standards is already being used. As such, the true impact of the proposed amendments will be a shift of the incremental demand of diesel fuel being used by intrastate locomotive and harborcraft operators that currently meets the U.S. EPA (either on-road or nonroad) diesel fuel standards to CARB diesel fuel. This incremental demand, estimated to be about 4.5 thousand barrels per day (68.6 million gallons per year), is within the existing California diesel fuel production capacity.

In addition, the implementation of the U.S. EPA on-road low sulfur (15 ppmw) diesel fuel regulations, adoption of the CARB diesel fuel regulations by the state of Texas for on-road and nonroad sources (including locomotives and marine vessels), and the ability of out-of-state refiners to produce diesel fuel meeting California standards should provide even greater assurance of diesel fuel availability to California. Therefore, the overall diesel fuel production system – consisting of California refineries and imports – should not be impacted after the implementation of the proposed regulations.

O. What are the Overall Costs of the Proposed Amendments?

In evaluating the potential costs of the proposed amendments, staff has considered the likely diesel fuels expected to be generally available in California in 2007. Based on the fact that intrastate locomotive and harborcraft operators will likely use, at a minimum, U.S. EPA on-road diesel fuel meeting a 15 ppmw sulfur limit, even without ARB requirements, staff has determined the costs of the proposed amendments based on the incremental cost in 2007 to produce CARB diesel fuel relative to U.S. EPA on-road diesel fuel.

Staff estimates that the incremental cost to produce CARB diesel fuel relative to U.S. EPA on-road diesel fuel will be about 3 cents per gallon. This is the incremental cost to reduce the aromatic hydrocarbon content of U.S. EPA on-road diesel fuel from a limit of 35 volume percent to a limit of 10 volume percent (or an equivalent formulation limit). Staff estimates that the overall statewide costs of the proposed amendments could be \$2 to \$3 million dollars annually.

Staff has also identified several cost benefits to diesel fuel end users from the proposed amendments that have not been quantified in the above production cost estimates. These benefits will be felt both initially, and over the course of the life of the program. Initially, diesel fuel users are expected to see a decrease in engine wear as a result of low sulfur diesel fuel. In addition, lower sulfur fuels should increase the life of diesel engine lubrication oil, as fuel sulfur tends to increase the acidification of engine lubricating oils resulting in loss of pH control. By reducing the diesel fuel sulfur content, it is expected that the interval between oil changes can be extended, leading to a cost saving to diesel engine operators.

P. Are the Proposed Regulations Cost-Effective?

The cost-effectiveness of the proposed amendments in 2006 in the SCAQMD ranges between \$0.80 and \$1.10 per pound of NO_x plus PM reduced. In 2007, when the proposed amendments are fully implemented statewide, the cost-effectiveness ranges between \$1.10 and \$1.60 per pound of NO_x plus PM reduced. This is in the range of other recent criteria pollutant control measures approved by the Board.

Q. What are the Economic Impacts of the Proposed Regulations?

The proposed regulations are not expected to have a significant impact on the overall California economy. Staff also evaluated the potential economic impact on intrastate locomotive and harborcraft operators. The analysis concluded that there would be very minor economic impacts on these operators. Staff also found that there should be no significant adverse effect on small businesses because of the cost impacts of the proposed amendments.

II. RECOMMENDATIONS

The staff recommends that the Board adopt the proposed amendments to the CARB diesel regulations and the airborne toxics control measure (ATCM) as contained in Appendix A. These amendments will do the following:

1. Beginning January 1, 2006, require that diesel fuel supplied, sold, or offered for sale for use in harborcraft in the SCAQMD meet the standards of vehicular diesel fuel, as set forth in title 13, CCR, sections 2281, 2282, and 2284.
2. Beginning January 1, 2007, require that diesel fuel supplied, sold, or offered for sale for use in any intrastate locomotive and harborcraft statewide meet the standards of vehicular diesel fuel, as set forth in title 13, CCR, sections 2281, 2282, and 2284.
3. Allow intrastate locomotive operators to enter into an agreement with the Executive Officer for an alternative emission control plan (AECP) which would provide equivalent or better emission reductions than through compliance with the supply and sale requirements for California diesel fuel.

III. EXISTING DIESEL FUEL REGULATIONS AND DIESEL FUEL QUALITY

This chapter presents a summary of state, federal, and local diesel fuel regulations that affect the quality of diesel fuel consumed in California.

A. California Diesel Fuel Regulations

“CARB diesel” is diesel fuel that meets the ARB’s regulations controlling the sulfur and aromatic contents of diesel fuels used in motor vehicles. CARB diesel fuel must also meet the requirements of the California Division of Measurement Standards (DMS), the ASTM D-975 diesel fuel specifications, and have a minimum cetane number of 40. About 90 percent of the diesel fuel sold or supplied in California meets the CARB diesel requirements. Beginning on December 12, 2004, CARB diesel fuel requirements will apply to nonvehicular sources except for locomotives and marine vessels. Beginning on June 1, 2006, CARB diesel low sulfur (15 ppmw) requirements will apply to vehicular and nonvehicular sources, except locomotives and marine vessels. The requirements of the CARB diesel fuel regulations are summarized in Table III-1.

Table III-1: CARB Diesel Fuel Standards

| Implementation Date | Maximum Sulfur Level (ppmw) | Aromatics by Volume | Cetane Index Number |
|---------------------|-----------------------------|---------------------|---------------------|
| 1993 | 500 | 10 * | 40 |
| 2006 | 15 | 10 * | 40 |

* or meet alternative formulation that provides equivalent emission benefits to that obtained with a 10 percent aromatic standard.

1. Sulfur Standard

Section 2281 of Title 13, CCR regulates the sulfur content of vehicular diesel fuel sold or supplied in California. This standard was approved by the ARB in 1988 and was implemented in October 1993 statewide. All diesel fuel sold or supplied in California for motor-vehicle use must have a sulfur content no greater than 500 ppmw. At a July 2003 hearing, the Board approved changes to the CARB diesel fuel regulations that, among other things, lowered the maximum allowable sulfur levels in California motor vehicle diesel fuel to 15 ppmw beginning on June 1, 2006.

2. Aromatic Hydrocarbon Standard

Section 2282 of Title 13, CCR regulates the aromatic hydrocarbon content of vehicular diesel fuel sold or supplied in California. Like the specification for maximum sulfur levels in diesel fuel, the aromatic hydrocarbon standard was approved by the Board in 1988 and implemented in October 1993. The aromatic hydrocarbon content of vehicular diesel sold or supplied in California must not exceed 10 percent by volume for large refiners. Small refiners are allowed to meet a less stringent 20 percent limit on aromatic hydrocarbons.

The regulation limiting aromatic hydrocarbons also includes a provision that enables diesel fuel producers and importers to comply with the regulation by qualifying a set of alternative specifications of their own choosing. The alternative formulation must be shown, through emissions testing, to provide emission benefits equivalent to that obtained with a 10 percent aromatic standard (or in the case of small refiners, the 20 percent standard). Most refiners have taken advantage of the regulation's flexibility to produce alternative diesel formulations that provide the required emission reduction benefits at a lower cost.

3. *Lubricity Standard*

The Board approved a lubricity standard (Section 2284, Title 13, CCR) at a July 2003 public hearing, along with the CARB low sulfur (15 ppmw) diesel fuel regulations, in order to ensure that CARB diesel fuel provides adequate lubrication for fuel systems of existing and future diesel engines. The CARB diesel fuel first phase lubricity standard is appropriate for protecting existing hardware and is to be implemented January 1, 2005. The ASTM has approved a lubricity standard for the D-975 diesel fuel specifications that will become effective January 1, 2005. This ASTM standard is identical to the ARB first-phase standard. The ARB and ASTM approved standard is at least as protective as the current voluntary standard to protect current in-use engines. When DMS adopts and begins enforcing the ASTM standard, the ARB first-phase standard will no longer apply.

Diesel fuel lubricity can be defined as the ability of diesel fuel to provide surface contact lubrication. Adequate levels of fuel lubricity are necessary to protect the internal contact points in fuel pumps and injection systems to maintain reliable performance. The levels of natural lubricity agents in diesel fuel are expected to be reduced by the more severe hydrotreating needed to lower the sulfur content of diesel fuel to meet the CARB low sulfur (15-ppmw) limit in 2006. Lubricity additives are available to increase the lubricity of fuels that have had their natural lubricity agents depleted.

The Board's resolution approving the first phase lubricity standard directed staff to conduct a technical assessment, to be completed in 2005, to determine an appropriate 2006 lubricity standard. The Board's resolution further directed staff to return to the Board in 2005 with a proposed 2006 lubricity standard if the technology assessment determines that a High Frequency Reciprocating Rig (HFRR) maximum wear scar diameter (WSD) of 460 microns at 60 degrees C, or a more appropriate standard, should be implemented on the same schedule as the CARB diesel fuel low sulfur (15-ppmw) limit in 2006.

B. Federal Diesel Fuel Regulations

1. *Federal On-Road Diesel Fuel*

The current U.S. EPA diesel fuel standards have been applicable since October 1993. The U.S. EPA regulation – 40 Code of Federal Regulations (CFR) §80.29 – prohibits the sale or supply of diesel fuel for use in on-road motor vehicles, unless the diesel fuel has a sulfur content no greater than 500 ppmw. In addition, the regulation requires on-road motor-vehicle diesel fuel to have a cetane index of at least 40 or have an aromatic hydrocarbon content of no greater than 35 percent by volume (vol. %). All federal on-road motor-vehicle diesel fuel sold or supplied in

the United States, except in Alaska, must comply with these requirements. Diesel fuel, not intended for on-road motor-vehicle use, must contain dye solvent red 164.

On January 18, 2001, the U.S. EPA published a final rule which specifies that, beginning June 1, 2006, refiners must begin producing on-road highway diesel fuel that meets a maximum sulfur standard of 15 ppmw. The requirements are contained in 40 CFR §§80.500 et seq. The specifications for U.S. EPA on-road diesel fuel are shown in Table III-2 below.

Table III-2: U.S. EPA Diesel Fuel Standards

| Applicable | Implementation Date | Maximum Sulfur Level (ppmw) | Maximum Aromatic Hydrocarbon (ppmw) | Color (ASTM D155) |
|---|---------------------|-----------------------------|-------------------------------------|-------------------|
| On-road | 1993 | 500 | 35 | 40 |
| On-Road | 2006 | 15 | 35 | 40 |
| Nonroad * | 1993 | 5,000 | 35 | 40 |
| Nonroad * | 2007 | 500 | 35 | 40 |
| Nonroad, <i>excluding loco/marine</i> * | 2010 | 15 | 35 | 40 |
| Nonroad, <i>loco/marine</i> * | 2012 | 15 | 35 | 40 |

* Nonroad diesel fuels must comply with ASTM No. 2 diesel specifications for aromatics and cetane.

2. Federal Nonroad Diesel Fuel

On June 29, 2004, the U.S. EPA published a final rulemaking for the control of emissions from nonroad diesel engines and fuel. The U.S. EPA rulemaking requires that sulfur levels for nonroad diesel fuel be reduced from current uncontrolled levels ultimately to 15 ppmw, though an interim cap of 500 ppmw is contained in the rule. Beginning June 1, 2007, refiners would be required to produce nonroad, locomotive, and marine diesel fuel that meets a maximum sulfur level of 500 ppmw. The federal nonroad diesel fuel rule does not apply to stationary sources. Beginning June 1, 2010, the maximum sulfur level is 15 ppmw for diesel fuel used by nonroad sources, excluding locomotives and marine vessels. In 2012, nonroad diesel fuel used in locomotives and marine applications must meet the low sulfur (15 ppmw) standard. The nonroad diesel fuel standards are shown above in Table III-2.

It is important to note that for both the federal on-road and nonroad diesel fuel regulations, U.S. EPA has not established an aromatic hydrocarbon content (or equivalent property) specification. Accordingly, neither the federal on-road or nonroad diesel fuels provide the same level of emission reductions (for both NO_x and PM) achieved through the use of CARB diesel fuel.

C. SCAQMD Rule 431.2

Health and Safety Code Section 40447.6 authorizes the SCAQMD to adopt regulations that specify the composition of diesel fuel manufactured for sale in the SCAQMD, subject to ARB approval. In September 2000, the SCAQMD amended Rule 431.2 to define low sulfur diesel

fuel as having a sulfur content no higher than 15 ppmw. For mobile sources (locomotives and marine vessels are specifically exempted from this rule), Rule 431.2 prohibits the supply, sale or offer for sale of any diesel fuel for any mobile source application in the District, unless the diesel fuel meets the definition of low sulfur diesel fuel (sulfur content is 15 ppmw or less), beginning June 1, 2006. However, Rule 431.2 does not require the use of diesel fuel meeting the aromatic hydrocarbon or lubricity specifications of CARB diesel fuel, as specified in title 13, CCR, sections 2282 and 2284, respectively.

D. Texas Diesel Fuel Regulations

In June 2000, Texas Commission on Environmental Quality (TCEQ) incorporated California's CARB diesel fuel requirements into their SIP and extended the CARB diesel fuel requirements to on-road and nonroad sources, including locomotives and marine vessels. TCEQ rules 114.312-114.319 require that beginning on April 1, 2005, that diesel fuel produced within 114 counties around the Houston-Galveston areas of Texas meet the 500 ppmw maximum sulfur levels and the 10 percent aromatics hydrocarbon content limit or equivalent emissions benefits. Beginning on June 1, 2006, the TCEQ regulations lower the CARB diesel fuel sulfur limit to 15 ppmw to be consistent both with the U.S. EPA and CARB diesel fuel sulfur requirements. TCEQ also includes an Alternative Emission Reduction Plan (AERP) component which can provide fuel producers with the flexibility to comply with both gasoline and diesel limits as long as a substitute fuel strategy provides equivalent emissions benefits.

E. Properties of In-Use Diesel Fuel

Under the provisions for CARB diesel fuel alternative formulations, the ARB has certified CARB diesel fuel for use in California that typically has a lower sulfur content than 500 ppmw and a higher aromatic content than 10 percent. The average sulfur content of California diesel fuel sold in California has been about 140 ppmw (see Table III-3). Excluding the small refiners' fuel production, the average has been about 120 ppmw. About 20 percent of the motor vehicle diesel fuel currently produced in California has a sulfur content of 15 ppmw or less.

Table III-3 shows the average values for sulfur and four other fuel properties for motor vehicle fuel sold in California before and after the current diesel fuel regulation became effective in 1993. The corresponding national averages are shown for the same properties for U.S. EPA on-road diesel fuel only since the U.S. EPA sulfur standard does not apply to off-road or nonvehicular diesel fuel.

Table III-3: Average 1999 Properties of Reformulated Diesel Fuel

| Property | California | U.S. EPA |
|-------------------|--------------------|----------|
| Sulfur, ppmw | 140 ⁽²⁾ | 360 |
| Aromatics, vol. % | 19 | 35 |
| Cetane No. | 50 | 45 |
| PNA, wt. % | 3 | NA |
| Nitrogen, ppmw | 150 | 110 |

1 U.S. EPA, December 2000.

2 About 20 % of total California volume is less than 15 ppmw.

As can be seen from Table III-3 above, in-use CARB diesel fuel has higher cetane and has lower density, aromatics, and sulfur content than U.S. EPA on-road diesel fuel.

IV. NEED FOR EMISSIONS REDUCTIONS

California's mobile source and fuels programs have contributed significantly to the state's nonattainment areas in making progress towards meeting both federal and state air quality standards. The combination of fuels and vehicle emissions regulations provide significant statewide reductions in emissions of CO, fine particulates (PM₁₀), SO_x, and ozone precursors NO_x and VOCs. Nevertheless, significant additional reductions in mobile source emissions are essential if the state is to attain the state and national ambient air quality standards.

As part of the ARB's Statewide SIP Strategy, the ARB has committed to a series of new measures to reduce emissions of VOC, NO_x, and PM. The ARB has committed, among other things, to:

- pursue approaches to clean up the existing harborcraft fleet (SIP measure Marine-1), including the use of California on-road low sulfur diesel;
- evaluate approaches to reduce emissions from in-use locomotives;
- evaluate emission reductions for switcher and short-haul locomotives, and;
- reduce emissions from passenger rail

A. Criteria Pollutants

1. *One-Hour Ozone Standard*

As shown in Figure IV-1, most of the state does not meet the state or federal ozone standards. The areas that violate the national ozone standard are pursuing a strategy that reduces the emissions of precursors of ozone. Lowering ozone precursor emissions will also help reduce secondary PM formation.

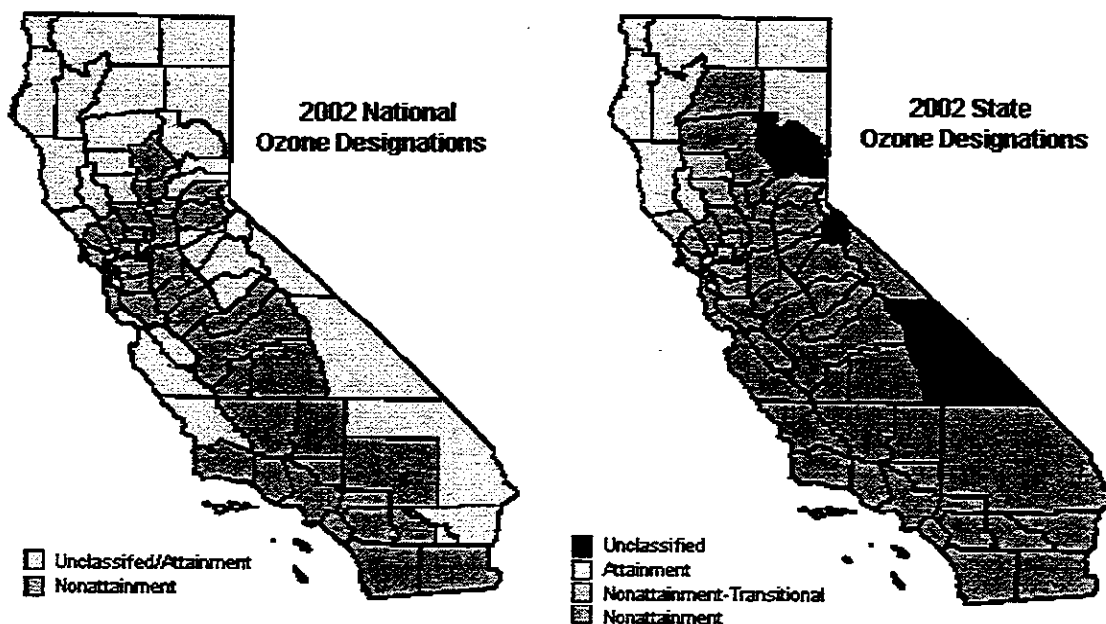
California's plan for achieving the federal ozone standard is contained in the California SIP that was approved by the Board in 1994. A significant part of the emission reductions in the SIP is achieved by controlling vehicles and their fuels. Mobile source emissions, both on-road and off-road, account for about 70 percent of ozone precursor emissions in California with diesel engines contributing 24 percent to the statewide total in 2000. Further reductions from the current emissions levels of NO_x and VOC are essential if California is to reach attainment for ozone.

2. *Eight-Hour Ozone Standard*

U.S. EPA designated nonattainment areas for the new eight-hour ozone standard effective June 15, 2004. In California, many of these areas are already nonattainment for the federal 1-hour standard. New nonattainment designations include a number of rural Sierra foothill counties and additional parts of the Sacramento Valley. This action starts the transition from the one-hour standard to the eight-hour standard. The one-hour standard will be revoked on June 15, 2005, one year after the effective date of the designation, and SIPs showing how each area will meet the eight-hour standard are due by 2007. In order to maintain progress towards clean air, the Clean Air Act prohibits backsliding on the control program. Since the eight-hour

standard is more health-protective than the federal one-hour standard, ARB expects that California will need to reduce emissions beyond the existing one-hour SIP targets.

Figure IV-1: Federal and State Area Designations for One-Hour Ozone Standards



The greatest reductions are needed in the South Coast Air Basin. The SCAQMD revised its part of the ozone SIP in 1997, 1999, and in 2003. The 2003 SCAQMD ozone SIP revision calls for additional reductions beyond those incorporated in the 1997/1999 plan. These additional reductions are needed to offset increased emissions from mobile sources and meet all federal criteria pollutant standards within the time frames allowed under the Clean Air Act. The South Coast Air Basin is required to demonstrate attainment of the federal 1-hour ozone standard by 2010.

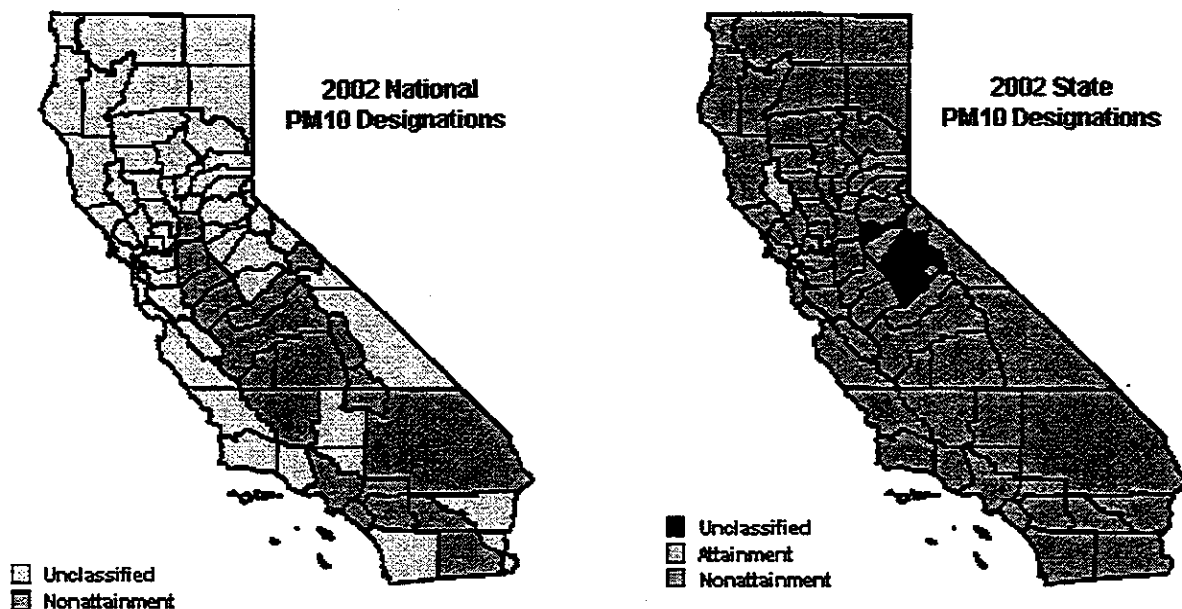
Significant reductions will also be needed in the San Joaquin Valley Air Basin which has been classified as severe nonattainment for ozone effective December 10, 2001. The San Joaquin Valley Air Basin is required to attain the ozone standards as expeditiously as possible, but no later than November 15, 2005. The San Joaquin Valley Air Basin cannot attain the one-standard by the required date but the District must reduce emissions by 3 percent per year on average and must continue to make progress toward attainment.

3. PM

Particulate pollution is a problem affecting much of California. The majority of California is designated as non-attainment for the state and federal fine particulate (PM₁₀) standards as shown in Figure IV-2. Only the Lake County Air Basin is designated as attainment in California and three counties in the northern half of the state remain unclassified. The nonattainment areas with

serious problems will require substantial reductions of directly emitted PM₁₀ pollutants and PM₁₀ precursors. Also control of the emissions of ozone precursors should provide some small benefit due to the reduction in condensible PM₁₀ emissions from the organic ozone precursors. Control of NO_x would also be effective in controlling ambient nitrate concentrations.

Figure IV-2: Federal and State Area Designations for PM₁₀.



B. Governor's Action Plan for California's Environment

As part of Governor Schwarzenegger's action plan for California environment, he has committed to protecting and restoring California's air quality through an initiative to cut air pollution statewide by up to 50 percent. Through this initiative, the Governor has stated:

"Breathing clean and healthy air is a right of all Californians, especially our children, whose health suffers disproportionately when our air is polluted. The future health of California's environment and economy depend on our taking action now."

One component of the Governor's action plan for California's environment includes expediting clean fuel transportation in the state. This includes the early introduction of cleaner, low-sulfur diesel fuels.

C. State Implementation Plan Commitments

1. *State Implementation Plan - 2003 State and Federal Strategy and 2003 South Coast SIP*

On October 23, 2003, ARB adopted *the Proposed 2003 State and Federal Strategy for the California State Implementation Plan (Statewide Strategy)* which reaffirms the ARB's commitment to achieve health-based air quality standards through specific near-term actions and the development of additional longer-term strategies. The Statewide Strategy identifies the Board's near-term regulatory agenda to reduce ozone and PM by establishing enforceable targets to develop and adopt new measures for each year from 2003 to 2006, including commitments for the Board to consider 19 specific measures. It also sets into motion a concurrent initiative to identify longer-term solutions to achieve the full scope of emission reductions needed to meet federal air quality standards in the South Coast, San Joaquin Valley, and the rest of California. In addition to meeting federal requirements, the Statewide Strategy ensures continued progress towards California's own health-based standards.

ARB and local air districts are in the process of updating the California SIP to show how each region in the state will meet the federal air quality standards. The measures outlined in the adopted Statewide Strategy are being incorporated into these SIP revisions. The South Coast's 2003 Air Quality Management Plan was adopted by the SCAQMD Governing Board on August 1, 2003. ARB approved the local SIP element on October 23, 2003, and on January 9, 2004, ARB submitted to U.S. EPA both the Statewide Strategy and the 2003 South Coast SIP as revisions to the California SIP. The new SIP updates all elements of the approved 1994 SIP. Upon approval by U.S. EPA, the 2003 SIP will replace the State's commitments in the 1994 SIP. ARB is currently working with the SJVUPACD on a revision to the San Joaquin Valley's ozone SIP. The revised San Joaquin Valley SIP is tentatively scheduled for consideration by the District's Governing on Board October 8, 2004 and by ARB on October 28, 2004.

Together with significant reductions from cleaner engines, stationary industrial facilities, and other areawide sources, the use of cleaner fuels is an essential part of California's effort to attain the air quality standards. In addition to providing direct emission benefits, cleaner fuels also enable more efficient use of exhaust treatment devices to further reduce emissions from existing engines.

Use of cleaner fuels for harborcraft is included in the Statewide Strategy and the 2003 South Coast SIP in *Measure Marine-1: Pursue Approaches to Clean Up the Existing Harborcraft Fleet -Cleaner Engines and Fuels*. One element of this SIP measure would require the use of cleaner diesel fuel in harborcraft operating in California.

To meet an emission reduction commitment for locomotives in the 1994 Ozone SIP for the South Coast, ARB and the two Class I freight railroads operating in California signed a memorandum of understanding (MOU) to ensure that the cleanest locomotive engines are brought to the South Coast Air Basin. Under the terms of the MOU, the use of cleaner fuels is one of the options for meeting the emission reduction targets. Any reductions achieved through use of cleaner fuels in the locomotives under the purview of the MOU could be credited toward

the existing locomotive SIP commitment and may not be credited toward ARB's new commitments under the 2003 SIP. However, emission reductions from the use of cleaner diesel fuels by passenger trains and Class III railroad intrastate locomotives is not covered by the MOU and could be creditable to the SIP. Thus, reductions from locomotives in other parts of California, such as the San Joaquin Valley, could also be credited in upcoming SIPs for those regions.

While no new defined controls for locomotives are included in the 2003 South Coast SIP, Board Resolution 03-22 directs staff to evaluate approaches to reduce emissions from in-use locomotives, passenger rail, and switcher and short haul locomotives not subject to the MOU.

In addition to the defined SIP measures, it is expected that further emission reductions will be needed from all source categories to meet the long-term emission reduction targets included in the South Coast SIP.

D. Toxic Air Contaminants

1. Components of Diesel Exhaust

Diesel exhaust is a complex mixture of inorganic and organic compounds that exist in gaseous, liquid, and solid phases. The composition of this mixture will vary depending on engine type, operating conditions, fuel, lubricating oil, and whether an emission control system is present.

Diesel engines operate with excess air (around 25-30 parts air to 1 part fuel). Consequently, the primary gas or vapor phase components of whole diesel exhaust are nitrogen (N₂), oxygen (O₂), carbon dioxide (CO₂), and water vapor (H₂O). Diesel exhaust also contains substances such as carbon monoxide (CO), NO_x, SO_x, hydrocarbons, PM, aldehydes, ketones, sulfates, cyanides, phenols, metals, and ammonia. These substances are unburned fuel and lubricant components, products of combustion, or are a result of engine wear or trace contaminants in the fuel and lubricating oil. Other gas phase components of diesel exhaust, are low-molecular mass polycyclic aromatic hydrocarbon (PAH) and nitro-PAH derivatives. Atmospheric reactions of these gas phase PAH and nitro-PAH derivatives may lead to the formation of several mutagenic nitro-PAH, and nitro-PAH compounds, including nitrodibenzopyranones, 2-nitrofluoranthene and 2-nitropyrene.

Diesel exhaust contains over 40 substances that have been listed as TACs by the state of California and as hazardous air pollutants by the U.S. EPA. Fifteen of these substances are listed by the International Agency for Research on Cancer (IARC) as carcinogenic to humans, or as a probable or possible human carcinogen. The list includes the following substances: formaldehyde, acetaldehyde, 1,3-butadiene, antimony compounds, arsenic, benzene, beryllium compounds, bis(2-ethylhexyl)phthalate, dioxins and dibenzofurans, inorganic lead, mercury compounds, nickel, POM (including PAHs); and styrene.

Almost all of the diesel particle mass is in the fine particle (PM₁₀) fraction. However, approximately 95 percent of the mass of these fine particles is less than 2.5 microns in diameter. The particles have a very large surface area per unit mass which makes them excellent carriers for many of the organic compounds and metals found in diesel exhaust.

2. Potential Cancer Risk

In 1990, ARB staff reported the statewide population-weighted annual outdoor average diesel PM concentration as $3.0 \mu\text{g}/\text{m}^3$. Using this 1990 value for ambient concentrations, and assuming that the ratio of ambient concentration to statewide emissions remained constant, ARB staff calculated ambient diesel PM concentrations for 2000, 2010, and 2020. Estimates of statewide annual average ambient PM concentration are presented in Table IV-1 along with the corresponding percent reduction from the 1990 ambient concentration. Table IV-1 also shows estimates of the risks of contracting cancer from exposure to the indicated ambient diesel PM concentrations. The methodology for estimating these cancer risks is described in the ARB's DRRP.

Diesel PM is a major contributor to potential ambient risk levels. In 2000, the average potential cancer risk associated with diesel PM emissions was estimated at over 500 potential cases per million. This diesel PM cancer risk accounted for approximately 70 percent of the ambient air toxics cancer risk (Figure IV-3).

In the SCAQMD's Multiple Air Toxics Exposure Study II (MATES II), it was estimated that the average potential cancer risk in the South Coast Air Basin from diesel PM was about 1000 excess cancers per million people, or 71 percent of the average cancer risk from all air toxics in the South Coast Air Basin. Localized or near-source exposures to diesel exhaust, such as might occur near busy roads and intersections, will present much higher potential risks.

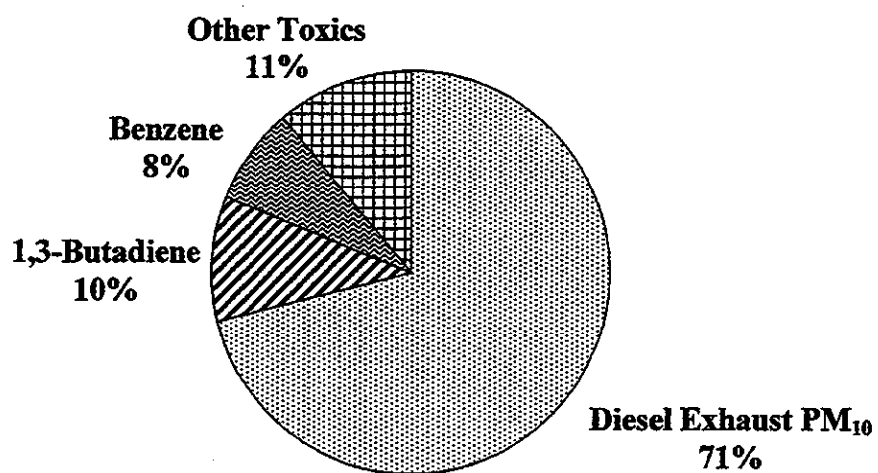
Reducing the risk from diesel PM is essential to reducing overall public exposure to air toxics. The control measures proposed in the DRRP will result in an overall 85 percent reduction in the diesel PM inventory and the associated cancer risk by 2020.

Table IV-1: Statewide Population-Weighted Annual Outdoor Average Diesel PM Concentration for 1990, 2000, 2010, and 2020

| | 1990 | 2000 | 2010 | 2020 |
|--|------|------|------|------|
| Outdoor Ambient Concentration ($\mu\text{g}/\text{m}^3$) | 3.0 | 1.8 | 1.5 | 1.2 |
| Percent Reduction in Diesel PM from 1990 Concentration | N/A | 40% | 50% | 60% |
| Risk (cancers/million) | 900 | 540 | 450 | 360 |

Figure IV-3

**State Average Potential Cancer Risk from
Outdoor Ambient Levels of Toxic Pollutants for the Year 2000**



V. HEALTH BENEFITS OF DIESEL EMISSIONS REDUCTIONS

This chapter discusses the health effects of the pollutants emitted by diesel engines and the health benefits of the emissions reductions that would result from the use of CARB diesel fuel in intrastate locomotives and harborcraft. There would be health benefits through lower directly emitted diesel PM and ozone precursors. There would also be health benefits from the sulfate PM emissions reductions that result from the lowering of the sulfur limit to 15 ppmw. In addition, through the use of CARB low sulfur (15 ppmw) diesel fuel, there would be major health benefits from the reductions of emissions of NO_x, diesel PM, and other toxic air contaminants from diesel engines equipped with exhaust aftertreatment systems.

A. Diesel Exhaust

Diesel exhaust is a complex mixture of inorganic and organic compounds that exist in gaseous, liquid, and solid phases. The composition of this mixture will vary depending on engine type, operating conditions, fuel, lubricating oil, and whether or not an emission control system is present. The primary gas or vapor phase components of diesel exhaust include typical combustion gases and vapors such as CO, CO₂, SO₂, NO_x, reactive organic gases (ROG), water vapor, and excess air (nitrogen and oxygen). The emissions from diesel-fueled engines also contain potential cancer-causing substances such as arsenic, nickel, benzene, formaldehyde, and polycyclic aromatic hydrocarbons. Diesel exhaust includes over 40 substances that are listed by the U.S. EPA as hazardous air pollutants (HAPS) and by the ARB as toxic air contaminants (TACs). Fifteen of these substances are listed by the IARC as carcinogenic to humans, or as a probable or possible human carcinogen. The list includes the following substances: formaldehyde, acetaldehyde, 1,3-butadiene, antimony compounds, arsenic, benzene, beryllium compounds, bis(2-ethylhexyl)phthalate, dioxins and dibenzofurans, inorganic lead, mercury compounds, nickel, POM (including PAHs), and styrene.

1. Diesel PM

Diesel PM is either directly emitted from diesel-powered engines (primary PM) or is formed from the gaseous compounds emitted by a diesel engine (secondary PM). Diesel PM consists of both solid and liquid material and can be divided into three primary constituents: the elemental carbon fraction (ECF); the soluble organic fraction (SOF), and the sulfate fraction.

Many of the diesel particles exist in the atmosphere as a carbon core with a coating of organic carbon compounds, or as sulfuric acid and ash, sulfuric acid aerosols, or sulfate particles associated with organic carbon. The organic fraction of the diesel particle contains compounds such as aldehydes, alkanes and alkenes, and high-molecular weight PAH and PAH-derivatives. Many of these PAHs and PAH-derivatives, especially nitro-PAHs, have been found to be potent mutagens and carcinogens. Nitro-PAH compounds can also be formed during transport through the atmosphere by reactions of adsorbed PAH with nitric acid and by gas-phase radical-initiated reactions in the presence of oxides of nitrogen. Fine particles may also be formed secondarily from gaseous precursors such as SO₂, NO_x, or organic compounds. Fine particles can remain in the atmosphere for days to weeks and travel through the atmosphere for hundreds to thousands of

kilometers, while coarse particles deposit to the earth within minutes to hours and within tens of kilometers from the emission source.

Almost all of the diesel particle mass is in the fine particle range of 10 microns or less in diameter (PM₁₀). However, approximately 95 percent of the mass of these fine particles are less than 2.5 microns in diameter (PM_{2.5}). Because of their small size, the particles are readily respirable and can effectively reach the lowest airways of the lung along with the adsorbed compounds, many of which are known or suspected mutagens and carcinogens. They are easily distinguished from noncombustion sources of PM_{2.5} by the high content of elemental carbon with the adsorbed organic compounds and the high number of ultrafine particles (organic carbon and sulfate).

The SOF consists of unburned organic compounds in the small fraction of the fuel and atomized and evaporated lubricating oil that escape oxidation. These compounds condense into liquid droplets or are adsorbed onto the surfaces of the elemental carbon particles. Several components of the SOF have been identified as individual toxic air contaminants.

B. Health Impacts of Exposure to Diesel Exhaust

In addition to its contribution to ambient PM inventories, diesel exhaust is of specific concern because it poses a lung cancer hazard for humans as well as a hazard from noncancer respiratory effects such as pulmonary inflammation. More than 30 human epidemiological studies have investigated the potential carcinogenicity of diesel exhaust. On average, these studies found that long-term occupational exposures to diesel exhaust were associated with a 40 percent increase in the relative risk of lung cancer. However, there is limited specific information that addresses the variable susceptibilities to the carcinogenicity of diesel exhaust within the general human population and vulnerable subgroups, such as infants and children and people with pre-existing health conditions. The carcinogenic potential of diesel exhaust was also demonstrated in numerous genotoxic and mutagenic studies on some of the organic compounds typically detected in diesel exhaust.

Diesel exhaust was listed as a TAC by ARB after an extensive review and evaluation of the scientific literature by Office of Environmental Health Hazard Assessment (OEHHA) and subsequent review by the Scientific Research Panel (SRP). Using the cancer unit risk factor developed by OEHHA for the TAC program, it was estimated that for the year 2000, exposure to ambient concentrations of diesel (1.8 µg/m³) could be associated with a health risk of 540 excess cancer cases per million people exposed over a 70-year lifetime. This estimated risk is equivalent to about 270 excess cases of cancer per year for the entire State, which is several times higher than the risk from all other identified TACs combined. Another highly significant health effect of diesel exhaust exposure is its apparent ability to act as an adjuvant in allergic responses and possibly asthma. However, additional research is needed at diesel exhaust concentrations that more closely approximate current ambient levels before the role of diesel exhaust exposure in the increasing allergy and asthma rates is established.

C. Health Impacts of Exposure to Diesel PM

U.S. EPA discussed the epidemiological and toxicological evidence of the health effects of ambient PM and diesel PM in the regulatory impact analyses for on-road and nonroad diesel engine emission standards. The key health effects categories associated with ambient PM include premature mortality, aggravation of respiratory and cardiovascular disease (as indicated by increased hospital admissions and emergency room visits, school absences, work loss days, and restricted activity days), aggravated asthma, acute respiratory symptoms, including aggravated coughing and difficult or painful breathing, chronic bronchitis, and decreased lung function that can be experienced as shortness of breath.

Health impacts from exposure to the PM_{2.5} component of diesel exhaust have been calculated for California, using concentration-response equations from several epidemiologic studies. Both mortality and morbidity effects could be associated with exposure to either direct diesel PM_{2.5} or indirect diesel PM_{2.5}, the latter of which arises from the conversion of diesel NO_x emissions to PM_{2.5} nitrates. It was estimated that 2,000 and 900 premature deaths resulted from long-term exposure to either 1.8 µg/m³ of direct PM_{2.5} or 0.81 µg/m³ of indirect PM_{2.5}, respectively, for the year 2000. The mortality estimates are likely to exclude cancer cases, but may include some premature deaths due to cancer, because the epidemiologic studies did not identify the cause of death. Exposure to fine PM, including diesel PM_{2.5} can also be linked to a number of heart and lung diseases. For example, it was estimated that 5,400 hospital admissions for chronic obstructive pulmonary disease, pneumonia, cardiovascular disease and asthma were due to exposure to direct diesel PM_{2.5}. An additional 2,400 admissions were linked to exposure to indirect diesel PM.

D. Health Impacts of Exposure to Ozone

Ozone is formed by the reaction of VOCs and NO_x in the atmosphere in the presence of heat and sunlight. The highest levels of ozone are produced when both VOC and NO_x emissions are present in significant quantities on clear summer days. This pollutant is a powerful oxidant that can damage the respiratory tract, causing inflammation and irritation, which can result in breathing difficulties. Currently there are no quantitative data available regarding the health impacts associated with ozone.

Studies have shown that there are impacts on public health and welfare from ozone at moderate levels that do not exceed the 1-hour ozone standard. Short-term exposure to high ambient ozone concentrations have been linked to increased hospital admissions and emergency visits for respiratory problems. Repeated exposure to ozone can make people more susceptible to respiratory infection and lung inflammation and can aggravate pre-existing respiratory diseases, such as asthma. Prolonged (6 to 8 hours), repeated exposure to ozone can cause inflammation of the lung, impairment of lung defense mechanisms, and possibly irreversible changes in lung structure, which over time could lead to premature aging of the lungs and/or chronic respiratory illnesses such as emphysema and chronic bronchitis.

The subgroups most susceptible to ozone health effects include individuals exercising outdoors, children and people with pre-existing lung disease such as asthma, and chronic pulmonary lung disease. Children are more at risk from ozone exposure because they typically are active outside,

during the summer when ozone levels are highest. Also, children are more at risk than adults from ozone exposure because their respiratory systems are still developing. Adults who are outdoors and moderately active during the summer months, such as construction workers and other outdoor workers, also are among those most at risk. These individuals, as well as people with respiratory illnesses such as asthma, especially asthmatic children, can experience reduced lung function and increased respiratory symptoms, such as chest pain and cough, when exposed to relatively low ozone levels during prolonged periods of moderate exertion.

E. Health Benefits of Reductions of Diesel Exhaust Emissions

1. Reduced Ambient PM Levels

Studies have shown that there are public health and welfare effects from PM at concentrations that do not constitute a violation of the National Ambient Air Quality Standard (NAAQS) for PM. The emission reductions obtained with low sulfur (15 ppmw) diesel fuel and diesel engines equipped with aftertreatment systems will result in lower ambient PM levels and significant reductions of exposure to primary and secondary diesel PM. In contrast to ozone, which is a product of complex photochemical reactions and therefore difficult to directly relate to precursor emissions, ambient PM₁₀ concentrations are more directly influenced by emissions of PM and can therefore be correlated more meaningfully with emissions inventories. Lower ambient PM levels and reduced exposure mean reduction of the prevalence of the diseases attributed to diesel PM, reduced incidences of hospitalizations, and prevention of premature deaths.

2. Reduced Ambient Ozone Levels

Emissions of NO_x are precursors to the formation of ozone in the lower atmosphere. Ozone can have adverse health impacts at concentrations that do not exceed the 1-hour NAAQS. Mobile sources contribute a substantial fraction of ozone precursors in any metropolitan area. Therefore, reduction of diesel mobile source emissions of NO_x in urban areas, through the use of CARB low sulfur (15 ppmw) diesel fuel and exhaust aftertreatment systems, would make a considerable contribution to reducing exposures to ambient ozone. Controlling emissions of ozone precursors would reduce the prevalence of the types of adverse respiratory effects associated with ozone exposure and would reduce hospital admissions and emergency visits for respiratory effects.

VI. INTRASTATE LOCOMOTIVES: OPERATIONS, FUEL CONSUMPTION, AND EMISSION STUDIES

This chapter provides an overview of California railroads that operate intrastate diesel-electric locomotives. This chapter also includes information about the ARB locomotive survey that was sent to operators of intrastate locomotives. Further, this chapter explains how the information collected in the ARB survey was used to estimate intrastate locomotive fuel consumption for each region of the state and for each type of railroad. Finally, this chapter examines existing test programs and studies on the emission benefits of using CARB diesel fuel as compared to U.S. EPA on-road diesel fuel and nonroad diesel fuel in locomotives.

A. Diesel-Electric Locomotives

The proposed regulatory amendments would apply to intrastate diesel-electric locomotives. In this section ARB staff provides definitions of diesel-electric locomotives, how their engines work, and why diesel-electric locomotive engines operate in a different manner from motor vehicle engines.

1. Definition of a Diesel-Electric Locomotive

A "locomotive" is defined in U.S. EPA's locomotive regulations (1998) as "a self-propelled piece of on-track equipment designed for moving or propelling cars that are designed to carry freight, passengers or other equipment, but which itself is not designed or intended to carry freight, passengers (other than those operating the locomotive) or other equipment." Diesel-electric locomotives are defined by the railroad industry as those locomotives that use electric power provided by a diesel engine that drives a generator or alternator; the electrical power produced then drives the wheels using electric motors.

2. Use of Engine Power on a Diesel-Electric Locomotive

The fuel (usually diesel fuel in the United States) for an "engine-powered" locomotive is carried on the locomotive. The energy contained in the fuel is converted to power by burning the fuel in the locomotive engine. A small portion of the engine output power is normally used directly to drive an air compressor to provide brakes for the locomotive and train. However, the vast majority of the output power from the engine is converted to electrical energy in an alternator or generator which is directly connected to the engine. This electrical energy is transmitted to electric motors (traction motors) connected directly to the drive wheels of the locomotive for propulsion, as well as to motors which drive the cooling fans, pumps, etc., necessary for operation of the engine and the locomotive.

3. Differences Between Motor Vehicles and Diesel-Electric Locomotive Engines

One feature of locomotives that makes them different from motor vehicles is the way that power is transferred from the engine to the wheels. Most motor vehicles utilize mechanical means (*i.e.*, a transmission) to transfer energy from the engine to the wheels or other point where the power is applied. Because there is a mechanical connection between the road vehicle engine and the wheels, the relationship between engine rotational speed and vehicle speed is mechanically

dictated by the gear ratios in the transmission and final drive (e.g., the differential and rear axle). This results in engine operation which is very transient in nature, with respect to changes in both speed and load. In contrast, locomotive engines are typically connected to an electrical alternator or generator to convert the mechanical energy to electricity. As noted above, this electricity is then used to power traction motors which turn the wheels. The effect of this arrangement is that a locomotive engine can be operated at a desired power output and corresponding engine speed (steady-state) without being constrained by vehicle speed.

4. Use of Hotel Power on Passenger Trains

Hotel power is that electrical power generated on a locomotive to provide comfort for passengers aboard a train. Hotel power includes electrical demand for lighting, air conditioning, heating, kitchen power, and other uses that do not relate to actually moving the train. The electricity demand for hotel power to all of the passenger cars on a train can amount to as much as 800 KW (1,070 horsepower). Hotel power on a passenger locomotive is usually supplied either as a draw from the main propulsion engine, or from a head-end power engine or HEP. In some instances, a special generator car or engines mounted underneath one or more of the passenger cars on the train is used.

In older passenger train locomotives, hotel power is drawn from the main propulsion engine and this drain on the main engine can affect the fuel consumption and operations of the main propulsion engine. Since electrical demand can vary, the supply of hotel power will result in different speed and load points to generate similar propulsion power. These differences in speed and load points mean that locomotive engines will have different emissions characteristics when providing hotel power, as compared to a non-HEP equipped locomotive providing propulsion energy only.

In most newer passenger trains, however, electrical energy required for the operation of the passenger coaches is supplied by a separate auxiliary engine mounted on the locomotive, but operated separately from the main propulsion engine. Most of California's intrastate passenger trains are newer and have HEP engines that operate separately from the prime mover engine.

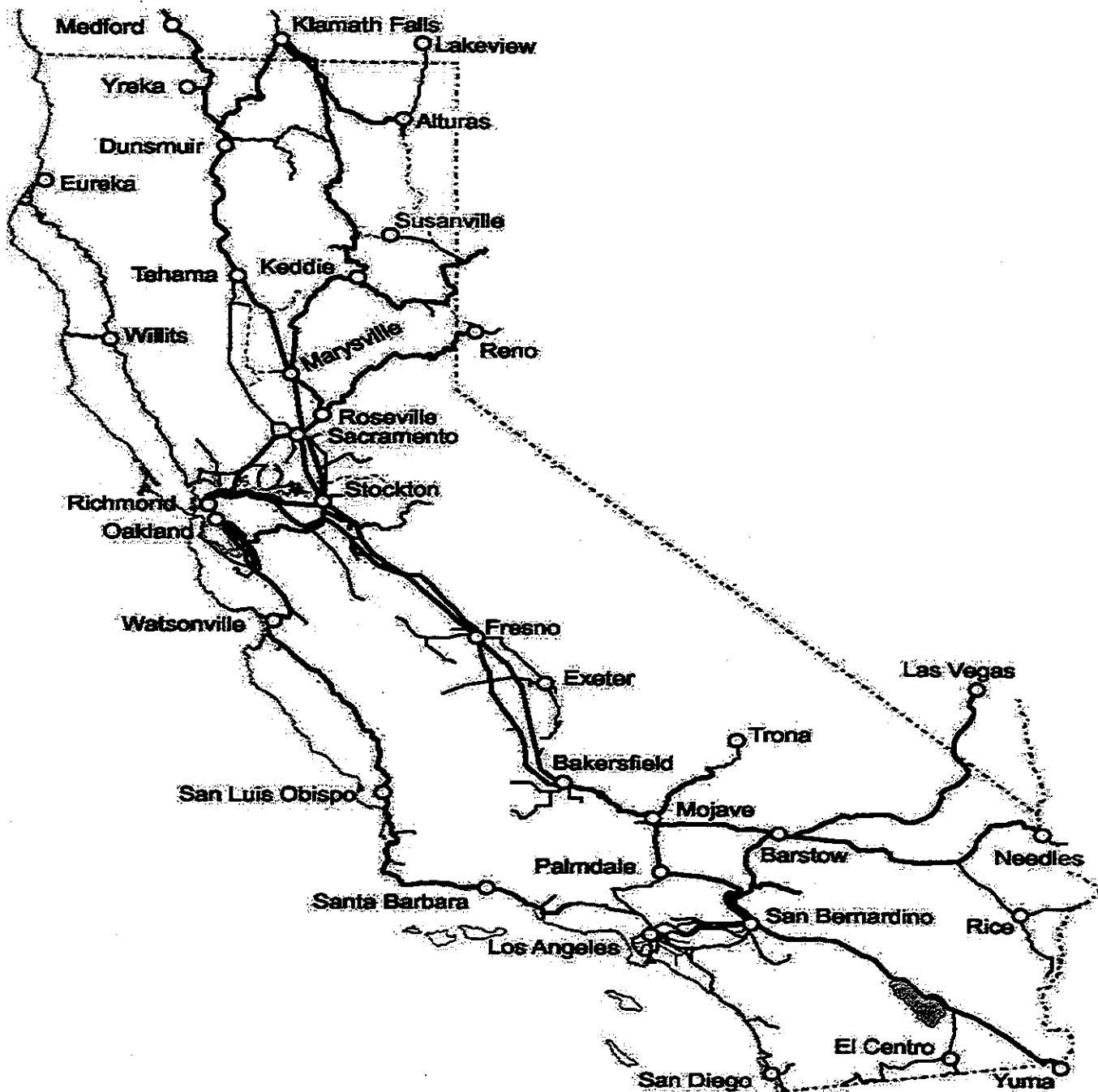
B. Types of Railroads that Operate in California

In the United States, railroads are classified through federal Surface Transportation Board (STB) regulations. STB classifies railroads into three categories based on annual operating revenues as prescribed in 49 CFR Chapter, X Part 1201, General Instruction 1-1(a). In 1992, the STB established national railroad classifications based on an average of three years of annual operating revenues and an annual inflation rate adjustment based on 1991 dollars:

- Class I railroad if annual revenue is \$255.9 million or greater,
- Class II railroad if annual revenue is between \$20.5 and 255.8 million,
- Class III railroad if annual revenue is less than \$20.5 million.

Figure VI-1 shows the railroad lines operating in California. The heavy (thick) line denotes Class I railroads. The thin line denotes Class II and III railroads.

Figure VI-1
California Class I and Class III Railroads



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1. Class I Freight Railroads

The Class I freight railroads are the nationwide, long distance, line-haul railroads which carry the bulk of the railroad commerce. Class I freight railroads account for nearly 90 percent of the ton-miles of freight hauled annually in the United States. The two Class I freight railroad companies that operate in California are Union Pacific Railroad (UP) and the Burlington Northern & Santa Fe Railroad (BNSF). While UP and BNSF provide freight services across the United States, they also have significant intrastate operations in California.

2. Passenger Railroads

California's sole Class I passenger railroad operator is Amtrak, which has both interstate and intrastate passenger train operations. Amtrak is the major interstate passenger train operator in California with a number of interstate lines that originate or terminate within the state. Amtrak does operate one intrastate passenger line (the Pacific Surfliner) from Oceanside to San Luis Obispo, and contractually operates both the San Joaquin and Capitol Corridor passenger trains for the California Department of Transportation (CalTrans).

There are also four regional and local government funded intrastate passenger-commuter and inter-city operations in California. These are:

- Metrolink in the Los Angeles area.
- Caltrain in the Bay Area.
- Coaster between San Diego and Oceanside.
- Altamont Commuter Express (ACE) between Stockton and San Jose.

A list of California's intrastate passenger trains is provided in Appendix B.

3. Class II Railroads

There is currently no Class II railroad operating in California that meets the proposed intrastate definition. A Class II railroad headquartered in Oregon does operate on a regular basis, but a small percentage of time, within California (i.e., Medford, Oregon to Weed, California). Class II railroads are being described here because a California Class III intrastate railroad could expand in the future, via mergers or consolidations, into a Class II railroad.

4. Class III Railroads

There are several Class III railroad companies operating within the state. These companies range from excursion operations to short distance line haul operations (i.e., small regional railroads) and terminal operations at major distribution centers like the ports of Los Angeles and Long Beach. A list of Class III railroads that operate solely within California are provided in Appendix B. Also, note there are two interstate Class III railroads headquartered in adjacent states that have partial operations in California (the Lake County Railroad (Lakeview, Oregon to Alturas) and the Arizona California Railroad (Parker, Arizona to Cadiz).

5. *Industrial and Military Locomotives*

California has a small number of intrastate locomotives that are owned by individual (non-railroad) companies or operated by the federal government on military bases within the state. This class of locomotive is referred to as "industrial" locomotives and are generally much smaller in size and horsepower than other classes of locomotives used by the larger railroads. Industrial locomotive operations are usually limited to small confined yards or industrial plants. ARB staff has identified about 120 of these locomotives with over half of them in the San Joaquin Valley (40) and South Coast (25) air districts.

C. **CARB Intrastate Locomotive Survey on Operations and Fuel Consumption**

In May 2004, ARB staff developed a survey (see Appendix C) to collect operational and fuel consumption information to better understand the existing operations of intrastate locomotives in California. This survey was developed with the input of California's Class I railroads, passenger train operators, and the California Shortline Railroad Association (CSLRA). The survey defined intrastate diesel-electric locomotives as those locomotives that operate and fuel primarily (at or greater than 90 percent of annual fuel consumption, mileage, and/or hours of operation) within the boundaries of the state of California.

The ARB intrastate locomotive survey was prepared to determine the following information:

Locomotive and Engine Information

- Locomotive identification number.
- Manufacturing make and model.
- Locomotive year built and year engine rebuilt (if applicable).
- Any plans for future locomotive engine rebuilds.
- Whether the locomotive was owned or leased.

Locomotive Operational Information

- Primary operational use (i.e., Switcher, Terminal, Local/Short Haul, Passenger).
- Home Railyard.
- Key cities and towns on primary rail routes.
- Annual hours of operations (years 2001, 2002, and 2003).
- Annual (rail) miles travelled (years 2001, 2002, 2003).

Locomotive Fuel Consumption

- Type of diesel fuel used (i.e., ULSD CARB, CARB diesel, U.S. EPA on-road diesel, or other fuel (e.g., biodiesel)).
- Fuel consumption for the years 2001, 2002, and 2003.

On May 18, 2004, ARB staff mailed the survey to California's intrastate locomotive owners and operators. The survey was mailed to both Class I railroad operators (UP and BNSF), and Amtrak and CalTrans, as well as the other commuter train operators in California (i.e., Metrolink, CalTrain, Coaster, and ACE). The survey was also mailed to 28 Class III railroad operators, of which only 20 operated locomotives that met the intrastate definition. ARB staff worked with

the CSLRA to coordinate survey responses for their Class III railroad members. ARB staff requested all survey responses by June 28, 2004.

Survey responses were received from both of California's Class I railroads, all of the intrastate passenger railroad operators, and all but three of the twenty Class III railroads operators. For the three Class III railroad operators that did not respond to the survey, ARB staff obtained publicly available information on their locomotives and operations and developed estimates of fuel consumption, based on estimated annual miles traveled or annual hours of operation, to place in the survey database.

D. California's Intrastate Locomotive Population

As discussed in the previous section, there are four primary groups of intrastate locomotives that operate in California: 1) Class I freight railroads with short haul, switcher, and manifest operations, 2) passenger-commuter train operations that operate from city-to-city and usually within a particular area or region, 3) Class III short haul and switcher or terminal operations, and 4) individual company-owned industrial and military base locomotives that usually operate within a small confined yard or area

1. Class I Railroads

The UP and BNSF intrastate locomotives are generally segregated into three categories: switchers, short haul, and manifests. Switch locomotives generally operate within a railyard moving line haul locomotives and freight cars within the yard. Short hauls typically operate and move freight within a region or local area. Manifest operations are short hauls that operate in many yards (for intrastate purposes - usually within a region) by connecting mixed freight cars at different locations and eventually moving them to combine with larger or unit trains at central railyards.

Interstate line-haul locomotives are typically powered by engines of 4,000-6,000 horsepower. California's Class I railroads intrastate locomotives are usually older locomotives retired from line haul service. These locomotives are typically powered by engines with horsepower ranging from 1,500-4,000 horsepower. UP and BNSF combined operate about 383 intrastate locomotives in California. The average age of California's Class I intrastate locomotives is between 15 and 20 years. The Class I intrastate locomotives consume 23.3 million gallons annually within the state (about 60,000 gallons per locomotive per year). This information is summarized below in Table VI-1.

Table VI-1: Profile of Class I Railroad Intrastate Locomotives

| Class I Intrastate Locomotives | Range (HP) | Avg (HP) | Age Range (Years) | Average Age (Years) | Total Annual Fuel Consumption (Gallons) | Avg Annual Fuel Consumption Per Locomotive (Gallons) |
|--------------------------------|-------------|----------|-------------------|---------------------|---|--|
| 383 | 1,500-4,000 | 2,400 | 1-19 | 15 | 23,300,000 | 60,000 |

2. Passenger (Commuter) Trains

California's intrastate passenger trains consist of intercity-commuter type operations that occur exclusively within the state of California (see Appendix B). California's intrastate passenger trains utilize a fleet of 113 locomotives to support their operations, with two of the locomotives serving only as switchers in one railyard. The 111 intrastate passenger train locomotives are typically fairly new, on average 10 years old, with a range from 1 to 19 years old. The two switchers used to support intrastate passenger train operations are on average 40 years old and both are rated at 1,500 horsepower. This information is summarized in Table VI-2.

Table VI-2: Profile of Passenger Train Intrastate Locomotives

| Passenger Train Intrastate Locomotives | Range (HP) | Avg (HP) | Age Range (Years) | Average Age (Years) | Total Annual Fuel Consumption (Gallons) | Avg Annual Fuel Consumption Per Locomotive (Gallons) |
|--|-------------|----------|-------------------|---------------------|---|--|
| 111 | 3,000-3,600 | 3,100 | 1-19 | 10 | 20,400,000 | 184,000 |

California's intrastate passenger train locomotives are powered by engines that are on average 3,000 horsepower or more. Passenger train locomotives are usually equipped with an auxiliary engine to provide separate hotel power for the train, although some older passenger locomotives may also generate hotel power off the main engine.

California's 111 intrastate passenger trains transport commuters an estimated 8 million miles per year. Based on the ARB survey results, these locomotives consume an estimated 20.4 million gallons per year, which includes fuel consumption for the two switch locomotives that are operated only to support passenger train operations. Intrastate passenger trains typically are moving passengers 8 or more hours per day, but in some cases may leave hotel power and prime engines idling the remaining 16 hours each day. California's regional passenger trains generally operate 365 days per year (e.g., Pacific Surfliner, San Joaquin, and Capitol Corridor), which the intercity passenger trains (e.g., Metrolink, CalTrain, Coaster, and ACE) are focused more on the work week with some limited operations on the weekends.

3. Class III Railroads

Class III railroads typically operate either short haul or switcher-terminal locomotives. California has twenty Class III railroads that operate 120 intrastate locomotives. California's Class III railroad intrastate operations can generally be segregated into two major subset groups: switcher-terminal operations (such as Pacific Harbor Lines which operates in Los Angeles and Long Beach harbors and Modesto Empire and Traction which operates in the Modesto industrial railyard) and short haul operations (such as San Joaquin Valley Railroad and the California Northern Railroad). California has three interstate Class II/III railroads for which information was not collected as they did not meet the intrastate definition.

Class III railroad locomotives in California are operated with a wide range in engine size. Engine size ranges from 150 horsepower to 3,000 horsepower, averaging about 1,640 horsepower, which is about half the average engine size of the locomotives used for intrastate passenger train operations. California's Class III railroads consume on average about 27,800 gallons of diesel fuel annually per locomotive. In many cases, Class III shortline railroads will purchase older locomotives when they are retired by Class I railroads. As such, the locomotives operated by Class III railroads are typically older compared to those operated by Class I railroads. California's Class III railroads operate intrastate locomotives that are on average 40 years old, with an age-range of 24 to 62 years. Based on the ARB survey results, Class III railroads consume an estimated 3.3 million gallons annually statewide. This information is summarized in Table VI-3.

Table VI-3: Profile of Class III Railroad Intrastate Locomotives

| Class III Intrastate Locomotives | Range (HP) | Avg (HP) | Age Range (Years) | Average Age (Years) | Total Annual Fuel Consumption (Gallons) | Avg. Annual Fuel Consumption Per Locomotive (Gallons) |
|----------------------------------|------------|----------|-------------------|---------------------|---|---|
| 120 | 150-3,000 | 1,640 | 24-62 | 40 | 3,336,000 | 27,800 |

4. Industrial and Military Locomotives

Industrial and military locomotives are used by individual companies (e.g., oil, chemical, agricultural) and the military for localized operations. These types of locomotives are typically less than 2,000 horsepower and average about 1,000 horsepower. Railroad enthusiasts refer to a large subset of these types of locomotives as "critters", those military and industrial locomotives ranging between 150 to 1,000 horsepower and limited to particular companies and specific yards.

Military and industrial locomotives are typically used intermittently throughout a calendar year, and usually limit their operations to a small confined yard or area. U.S. EPA's locomotive regulations specifically define that engines with rated horsepower of less than 750 kw (1,006 hp) are not locomotives (40 CFR Parts 86 and 89) for purposes of the federal locomotive regulations.

ARB staff did not survey industrial and military locomotive operators in California due to the difficulty in identifying all of the individual organizations with these types of locomotives.

However, ARB staff did receive information from a railroad industry organization with a list of known industrial locomotives in the SCAQMD and SJVUAPCD. ARB staff also did internet searches to identify known locomotive rosters for military and other industrial locomotives located in other areas in California. Based on available information, it is estimated that individual companies and the military operate approximately 117 intrastate industrial and military locomotives in California.

E. Fuel Consumption for California's Intrastate Locomotives

Table VI-4 presents estimates of the fuel consumption for the Class I freight, passenger train, and Class III railroads intrastate locomotives, by region of the state. As can be seen, statewide intrastate locomotives consume over 47 million gallons of diesel fuel annually, which represents about 1.0 percent of California's total estimated annual diesel fuel production of about 4.6 billion gallons (both CARB and U.S. EPA on-road). Of the 47 million gallons consumed annually by intrastate locomotives, about 60 percent (28.4 million gallons) is CARB or CARB low sulfur diesel fuels (CARB diesel fuel already meeting a 15 ppmw sulfur cap). The remainder of the 47 million gallons consumed by intrastate locomotives is primarily EPA on-road diesel fuel (over 18 millions gallons), with a small amount of high sulfur federal nonroad diesel fuel (300,000 gallons annually).

**Table VI-4: Intrastate Locomotive Diesel Fuel Consumption by Region
(Millions of Gallons)**

| Region | CARB Low Sulfur | CARB | U.S. EPA On-road | U.S. EPA Nonroad | Total |
|-----------------|-----------------|-------------|------------------|------------------|-------------|
| South Coast | 5.0 | 3.9 | 10.1 | 0 | 19.0 |
| Bay Area | 0 | 8.1 | 0.4 | 0 | 8.5 |
| San Joaquin | 0 | 4.3 | 3.5 | 0.2 | 8.0 |
| Mojave Desert | 0 | 0.6 | 3.3 | 0 | 3.9 |
| Sacramento Area | 0 | 2.9 | 0 | 0 | 2.9 |
| San Diego | 0.8 | 0.1 | 0 | 0 | 0.9 |
| REST OF STATE | 0 | 2.7 | 1.0 | 0.1 | 3.8 |
| Total * | 5.8 | 22.6 | 18.3 | 0.3 | 47.0 |

* may not add due to rounding.

As can be seen in Table VI-5 below, Class I freight intrastate locomotives accounted for 23.3 million gallons, or about half (50 percent) of the total intrastate locomotive fuel volume. Nearly 17 million gallons or 73 percent of Class I freight railroad intrastate locomotive diesel fuel consumption is non-CARB diesel fuel, but which meets U.S. EPA on-road diesel fuel specifications.

**Table VI-5: Intrastate Locomotive Diesel Fuel Consumption By Type of Railroad
(Millions of Gallons)**

| Type of Railroad | CARB Low Sulfur | CARB | U.S. EPA On-road | U.S. EPA Nonroad | Total |
|------------------|--------------------|-------------|---------------------|---------------------|-------------|
| Class I Freight | 0 | 6.4 | 16.9 | 0 | 23.3 |
| Passenger Trains | 5.8 | 14.1 | 0.5 | 0 | 20.4 |
| Class III | 0 | 2.1 | 0.9 | 0.3 | 3.3 |
| Total * | 5.8 | 22.6 | 18.3 | .3 | 47.0 |

* Numbers may not add due to rounding.

Passenger trains consume over 20 million gallons of diesel fuel annually, about 43 percent of the state's intrastate locomotive diesel fuel consumption, which is an amount slightly less than the Class I freight railroads. However, most of the passenger train diesel fuel consumption is CARB diesel, with less than 500,000 gallons annually of EPA on-road diesel fuel used, or about 2 percent of their total diesel fuel consumption. It is interesting to note that almost 30 percent of the passenger train diesel fuel consumption is low sulfur (15 ppmw) CARB diesel.

Class III railroads represent a small percentage (7 percent) of the intrastate locomotive diesel fuel consumption, with 3.3 million gallons of total annual diesel fuel consumption and nearly two-thirds (65 percent) of their diesel fuel consumption being CARB diesel fuel. The Class III railroads consume slightly over 1 million gallons annually of non-CARB diesel fuel.

F. Interstate Locomotive Activities in California

Both UP and BNSF have extensive national railroad freight operations. A component of those operations is the flexibility to move locomotives around the country to locations where they are needed. Because of this, unlike intrastate locomotives where the locomotives typically never leave the state, the in-state operations of interstate line-haul locomotives present in California are typically transitory in nature. An interstate locomotive present in California on one day may end up in another part of the country within a matter of days. This is in contrast to intrastate locomotives which typically never leave the state.

Interstate line-haul locomotives are typically powered by engines of 4,000-6,000 horsepower and a particular interstate locomotive may not remain in California for an extended period. As is discussed in the following sections, these locomotives consume significant quantities of diesel fuel, and are responsible for a significant quantity of emissions.

1. Interstate Locomotive Fuel Consumption

Table VI-6 shows the California diesel fuel consumption of both intrastate and interstate locomotives operated by UP and BNSF.

**Table VI-6: Class I Freight Locomotive Fuel Consumption in California
(Millions of Gallons)**

| Type of Locomotive Activity | CARB Low Sulfur | CARB | U.S. EPA On-road | U.S. EPA Nonroad | Total |
|-----------------------------|-----------------|------|------------------|------------------|-------|
| Intrastate | 0 | 6.4 | 16.9 | 0 | 23.3 |
| Interstate | 0 | 11.5 | 89.0 | 70.0 | 170.5 |
| Total | 0 | 17.9 | 105.9 | 70.0 | 193.8 |

As can be seen from Table VI-6, intrastate locomotive fuel consumption represents only a small portion (about 12 percent) of the total fuel consumed by Class I freight locomotives in California. The remaining fuel consumption is in interstate locomotives. These locomotives consume about 11.6 million gallons of CARB diesel fuel and almost 90 million gallons of U.S. EPA on-road diesel fuel in California annually. Typically, the CARB and U.S. EPA on-road diesel fuel consumed in California by interstate locomotives is supplied from a railyard or other fueling facility in California.

However, unlike intrastate locomotives, where all of the fuel consumed by the locomotive is supplied within the state, interstate locomotives consume significant quantities of fuel supplied out-of-state and brought into the state in the locomotive's on-board fuel tanks. This diesel fuel is typically U.S. EPA nonroad diesel fuel, with high fuel sulfur levels (averaging about 3,000 ppmw) and high aromatics levels. Because of this, unlike intrastate locomotives operated by the Class I freight railroads, not all of the diesel fuel consumed by interstate locomotives meets on-road (either CARB or U.S. EPA) diesel fuel standards.

2. Interstate Locomotive Emission Inventory

Commensurate with their substantially larger fuel consumption, emissions from interstate locomotives are more significant than those from intrastate locomotives. Table VI-7 shows the emission inventory for Class I freight locomotives in California.

**Table VI-7: Interstate Locomotive Emission Inventory
(tons per day)**

| Region | NO _x | PM | SO ₂ |
|---------------------|-----------------|------------|-----------------|
| South Coast | 24.9 | 0.6 | 1.1 |
| Bay Area | 6.2 | 0.2 | 0.3 |
| San Joaquin | 22.0 | 0.5 | 1.0 |
| Sacramento Valley | 21.0 | 0.5 | 1.0 |
| South Central Coast | 6.7 | 0.2 | 0.3 |
| San Diego | 0.2 | 0 | 0 |
| Mojave Desert | 46.0 | 1.3 | 2.1 |
| Rest of the State | 26.6 | 0.7 | 1.2 |
| Total | 153.6 | 4.0 | 7.0 |

As can be seen in Table VI-7, Mojave Desert Air Basin accounts for 30 percent of the total interstate locomotive NOx and PM emissions in California. SCAQMD, San Joaquin Valley, and Sacramento Valley each account for 17 percent of the total NOx and PM interstate locomotive emissions. Combined these four regions of the state account for over 80 percent of the statewide NOx and particulate emissions from interstate locomotives.

G. Summary of the Benefits of Clean Fuels in Diesel-Electric Locomotives

In this section, staff has provided a summary of the benefits of cleaner fuels in diesel-electric locomotives.

1. NOx

In 2000, the Southwest Research Institute (SWRI) conducted a test program to quantify emissions of two types of locomotive engines using selected diesel fuels. Emission testing was performed between August 1998 and May 1999 at the SWRI Locomotive Exhaust Emissions Test Center in San Antonio, Texas. Locomotive exhaust emission and fuel consumption measurements were performed on six late-model locomotives:

- Three (3) - 4,000 horsepower EMD SD70MAC
- Three (3) - 4,400 horsepower GE DASH944CW

This test program made regulated and selected unregulated exhaust emission measurements on six locomotives, each operating on commercially available CARB diesel fuel, federal on-highway diesel, and a high-sulfur (4,760 ppmw) nonroad diesel fuel. Due to the fact that the sulfur level of the "high sulfur" fuel was higher than the nonroad diesel fuel typically purchased by the railroads, a fourth fuel was also used in the three GE locomotives, which was a nonroad fuel with a sulfur level of 3,190 ppmw. This fourth fuel is considered to be more representative of high sulfur nonroad diesel fuels used by the railroads. Table VI-8 shows some of the key properties of these four test fuels.

Table VI-8: SWRI Locomotive Test Program: Key Diesel Fuel Properties

| Property | ASTM Test Method | CARB | | U.S. EPA On-road | | U.S. EPA Nonroad | |
|----------------------|------------------|-----------|---------------|------------------|---------------|------------------|-----------|
| | | Test Fuel | In-Use Levels | Test Fuel | In-Use Levels | Test Fuel | Test Fuel |
| Sulfur (ppmw) | D2622-94 | 50 | 140 | 330 | 360 | 4,760 | 3,190 |
| Cetane Index | D976 | 52.0 | 50 | 47.8 | 45 | 48.6 | 46.5 |
| Aromatics (% Volume) | D5186-96 | 22.4 | 19 | 32.2 | 35 | 34.4 | 39.8 |

A summary of the relative emissions difference for the line haul weighted NOx results from the test program are shown below in Table VI-9. The test program indicated that the CARB test fuel emitted 3.4 percent lower NOx than the EPA low sulfur test fuel and about 6.7 percent less NOx than both of the high sulfur test fuels. However, ARB staff believes that the NOx emission benefits of transitioning from U.S. EPA on-highway diesel fuel to CARB diesel fuel are underreported. This is because U.S. EPA on-highway diesel fuel has aromatics levels in-use at

about 35 percent by volume, 3 percent by volume higher than the test fuel used. In addition, the aromatics content of average CARB diesel is about 19 percent, about 3 percent less than the CARB diesel used in the comparison test. Also, the cetane index number was higher on the U.S. EPA on-highway test fuel than in-use levels. These differences would tend to suppress the NOx emissions benefits. As such, ARB staff believes that the actual NOx emission benefits are closer to those shown from going from nonroad diesel fuel to CARB diesel fuel. As a result, CARB staff expects about a 6 percent reduction in NOx emissions from the use of CARB diesel fuel versus EPA on-road and nonroad diesel fuels. This estimate is more in line with a much larger body of test results of diesel engines that use lower aromatic and higher cetane diesel fuels.

Table VI-9: NOx Emissions Comparison - ARB Test Fuel vs. Others

| Engine | Cycle | U.S. EPA | | |
|---------------------------|----------|--------------|------------------|-----------------------------|
| | | On-road | Hi Sulfur (0.5%) | Nonroad Hi Sulfur (0.3%) |
| BNSF 9693 | 2-stroke | -3.0% | -6.3% | NA |
| BNSF 9754 | 2-stroke | -3.8% | -4.1% | NA |
| BNSF 9696 | 2-stroke | -4.7% | -7.1% | NA |
| UP9715 | 4-stroke | -2.6% | -7.9% | -6.0% |
| UP9724 | 4-stroke | -4.3% | -8.2% | -5.6% |
| UP 9733 | 4-stroke | -2.5% | -6.2% | -5.1% |
| Average Difference | | -3.4% | -6.7% | -5.6% |

2. SOx

Intrastate locomotives and harborcraft will realize over a 95 percent reduction in SOx emissions by using CARB low sulfur (15 ppmw) or U.S. EPA on-road diesel fuels as compared to U.S. EPA nonroad diesel fuel in 2007. In 2007, U.S. EPA nonroad diesel fuel will have a sulfur maximum limit of 500 ppmw. Current in-use levels for U.S. EPA on-road diesel fuel nationwide is about 350 ppmw. Staff assumes that when the U.S. EPA nonroad diesel fuel requirements begin in 2007, that refiners will produce this diesel fuel in-use with sulfur levels about 350 ppmw. When diesel fuel is consumed the fuel sulfur is converted to SOx and emitted to the atmosphere. As such, a 95 percent reduction in fuel sulfur levels will result in a 95 percent reduction in SOx emissions.

3. PM

Directly Emitted PM

The SWRI study also examined the PM benefits of CARB diesel fuel relative to U.S. EPA fuels. The findings of the SWRI study indicated that the PM emissions were significantly lower on the CARB diesel fuel and the U.S. EPA on-road diesel fuel as compared to the high sulfur test diesel fuels. PM emissions decreased 26 percent with the CARB test diesel fuel as compared to the high sulfur diesel fuels. The difference between the CARB test diesel fuel and the EPA on-road test diesel fuel was small. Only on one engine were the PM results significantly lower with the CARB diesel fuel as compared to U.S. EPA on-road diesel fuel. Part of the reason the

differences were small is that at low diesel fuel sulfur levels, the relatively high engine oil consumption (and its contribution to PM emissions) masks the differences in fuel properties.

However, ARB staff believes that the PM emission benefits of transitioning from U.S. EPA on-road diesel fuel to CARB diesel fuel were under represented, as was the case with the NO_x benefits. Again, this is due to differences in the test fuel properties relative to actual in-use levels as was discussed in the previous section. As such, ARB staff believes that the actual PM emission benefits are similar to those observed transitioning from nonroad diesel fuel to CARB diesel fuel. As a result, ARB staff expects about a 14 percent reduction in PM emissions from the use of CARB diesel fuel as compared to U.S. EPA on-road and nonroad diesel fuels.

Indirectly Emitted PM:

SO_x emissions from diesel-powered engines are proportional to fuel sulfur levels. As was discussed in Chapter V, SO_x emissions result in the formation of secondary particulate in the atmosphere. The U.S. EPA estimates that SO₂ reacts in the atmosphere to form either ammonium sulfate or ammonium bisulfate.

The U.S. EPA estimates that about 12 percent of SO₂ emitted in urban areas is converted in the atmosphere to sulfate PM. Using U.S. EPA's methodology, which assumes 12 percent of the SO₂ forms sulfate PM, and correcting for the differences in the molecular weight between ammonium sulfate and ammonium bisulfate and SO₂, staff estimated the indirect PM reductions from the use of CARB diesel fuel.

Like SO_x, NO_x emissions serve as a precursor to the formation of secondary particulate matter emissions. This formation is through the oxidation of NO_x into nitric acid, which then reacts with gaseous ammonia to form ammonium nitrate. Staff estimates that the NO_x emission reductions achieved through the proposed amendments would provide about a 0.03 percent reduction in ambient particulate levels. This corresponds to less than a 0.02 tpd reduction in secondary particulate matter emissions from intrastate locomotives and harborcraft.

VII. HARBORCRAFT - CALIFORNIA OPERATIONS AND EMISSIONS

This chapter provides an overview of the different types of diesel powered harborcraft operating in California. In this chapter, staff also provides estimates of the quantities and types of diesel fuel these harbor craft consume.

Much of the information in this chapter is based on the results of a 2002 survey of commercial harborcraft conducted by the ARB staff. The survey collected information about the various commercial harborcraft operating in California to help update the statewide emissions inventory for commercial marine vessels operating in the State. The survey did not collect information on recreational diesel powered vessels, so other sources of information were used for these vessels. As noted below, recreational diesel engines account for a relatively small percentage of the total harborcraft emissions inventory.

A. Types of Harborcraft Operating in California

Harborcraft are marine vessels that operate primarily along California's coastline, and in inland waterways. They include a wide variety of vessels such as tug/tow boats, commercial fishing vessels, commercial passenger fishing vessels ("party boats"), pilot boats, work boats, crew/supply boats, ferries/excursion vessels, military vessels, and diesel powered recreational vessels. Brief descriptions of each type of vessel follows:

Tug/Tow Boats: These vessels are designed to move large oceangoing ships into and out of berths, or to tow barges (unpowered vessels) between ports.

Commercial Fishing Vessels: Vessels dedicated to the search and collection of fish or other sea life for the purpose of sale at market.

Commercial Passenger Fishing Vessels: Vessels for hire by the general public dedicated to fishing for sport or personal consumption.

Work Boats: Vessels used to perform duties such as fire/rescue, law enforcement, hydrographic surveys, spill/response, research, training, and construction.

Crew/Supply Boats: Vessels used for carrying personnel and supplies to and from off-shore and in-harbor locations, such as offshore work platforms, construction sites, and other vessels.

Ferries/Excursion: Vessels operated for public use in the transportation of persons or property. Ferries are generally used primarily as a means of transportation, while excursion vessels are often used for pleasure and tourism (harbor tours, weddings, etc.).

Military: Vessels used by the Coast Guard or other branches of the military. For example, Coast Guard utility boats, patrol boats, and buoy tenders.

Recreational Vessels: Diesel powered vessels used for pleasure, including cabin cruisers, inboard runabouts, and yachts.

Table VII-1 below shows a breakdown by the number of vessels for each sector of commercial harborcraft, based on the ARB's 2002 survey. As shown, commercial fishing vessels account for the largest number of vessels by far. ARB's 2002 survey did not cover recreational vessels. However, a recent EPA staff report noted that the diesel engines used on recreational craft tend to be inboard cabin cruisers, with a limited number of sterndrive vessels and very few outboard designs ("Final Regulatory Support Document: Control of Emissions from Unregulated Nonroad Engines;" U.S. EPA, September, 2002).

Table VII-1: Commercial Harborcraft Use

| Type of Vessel | Number of Vessels | Total |
|--------------------------|-------------------|-------------|
| Commercial Fishing Boats | 2,520 | 64% |
| Charter Fishing Boats | 512 | 13% |
| Ferry/Excursion Boats | 412 | 11% |
| Tug Boats | 128 | 3% |
| Other | 136 | 3% |
| Work Boats | 87 | 2% |
| Crew Boats | 70 | 2% |
| Tow Boats | 35 | 1% |
| Pilot Boats | 24 | 1% |
| Total * | 3,924 | 100% |

* Based on December 2002 ARB Commercial Harborcraft Survey, USCG, CDFG and other sources.

B. Harborcraft Operational Range

As mentioned above, harborcraft are marine vessels that operate primarily along California's coastline, and in inland waterways. As shown in Figure VII-1, most commercial harborcraft spend the majority of their time operating within 25 miles of shoreline, with very little operation greater than 100 miles offshore. This is significant because it means that the majority of their emissions are likely to impact California's air quality. More specifically, their emissions are primarily within "California Coastal Waters (CCW)," the boundary within which emissions are likely to be transported ashore and affect air quality in California's coastal air basins. CCW ranges from 27 to 102 miles offshore as shown in Figure VII-2. Development of the definition of CCW was based on over 500 thousand island, shipboard, and coastal meteorological observations. These data were taken from official records of a number of agencies including the U.S. Weather Bureau, Coast Guard, Navy, Air Force, Marine Corps., Civil Aeronautics Administration and Army Air Force. ("Report to the California Legislature on Air Pollutant Emissions from Marine Vessels;" ARB, 1984).

Figure VII-1
Percent of Vessel Hours Operated at Varying Distances from Shore

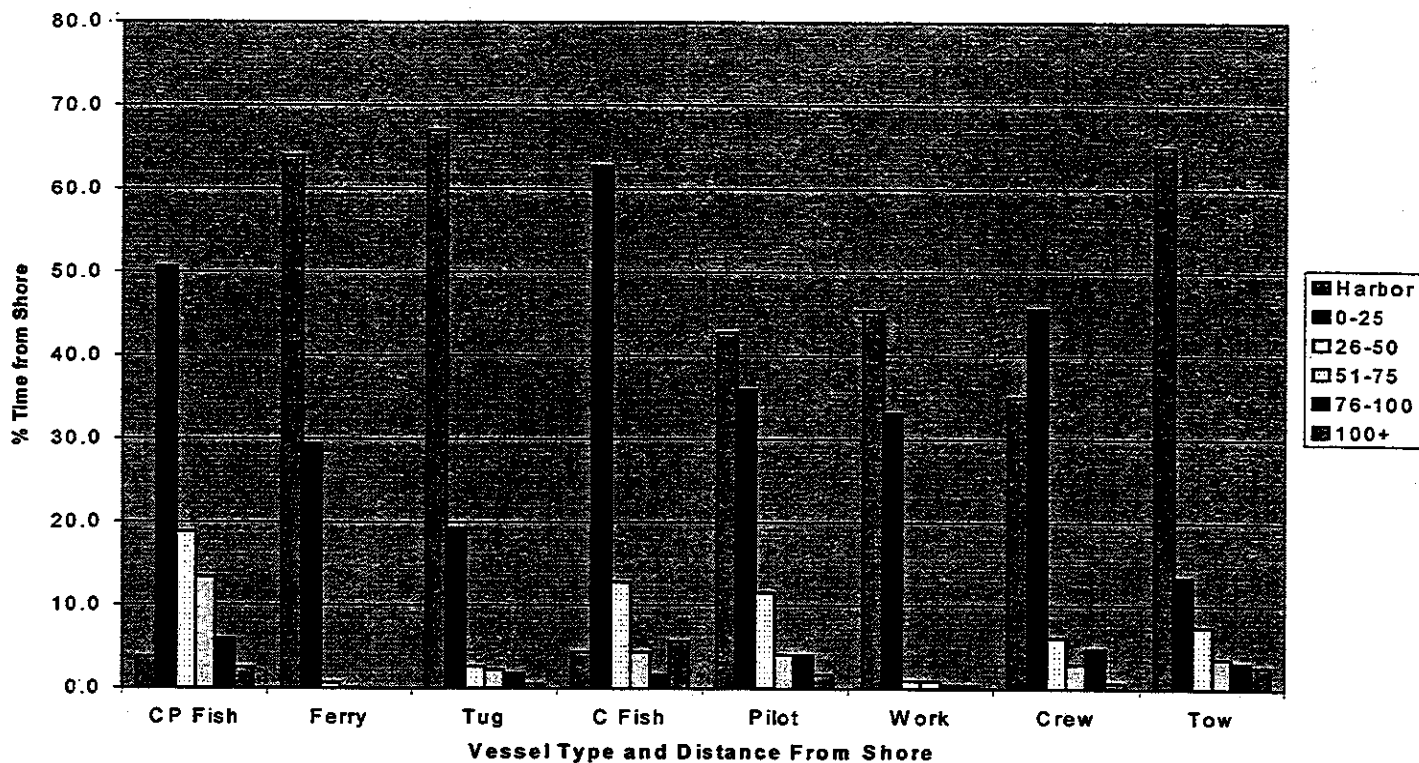
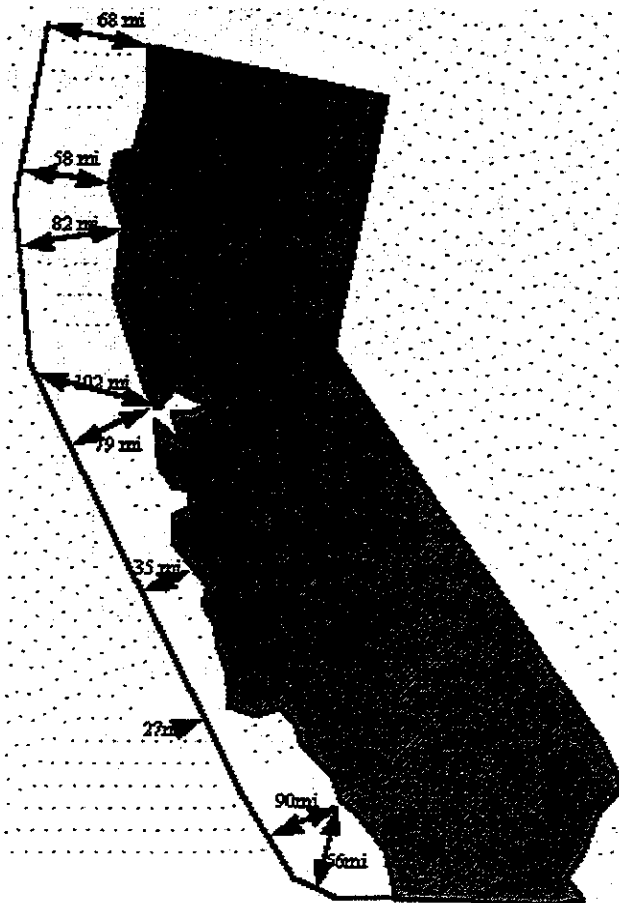


Figure VII-2: California Coastal Waters



C. Harborcraft Distinction from Oceangoing Ships

Harborcraft include all marine vessels except oceangoing ships. Oceangoing ships are not distinct from harborcraft because they travel internationally, generally burn heavy fuel oil in their main engines, and often do not take on fuel when they visit California ports. Oceangoing ships are generally defined as vessels that meet any one of the following criteria:

- (1) a foreign trade vessel with a "registry" endorsement on their United States Coast Guard certificate of documentation, or registration under the flag of another country.
- (2) a vessel greater than or equal to 400 feet in length overall (LOA) as defined in 50 CFR § 679.2.
- (3) a vessel of 10,000 gross tons (GT ITC) or greater per the convention measurement (international system) as defined in 46 CFR 69 Subpart B.
- (4) a vessel propelled by a marine diesel engine with a per-cylinder displacement of 30 liters or more (United States Environmental Protection Agency "category 3" engine).

Since most oceangoing ships visiting California's ports are foreign-flagged vessels, the first criteria will cover the vast majority of oceangoing ships in California. The remaining three categories cover oceangoing ships involved in the domestic trade, such as tankers traveling between California and Alaska, and cargo vessels traveling between California and Hawaii.

D. Types of Engines Used in Commercial Harborcraft

Harborcraft have one or more propulsion engines, and often auxiliary engines as well. Based on the ARB's 2002 survey, 63 percent of commercial harborcraft have one propulsion engine, 33 percent have two, and the remaining have more than two. Data on the manufacturers of propulsion engines is provided in Figure VII-3. As shown, Detroit Diesel engines are most common, followed by Caterpillar, Cummins, and a number of other manufacturers. Table VII-2 shows the range and average horsepower for different types of harborcraft. As shown, these engines range in horsepower from less than 50 to nearly 4,000. In general, tugs have the highest horsepower engines, averaging about 1300 horsepower. Commercial fishing and work boats, at the other end of the spectrum, averaged a little over 200 horsepower.

Figure VII-3: Commercial Harborcraft Propulsion Engine Manufacturers

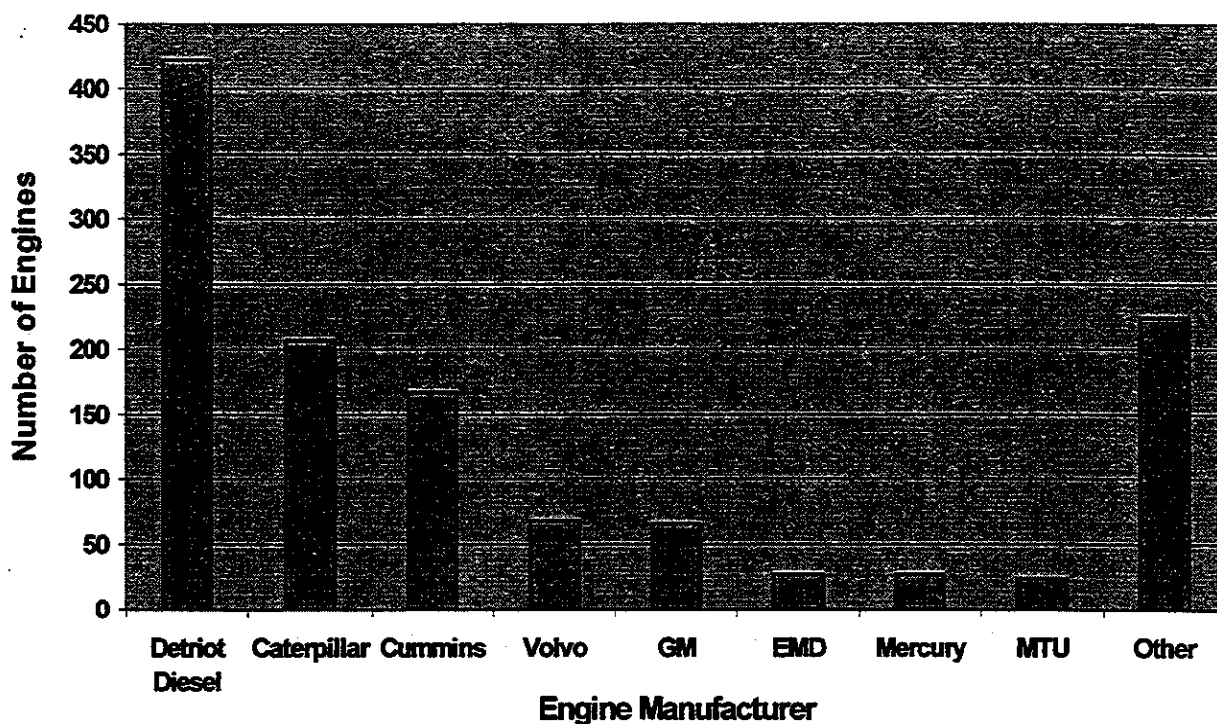


Table VII-2: Propulsion Engine Horsepower

| Type of Vessel | Horsepower | |
|------------------------------------|------------|---------|
| | Range | Average |
| Commercial Fishing Boats | 8 – 1,485 | 230 |
| Commercial Passenger Fishing Boats | 80 – 1,400 | 381 |
| Ferry Boats | 35 – 3,110 | 733 |
| Tug Boats | 24 – 3,600 | 1,274 |
| Work Boats | 15 – 1,300 | 239 |
| Other | 28 – 764 | 281 |
| Crew Boats | 225 – 750 | 439 |
| Tow Boats | 24 – 1,500 | 500 |
| Pilot Boats | 230 – 550 | 408 |

Auxiliary engines are used to power on-board equipment such as electrical lights, refrigeration units, and radios. Based on the ARB's 2002 survey, about 40 percent of harborcraft have auxiliary engines. Of those vessels with auxiliary engines, 56 percent reported having one engine, 38 percent reported having two, and 5 percent reported have three to five. Figure VII-4 provides information on the manufacturers of these engines. Detroit Diesel engines are the most

prevalent, as with propulsion engines. Table VII-3 shows the power range for auxiliary engines used on different types of harborcraft. As shown, these engines ranged from 4-400 horsepower.

Figure VII-4: Harborcraft Auxiliary Engine Manufacturers

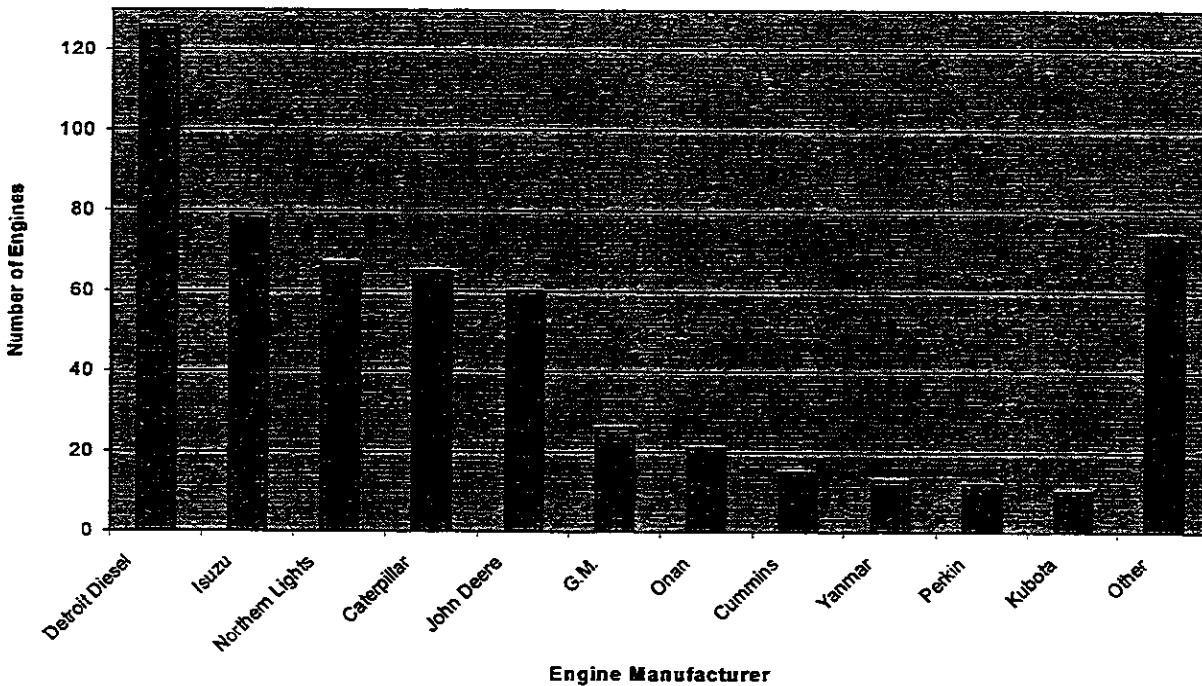


Table VII-3: Quantity of Auxiliary Engines and Average Horsepower

| Type of Vessel | Horsepower | |
|------------------------------------|------------|---------|
| | Range | Average |
| Commercial Fishing Boats | 6 - 300 | 71 |
| Tug Boats | 7 - 300 | 111 |
| Ferry Boats | 10 - 400 | 94 |
| Commercial Passenger Fishing Boats | 4 - 185 | 50 |
| Other | 10 - 240 | 56 |
| Work Boats | 9 - 221 | 101 |
| Crew Boats | 16 - 110 | 79 |
| Tow Boats | 18 - 175 | 79 |
| Pilot Boats | N/A | 30 |

E. Fuel Consumption in Commercial and Recreational Harborcraft

Harborcraft are estimated to consume nearly 90 million gallons of diesel fuel annually, as shown in Table VII-4. This estimate relies on data from ARB's 2002 Commercial Harborcraft Survey. Specifically, total annual fuel consumption from commercial harborcraft is estimated using the average annual fuel consumption per vessel from the survey respondents, and scaling this up for the total estimated number of commercial harborcraft in California. For recreational craft, diesel fuel consumption is estimated based on the ARB emissions inventory, as shown in Appendix D.

The estimated breakdown of CARB and U.S. EPA on-road diesel fuels was estimated based on the following:

- (1) a state law requiring that ferries use CARB on-road diesel fuel. Specifically, CARB diesel is required for ferries with a capacity to hold 75 or more passengers (California Harbors and Navigation Code Section 654.3);
- (2) information provided by the major suppliers of marine fuels in California. These suppliers have noted that U.S. EPA on-road diesel is the predominate diesel fuel used, except for coastal areas north of the Bay Area, where CARB diesel fuel is supplied to marine vessels as well as on-road heavy duty trucks, since the small volumes do not justify a dual distribution system. Suppliers indicated that very little federal nonroad diesel fuel is used by harborcraft in California; and
- (3) the ARB's 2002 Commercial Harborcraft Survey, which provides data by vessel type (e.g. ferries) and by region (e.g. north coast).

**Table VII-4: Harborcraft Fuel Consumption by Region
(Millions of gallons)**

| Type of Vessel | Total | CARB | U.S. EPA On-Road |
|--------------------------------------|-------------|-------------|------------------|
| Commercial Harborcraft (CHC)* | | | |
| S.F. Bay Area Air Basin | 27.0 | 10.2 | 16.8 |
| South Coast Air Basin | 23.8 | 10.8 | 13.0 |
| North Coast Air Basin | 6.0 | 6.0 | 0 |
| All Other Areas | 25.5 | 10.0 | 15.5 |
| Total CHC | 82.3 | 37.0 | 45.3 |
| Recreational Craft** | | | |
| S.F. Bay Area Air Basin | 0.4 | 0 | 0.4 |
| South Coast Air Basin | 1.8 | 0 | 1.8 |
| North Coast Air Basin | 0.1 | 0.1 | 0 |
| All Other Areas | 2.7 | 0 | 2.7 |
| Total Recreational Craft | 4.9 | 0.1 | 4.9 |
| Harborcraft Total | 87 | 37 | 50 |

* Commercial fuel consumption estimates based on 2002 ARB Commercial Harborcraft Survey. All ferries

** Recreational fuel consumption estimates based on 2003 ARB Emissions Inventory (See Appendix E)

Table VII-5 shows the fuel consumption by type of harborcraft. As shown, ferries consume the largest amount of fuel, followed by commercial fishing vessels, and tugboats.

**Table VII-5: Harborcraft Fuel Consumption by Type of Vessel
(Millions of gallons)**

| | 2002 | CARB | 2003 |
|--------------------------------------|-------------|-------------|-------------|
| <i>Commercial Harborcraft (CHC)*</i> | | | |
| Ferry/Excursion | 31.5 | 31.5 | 0 |
| Commercial Fishing | 17.4 | 4.5 | 12.9 |
| Tugs | 12.6 | 0.2 | 12.4 |
| Charter Fishing | 9.8 | 0.5 | 9.3 |
| Tow Boats | 4.7 | 0 | 4.7 |
| Crew and Supply | 3.7 | 0.3 | 3.4 |
| Work Boats | 1.5 | 0.1 | 1.4 |
| Pilot | 0.7 | 0 | 0.7 |
| Other | 0.4 | 0 | 0.4 |
| Total CHC | 82.3 | 37.0 | 45.3 |
| <i>Recreational Craft**</i> | 4.9 | 0.1 | 4.9 |
| Harborcraft Total | 87.2 | 37.1 | 50.2 |

* Commercial fuel consumption estimates based on 2002 ARB Commercial Harborcraft Survey.

** Recreational fuel consumption estimates based on 2003 ARB Emissions Inventory (See Appendix XX)

F. Benefits of Clean Fuels in Harborcraft

The benefits of cleaner fuels, such as CARB diesel fuel, in harborcraft are the same as those discussed for locomotives in Chapter VI. In summary, staff estimates that harborcraft would realize emission reductions of 6 percent NO_x, 14 percent PM, and over 95 percent SO_x from the use of CARB diesel fuel. In addition, the SO_x emission reductions would also provide a significant reduction in sulfates which would form PM indirectly.

VIII. PROPOSED AMENDMENTS FOR INTRASTATE LOCOMOTIVES

In this chapter, staff's proposed amendments extending the California motor vehicle diesel fuel standards to diesel fuel used in intrastate locomotives are discussed. The full text of the proposed regulatory language is contained in Appendix A. A discussion of the alternative regulatory concepts considered is provided in Chapter X.

A. Diesel Fuel Sold to Intrastate Locomotive Operators Statewide Beginning January 1, 2007

ARB staff is proposing that, beginning January 1, 2007, diesel fuel sold, supplied, or offered for use in California intrastate diesel-electric locomotives statewide be required to meet the specifications for vehicular diesel fuel, as specified in Title 13, CCR, sections 2281, 2282, and 2284.

The proposed effective date will ensure implementation of the proposed amendments prior to U.S. EPA's nonroad diesel fuel program implementation date of June 1, 2007. In addition, ARB staff believes implementing the proposed amendments on January 1, 2007, will provide adequate time for diesel fuel suppliers to complete the transition to U.S. EPA and CARB low sulfur (15 ppmw) diesel fuel for on-road, off-road, and stationary sources in California on June 1, 2006. Further, the proposed effective date would be in the winter, when diesel fuel demand is historically low, and diesel fuel inventories are typically at higher levels. Therefore, implementation during the winter months should reduce potential impacts on diesel fuel production and supply.

Under the proposal, California would receive the benefits of five years use of low sulfur (15 ppmw) diesel fuel over the federal nonroad diesel fuel program. In addition, neither the U.S. EPA on-road or nonroad diesel programs achieve the NO_x and PM emission reductions provided by the aromatic component of the CARB diesel fuel program.

B. Alternative Emission Control Plan

To provide flexibility to affected locomotive operators, staff is also proposing that operators of intrastate locomotives be provided the opportunity to participate in an alternative emission control plan (AECp). The AECp concept is intended to provide a less costly mechanism to comply with the proposed amendments. The AECp would allow the owner or operator of an intrastate diesel-electric locomotive to submit, for approval by the Executive Officer, a substitute fuel and/or emission control strategy. The substitute fuel and/or emission control strategy must achieve equivalent or greater reductions than those achieved solely through compliance with CARB diesel fuel requirements or which would otherwise be expected to be a best practices measure used to reduce emissions and exposure to PM around rail facilities. In addition, adequate enforcement provisions would be required. Further, a proposed AECp would need to be as protective as the use of CARB diesel in terms of reducing exposure to diesel PM for individuals living in areas that have existing local air pollution or localized air toxic impacts.

The AECF provisions are intended to provide the flexibility to intrastate locomotive operators to consider any combination of fuels, equipment, or operational changes at one or more of their rail facilities in the State. Some examples of these changes might include:

- The increased use of CARB diesel fuel in interstate locomotives.
- The use of alternative diesel fuels, such as biodiesel and emulsified fuels.
- Exhaust aftertreatment devices, such as diesel particulate filters or diesel oxidation catalysts.
- Engine modifications, such as cylinder liners for reduced lubrication oil consumption or engine timing adjustments.
- Replacement of a portion of the existing fleet with less polluting equipment, such as low horsepower, electric or hybrid switchers.

However, whatever approach is proposed, the AECF may not sacrifice emission reductions in one area or region at the expense of another, and could not take credit for other measures such as smoke reduction programs or efforts that would reduce unnecessary idling that should be implemented as best management practices around major rail facilities or are required by other regulations or agreements.

C. Definitions for Intrastate Locomotives

In this section, staff examines the proposed amendments and definitions recommended for diesel-electric locomotive and intrastate locomotive.

1. Definition of a Diesel-Electric Locomotive

A "locomotive" was defined in the U.S. EPA locomotive regulations (1998) as a self-propelled piece of on-track equipment designed for moving or propelling cars that are designed to carry freight, passengers or other equipment, but which itself is not designed or intended to carry freight, passengers (other than those operating the locomotive) or other equipment. Diesel-electric locomotives are defined by the railroad industry as those locomotives that use electric power provided by a diesel engine that drives a generator or alternator; the electrical power produced then drives the wheels using electric motors.

2. Definition of an Intrastate Locomotive

Staff is proposing that an intrastate locomotive be defined to include a diesel-electric locomotive that operates principally within California, where at least 90 percent of a locomotive's fuel consumption, hours of operation, or annual rail miles traveled occur within the boundaries of the state of California. This definition includes, but is not limited to, diesel-electric locomotives used in the following operations: passenger intercity and commuter, short haul, short line, switch, industrial, port, and terminal operations. This definition is intended to allow for some out-of-state operation of intrastate locomotives for such activities as repair or maintenance at facilities outside of the state, or infrequent operation in neighboring states, for up to 36 days per year.

Staff is proposing to not include in the definition of California intrastate locomotives those line-haul freight locomotives meeting the U.S. EPA's "Tier II" locomotive emission standards (for both NOx and PM) which primarily move freight into and out of the SCAQMD. This is in recognition that by 2010, both UP and BNSF will, under the federally enforceable railroad MOU in the SCAQMD, be required to meet a "Tier II" fleet average for NOx for their locomotive operations in the SCAQMD. This will achieve over a 60 percent reduction in NOx emissions from the operations of UP and BNSF within the SCAQMD. For UP and BNSF, meeting this fleet average will likely necessitate the deployment of dedicated Tier II locomotives for service into and out of the SCAQMD, beginning in 2005, creating a "new" captive intrastate locomotive fleet not currently present in the State. To the extent that these locomotives do use CARB diesel fuel, under the railroad MOU, the emission reductions achieved through the use of cleaner fuels are creditable towards the railroads Tier II fleet average and not to the use of CARB diesel. In addition, staff is investigating means to encourage the early introduction of Tier II locomotives in the rest of the state and may propose additional recommendations to the Board at the hearing.

However, under staff's proposed definition, switcher and short haul locomotives operated by UP and BNSF in the SCAQMD would continue to be subject to the proposed amendments, even if they meet the U.S. EPA Tier II emission standards. This is designed to preserve both the NOx and PM emission benefits achieved with the proposed amendments in and around railyards in the SCAQMD.

D. Structure of the regulations

The staff is proposing that the Board adopt two almost identical sections of the California Code of Regulations (CCR). Section 2299, title 13, CCR, would be in a new Chapter 5.1. Standards for Fuels For Nonvehicular Sources, and would regulate diesel fuel used in intrastate locomotives and harborcraft pursuant to ARB's Health and Safety Code section 43013 authority to adopt standards and regulations for locomotives and marine vessels. A second regulation – section 93116, title 17, CCR – would regulate diesel fuel used in intrastate locomotives and harborcraft as an Air Toxic Control Measure (ATCM) for nonvehicular sources. Both regulations would provide that all diesel fuel sold, offered for sale or supplied for use in harborcraft and intrastate diesel-electric locomotives on or after the implementation dates will be subject to all of ARB's requirements for California motor vehicle fuel on sulfur content, aromatic hydrocarbon content, and lubricity. Technical amendments would be made to the motor vehicle diesel fuel regulations to alert the reader of the applicability of the two new sections on diesel fuel for use in intrastate diesel-electric locomotives and harborcraft.

IX. PROPOSED AMENDMENTS FOR COMMERCIAL AND RECREATIONAL HARBORCRAFT

In this chapter, staff's proposed amendments extending the California motor vehicle diesel fuel standards to diesel fuel used in commercial and recreational harborcraft are discussed. The full text of the proposed regulatory language is contained in Appendix A. A discussion of the alternative regulatory concepts considered is provided in Chapter X.

A. Diesel Fuel Sold to Harborcraft Operators in the SCAQMD Beginning January 1, 2006.

ARB staff is proposing that, beginning January 1, 2006, diesel fuel sold, supplied, or offered for use in commercial or recreational harborcraft within the SCAQMD be required to meet the specifications for motor vehicular diesel fuel, as specified in title 13, CCR, sections 2281, 2282, and 2284.

The early implementation date for the SCAQMD is proposed in order to satisfy emission reduction commitments for harborcraft, as contained in the 2003 Statewide Strategy of the California SIP. Specifically, the use of cleaner fuels (including CARB diesel fuel) for harborcraft is included in *Measure Marine-1: Pursue Approaches to Clean Up the Existing Harborcraft Fleet – Cleaner Engines and Fuels*.

The 2003 Statewide Strategy requires a total of 0.09 tons per day of NOx emission reductions by 2006 and 2.7 tons per day of NOx emission reductions from harborcraft by 2008. The proposed amendments will provide about 0.4 tons per day of direct NOx emission reductions for existing harborcraft in the SCAQMD beginning in 2006, and enable advanced control technologies to provide additional emission reductions in the future.

The 2003 Statewide Strategy also requires a total of 0.02 tons per day of PM emission reductions by 2006 and 0.05 tons per day of PM emission reductions by 2008. The proposed amendments will provide the SCAQMD with 0.02 tons per day or more of PM emission reductions from existing harborcraft in the SCAQMD beginning in 2006, and enable advanced control technologies to provide additional emission reductions in the future.

B. Diesel Fuel Sold to Harborcraft Operators Statewide Beginning January 1, 2007

ARB staff is proposing that, beginning January 1, 2007, diesel fuel sold, supplied, or offered for use in commercial or recreational harborcraft statewide be required to meet the specifications for vehicular diesel fuel, as specified in Title 13, CCR, sections 2281, 2282, and 2284.

The proposed effective date will ensure implementation of the proposed amendments prior to the U.S. EPA's nonroad diesel fuel program implementation date of June 1, 2007. In addition, CARB staff believes implementing the proposed amendments on January 1, 2007, will provide adequate time for diesel fuel suppliers to complete the transition to U.S. EPA and CARB low sulfur (15 ppmw) diesel fuel for on-road, off-road, and stationary sources in California on June 1, 2006. Further, the proposed effective date would be in the winter, when diesel fuel demand is historically low, and diesel fuel inventories are typically at higher levels. Therefore,

implementation during the winter months should reduce potential impacts on diesel fuel production and supply.

Under the proposal, California would receive the benefits of five years use of low sulfur (15 ppmw) diesel fuel over the federal nonroad diesel fuel program. In addition, neither the U.S. EPA on-road or nonroad diesel programs achieve the NO_x and PM emission reductions provided by the aromatic component of the CARB diesel fuel program.

C. Definition of Commercial and Recreational Harborcraft

The following is a discussion of the proposed definition for commercial and recreational harborcraft used in the proposed amendments.

Staff is proposing that the definition of harborcraft include a subset of all marine vessels. "Marine vessels" would be defined as any ship, boat, watercraft, or other artificial contrivance used as a means of transportation on water. This includes recreational as well as commercial vessels. To exclude ocean-going ships, the definition of harborcraft would exclude the following marine vessels:

- Foreign trade vessels with a "registry" endorsement on their United States Coast Guard certificate of documentation, or registration under the flag of another country.
- Vessels greater than or equal to 400 feet in length overall (LOA) as defined in 50 CFR § 679.2.
- Vessels of 10,000 gross tons (GT ITC) or greater per the convention measurement (international system) as defined in 46 CFR 69 Subpart B.
- Vessels propelled by a marine diesel engine with a per-cylinder displacement of 30 liters or more (U.S. EPA "category 3" engine).

D. Structure of the regulations

The staff is proposing that the Board adopt two almost identical sections of the California Code of Regulations (CCR). Section 2299, title 13, CCR, would be in a new Chapter 5.1. Standards for Fuels For Nonvehicular Sources, and would regulate diesel fuel used in intrastate locomotives and harborcraft pursuant to ARB's Health and Safety Code section 43013 authority to adopt standards and regulations for locomotives and marine vessels. A second regulation – section 93116, title 17, CCR – would regulate diesel fuel used in intrastate locomotives and harborcraft as an ATCM for nonvehicular sources. Both regulations would provide that all diesel fuel sold, offered for sale or supplied for use in harborcraft and intrastate diesel-electric locomotives on or after the implementation dates will be subject to all of ARB's requirements for California motor vehicle fuel on sulfur content, aromatic hydrocarbon content, and lubricity. Technical amendments would be made to the motor vehicle diesel fuel regulations to alert the reader of the applicability of the two new sections on diesel fuel for use in intrastate diesel-electric locomotives and harborcraft.

X. ALTERNATIVES CONSIDERED

This chapter presents a summary of the alternatives to the proposed amendments that were considered for intrastate locomotives and commercial and recreational harborcraft.

A. Alternatives Considered for Intrastate Locomotive Diesel Fuel

Staff evaluated five alternatives to the proposed amendments for intrastate locomotives that included:

- Not extending CARB diesel fuel requirements to diesel fuel for use by intrastate locomotives (in which case the fuel would still be subject to U.S. EPA nonroad diesel fuel standards).
- Not requiring any diesel fuel for use by Class III railroads locomotives to have to comply with the CARB diesel fuel requirements.
- Not requiring diesel fuel for use by certain rural Class III railroads locomotives, not operating in ozone non-attainment areas, to have to comply with the CARB diesel fuel requirements until June 1, 2012.
- Requiring diesel fuel for use by all intrastate locomotives in the SCAQMD to meet the CARB diesel fuel standards by January 1, 2006, with diesel fuel for use by intrastate locomotives and harborcraft in the rest of the state to be subject to the CARB diesel fuel standards by January 1, 2007.
- Making diesel fuel for use by all harborcraft and all interstate and intrastate locomotives subject to the CARB diesel fuel requirements.

In considering the alternatives identified above, staff concluded that the first three would not provide the emission reductions needed, for both the SIP and overall improvements in air quality, above those that would be realized through implementation of only the U.S. EPA nonroad diesel fuel program.

Staff believes that the additional CARB diesel fuel demand created by the fourth alternative could put excessive strain on the diesel fuel supply in the SCAQMD in 2006, during the transition to 15 ppmw CARB and U.S. EPA on-road diesel fuel. The fifth alternative would not assure emission reductions as interstate locomotives have the potential to change existing fuel patterns. This might increase the purchase of U.S. EPA nonroad diesel fuel prior to entering California, reducing the potential benefits of this option.

A discussion of the cost and emission impacts of these alternatives is provided in Chapter XIII.

B. Alternatives Considered for Harborcraft Diesel Fuel

In considering alternatives for diesel fuel for harborcraft, staff considered the alternative of allowing for the implementation of only the U.S. EPA nonroad diesel fuel program. However, staff concluded that this alternative would not provide the emission benefits achieved through the proposed amendments above those that would be realized through implementation of only the U.S. EPA nonroad diesel fuel program. Further, this alternative would not provide the NO_x and

PM emission reductions required under *Measure Marine-1: Pursue Approaches to Clean Up the Existing Harborcraft Fleet – Cleaner Engines and Fuels* in the 2003 SCAQMD SIP. A discussion of the cost and emission impacts of these alternatives is provided in Chapter XIII.

XI. ENVIRONMENTAL EFFECTS OF THE PROPOSED AMENDMENTS TO THE DIESEL FUEL REGULATIONS

This chapter discusses the environmental impacts of the proposed amendments to extend the applicability of the CARB diesel fuel regulations to diesel fuel used in intrastate locomotives and harborcraft.

A. Legal Requirements Applicable to Analysis

The California Environmental Quality Act (CEQA) and ARB policy require an analysis to determine the potential adverse environmental impacts of the proposed standards. Because the ARB's program involving the adoption of regulations has been approved by the Secretary of Resources (see Public Resources Code, section 21080.5), the CEQA environmental analysis requirements are to be included in the ARB's Staff Report in lieu of preparing an environmental impact report or negative declaration. In addition, the ARB will respond in writing to all significant environmental issues raised by the public during the public review period or the public Board hearing. These responses are to be contained in the Final Statement of Reasons for the proposed amendments.

Public Resources Code section 21159 requires that the environmental impact analysis conducted by the ARB include the following:

- An analysis of the reasonably foreseeable environmental impacts of the methods of compliance;
- An analysis of reasonably foreseeable mitigation measures; and
- An analysis of reasonably foreseeable alternative means of compliance with the standard.

Compliance with the proposed amendments is expected to directly affect air quality and have minimal indirect effects on other environmental media as a consequence of the air quality impacts. Staff's analysis of the reasonable foreseeable environmental impacts of the methods of compliance is presented in the sections below. Regarding mitigation measures, CEQA requires the lead agency to identify and adopt any feasible mitigation measures that would minimize any significant adverse environmental impacts described in the environmental analysis.

The proposed amendments to extend the applicability of the CARB diesel fuel regulations to intrastate locomotives and harborcraft are needed to:

- Ensure compliance with California's State Implementation Plan (SIP).
- Provide necessary emission reductions towards achieving state and federal ambient air quality standards.
- Enable the retrofit of existing intrastate locomotives and commercial and recreational harborcraft with aftertreatment control technologies.
- Reduce the risk from diesel PM emissions as required by the 2000 California Diesel Risk Reduction Plan (DRRP).

Alternatives to the proposed amendments have been discussed in the previous chapter of this report. ARB staff has concluded that at this time, there is no alternative means.

B. Effects on Air Quality

Intrastate locomotives and harborcraft (with the exception of ferries) are not currently required to use fuel that meets CARB diesel formulation requirements. However, a significant portion of these source categories are already using complying fuel because of California's fuel distribution network which limits access to non-CARB diesel fuel at many locations in the state. The proposed amendments will increase the use of CARB diesel fuel which will result in lower NO_x, PM, and SO_x emissions from intrastate locomotive and harborcraft diesel fueled engines. Requiring the use of CARB diesel in intrastate locomotives and harborcraft will have a positive air quality impact by reducing ambient levels of ozone and both primary and secondary emitted PM.

1. Reduced Ambient Ozone Levels

Emissions of NO_x and ROG are precursors to the formation of ozone in the lower atmosphere. Exhaust from diesel engines contributes a substantial fraction of ozone precursors in any metropolitan area. Therefore, reductions in NO_x from diesel engines would make a considerable contribution to reducing exposures to ambient ozone. Controlling emissions of ozone precursors would reduce the prevalence of the types of respiratory problems associated with ozone exposure and would reduce hospital admissions and emergency visits for respiratory problems.

2. Reduced Ambient PM Levels

Emissions of diesel PM directly affect PM levels in both urban and rural areas and impact contributions to local air toxics impacts. Sulfur in diesel fuel contributes to ambient levels of secondary fine PM through the formation of sulfates, both in the exhaust stream of the diesel engine and later in the atmosphere leading to higher ambient PM levels. Higher aromatic hydrocarbon levels in diesel fuel contribute to ambient levels of NO_x and PM. Additional air quality benefits will be achieved from reductions of emissions of toxic air contaminants (diesel PM) through the use of CARB diesel fuel in intrastate locomotive and harborcraft diesel engines.

3. Reduced Ambient Sulfur Dioxide Levels

The proposed amendments would ensure that intrastate locomotive and harbor craft operators would reduce the impacts of SO₂ emissions in both urban and rural areas. As discussed above, lowering sulfur levels in diesel fuel will result in approximately a 12 percent reduction in sulfate and diesel PM emissions. Further, there will be at least a 95 percent reduction in SO₂ emissions. The proposed amendments will ensure that intrastate locomotives and harborcraft are using low sulfur (15 ppmw) diesel fuel and eliminates the possibility of the use of much higher sulfur levels (500 ppmw) from nonroad diesel fuel, prior to implementation of the U.S. EPA low sulfur (15 ppmw) requirements in 2012.

4. *Enabling Advanced Control Technologies*

The use of CARB diesel will also help provide added emissions benefits by enabling the implementation of the DRRP to reduce diesel PM emissions from existing intrastate locomotives and commercial and recreational harborcraft diesel-fueled engines. The proposed amendments will enable the retrofitting of existing intrastate locomotives and harborcraft diesel engines with sulfur sensitive catalytic after-treatment control technologies to control diesel PM and oxides of nitrogen emissions.

C. **Current Emission Inventory**

This section discussed the current emission inventory for both intrastate locomotives and harborcraft.

1. *Intrastate Locomotives*

Below are ARB's emission inventory estimates for intrastate locomotives by type of railroad (Table XI-1) and by the region of the state (Table XI-2).

Table XI-1: Emission Inventory from Intrastate Locomotives by Type of Railroad (tons per day)

| | NOx | SOx | PM ₁₀ |
|-----------------|-----------|------------|------------------|
| Class I | 22 | 0.2 | 0.5 |
| Passenger Train | 10 | 0.0 | 0.3 |
| Class III | 6 | 0.1 | 0.1 |
| Total * | 38 | 0.3 | 1.0 |

* Numbers may not add due to rounding.

As can be seen in Table XI-1, Class I freight railroads account for about 60 percent of the NOx and PM emissions, and about 70 percent of the SOx emissions associated with intrastate locomotives. Passenger trains, due to their current high use of CARB and low sulfur (15 ppmw) CARB diesel fuel, have a smaller impact on emissions (especially for SOx) despite their significant fuel consumption (20.4 million gallons annually). However, passenger trains still account for over 25 percent of the intrastate locomotive NOx emissions. The emissions from the Class III railroads represent the smallest contributors to the emission inventory due to their lower fuel consumption.

As can be seen in Table XI-2, the regions of the state most impacted by intrastate locomotive NOx emissions are the South Coast (34 percent), and the Bay Area (21 percent) and San Joaquin Valley (20 percent). These three regions combined account for 75 percent of the NOx emissions associated with intrastate locomotives.

**Table XI-2: Emission Inventory from Intrastate Locomotives by Region of the State
(tons per day)**

| Region | NO _x | SO ₂ | PM ₁₀ |
|---------------------|-----------------|-----------------|------------------|
| South Coast | 12.9 | 0.1 | 0.3 |
| Bay Area | 8.2 | 0.1 | 0.2 |
| San Joaquin | 7.5 | 0.1 | 0.3 |
| Sacramento Valley | 4.2 | 0 | 0.1 |
| South Central Coast | 2.4 | 0 | 0 |
| San Diego | 1.2 | 0 | 0 |
| Rest of the State | 2.0 | 0 | 0 |
| Total * | 38.0 | 0.3 | 1.0 |

* Number may not add due to rounding.

2. Commercial and Recreational Harborcraft

Commercial Harborcraft

Based on the ARB's 2003 emission inventory and the ARB commercial harborcraft survey, commercial and recreational harborcraft emissions statewide are estimated to be about 27 tons per day of NO_x and about 1.5 tons per day of PM. Table XI-3 presents the emissions data by air district.

**Table XI-3: Emission Inventory for Harborcraft by Region
(tons per day)**

| Region | NO _x | SO ₂ | PM ₁₀ |
|-------------------------------|-----------------|-----------------|------------------|
| <i>Commercial Harborcraft</i> | | | |
| S.F. Bay Area Air Basin | 5.8 | 1.0 | 0.3 |
| South Coast Air Basin | 10.6 | 0.2 | 0.2 |
| North Coast Air Basin | 2.6 | 0.4 | 0.3 |
| All Other Areas | 5.0 | 0.3 | 0.5 |
| <i>Total</i> | <i>24.0</i> | <i>1.9</i> | <i>1.4</i> |
| <i>Recreational Vessels *</i> | | | |
| S.F. Bay Area Air Basin | 0.2 | 0 | 0 |
| South Coast Air Basin | 1.0 | 0 | 0 |
| North Coast Air Basin | 0 | 0 | 0 |
| All Other Areas | 1.5 | 0 | 0 |
| <i>Total</i> | <i>2.8</i> | <i>0.1</i> | <i>0.1</i> |
| Total ** | 27.0 | 2.0 | 1.5 |

* ARB 2003 Emissions Inventory (See Appendix E for details).

** Numbers may not add due to rounding.

In evaluating this data, it is important to note that the current inventory is being updated, and ARB staff hope to have a revised inventory completed by the end of the year. Preliminary results for this effort indicate that harborcraft emissions may be much higher than currently estimated.

Recreational Vessels

California has nearly 20,000 recreational diesel-powered watercraft engines according to current ARB modeling estimates. However, their emissions are much lower than commercial harborcraft. For recreational vessels, the ARB emissions inventory estimates about 2.8 tons per day of NO_x and about 0.1 tons per day of PM statewide.

D. Anticipated Emission Reductions

In this section, staff provides estimates of the anticipated emission reductions from the proposed amendments.

1. Emission Reductions from Intrastate Locomotives

The intrastate locomotive emission reductions were calculated based on the level of current non-CARB diesel fuel use and segregated by each of the railroad types. As can be seen in Table XI-4, about 90 percent of the anticipated NO_x, and about 80 percent of the directly and indirectly emitted PM emission reductions from the proposed amendments are from Class I intrastate freight locomotives. Passenger trains consume nearly as much diesel fuel as the Class I intrastate locomotives, but nearly all of their diesel fuel consumption is currently low sulfur (15 ppmw) CARB or CARB diesel. About 10 percent of the anticipated intrastate locomotive emission reductions are from Class III railroads.

Table XI-4: Emission Reductions from Intrastate Locomotives by Railroad Type (tons per day)

| Type of Railroad | NO _x | SO _x | PM | |
|------------------|-----------------|-----------------|-------------|-------------|
| | | | Direct | Indirect |
| Class I | 0.9 | 0.3 | 0 | 0 |
| Passenger Train | 0 | 0 | 0 | 0 |
| Class III | 0.1 | 0 | 0 | 0 |
| Total * | 1.0 | 0.3 | 0.05 | 0.06 |

* Numbers may not add due to rounding.

As can be seen in Table XI-5, over 30 percent of the NO_x and PM emission reductions associated with the proposed amendments would be realized in the SCAQMD. Significant reductions of NO_x and PM would also be realized in the SJVUAPCD and the Bay Area. Also, the use of CARB diesel in intrastate locomotives and harborcraft is expected to reduce SO_x emissions by over 95 percent.

Table XI-5: Emission Reductions from Intrastate Locomotives by Region of State (tons per day)

| Region | NO _x | SO _x | Direct | Indirect |
|---------------------|-----------------|-----------------|-------------|-------------|
| South Coast | 0.3 | 0.1 | 0.02 | 0.02 |
| Bay Area | 0.2 | 0.1 | 0.01 | 0.01 |
| San Joaquin | 0.2 | 0.1 | 0.01 | 0.01 |
| Sacramento Region | 0.1 | 0 | 0.01 | 0.01 |
| South Central Coast | 0.1 | 0 | 0 | 0.01 |
| San Diego | 0 | 0 | 0 | 0 |
| Rest of the State | 0.1 | 0 | 0 | 0.01 |
| Total * | 1.0 | 0.3 | 0.05 | 0.06 |

* Numbers may not add due to rounding.

2. Emission Reductions from Harborcraft

As shown in Table XI-6, the total estimated NO_x and PM and emissions and emission reductions for harborcraft from implementing the proposed amendments are provided. The potential emission reductions are about 1 ton per day of NO_x and about 0.5 tons per day of directly and indirectly emitted PM. In addition, SO_x emissions would be reduced by nearly 1.5 tons per day. These emissions reductions are significant when considering that the majority of harborcraft emissions are concentrated in and around California's coastal nonattainment districts, and large commercial ports in particular. The methodology used to calculate harborcraft emission reductions is described in Appendix F.

**Table XI-6: Emission Reductions for Harborcraft by Region of the State
(tons per day)**

| Region | NO _x | SO _x | PM | |
|-------------------------------|-----------------|-----------------|------------|------------|
| | | | Direct | Indirect |
| <i>Commercial Harborcraft</i> | | | | |
| S.F. Bay Area Air Basin | 0.2 | 1.0 | 0 | 0.2 |
| South Coast Air Basin | 0.4 | 0.2 | 0 | 0 |
| North Coast Air Basin | 0 | 0.01 | 0 | 0 |
| All Other Areas | 0.2 | 0.3 | 0.1 | 0.1 |
| <i>Total</i> | <i>0.8</i> | <i>1.5</i> | <i>0.1</i> | <i>0.3</i> |
| <i>Recreational Craft</i> | | | | |
| S.F. Bay Area Air Basin | 0 | 0 | 0 | 0 |
| South Coast Air Basin | 0.1 | 0 | 0 | 0 |
| North Coast Air Basin | 0 | 0 | 0 | 0 |
| All Other Areas | 0.1 | 0 | 0.1 | 0 |
| <i>Total</i> | <i>0.2</i> | <i>0</i> | <i>0.1</i> | <i>0</i> |
| Total | 1.0 | 1.5 | 0.1 | 0.3 |

* Commercial fuel consumption estimates based on 2002 ARB Commercial Harborcraft Survey.

** Recreational fuel consumption estimates based on 2003 ARB Emissions Inventory (See Appendix D).

3. Total Emission Reductions for Intrastate Locomotives and Harborcraft

The total emission reductions anticipated from intrastate locomotives and commercial and recreational harborcraft are shown in Table XI-7. As can be seen, it is estimated that the use of CARB diesel in both intrastate locomotives and harborcraft would provide an estimated 2 tons per day of NO_x emission reductions, nearly 2 tons per day of SO_x emission reductions, and about 0.6 tons per day of directly and indirectly emitted PM emission reductions.

**Table XI-7: Emission Reductions from Intrastate Locomotives and
Harborcraft by Regions
(tons per day)**

| Region | NO _x | SO _x | PM | |
|-------------------|-----------------|-----------------|------------|------------|
| | | | Direct | Indirect |
| South Coast | 0.7 | 0.3 | 0.05 | 0.1 |
| Bay Area | 0.5 | 1.0 | 0.05 | 0.2 |
| Rest of the State | 0.8 | 0.5 | 0.10 | 0.1 |
| Total * | 2.0 | 1.8 | 0.2 | 0.4 |

* Numbers may not add due to rounding.

Table XI-8 shows the anticipated emission reductions by source type. As can be seen, Class I intrastate locomotives and harborcraft combined account for about 85 percent of both the total NO_x and PM emission reductions.

**Table XI-8: Emission Reductions from Intrastate Locomotives and Harborcraft
(tons per day)**

| Source Type | NOx | SO _x | Direct | Indirect |
|--------------------------|------------|-----------------|------------|------------|
| Class I | 0.9 | 0.3 | 0.1 | 0.1 |
| Passenger Train | 0 | 0 | 0 | 0 |
| Class III | 0.1 | 0 | 0 | 0 |
| Subtotal | 1.0 | 0.3 | 0.1 | 0.1 |
| Commercial Harborcraft | 0.8 | 1.5 | 0.1 | 0.3 |
| Recreational Harborcraft | 0.2 | 0 | 0 | 0 |
| Subtotal | 1.0 | 1.5 | 0.1 | 0.3 |
| Total | 2.0 | 1.8 | 0.2 | 0.4 |

* Numbers may not add due to rounding.

E. Effects on Greenhouse Gas Emissions

Greenhouse gases (GHG) are predominantly comprised of carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). The gases differ in their atmospheric warming potential and as a result, the contribution of each gas is determined as equivalent CO₂ emissions using conversion factors approved by the Intergovernmental Panel on Climate Change; for example, methane has 21 times the warming potential of carbon dioxide.

Transportation is a large source of greenhouse gas emissions around the world. Table XI-9 reports greenhouse gas emissions as million metric tons of carbon dioxide equivalent (MMTCO₂ Eq.) for diesel and gasoline consumption in the transportation sector in California. The CO₂ emissions estimates for diesel consumption include non-highway vehicles, ships, and trains which together are a small proportion of the total emissions. The estimates of CH₄ and N₂O emissions are only for highway vehicles.

Table XI-9: Greenhouse Gas Emissions from Diesel and Gasoline Consumption in the Transportation Sector in 1999

| Greenhouse Gas | Global Warming Potential | GHG Emissions (MMTCE, Eq.) | |
|------------------|--------------------------|----------------------------|----------|
| | | Diesel | Gasoline |
| CO ₂ | 1 | 27.0 | 126.8 |
| CH ₄ | 21 | + | 0.4 |
| N ₂ O | 310 | 0.2 | 5.6 |

+ Does not exceed 0.05.

Source: California Energy Commission: Inventory of California Greenhouse Gas Emissions and Sinks: 1990-1999. California Energy Commission Publication #600-02-001F-ES, November 2002.

Implementation of the proposed amendments could have a small net effect on global warming. The production of low sulfur diesel is expected to increase emissions of greenhouse gases, but the greenhouse effect from diesel production is expected to be substantially offset by the effect of a reduction in CO₂ emissions from the use of the lower sulfur diesel fuel in diesel engines.

Emissions of CO₂ from refineries will increase due to the increased demand for energy for additional hydrogen production and additional processing to produce low sulfur diesel fuel. Methane emissions are expected to increase due to natural gas production and distribution losses but these methane losses will be small compared to the additional carbon dioxide emissions. A smaller amount of methane and nitrous oxide will be emitted in the natural gas combustion process. Some of the extra hydrogen and the energy it represents will be in the fuel, increasing the hydrogen to carbon ratio and reducing CO₂ exhaust emissions.

F. Impacts on the SIP in the South Coast and San Joaquin Valley

In this section, staff examines the impacts of the proposed amendments on the SIP for both the SCAQMD and SJVUAPCD.

On October 23, 2003, ARB adopted *the Proposed 2003 State and Federal Strategy for the California State Implementation Plan (Statewide Strategy)* which reaffirms the ARB's commitment to achieve the health-based air quality standards through specific near-term actions and the development of additional longer-term strategies. It also sets into motion a concurrent initiative to identify longer-term solutions to achieve the full scope of emission reductions needed to meet federal air quality standards in the SCAQMD, SJVUAPCD, and rest of California. Upon approval by U.S. EPA, the 2003 SIP will replace the State's commitments in the 1994 SIP.

In addition to the defined SIP measures, it is expected that further emission reductions will be needed from all source categories to meet the long-term emission reduction targets included in the South Coast SIP.

1. *Harborcraft*

ARB staff estimates that the proposed amendments would reduce NOx emissions by about 0.4 tons per day from harborcraft in the SCAQMD in 2010. The harborcraft NOx emission reductions would provide the first increment of progress toward fulfilling ARB's commitment for *Measure Marine-1: Pursue Approaches to Clean Up the Existing Harborcraft Fleet – Cleaner Engines and Fuels* in the 2003 SCAQMD SIP.

Under measure Marine-1, ARB anticipates reducing 2010 South Coast harborcraft NOx emissions by a total of 2.7 tons per day. In addition to providing immediate NOx emission reductions, the low sulfur (15 ppmw) CARB diesel fuel will enable the use of exhaust treatment devices on harborcraft engines, another element of measure Marine-1. The proposed amendments would have a minimal emissions benefit in the SJVUAPCD as harborcraft emissions are a relatively small part of the emission inventory in that region.

2. *Intrastate Locomotives*

ARB staff estimates that the proposed amendments would reduce NOx emissions by about 0.3 tons per day from intrastate locomotives in the SCAQMD in 2010. However, these new NOx emission reductions are not directly creditable towards ARB's commitments in the 2003 SCAQMD SIP.

To meet an emission reduction commitment for locomotives in the 1994 Ozone SIP for the South Coast, ARB and the two freight railroads operating in California signed a memorandum of understanding (MOU) to ensure that the cleanest locomotive engines are brought to the SCAQMD. Under the terms of the MOU, use of cleaner diesel fuels is one of the options for meeting the emission reduction targets. Any emission reductions achieved through use of cleaner diesel fuels in the locomotives, under the purview of the MOU, could be credited toward the existing locomotive SIP commitment, not towards ARB's new 2003 SIP commitments. However, emission reductions from passenger train and Class III railroads with intrastate locomotives could be credited to the SIP.

NOx emission reductions from intrastate locomotives not covered in the MOU, such as those in the San Joaquin Valley, would be creditable in the SIPs for those regions. ARB staff estimates that this measure would reduce intrastate locomotive NOx emissions in the San Joaquin Valley by 0.2 tons per day in 2010.

G. **Health Benefits of Reductions of Diesel PM Emissions**

The emission reductions obtained from this regulation will result in lower ambient PM levels and significant reductions of exposure to primary and secondary diesel PM. Lower ambient PM levels and reduced exposure, in turn, would result in a reduction of the prevalence of the diseases attributed to PM and diesel PM, including hospitalizations for cardio-respiratory disease, and premature deaths. ARB staff estimates approximately 71 premature deaths would be avoided by 2010 and cumulatively 233 premature deaths by 2020 as a result of the emission reductions of primary and secondary PM obtained through the proposed regulations.

1. Primary Diesel PM

Lloyd and Cackette estimated that, based on the Krewski *et al.* study, a statewide population-weighted average diesel PM_{2.5} exposure of 1.8 µg/m³ resulted in a mean estimate of 1,985 premature deaths per year in California. (Lloyd/Cackette, 2001). The diesel PM emissions corresponding to the direct diesel ambient population-weighted PM concentration of 1.8 µg/m³ is 28,000 tons per year. (ARB, 2000) Based on this information, we estimate that reducing 14.11 tons per year of diesel PM emissions would result in one fewer premature death (28,000 tons/1,985 deaths). Comparing the PM_{2.5} emission before and after this regulation, the proposed regulation is expected to reduce emissions by 3,054 tons at the end of year 2020, and therefore prevent an estimated 217 premature deaths (106-326, 95 percent confidence interval (95 CI) by year 2020. Prior to 2020, cumulatively, it is estimated that 66 premature deaths (33-100, 95 CI) would be avoided by 2010 and 141 (70-213, 95 CI) by 2015. The health benefit calculations are based on the assumption that the emission reductions would occur in populated areas, and therefore, the results may over-estimate the actual health benefits of implementing the proposed regulation.

The estimated annual costs of the proposed regulation from 2006 to 2020 range from \$444,000 to \$3,038,465 (in 2004 \$). Since 93% of the estimated deaths prevented by this regulation would be attributed to PM emission reduction, we allocate 93% of these costs to PM emission reductions and 7% to NOx reductions. To adjust for the time value of money, we discounted future costs to present value (at 5% real discount rate). The average present value of costs per ton of PM would be \$5,412 based on low cost estimate and \$7,964 based on high cost estimate. The average present value of costs per ton of NOx would be \$122 (low cost estimate) and \$179 (high cost estimate). To estimate the costs of control per premature death prevented, we multiply the estimated tons of diesel PM that would result in one fewer premature deaths (14.11 tons per year) by the cost of \$5,412 or \$7,964 per ton. The resulting estimated cost of control per premature death prevented is about \$76,360 to \$112,375. The U. S. EPA has established \$6.3 million (in 2000 \$) for a 1990 income level as the mean value of avoiding one death (U.S. EPA, 2003). As real income increases, the value of a life may rise. The U.S. EPA further adjusted the \$6.3 million value to \$8 million (in 2000 \$) for a 2020 income level. Assuming that real income grew at a constant rate from 1990 and will continue at the same rate until 2020, we adjusted the value of avoiding one death for the income growth. Since the control costs are expressed in 2004 \$ discounted values, accordingly, we updated value of life to 2004 dollar and discounted values of avoiding a premature death in the future back to the year 2004. In the U.S. EPA's guidance of social discounting, it recommends using both three and seven percent discount rates. (U.S. EPA, 2000a) Using these rates, and the annual avoided deaths as weights, the weighted average value of reducing a future premature death discounted back to the year 2004 is \$4.3 million at seven percent discount rate, and \$6.1 million at three percent. The cost range per death avoided because of this proposed regulation is 38 to 80 times lower than the U.S. EPA's benchmark for value of avoided death. This rule is, therefore, a cost-effective mechanism to reduce premature deaths that would otherwise be caused by diesel PM emissions without this proposed regulation.

2. *Secondary Diesel PM*

Lloyd and Cackette also estimated that indirect diesel PM_{2.5} exposures at a level of 0.81 µg/m³ resulted in a mean estimate of 895 additional premature deaths per year in California, above those caused by directly emitted formed diesel PM. The NOx emission levels corresponding to the indirect diesel ambient PM concentration of 0.81 µg/m³ is 1,641 tpd (598,965 tpy).

Following the same approach as above, we estimate that reducing 669 tons of NOx emissions would result in one fewer premature death (598,965 tons/895 deaths). Therefore, with the 10,403 ton reduction of NOx that is expected by the end of 2020, an estimated 16 deaths (8-24, 95 percent CI) would be avoided. Similar to the calculation of premature deaths avoided through reducing primary diesel PM, it was assumed that the emission reductions would occur in populated areas, and therefore, the results may over-estimate the actual health benefits of implementing the proposed regulation.

If we multiply 669 tons of NOx emissions by the NOx cost of \$122 or \$179 per ton, the estimated costs of control per premature death prevented are about \$81,640 to \$119,880. The costs are again lower than the U.S. EPA's present value of an avoided death by 36 to 75 times.

3. *Additional Benefits*

There are additional benefits associated with reducing diesel PM emissions. These include:

- Improved visibility with reduction of both primary and secondary particles;
- Less soiling and material damage as a result of decreased deposition of airborne diesel PM; and
- Decreased noncancer health effects associated with diesel PM.

The proposed amendments to extend the applicability of CARB diesel fuel regulations to diesel fuel used in intrastate locomotives and commercial and recreational harborcraft are critical to the attainment of the emission and risk reduction targets in the Diesel Risk Reduction Plan (DRRP).

H. Potential Exposures and Risk from Diesel PM Emissions from Diesel-Fueled Locomotives and Harborcraft

This section examines the potential exposures and cancer health risks associated with exposure to PM emissions from intrastate locomotives and harborcraft. A brief qualitative discussion is provided on the potential exposures of Californians to the diesel PM emissions from these sources. In addition, a summary is presented of the health risk assessment conducted to determine the 70-year potential cancer risk associated with potential exposures to diesel PM emissions from locomotives and diesel-fueled harborcraft. Additional details on the methodology used to estimate the health risks are presented in Appendix G this report.

I. Potential Exposures

As discussed previously, diesel-fueled locomotive and harborcraft engines are found in many areas of the State and contribute to ambient levels of diesel PM emissions. Because analytical tools to distinguish between ambient diesel PM emissions from diesel-fueled locomotive and harborcraft engines from other sources of diesel PM do not exist, we cannot measure the actual

exposures to persons from the emissions of these emission sources. However, modeling tools can be used to estimate potential exposures to the emissions from diesel-fueled locomotive and harborcraft engines.

Based on the most recent emissions inventory, there are over 700 intrastate locomotive engines and 3,900 harborcraft engines operating in California. These engines are distributed throughout California. As mentioned previously, the locomotives typically operate as short haul, switcher, terminal, or manifest locomotives. By virtue of their operation, many of these locomotives are found in urban areas near where people live such as railyards, short haul lines and passenger lines that travel through urban areas. Harborcraft can also operate in areas where people may be nearby such as ferry and excursion shuttles that typically operate out of highly populated centers such as San Francisco. Based on this information, we believe that there are exposures to diesel PM emissions from the operation of diesel-fueled intrastate locomotives and harborcraft in California. As presented below these exposures can result in potential cancer health risks.

2. Health Risk Assessment

Risk assessment is a complex process that requires the analysis of many variables to simulate real-world situations. There are three key types of variables that can impact the results of a health risk assessment for stationary diesel-fueled engines – the magnitude of diesel PM emissions, local meteorological conditions, and the length of time someone is exposed to the emissions. Diesel PM emissions are a function of the age and horsepower of the engine, the emissions rate of the engine and the annual hours of operation. Older engines tend to have higher pollutant emissions rates than newer engines, and the longer an engine operates, the greater the total pollutant emissions. Meteorological conditions can have a large impact on the resultant ambient concentration of diesel PM, with higher concentrations found along the predominant wind direction and under calm wind conditions. How close a person is to the emissions plume and how long he or she breathes the emissions (exposure duration) are key factors in determining potential risk with longer exposures times typically resulting in higher risk.

Because risk estimates for diesel-fueled locomotives and harborcraft engines are dependent on numerous factors and because these factors vary from location to location, ARB staff developed a generic risk assessment to represent possible operating scenarios for intrastate locomotives and harborcraft. We evaluated two scenarios: excursion or ferry vessel activity within a port and a short-haul intrastate locomotive. Two sets of meteorological data were used to represent the range of meteorological conditions in California. West Los Angeles (1981) (West LA) was selected to provide meteorological conditions with lower wind speeds and more persistent wind directions, which will result in less pollutant dispersion and higher estimated risk. Long Beach (1981) and Richmond (1998) were selected to represent other areas. The U.S. EPA's ISCST3 air dispersion model was used to estimate the annual average diesel PM concentration at varying distances from the locomotive or harborcraft activity.

The estimated annual average diesel PM concentrations were then adjusted following the current risk assessment methodology recommended by the OEHHA and used by ARB in evaluating potential cancer risk from diesel PM emission sources. (OEHHA, 2002a) (OEHHA, 2002b) (OEHHA, 2000) Following the OEHHA guidelines, we assumed that the most impacted

individual would be exposed to modeled diesel PM concentrations for 70 years. This exposure duration represents an "upper-bound" of the possible exposure duration. The potential cancer risk was estimated by multiplying the modeled current annual average concentrations of diesel PM, adjusted for the duration of exposure, by the unit risk factor for diesel PM (300 excess cancers per million people/microgram/cubic meter of diesel PM).

Based on our analysis under the conditions outlined above, the estimated cancer risk for persons exposed to the emissions from a hypothetical excursion vessel or ferry in port and that live about 200 meters away, ranged from 50 to 280 potential cancer cases in a million. The low end represents a the 65th percentile breathing rate results using the Richmond meteorological data and the high end, the 95th percentile breathing rate and West Los Angeles meteorological data. For the locomotives, operation of a short-haul line through an urban neighborhood resulted in potential risks ranging from 4 to 12 at a distance of 200 meters away from the locomotive activity. The low end in this case represents the 65th percentile breathing rate results using the Long Beach meteorological data and the high end, the 95th percentile breathing rate and West Los Angeles meteorological data.

The estimated risk levels presented here are based on a number of assumptions. The potential cancer risk for actual situations may be less than or greater than those presented here. For example, an increase in the emissions rate of an engine or the annual hours of operation in a given area would increase the potential risk levels. A decrease in the exposure duration or an increase in the distance from the engine would decrease potential risk levels. The estimated risk levels would also decrease over time as newer, lower-emitting locomotive or harborcraft diesel-fueled engines replace older engines. Therefore, the results presented are not directly applicable to any particular operation. Rather, this information provides an indication as to the potential relative levels of risk that may be attributed to diesel-fueled locomotives and harborcraft and to act as an example when performing a site-specific risk assessment for locomotives or harborcraft.

I. Effects on Water Quality

The proposed amendments should have no significant adverse impacts on water quality. One direct benefit of lowering the sulfur content limit is a reduction of emitted sulfur oxides, and particulate sulfate and consequently a reduction of atmospheric deposition of sulfuric acid and sulfates in water bodies. The low sulfur diesel fuel will enable the use of aftertreatment devices to reduce NO_x and diesel PM emissions from retrofitted engines. As a result, there should be a decrease in atmospheric deposition of nitrogen and airborne diesel particles as well as the associated heavy metals, PAHs, dioxins, and other toxic compounds typically found in diesel exhaust.

The release of diesel fuel to surface water and groundwater can occur during production, storage, distribution or use. The potential sources of such releases, which include underground storage tanks, above-ground storage tanks, refineries, pipelines, and service stations, will be the same as with the current diesel fuel. Also, the mechanisms by which the diesel fuel enters surface water or migrates in the subsurface at a site will be unchanged. The factors that control the behavior of diesel in soil and water are not expected to be significantly different with the low sulfur fuel.

The refining process to reduce the sulfur content of diesel fuel to 15 ppmw is not expected to result in a significant change in the chemical composition of the fuel. Also, the expected increase in additives to meet ARB's lubricity standard should not significantly change the chemical composition of the diesel fuel. Therefore, there should be no significant change in the physical or chemical properties that affect the activity of the fuel in soil and water, and any release of low sulfur diesel fuel to the environment should have no additional impact on water quality compared to the current diesel fuel.

J. Retrofitting of Intrastate Locomotives and Harborcraft

The proposed amendments will remove one obstacle that might otherwise prevent the retrofitting of existing diesel engines with control devices that reduce PM emissions. ARB staff estimates that the retrofit of existing intrastate locomotives and commercial and recreational harborcraft could result in a significant reduction in the diesel PM emission inventory and the associated potential cancer risk for 2020, when compared to today's diesel PM emission inventory and risk. ARB staff is currently determining the availability and feasibility of DPFs and other control technologies. This reduction in potential cancer risk from diesel PM is necessary to achieve the Board's goals as defined in the DRRP.

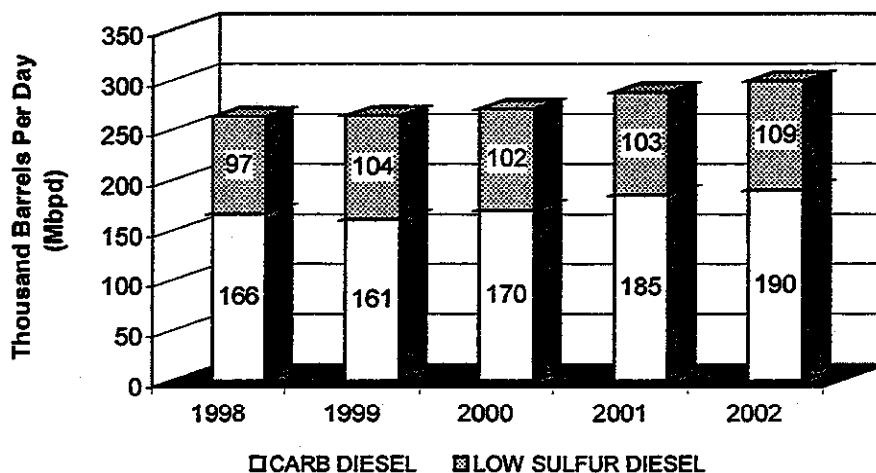
XII. POTENTIAL IMPACTS OF THE PROPOSED AMENDMENTS ON THE AVAILABILITY OF CALIFORNIA DIESEL FUEL

This chapter presents a summary of the potential impacts of the proposed amendments on diesel fuel production by California refineries and diesel fuel supply in California.

A. Diesel Production in California Refineries

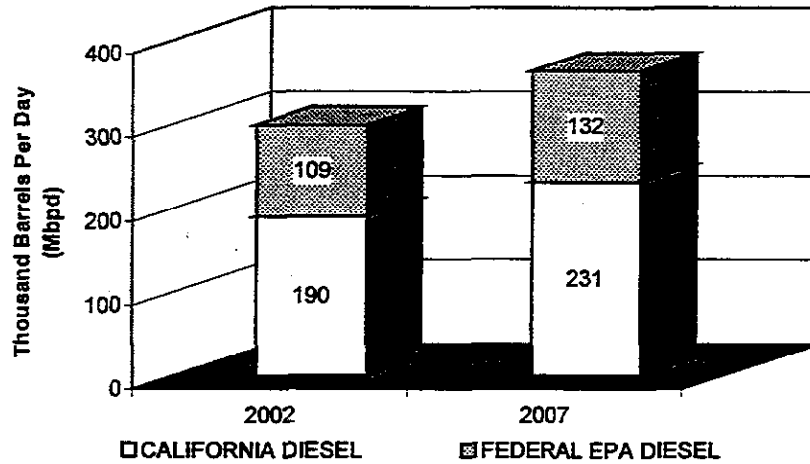
The proposal to extend CARB diesel fuel requirements to intrastate locomotives and harborcraft are not expected to have any significant impact on the ability of California to produce and supply adequate volumes of California diesel fuel. In California, on-road diesel fuel (either CARB or U.S. EPA) is produced at 12 large refineries and two small refineries. Based on information from the CEC, in 2001, these refineries produced 190 Mbpd of California diesel fuel, and nearly 110 Mbpd of U.S. EPA on-road diesel fuel (about 3 percent, or 9 Mbpd, of this production includes diesel fuel used by locomotives and marine vessels). This is an increase in California diesel fuel production of more than 14 percent, and an increase of more than 12 percent for U.S. EPA on-road diesel fuel over 1998 levels. Figure XII-1 shows the annual diesel fuel production from California refineries from 1998 through 2002.

Figure XII-1
California Refinery Diesel Production (1998 – 2002)



Based on recent statewide diesel fuel consumption trends showing increases of nearly four percent per year, staff estimates that in 2007, nearly 231 Mbpd of California low sulfur diesel fuel will need to be produced to meet anticipated California demand. Also, over 130 Mbpd of U.S. EPA on-road diesel fuel will be needed to meet diesel demands in neighboring states. These diesel fuel production demand estimates are shown in Figure XII-2.

**Figure XII-2
Anticipated 2007 On-Road Diesel Production Compared
to 2002 Actual Diesel Production**

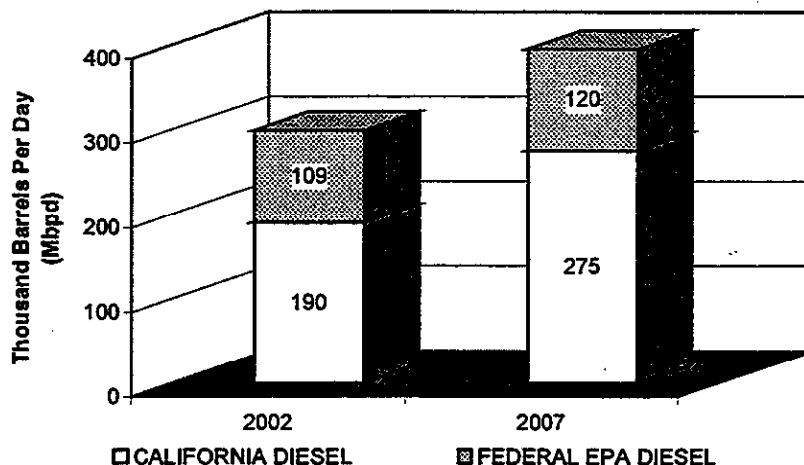


Based on information from California refiners, CARB diesel fuel capacity is expected to be approximately 275,000 barrels per day in 2007. As can be seen, there is still a wide margin between projected estimates for diesel fuel production in 2007 and the estimated diesel capacity, as reported by the refineries.

B. Diesel Capacity of California Refineries

Currently, California refineries have the capacity to produce about 190 Mbbpd of California diesel fuel, and about 110 Mbbpd of capacity to produce U.S. EPA on-road diesel fuel. Based on information provided by refiners, the requirements to supply CARB diesel fuel to intrastate locomotives and harborcraft will not have any significant impact on the ability of California refiners to produce adequate volumes of CARB diesel fuel. Because several refiners indicated that they will expand their ability to produce volumes of California diesel fuel, it is expected that California refining capacity to produce California diesel fuel will increase to 275 Mbbpd by 2007. In addition, the capacity of California refiners to produce U.S. EPA on-road diesel fuel will increase to about 120 Mbbpd by 2007. This is shown in Figure XII-3.

**Figure XII-3
California Refiners' Diesel Fuel Production Capacity
(2002 Versus 2007)**



In comparing Table XII-2 to Table XII-3, it can be seen that there should be more than adequate refining capacity by California refineries to increase their production of CARB diesel fuel to meet projected incremental demand estimates. However, it appears the situation may be more constrained for the production of U.S. EPA diesel fuel. Staff does not believe that this should be significant for two reasons. First, the ability of refiners to import U.S. EPA diesel from other parts of the country fuel to supply to neighboring states will be available. Also, since there appears to be excess CARB diesel fuel production capacity available to California refiners, they have the ability to supply CARB diesel fuel to neighboring states as demand and market conditions allow.

XIII. COST ANALYSIS

This chapter presents a summary of the analysis of the costs to produce CARB diesel fuel for use in intrastate locomotives and harborcraft. Analysis of diesel fuel spot prices, the cost effectiveness of the proposed amendments, and the costs of the alternatives described in Chapter X are also provided.

A. Costs to produce CARB diesel fuel

Today, only two types of diesel fuel are generally produced, supplied, or transported in California – U.S. EPA on-road diesel fuel and CARB diesel fuel, both meeting a 500 ppmw sulfur limit (limited quantities of CARB diesel fuel meeting a 15 ppmw sulfur limit are available). There currently exists little, if any, supply of diesel fuel not meeting either of these specifications (this is evident in the fuel usage data reported by intrastate locomotive and harborcraft operators in Chapters VI and VII). Based on conversations with California refiners and the CEC, staff believes that when the proposed amendments are fully implemented in 2007, the diesel fuel supply market in California will be similar to today's. The only change would be that diesel fuel in general commerce in the state will meet a 15 ppmw sulfur limit.

In evaluating the potential costs of the proposed amendments, staff has considered the likely diesel fuels expected to be generally available in California in 2007. Based on the fact that intrastate locomotive and harborcraft operators will likely use, at a minimum, U.S. EPA on-road diesel fuel meeting a 15 ppmw sulfur limit, staff has determined the costs of the proposed amendments based on the incremental cost in 2007 to produce CARB diesel fuel relative to U.S. EPA on-road diesel fuel.

Staff estimates that the incremental cost to produce CARB diesel fuel relative to U.S. EPA on-road diesel fuel will be about 3 cents per gallon. This is the incremental cost to reduce the aromatic hydrocarbon content of U.S. EPA on-road diesel fuel from a limit of 35 volume percent to a limit of 10 volume percent (or an equivalent formulation limit)².

B. Effects of Staff's Proposal on Fuel Prices

With respect to the impacts on diesel prices as a result of staff's proposed amendments, it is very difficult to predict what will occur in the marketplace. Supply/demand, crude oil prices, competitive market considerations, etc. predominately influence diesel fuel prices. However, it is reasonable to assume that over time, refiners will recover the increased costs of production in the marketplace. With this assumption, and the staff's estimate that the incremental cost to produce CARB diesel fuel relative to U.S. EPA on-road diesel fuel will be about 3 cents per gallon, it is reasonable to assume that this increase in production cost will, on average, be reflected in diesel fuel prices. This assumption does not attempt to predict changes in fuel taxes and refinery product markup. Refiners will recover costs through increased diesel fuel markup if

² *Technical Support Document for Proposed Adoption of Regulations Limiting the Sulfur Content and the Aromatic Hydrocarbon Content of Motor Vehicle Diesel Fuel*, October 1988, ARB.

competitive conditions allow it. However, predictions of 2006 and beyond petroleum product markup and pricing are beyond the scope of this document.

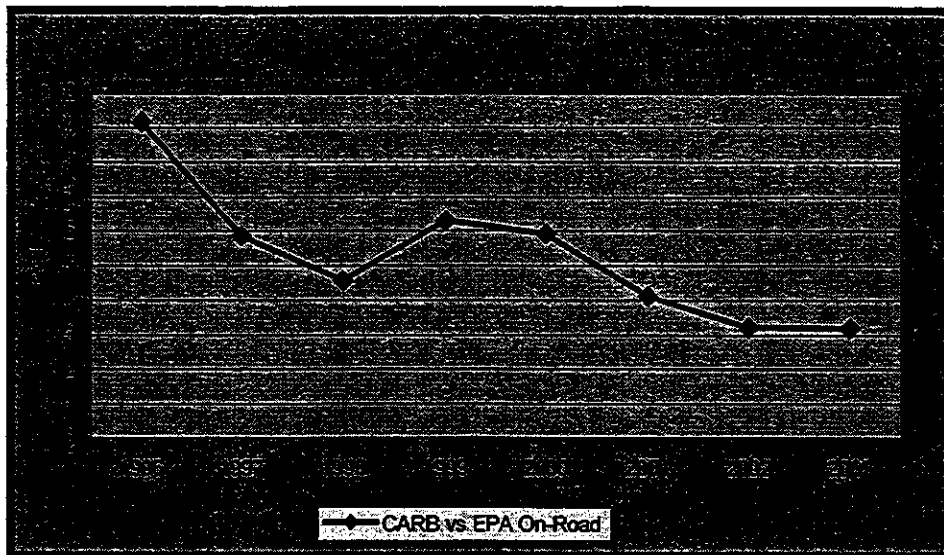
It is very difficult to predict how the proposed rule, which will result in a slight increase in the demand for CARB diesel fuel, will affect diesel pricing and volatility. However, the proposed amendments should not impact the ability of California refiners to supply sufficient quantities of diesel fuel to the California market. Conversations between ARB staff and California refiners, as well as with the staff of the CEC suggest that sufficient diesel refinery capacity already exists. In addition, the implementation of the federal on-road and nonroad low sulfur diesel regulations, adoption of the California diesel fuel regulations by the state of Texas, and the ability of out-of-state refiners to produce diesel fuel meeting California standards should provide even greater diesel fuel availability to the State. As a result, the overall diesel fuel production system consisting of California refineries and imports should be no more subject to supply disruptions than today. In fact 2006 market conditions may be better able to readily adjust to any California diesel production requirements that occur in the future.

1. Evaluation of spot fuel prices for various grades of diesel fuel

In evaluating the impacts of production costs, staff believes it is most useful to examine how production costs have historically translated into fuel costs on the open market. For diesel fuel supplied to locomotive and marine operators, this can be fairly represented by the diesel fuel spot market in California. In the diesel fuel spot market, sizable batches of diesel fuel (generally supplied directly from a refinery or fuel importer) are traded for a negotiated price. By using spot market prices, it is possible to remove such outside influences on fuel costs such as transportation, tax impacts, local diesel fuel market conditions, and other costs to yield a fairly representative gauge of fuel production costs.

In Figure XIII-1, staff has graphed the incremental spot price differential between CARB diesel fuel and both U.S. EPA on-road diesel fuel, for the years 1996 through 2003.

**Figure XIII-1:
Incremental Spot Price Differential between CARB
and U.S. EPA On-road Diesel Fuel
(1996-2003)**



As can be seen from Figure XIII-1, the incremental spot price of CARB diesel fuel relative to U.S. EPA on-road diesel fuel has been steadily decreasing over the last 8 years. In 1996, the incremental spot price differential between CARB diesel fuel and U.S. EPA on-road diesel fuel was about 9 cents per gallon. By 2003, that differential had been reduced to about 3 cents per gallon. This price differential is consistent with the estimated incremental diesel fuel production cost of 3 cents per gallon.

These data indicate that the relative price differences between CARB and non-CARB diesel fuel in California has been steadily decreasing over the last 8 years. Staff believes this is due to a number of factors, including:

- Increased demand of U.S. EPA on-road diesel fuel in PADD V (Alaska, Arizona, Hawaii, Nevada, Oregon and Washington) outside of California.
- A resulting shift in production at California and Washington refineries from nonroad diesel fuels to on-road diesel fuel.
- Changes in the fuel distribution system whereby higher sulfur fuels (such as U.S. EPA nonroad diesel fuel) are not fungible, thereby limiting the production demand for these fuels
- Tight overall supply of all transportation fuels in PADD V.

C. Other benefits from the use of low sulfur diesel fuel

Staff has identified several benefits to diesel fuel end users from the proposed amendments that have not been quantified in the above production cost estimates. These benefits will be felt both initially, and over the course of the life of the program.

Initially, diesel fuel users are expected to see a decrease in engine wear as a result of low sulfur diesel fuel. This is because fuel sulfur tends to produce acidic compounds that increases the corrosion wear of engine components.

In addition, lower sulfur fuels should increase the life of diesel engine lubrication oil, as fuel sulfur tends to increase the acidification of engine lubricating oils resulting in loss of pH control. By reducing the diesel fuel sulfur content, it is expected that the interval between oil changes can be extended, leading to a cost saving to diesel engine operators. The U.S. EPA estimates the reduced oil change intervals provide the single largest savings from using 15 ppm sulfur diesel fuel. Currently, engine manufacturers specify different oil change intervals as a function of diesel fuel sulfur levels.

The U.S. EPA has estimated fuel operating cost savings attributed to the oil change interval. The U.S. EPA estimates an oil change interval extension of 31 percent through the use of 500 ppmw sulfur fuel, resulting in a fuel operating cost savings of 2.9 cents per gallon. They further estimate additional cost savings of 0.3 cents per gallon for the oil change interval extension that would be enabled by the use of 15 ppmw sulfur diesel fuel. These savings will occur without additional new cost to the equipment owner beyond the incremental cost of the low-sulfur diesel fuel. These savings are dependent on changes to current maintenance schedules. Such changes seem likely given the magnitude of the savings. There are many mechanisms by which end-users could become aware of the opportunity to extend oil drain intervals. First, it is typical practice for engine and equipment manufacturers to issue service bulletins regarding lubrication and fueling guidance for end-users. In addition, the equipment and end-user industries have a number of annual conferences that are used to share information, including information regarding appropriate engine and equipment maintenance practices. The end-user conferences are also designed to help specific industries and business reduce operating costs and maximize profits, which would include information on equipment maintenance practices. There are trade journals and publications that provide information and advice to their users regarding proper equipment maintenance. Finally, some nonroad users perform routine oil sample analysis to determine appropriate oil drain intervals, and in some cases to monitor overall engine wear rates to determine engine rebuild needs.

D. Anticipated costs to intrastate locomotive and harborcraft diesel fuel end users

This section discusses the anticipated costs of the proposed amendments to intrastate locomotive and harborcraft diesel fuel end users. The first section discusses staff's estimate of the anticipated costs. The second section discusses the anticipated costs based on conversations with affected industry.

1. Staff's estimate of anticipated costs

Based on staff's belief that, over time, increased diesel fuel production costs will be passed on from producers to end users, staff has used the incremental fuel production cost estimate of 3 cents per gallon to estimate the potential statewide costs of the proposed amendments. These costs are based on both the volumes of non-CARB diesel fuel currently being consumed and the incremental diesel fuel production costs cited.

In developing these costs, staff's methodology uses a range of costs. The lower range of the costs is the anticipated incremental cost to shift all current non-CARB diesel fuel purchases to CARB diesel fuel. This methodology assumes that those nonroad diesel fuel users who are currently using CARB diesel fuel will not experience any fuel price increases as a result of the proposed amendments since they will continue to purchase the same fuel that they buy today. Staff believes this is a likely scenario, because in many portions of the state, CARB diesel fuel is the only fuel available, and the production costs of CARB diesel fuel are already being incurred and presumably reflected in current diesel fuel prices. Because of this, the increased demand for CARB diesel fuel should not place upward price pressures on the market in these areas. In addition, in a number of instances, CARB diesel fuel is currently being specified by the diesel fuel end user (i.e., for ferry operators and certain commuter train operators).

However, recognizing that the proposed amendments remove the flexibility of nonroad diesel fuel end users to use non-CARB diesel fuel, staff has also developed a conservative upper estimate which assumes that 50 percent of the existing CARB diesel fuel use, in addition to the non-CARB diesel fuel use, will command a higher price, equal to the production cost increases cited above.

Using the fuel use data provided in Chapters VI and VII, and the incremental production cost described above, staff has calculated the potential total statewide costs to intrastate locomotive and harborcraft operators associated with the proposed amendments. In developing this data, staff has looked at 2 different periods: 2006, and 2007 and beyond. This is necessary due to different implementation dates within the proposed amendments. The potential total annual statewide costs are shown in Table XIII-1.

Table XIII-1: Potential Total Annual Statewide Costs by Year

| Cost Range | Potential Costs by Year | |
|------------|-------------------------|-------------|
| | 2006 | 2007 |
| Upper | \$600,000 | \$3,040,000 |
| Lower | \$440,000 | \$2,060,000 |

As can be seen in Table XIII-1, the potential first year costs (which would only be experienced in the SCAQMD) are expected to range from about \$440,000 to \$600,000. When the proposed amendments become fully effective in 2007, the potential statewide costs are expected to range from \$2.1 to \$3 million.

2. Estimate of anticipated costs based on comments from affected industry

During the development of the proposed amendments, affected industry has indicated that the actual cost impact will be greater than that estimated by staff. This is because affected industry believes that even though they do not specify for the delivery of CARB diesel fuel, they often receive CARB quality diesel fuel, at below CARB diesel fuel market prices. As a result, they believe that any requirements for the supply of CARB diesel fuel will necessitate the specification of CARB diesel fuel for future fuel purchases, resulting in higher fuel costs. This will require that they incur the incremental additional fuel costs of 3 cents per gallon for both

their current non-CARB diesel fuel being supplied, as well as for that volume of CARB diesel fuel already being supplied.

Based on this information, staff has estimated these affected industry stated costs. These costs are presented below in Table XIII-2. While this methodology yields potential annual fuel cost increases that are about 30 percent higher than those estimated by staff, this has little impact on the overall cost-effectiveness of the proposed amendments.

Table XIII-2: Estimate of Potential Annual Costs Using Industry Methodology

| Year | |
|-----------|-------------|
| 2006 | 2007+ |
| \$770,000 | \$4,010,000 |

As previously discussed, staff does not believe that this methodology yields a realistic estimate of the anticipated costs of the proposed amendments. Because the incremental fuel production costs of CARB diesel relative to other grade of diesel fuel are generally fixed, the methodology advocated by affected industry would result in fuel producers selling diesel fuel below their production costs. While some diesel fuel end-users may receive diesel fuel price concessions from fuel vendors and suppliers, these are likely based on volume, other market conditions, or corporate relations between the end user and the fuel supplier, and can be highly variable from company to company, and even seasonal in nature. Because of this, a meaningful comparison between the price paid for diesel fuel by some end users in relation to market prices is not feasible. In addition, no data supporting affected industry's methodology has been provided to staff. As such, staff does not believe that the price concessions received by affected industry are a function of the ability of the end-user to use a "dirtier" (i.e., U.S. EPA nonroad) diesel fuel than is supplied, and that staff's upper range estimate above (which accounts for a lack of flexibility to use non-CARB diesel fuel) adequately accounts for potential increased fuel costs to affected industry.

E. Cost-Effectiveness

As was discussed in Chapter XI, staff has estimated that the proposed amendments, when fully implemented in 2007, will provide about 2 tpd of NO_x, and about or 0.6 tpd of diesel particulate (both directly emitted and secondary formation) emission benefits. Using these emission benefits and the cost information provided above, staff has calculated the cost-effectiveness of the proposed amendments. The cost-effectiveness, for the cost ranges and years shown in Table XIII-1, is shown below in Table XIII-3.

Table XIII-3: Anticipated Cost-Effectiveness of the Proposed Amendments

| Cost Range | Cost-Effectiveness (Dollars per Pound) | |
|------------|---|--------|
| | 2006 | 2007 |
| Upper | \$1.10 | \$1.60 |
| Lower | \$0.80 | \$1.10 |

* The emission benefits in 2006 are only from marine vessels in the SCAQMD and are estimated to be 0.5 tpd of NOx.

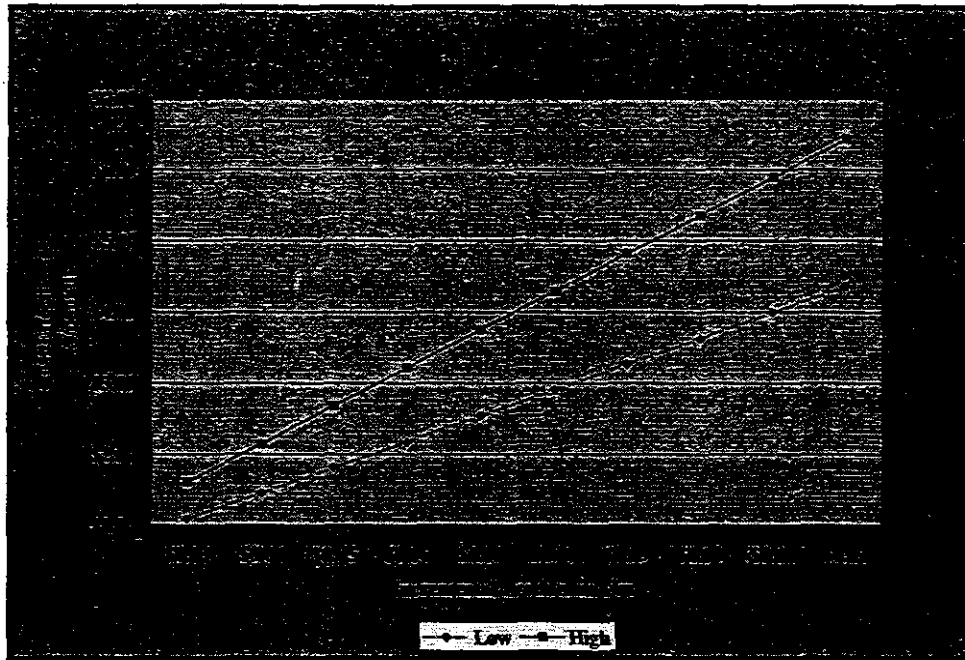
As can be seen from Table XIII-3, the cost-effectiveness of the proposed amendments in 2006 in the SCAQMD ranges between \$0.80 and \$1.10 per pound of NOx plus PM reduced. In 2007, when the proposed amendments are fully implemented statewide, the cost-effectiveness ranges between \$1.10 and \$1.60 per pound of NOx plus PM reduced. This is in the range of other recent criteria pollutant control measures approved by the Board.

In addition, calculating the cost-effectiveness using the costs derived with the industry cost methodology described above, the cost-effectiveness is about \$2.10 per pound of NOx plus PM reduced, which is also within the range of other recent criteria pollutant control measures approved by the Board.

1. Sensitivity of cost-effectiveness to CARB diesel fuel production cost increases

Based on concerns by current locomotive and harborcraft operators that the actual potential diesel fuel price increases will be higher than those predicted by staff, staff has performed a sensitivity analysis on the cost-effectiveness of the proposed amendments. In performing this sensitivity analysis, staff has evaluated the impact on cost-effectiveness based on changes to the CARB diesel fuel production cost estimates presented earlier. In doing this analysis, staff has looked at the impacts of the actual CARB diesel fuel production costs being greater than staff's estimate (as suggested by diesel fuel end users). The results of this analysis are shown below in Figure XIII-2.

Figure XIII-2
Sensitivity of Cost-Effectiveness from Differences in Incremental
CARB Diesel Fuel Production Cost Estimates



As can be seen from Figure XIII-2, for incremental CARB diesel fuel production cost differences that are higher than staff's estimate, even up to four times greater (12 cents per gallon versus 3 cents per gallon), the cost-effectiveness ranges from about \$4.40 to \$6.40 per pound of NO_x plus PM reduced. Even with these higher costs and reduced cost effectiveness, the proposed amendments are still within the range of other control measures approved by the Board.

F. Costs of Alternative Proposals Considered

As was discussed in Chapters VIII and IX, staff considered five alternatives to the proposed regulations. These alternatives are listed again below:

- Not extending CARB diesel fuel requirements to diesel fuel for use by intrastate locomotives (in which case the fuel would still be subject to U.S. EPA nonroad diesel fuel standards).
- Not requiring any diesel fuel for use by Class III railroad locomotives to have to comply with the CARB diesel fuel requirements.
- Not requiring diesel fuel for use by certain rural Class III railroad locomotives, not operating in ozone non-attainment areas, to have to comply with the CARB diesel fuel requirements until June 1, 2012.
- Requiring diesel fuel for use by all intrastate locomotives in the SCAQMD to meet the CARB diesel fuel standards by January 1, 2006, with diesel fuel for use by intrastate locomotives and harborcraft in the rest of the state to be subject to the CARB diesel fuel standards by January 1, 2007.

- Making diesel fuel for use by all harborcraft and all interstate and intrastate locomotives subject to the CARB diesel fuel requirements.

In considering the feasibility of the alternatives considered in relation to the proposal, staff has identified a number of factors that lead to the proposal as being the most appropriate approach.

For the first alternative, which would allow for the implementation of only the less stringent U.S. EPA nonroad diesel fuel standards in 2007, necessary emission reductions associated with the use of California diesel fuel would not be achieved. This would result in the State not meeting commitments identified in the federally enforceable SIP, and could also result in the State failing to meet federal National Ambient Air Quality Standards for both ozone and PM. This could result in the potential loss of federal highway funding.

The second alternative would retain the same harborcraft provisions as are contained in the proposed regulations, but would only include the Class I and passenger/commuter railroads (Class III railroads would be excluded). While this alternative would provide an annual cost savings of \$35,000 to \$68,000 to the Class III railroads in California, this alternative would sacrifice NOx emission benefits of about 0.1 tpd (about 10 percent of the NOx emission benefits anticipated from intrastate locomotives) on about 1 million gallons of diesel fuel consumed in the state annually. In addition, diesel particulate emission reductions would also be sacrificed. The loss of these diesel particulate emission benefits would be realized in certain environmentally sensitive (environmental justice) communities around the state, resulting in continued elevated exposure to toxic air contaminants (including diesel particulate). The emission reductions achieved through the proposed amendments will reduce exposure to diesel particulate in these sensitive areas.

The third alternative also would retain the same harborcraft provisions as are contained in the proposed regulations, but would exclude certain rural railroads not in ozone non-attainment areas until June 1, 2012. This alternative does sacrifice a small amount of emission reductions over the proposal and would provide a very slight cost savings of \$4,000 to \$5,000 for a few Class III railroad operators. However, the emission reductions sacrificed include diesel PM, and could potentially have an adverse impact on individuals living in close proximity to railroad operations in these rural areas. In addition, the proposed amendments would require these rural Class III railroads would meet the same CARB diesel fuel requirements as other on- and off-road mobile sources, as well as stationary sources, operating in these areas.

The fourth alternative would include both intrastate locomotives and harborcraft operating in the SCAQMD in the proposed regulations beginning January 1, 2006, and include the remaining railroads and harborcraft operating in the rest of the State beginning January 1, 2007. This alternative would achieve temporary additional emission reductions in 2006 of about 0.3 tpd of NOx benefits, at an additional cost of between \$300,000 to \$440,000 in 2006. However, the period during which these benefits would be realized (2006) will see the implementation of the California and federal on-road 15 ppmw sulfur diesel fuel standards, as well as the SCAQMD's Rule 431.2, which requires all diesel fuel supplied to mobile sources (except locomotive and marine applications) in the SCAQMD to meet a 15 ppmw sulfur cap. The addition of over 10 million gallons of additional CARB diesel fuel demand from intrastate locomotives in the

SCAQMD in 2006 could create supply issues during the simultaneous implementation of the three other diesel regulations in the SCAQMD. This could result in an environmental disbenefit if adequate volumes of CARB diesel fuel are unavailable.

The final alternative considered would have extended the proposed amendments to include both intrastate and interstate locomotives, as well as harborcraft. This alternative has the potential to achieve additional emission reductions up to about 5 tpd of NO_x, and 1.3 tpd of PM (both directly emitted and secondary) at an additional cost of about \$2.8 million per year. However, it is likely that the actual emissions reductions would be much less than this amount because interstate locomotive operators would have an economic incentive to significantly increase the amount diesel fuel bought out-of-state. This is because, by nature, interstate locomotives have the ability to travel long distances without refueling and could likely obtain lower priced fuel that meets U.S. EPA nonroad standards from out-of-state. As such, a requirement that interstate locomotive operators use CARB diesel fuel could result in changes to existing California locomotive fueling patterns, and an increase in the use of out-of-state U.S. EPA nonroad diesel fuel. Further, a requirement on interstate operators could also result in a corresponding decrease in the use of cleaner CARB or U.S. EPA diesel fuels that otherwise would have been used. Because of this potential loss in benefits, staff concluded that this alternative was not advisable.

XIV. ECONOMIC IMPACTS OF THE PROPOSED AMENDMENTS

This section describes the economic impacts of the proposed amendments. The section focuses on the economic impacts to the statewide economy and specific industry sectors. The industry sectors examined are transportation, railroad, and marine. In evaluating the economic impacts, staff used, where possible, both estimates of the direct costs to typical businesses, as well as the combined costs on the general economic sector in California.

A. Potential Impacts on the California Economy

The proposed amendments are not expected to require any new capital requirements at California refineries. However, the proposed amendments are expected to increase diesel fuel production costs for to California refiners by 3 cents per gallon from for that volume of fuel currently supplied to intrastate locomotive and harborcraft operators that does not presently meet the CARB diesel fuel requirements. This impact could increase diesel fuel costs to intrastate locomotive and harborcraft operators by \$2 to \$3 million per year. This impact is not expected to have a significant impact on the overall California economy.

B. Potential Impacts on the California Petroleum Sector

The proposed amendments are not expected to require any new capital requirements at California refineries. However, the proposed amendments are expected to increase diesel fuel production costs to California refiners by 3 cents per gallon beginning in 2007 for that volume of fuel currently supplied to intrastate locomotive and harborcraft operators that does not presently meet the CARB diesel fuel requirements. Staff expects that these costs will likely be passed on to intrastate locomotive and harborcraft operators.

C. Potential Impacts on Intrastate Locomotive Operators

This section describes the potential impacts of the proposed amendments on the Class I freight railroads, passenger railroad operations, and Class III railroads.

1. Class I Railroads

Both UP and BNSF are publicly traded corporations. Based on the most recently available annual financial data, staff has estimated the potential economic impacts of the proposed amendments on UP and BNSF. Table XIV-1 lists the pre-tax profits of both Class I railroads operating in California.

**Table XIV-1: National Operating Income of Class I Freight Railroads
Operating in California**

| | 2002 | 2003 | 2004 | Average |
|--------------|------------------------|------------------------|------------------------|------------------------|
| UP | \$2,018,000,000 | \$2,253,000,000 | \$2,133,000,000 | \$2,135,000,000 |
| BNSF | \$1,750,000,000 | \$1,656,000,000 | \$1,665,000,000 | \$1,690,000,000 |
| Total | \$3,768,000,000 | \$3,909,000,000 | \$3,798,000,000 | \$3,825,000,000 |

Source: 2003 Annual Reports from UP and BNSF.

As discussed in previous chapters, staff estimates that intrastate locomotives operated by UP and BNSF combined consume over 23 million gallons of diesel fuel annually. Of this diesel fuel, about 17 million gallons is U.S. EPA on-road diesel fuel and the rest is CARB diesel fuel. Using the same cost methodology described in Chapter XIII, applied to the Class I freight railroads combined, staff estimates that the costs of the proposed amendments, in terms of increased fuel costs, will range from about \$500,000 to \$600,000. This increase represents an impact of less than 0.02 percent on the combined operating income of the two railroads, and represents an average cost of \$1,300 to \$1,600 per Class I freight intrastate locomotive operated in California.

Based on this information, staff does not believe the proposed amendments will have a significant economic impact on the Class I freight railroads operating in California.

2. Passenger and Commuter Railroads

Currently, there are four local government transit agencies that operate diesel-electric locomotives in commuter service. Three of these, Metrolink (operated by the South Coast Regional Rail Authority) the Coaster (operated by the North Coast Transit District), and Caltrain (operated by the Peninsula Corridor Joint Powers Board), already specify CARB diesel fuel for their fuel purchases. The Altamont Commuter Express, operated by the Altamont Commuter Express Joint Powers Authority, currently receives CARB diesel fuel, but does not specify it during its fuel procurement process. Staff does not believe the proposed amendments will result in increased diesel fuel costs because the fuel suppliers do not have ready access to any fuel other than CARB diesel. Staff believes that the current prices paid already reflect CARB diesel fuel production costs. Staff believes the proposed regulations should have no fiscal or economic impact on these agencies.

Under the direction and funding of the state Department of Transportation (Caltrans), Amtrak operates two commuter rail services (the *Capital Corridor* between Emeryville and Auburn and the *San Joaquin* between Oakland or Sacramento and Bakersfield) in the State. Currently, these commuter rail lines receive CARB diesel fuel, although they do not specify this type of fuel during the fuel procurement process. Staff does not believe the proposed amendments will result in increased diesel fuel costs because the fuel suppliers do not have ready access to any fuel other than CARB diesel. Staff believes that the current prices paid by Caltrans already reflect CARB diesel fuel production costs. Staff believes the proposed regulations should have no fiscal or economic impact.

3. *Class III Railroads*

In general, Class III railroads in California are privately held companies. Financial data on these operations is not readily available. As such, the magnitude of any potential increases in fuel costs and the corresponding reduction in profits is difficult to estimate reliably for any particular Class III California railroad. However, the California Public Utilities Commission (PUC) collects and publishes information on the gross revenues of the Class III railroads operating in California. Staff used this information to estimate the economic impact of the proposed amendments on the Class III railroad operations subject to the proposed amendments.

Class III railroads operating in California (and subject to staff's proposed amendments) have gross revenues that range from \$25,000 to \$11.5 million per year. Using the cost methodology described in Chapter X, applied each Class III railroad operating in California, staff estimates that the costs of the proposed amendments, in terms of increased fuel costs, will vary for each company from no cost to about \$20,000, averaging between \$1,800 to \$3,400 per company, or about \$290-\$560 per Class III locomotive in California operation. Staff estimates that this potential increase in diesel fuel costs could represent up to 1 percent of the gross revenues of the Class III railroads. Based on this information, staff does not believe the proposed amendments will have a significant economic impact on the Class III railroads operating in California.

While the ability of the Class III railroad operators to absorb higher fuel costs is more difficult than the Class I freight railroad operators, fuel price volatility is commonplace in today's business environment. Staff does not believe that the proposed amendments will increase CARB diesel fuel prices above the current volatility range of diesel fuel prices. In fact, the spot diesel fuel price information provided in Chapter XIII suggests that the variation in diesel fuel prices for various grades of diesel fuel is shrinking. This should help mitigate diesel fuel price increases to Class III railroad operators resulting from the proposed amendments.

D. Potential Impacts on Harborcraft Operators

To analyze the impacts of the proposed amendments, typical commercial fishing businesses and tugboat operators were chosen for analysis. Commercial fishing operators represent the largest number of vessels and businesses compared to other types of harborcraft operations. As discussed in Chapter VII, commercial fishing vessels account for about half of all harborcraft operated in California. In addition, commercial fishing operations are largely single boat operations representative of smaller harborcraft businesses. Tugboat companies were analyzed because they have the highest average fuel consumption, and the most vessels per company. Staff believes that these two types of harborcraft operations are an adequate representation of the range of harborcraft companies.

The impacts on California harborcraft operators are to the extent that implementation of the proposed regulation reduces their profitability. Table XIV-2 summarizes the costs for typical commercial fishing and tug operators for various years, and provides the percent change in the return on owner's equity (ROE). Based on staff's analysis, staff believe that the average ROE may decline by less than one percent for commercial fishing operations and by about four to seven percent for tugboat operations as a result of the proposed amendments. The larger impact on tugboat operators is a reflection of their higher consumption of diesel fuel.

Based on this analysis, the proposed amendments are not expected to have a significant impact on the profitability of affected harborcraft operations. In addition, ferries are already required to use CARB diesel, so there would be no expected impact on their profitability. As a result, staff does not expect any noticeable economic impacts on California harborcraft operators.

Table XIV-2: Added Annual Costs and Change in Return on Owner's Equity for California Commercial Harborcraft Operators

| Location | Year | Commercial Fishing | | Harborcraft Operators | |
|----------------------|-----------|--------------------|--------|-----------------------|-------|
| | | Added Annual Cost | RGE | Added Annual Cost | RGE |
| South Coast | | | | | |
| | 2006 | \$372 | -0.184 | \$18,615 | -4.40 |
| | 2007-2011 | \$307 | -0.152 | \$15,330 | -3.62 |
| Rest of State | | | | | |
| | 2007 | \$591 | -0.293 | \$29,565 | -6.98 |
| | 2008-2011 | \$526 | -0.261 | \$26,280 | -6.21 |

E. Economic Effects on Small Businesses

Government Code sections 11342 et. Seq. requires the ARB to consider any adverse effects on small businesses that would have to comply with a proposed regulation. Also, this definition includes only businesses that are independently owned and, if in retail trade, gross less than \$2,000,000 per year. Thus, staff's analysis of the economic effects on small business is limited to the costs to Class III railroad transportation companies and commercial harborcraft.

Based on the potential economic impacts discussed above for Class III railroad and commercial harborcraft operators, staff does not believe the proposed amendments will have a significant economic impact on small businesses in California.

APPENDICES

APPENDIX A

PROPOSED REGULATION ORDER

**Proposed Regulatory Amendments
Extending the California Standards for Motor Vehicle Diesel Fuel to
Diesel Fuel Used in Harborcraft and Intrastate Locomotives**

PROPOSED REGULATION ORDER

Proposed Extension of the California Standards For Motor Vehicle Diesel Fuel to Diesel Fuel Used For Intrastate Diesel-Electric Locomotives and Harborcraft

Note: The proposed regulatory action consists of the addition of new section 2299, title 13, California Code of Regulations (CCR), and new section 93116, title 17, CCR, along with amendments to sections 2281, 2282, and 2284, title 13, CCR. The proposed amendments are shown in underline to indicate additions and ~~strikeout~~ to indicate deletions.

1. Add Section 2299, title 13, California Code of Regulations, to read as follows:

California Code of Regulations, Title 13, Division 3 Chapter 5.1. Standards for Fuels for Nonvehicular Sources

§ 2299. Standards for Nonvehicular Diesel Fuel Used in Diesel-Electric Intrastate Locomotives and Harborcraft.

(a) Requirements.

- (1) Standards for Nonvehicular Diesel Fuel Used in Harborcraft in the South Coast Air Quality Management District (SCAQMD) Beginning January 1, 2006. Beginning January 1, 2006, California nonvehicular diesel fuel sold, offered for sale, or supplied within the SCAQMD for use in harborcraft is subject to all of the requirements of Title 13 CCR sections 2281 (sulfur content), 2282 (aromatic hydrocarbons content) and 2284 (lubricity) applicable to vehicular diesel fuel, and shall be treated under those sections as if it were vehicular diesel fuel.
- (2) Standards for Nonvehicular Diesel Fuel Used in Intrastate Diesel-Electric Locomotives and Harborcraft Beginning January 1, 2007. Beginning January 1, 2007, California nonvehicular diesel fuel sold, offered for sale, or supplied for use in diesel-electric intrastate locomotives or harborcraft is subject to all of the requirements of title 13 CCR sections 2281 (sulfur content), 2282 (aromatic hydrocarbons content) and 2284 (lubricity) applicable to vehicular diesel fuel, and shall be treated under those sections as if it were vehicular diesel fuel.

(b) Definitions.

- (1) “California nonvehicular diesel fuel” means any diesel fuel that is not vehicular diesel fuel as defined respectively in Title 13 sections 2281(b), 2282(b), or 2284(b) and that is sold or made available for use in engines in California.

- (2) “Diesel-electric locomotive” means a locomotive using electric power provided by a diesel engine that drives a generator or alternator; the electrical power produced then drives the wheels using electric motors.
- (3) “Diesel fuel” means any fuel that is commonly or commercially known, sold or represented as diesel fuel, including any mixture of primarily liquid hydrocarbons that is sold or represented as suitable for use in an internal combustion, compression-ignition engine.
- (4) “Harborcraft” means any marine vessel that meets all of the following criteria:
- (A) The vessel does not carry a “registry” (foreign trade) endorsement on its United States Coast Guard certificate of documentation, and is not registered under the flag of a country other than the United States;
 - (B) The vessel is less than 400 feet in length overall (LOA) as defined in 50 CFR § 679.2 as adopted June 19, 1996;
 - (C) The vessel is less than 10,000 gross tons (GT ITC) per the convention measurement (international system) as defined in 46 CFR 69.51 - .61, as adopted September 12, 1989; and
 - (D) The vessel is propelled by a marine diesel engine with a per-cylinder displacement of less than 30 liters.
- (5) “Intrastate diesel-electric locomotive” means:
- (A) A diesel-electric locomotive that operates within California for which at least 90 percent of its annual fuel consumption, annual hours of operation, and annual rail miles traveled occur within California. This definition would typically include, but not be limited to, diesel-electric locomotives used in the following operations: passenger intercity and commuter, short haul, short line, switch, industrial, port, and terminal operations;
 - (B) An intrastate diesel-electric locomotive does not include those diesel-electric locomotives that:
 1. Meet the U.S. Environmental Protection Agency Tier II locomotive emission standards, and;
 2. Primarily move freight into and out of the South Coast Air Quality Management District, and;
 3. Has been included as a diesel-electric locomotive operating in the South Coast Nonattainment Area under paragraph IV.b. of the Memorandum of Mutual Understandings and Agreements for the South Coast Locomotive Fleet Average

Emissions Program, dated July 2, 1998.

(C) (This subsection reserved for consideration of diesel-electric locomotives that meet the U.S. Environmental Protection Agency Tier II locomotive emission standards and primarily move freight within California outside of the South Coast Air Quality Management District.)

(6) "Locomotive" means a piece of on-track equipment designed for moving or propelling cars that are designed to carry freight, passengers or other equipment, but which itself is not designed or intended to carry freight, passengers (other than those operating the locomotive) or other equipment.

(7) "Marine vessel" means any ship, boat, watercraft, or other artificial contrivance used as a means of transportation on water.

(c) *Alternative Emission Reduction Plan for Intrastate Diesel-Electric Locomotives.* For an owner or operator of an intrastate diesel-electric locomotive who has submitted an alternative emission reduction plan (plan) that contains a substitute fuel(s) and/or emission control strategy(s) and has been approved by the Executive Officer, compliance with the alternative emission reduction plan (plan) shall constitute compliance with the requirements of subsection (a)(2). In order to be approved, the plan must do all of the following:

(1) Identify or define the total fuel consumption and total emissions that would be associated with the activities of the diesel-electric locomotives were the owner or operator to comply with subsection (a)(2);

(2) Define a substitute fuel(s) and/or emission control strategy(s) for the plan.

(3) Identify the emission reductions that are attributable to the substitute fuel(s) and/or emission control strategy(s) relative to the emission reductions achieved through compliance with subsection (a)(2).

(4) Demonstrate that the substitute fuel(s) and/or emission control strategy(s) in the plan provide equivalent or better emission benefits than would be achieved through compliance with subsection (a)(2). The emission benefits achieved under the plan shall be targeted towards residents in those parts of the state most impacted by diesel-electric locomotive emissions.

(5) The plan shall contain adequate enforcement provisions.

NOTE: Authority cited: Sections 39600, 39601, 43013 and 43018 of the Health and Safety Code, and Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District, 14 Cal. 3d 411, 121 Cal. Rptr. 249 (1975). Reference: Sections 39000, 39001, 39515, 39516, 41511, 43013, 43016 and 43018, Health and Safety Code, and Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District, 14 Cal. 3d 411, 121 Cal. Rptr. 249 (1975).

2. Add new section 93116, title 17, California Code of Regulations, to read as follows:

§ 93116. Airborne Toxic Control Measure to Reduce Particulate Emissions from Diesel-Fueled Engines – Standards for Nonvehicular Diesel Fuel used in Intrastate Diesel-Electric Locomotives and Harbor craft.

(a) Requirements.

- (1) Standards for Nonvehicular Diesel Fuel Used in Harborcraft in the South Coast Air Quality Management District (SCAQMD) Beginning January 1, 2006. Beginning January 1, 2006, California nonvehicular diesel fuel sold, offered for sale, or supplied within the SCAQMD for use in harborcraft is subject to all of the requirements of Title 13 CCR sections 2281 (sulfur content), 2282 (aromatic hydrocarbons content) and 2284 (lubricity) applicable to vehicular diesel fuel, and shall be treated under those sections as if it were vehicular diesel fuel.
- (2) Standards for Nonvehicular Diesel Fuel Used in Intrastate Diesel-Electric Locomotives and Harborcraft Beginning January 1, 2007. Beginning January 1, 2007, California nonvehicular diesel fuel sold, offered for sale, or supplied for use in diesel-electric intrastate locomotives or harborcraft is subject to all of the requirements of title 13 CCR sections 2281 (sulfur content), 2282 (aromatic hydrocarbons content) and 2284 (lubricity) applicable to vehicular diesel fuel, and shall be treated under those sections as if it were vehicular diesel fuel.

(b) Definitions.

- (1) “California nonvehicular diesel fuel” means any diesel fuel that is not vehicular diesel fuel as defined respectively in Title 13 sections 2281(b), 2282(b), or 2284(b) and that is sold or made available for use in engines in California.
- (2) “Diesel-electric locomotive” means a locomotive using electric power provided by a diesel engine that drives a generator or alternator; the electrical power produced then drives the wheels using electric motors.
- (3) “Diesel fuel” means any fuel that is commonly or commercially known, sold or represented as diesel fuel, including any mixture of primarily liquid hydrocarbons that is sold or represented as suitable for use in an internal combustion, compression-ignition engine.
- (4) “Harbor craft” means any marine vessel that meets all of the following criteria:
- (A) The vessel does not carry a “registry” (foreign trade) endorsement on its United States Coast Guard certificate of documentation, and is not registered under the flag of a country other than the United States;

- (B) The vessel is less than 400 feet in length overall (LOA) as defined in 50 CFR § 679.2 as adopted June 19, 1996;
- (C) The vessel is less than 10,000 gross tons (GT ITC) per the convention measurement (international system) as defined in 46 CFR 69.51 - .61, as adopted September 12, 1989; and
- (E) The vessel is propelled by a marine diesel engine with a per-cylinder displacement of less than 30 liters.

(5) "Intrastate diesel-electric locomotive" means:

- (A) A diesel-electric locomotive that operates within California for which at least 90 percent of its annual fuel consumption, annual hours of operation, and annual rail miles traveled occur within California. This definition would typically include, but not be limited to, diesel-electric locomotives used in the following operations: passenger intercity and commuter, short haul, short line, switch, industrial, port, and terminal operations;
- (B) An intrastate diesel-electric locomotive does not include those diesel-electric locomotives that:
1. Meet the U.S. Environmental Protection Agency Tier II locomotive emission standards, and;
 2. Primarily move freight into and out of the South Coast Air Quality Management District, and;
 3. Has been included as a diesel-electric locomotive operating in the South Coast Nonattainment Area under paragraph IV.b. of the Memorandum of Mutual Understandings and Agreements for the South Coast Locomotive Fleet Average Emissions Program, dated July 2, 1998.
- (C) (This subsection reserved for consideration of diesel-electric locomotives that meet the U.S. Environmental Protection Agency Tier II locomotive emission standards and primarily move freight within California outside of the South Coast Air Quality Management District.)
- (6) "Locomotive" means a piece of on-track equipment designed for moving or propelling cars that are designed to carry freight, passengers or other equipment, but which itself is not designed or intended to carry freight, passengers (other than those operating the locomotive) or other equipment.
- (7) "Marine vessel" means any ship, boat, watercraft, or other artificial contrivance used as a means of transportation on water.

(c) Alternative Emission Reduction Plan for Intrastate Diesel-Electric Locomotives. For an owner or operator of an intrastate diesel-electric locomotive who has submitted an alternative emission reduction plan (plan) that contains a substitute fuel(s) and/or emission control strategy(s) and has been approved by the Executive Officer, compliance with the alternative emission reduction plan (plan) shall constitute compliance with the requirements of subsection (a)(2). In order to be approved, the plan must do all of the following:

- (1) Identify or define the total fuel consumption and total emissions that would be associated with the activities of the diesel-electric locomotives were the owner or operator to comply with subsection (a)(2).
- (2) Define a substitute fuel(s) and/or emission control strategy(s) for the plan.
- (3) Identify the emission reductions that are attributable to the substitute fuel(s) and/or emission control strategy(s) relative to the emission reductions achieved through compliance with subsection (a)(2).
- (4) Demonstrate that the substitute fuel(s) and/or emission control strategy(s) in the plan provide equivalent or better emission benefits than would be achieved through compliance with subsection (a)(2). The emission benefits achieved under the plan shall be targeted towards residents in those parts of the state most impacted by diesel-electric locomotive emissions.
- (5) The plan shall contain adequate enforcement provisions.

Note: Authority cited: Sections 39600, 39601, 39650, 39658, 39659, 39666, and 41511, Health and Safety Code. Reference: Sections 39650, 39658, 39659, 39666, and 41511, Health and Safety Code.

3. Amend section 2281, title 13, California Code of Regulations, to read as follows:

§ 2281. Sulfur Content of Diesel Fuel

(a) *Regulatory Standard.*

* * * * *

(5) *Applicability of standards to California nonvehicular diesel fuel.*

(A) Activities involving California nonvehicular diesel fuel (other than diesel fuel offered, sold or supplied solely for use in locomotives or marine vessels) are also subject to this section to the extent required by section 93114, title 17, California Code of Regulations. As adopted, section 93114 requires each air pollution control or air quality management district by December 12, 2004, to treat this section 2281 as applying to California nonvehicular diesel fuel (other than diesel fuel offered, sold or supplied solely for use in locomotives or marine vessels) as if it were vehicular diesel

fuel, and to enforce those requirements regarding California nonvehicular diesel fuel, unless the district has proposed its own airborne toxic control measure to reduce particulate emissions from diesel-fueled engines through standards for nonvehicular diesel fuel.

(B) Activities involving California nonvehicular diesel fuel used in harborcraft and most diesel-electric intrastate locomotives are also subject to this section 2281 as if the fuel were vehicular diesel fuel, to the extent required by section 2299, title 13, California Code of Regulations, and section 93116, title 17, California Code of Regulations. As adopted, these regulations make nonvehicular diesel fuel used in harborcraft in the South Coast Air Quality Management District subject to the requirements of this section 2281 starting January 1, 2006, and make all California nonvehicular diesel fuel used in harborcraft and most diesel-electric intrastate locomotives subject to this section 2281 starting January 1, 2007.

* * * * *

NOTE: Authority cited: Sections 39600, 39601, 39667, 43013, 43018, and 43101 of the Health and Safety Code, and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal. 3d 411, 121 Cal. Rptr. 249 (1975). Reference: Sections 39000, 39001, 39002, 39003, 39500, 39515, 39516, 39667, 41511, 43000, 43016, 43018, and 43101, Health and Safety Code, and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal. 3d 411, 121 Cal. Rptr. 249 (1975).

4. Amend section 2281, title 13, California Code of Regulations, to read as follows:

§ 2282. Aromatic Hydrocarbon Content of Diesel Fuel

(a) *Regulatory Standard.*

* * * * *

(3) *Applicability of standards to California nonvehicular diesel fuel.*

(A) Activities involving California nonvehicular diesel fuel (other than diesel fuel offered, sold or supplied solely for use in locomotives or marine vessels) are also subject to this section to the extent required by section 93114, title 17, California Code of Regulations. As adopted, section 93114 requires each air pollution control or air quality management district by December 12, 2004, to treat this section 2282 as applying to California nonvehicular diesel fuel (other than diesel fuel offered, sold or supplied solely for use in locomotives or marine vessels) as if it were vehicular diesel fuel, and to enforce those requirements regarding California nonvehicular diesel fuel, unless the district has proposed its own airborne toxic control measure to reduce particulate emissions from diesel-fueled engines through standards for nonvehicular diesel fuel.

(B) Activities involving California nonvehicular diesel fuel used in harborcraft and most diesel-electric intrastate locomotives are also subject to this section 2282 as if the fuel were vehicular diesel fuel, to the extent required by section 2299, title 13, California Code of Regulations, and section 93116, title 17, California Code of Regulations. As adopted, these regulations make nonvehicular diesel fuel used in harborcraft in the South Coast Air Quality Management District subject to the requirements of this section 2282 starting January 1, 2006, and make all California nonvehicular diesel fuel used in harborcraft and most diesel-electric intrastate locomotives subject to this section 2282 starting January 1, 2007.

* * * * *

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, and 43101 of the Health and Safety Code, and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal. 3d 411, 121 Cal. Rptr. 249 (1975). Reference: Sections 39000, 39001, 39002, 39003, 39500, 39515, 39516, 41511, 43000, 43016, 43018, and 43101, Health and Safety Code, and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal. 3d 411, 121 Cal. Rptr. 249 (1975).

5. Amend section 2284, title 13, California Code of Regulations, to read as follows:

§ 2284. Lubricity of Diesel Fuel

(a) *Regulatory Standard.*

* * * * *

(6) *Applicability of standards to California nonvehicular diesel fuel.*

(A) Activities involving California nonvehicular diesel fuel (other than diesel fuel offered, sold or supplied solely for use in locomotives or marine vessels) are also subject to this section to the extent required by section 93114, title 17, California Code of Regulations. As adopted, section 93114 requires each air pollution control or air quality management district by December 12, 2004, to treat this section 2284 as applying to California nonvehicular diesel fuel (other than diesel fuel offered, sold or supplied solely for use in locomotives or marine vessels) as if it were vehicular diesel fuel, and to enforce those requirements regarding California nonvehicular diesel fuel, unless the district has proposed its own airborne toxic control measure to reduce particulate emissions from diesel-fueled engines through standards for nonvehicular diesel fuel.

(B) Activities involving California nonvehicular diesel fuel used in harborcraft and most diesel-electric intrastate locomotives are also subject to this section 2284 as if the fuel were vehicular diesel fuel, to the extent required by section 2299, title 13, California Code of Regulations, and section 93116, title 17, California Code of Regulations. As adopted, these regulations make nonvehicular diesel fuel used in harborcraft in the South Coast Air Quality Management District subject to the requirements of this section 2284 starting January 1, 2006, and make all California nonvehicular diesel

fuel used in harborcraft and most diesel-electric intrastate locomotives subject to this section 2284 starting January 1, 2007.

* * * * *

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, and 43101 of the Health and Safety Code, and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal. 3d 411, 121 Cal. Rptr. 249 (1975). Reference: Sections 39000, 39001, 39002, 39003, 39500, 39515, 39516, 41511, 43000, 43016, 43018, and 43101, Health and Safety Code, and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal. 3d 411, 121 Cal. Rptr. 249 (1975).

APPENDIX B

CALIFORNIA'S RAILROADS WITH INTRASTATE LOCOMOTIVES

**Lists of California's Class I, Passenger Train, and Class III Railroads
With Intrastate Locomotives**

CALIFORNIA'S RAILROADS WITH INTRASTATE LOCOMOTIVES

CALIFORNIA'S CLASS I FREIGHT RAILROADS :

- Union Pacific Railroad (UP)
- Burlington Northern and Santa Fe Railroad (BNSF)

CALIFORNIA'S INTRASTATE PASSENGER TRAIN OPERATIONS:

| COMPANY NAME | ROUTE NAME | OPERATION LOCATION(S) |
|---|---------------------------|------------------------------------|
| Southern California Regional Rail Authority | Metrolink | Los Angeles Area |
| San Mateo County Transit District | CalTrain | Gilroy-San Jose-San Francisco |
| Amtrak | Pacific Surfliner | Oceanside-Los Angeles-Oxnard |
| CalTrans-Amtrak | San Joaquin | Bakersfield-Martinez or Sacramento |
| CalTrans-Amtrak | Capitol Corridor | Auburn-Sacramento-San Jose |
| North County Transit District | Coaster | San Diego-Oceanside |
| San Joaquin Regional Rail Commission | Altamont Commuter Express | Stockton-San Jose |

CLASS III RAILROADS: INTRASTATE SHORT HAUL OPERATIONS

| COMPANY NAME | OPERATION LOCATION(S) IN CALIFORNIA |
|--|--|
| Almanor Railroad | Chester-Clear Creek Junction |
| California Northern Railroad | Napa-Woodland-Tehama and Tracy-Los Banos |
| McCloud Railway | McCloud |
| Napa Valley Railroad | Napa-St. Helena |
| Santa Cruz Big Trees | Santa Cruz-Roaring Camp |
| San Diego and Imperial Valley Railroad | San Diego-San Ysidro |
| Santa Maria Valley Railroad | Santa Maria-Guadalupe |
| Northern Sierra Railway | Oakdale-Standard, West Sac to Clarksburg/Woodland, McClellan Park, and Ft. Bragg-Willits, California |
| San Joaquin Valley Railroad | Fresno-Bakersfield |
| Sierra Pacific Industries | Quincy-Susanville |
| Trona Railway | Trona-Searles |
| Ventura County Railroad | Oxnard-Port Hueneme |
| Yreka Western Railroad | Yreka-Montague |

CLASS III RAILROADS: SWITCHER-TERMINAL OPERATIONS

| COMPANY NAME | OPERATION LOCATION(S) IN CALIFORNIA |
|---|-------------------------------------|
| Central California Traction | Stockton-Lodi |
| Los Angeles Junction Railway Company | Los Angeles |
| Modesto and Empire Traction | Modesto |
| Oakland Terminal Railway | Oakland |
| Pacific Harbor Lines | Los Angeles-Long Beach Harbors |
| Parr Terminal-Richmond Pacific Railroad | Richmond |
| Stockton Terminal & Eastern Railroad | Stockton-Lodi |

APPENDIX C

**CALIFORNIA AIR RESOURCES BOARD
SURVEY OF CALIFORNIA RAILROADS WITH INTRASTATE LOCOMOTIVES**

ARB Letter and Survey Mailed to California Railroads on May 18, 2004



Terry Tamminen
Agency Secretary

Air Resources Board

Alan C. Lloyd, Ph.D.
Chairman

1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

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Arnold Schwarzenegger
Governor

May 18, 2004

Dear California Intrastate Locomotive Owner/Operator:

The California Air Resources Board (ARB) is requesting your participation in completing the attached survey. This survey is applicable to all intrastate diesel-electric locomotives, and does not apply to all-electric or steam locomotives. For the purposes of this survey, intrastate (diesel-electric) locomotives are defined as those locomotives that operate and fuel primarily (at or greater than 90% of annual fuel consumption, mileage, and/or hours of operation) within the boundaries of the state of California. We are requesting this information to improve ARB's emissions inventory and to evaluate the feasibility of using California diesel fuel in intrastate locomotives, or other control strategies that would achieve similar emission benefits.

This request for information is made pursuant to sections 39600, 39607, 39665, 39701, and 41511 of the California Health and Safety Code and section 91110, Title 17, of the California Code of Regulations (CCR). All companies that operate intrastate locomotives are being asked to complete the survey. State law requires that you provide the requested information by completing and returning the survey. If the survey does not apply to you, please state in the survey why it does not apply to you and return it to the address indicated.

ARB has adopted regulations to protect the confidentiality of trade secrets (Title 17, CCR, sections 91000 to 91022). A summary of ARB's confidentiality regulations can be found attached to this survey on the "Confidential Information Submittal Form." You should fill out the form if you wish to designate any survey information as confidential.

Please return this survey by **June 28, 2004** to:

California Air Resources Board
Attention: Harold Holmes
SSD-CPB-EES - 6th Floor
P.O. Box 2815
Sacramento, California 95812-2815
CONFIDENTIAL MATERIALS ENCLOSED (if applicable)

Phone: (916) 327-5607
FAX: (916) 322-6088

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Website: <http://www.arb.ca.gov>.

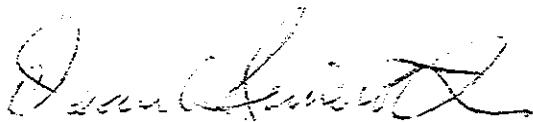
Dear California Intrastate Locomotive Owner/Operator

May 18, 2004

Page 2

Your participation in this survey is appreciated. If you should have any questions about this survey, please feel free to contact Mr. Erik C. White, Manager, Engineering Evaluation Section, at (916) 324-8029.

Sincerely,



Dean C. Simeroth, Chief
Criteria Pollutants Branch

cc: Mr. Erik White, Manager
Engineering Evaluation Section



"INTRASTATE LOCOMOTIVE SURVEY"

A. COMPANY - GENERAL CONTACT INFORMATION:

Company Name(s): _____

Contact Name/Title(s): _____

Address - Street: _____

Address - P.O. Box: _____

City: _____ Zip Code: _____

Office: () _____ Cell: () _____

Fax: () _____ Email Address: _____

Website (if applicable) : _____

Number of Employees: _____

If you own the fueling facility(s)/location(s), who is/are your primary diesel fuel supplier(s) (over the last three years):

If you use another parties' fueling facility(s)/location(s), who is/are the owner/operator(s) of the fueling facility(s), and who is their primary diesel fuel supplier(s) - if known (over the last three years):

Primary diesel fuel delivery method(s) (e.g., pipeline, truck to supply tank, truck to locomotive, etc.) to the fueling facility(s):

A. INSTRUCTIONS FOR COMPANY - GENERAL CONTACT INFORMATION:

- Company Name: Name of company or owner/operator.
Contact Name/Title: Name of primary company contact and title (e.g., CEO, GM, Superintendent).
Address: Company street and mailing address (i.e., P.O. Box).
City/Zip Code: City and zip code where company is located.
Office/Cell/Fax: Company and Contact phone numbers.
Email Address: Company and/or Contact email address.
Website Address: Company website address - http://www.??? .com/ - if applicable.
Number of Employees: Number of California employees with your company.
Own Fuel Facility: If you own your fueling facility, who has been your primary fuel supplier over the past three years?
Another Owner's Facility(s): If another company owns the fuel facility(s) your locomotives primary utilize, which company or operator owns that fueling facility(s)? If known, who is/are their primary fuel supplier(s)?
Primary Delivery Method: Which is the primary delivery method to the fueling facility or directly to your locomotives? (e.g., pipeline, ship, truck to locomotive or truck to supply tank, etc.).

(Please make additional copies if needed)
Company Name: _____

B. LOCOMOTIVE ENGINE INFORMATION

| Unit ID # | Mfg. Name | Mfg. Model | Year-First Built | Year-Last Rebuild | Certified USEPA: N/A Tier "0" Tier "1" Tier "2" | Any Plans For Rebuilds In the Near-Future? (Y/N)-(Year) | Owned (O) or Leased (L) | Leasing Company (if applicable) |
|-----------|-----------|------------|------------------|-------------------|---|---|-------------------------|---------------------------------|
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Unit ID No. : (e.g., CalTrain 900-920, etc)
Mfg Name : Manufacturer name - (e.g., GM, GE, Alco, etc.)
Mfg Model : Manufacturer model designation (e.g., GP20, GP30, F40PH-2, F59PHI, etc.)
Year First Built : Original year locomotive built - model year.
Year Last Rebuild : If applicable, year of last engine major rebuild/remanufacture.
Certified USEPA? : What is the current US EPA certification standard for the locomotive? N/A = not applicable. 0 = Tier "0", 1 = Tier "1", 2 = Tier "2".
Any Plans for Rebuilds : Any plans for engine rebuilds/remanufactures in the near future (within 5 years)? Y = Yes, N = No. Approximate year?
Owned (O) or Leased (L) : Does your company currently own or lease this locomotive. O = company owned. L = leased from another company.
Leasing Company : If applicable, from which company do you lease the locomotive.

California Environmental Protection Agency
 **AIR RESOURCES BOARD**

California Air Resources Board - SSD/CPD/EES - P.O. Box 2815, Sacramento, California 95812 - Attn: Harold Holmes

(Please make additional copies if needed)

Company Name: _____

C. LOCOMOTIVE - OPERATIONAL INFORMATION

| Unit ID # (Carry-over from Section B) | Primary Operational Use (S,T,L,P) | City/Town Home Railyard | Cities-Towns on Primary Routes | ANNUAL HOURS OF OPERATION (Switchers/Terminal Operations) | | | ANNUAL RAIL MILES TRAVELLED (Passenger and Short Haul Operations) | | |
|--|-----------------------------------|-------------------------|--------------------------------|--|------|------|--|------|------|
| | | | | 2001 | 2002 | 2003 | 2001 | 2002 | 2003 |
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Unit ID: Carry-over the Unit ID number from Section C.
 Primary Operational Use: Primary use for locomotive: S=Switcher; T=Terminal; L=Local/Short Haul; P=Passenger.
 Home Railyard : City or town which serves as the primary home location for this locomotive or where locomotive is primarily housed.
 Cities-Primary Routes: Identify primary cities or towns on the primary routes used during most of the year: Abbreviations (e.g., Sacramento=Sac) generally should be sufficient. Please attach route map(s) instead of identifying primary cities-towns on routes - if available.
 Annual Mileage/Hours of Operations: Switcher and Terminal locomotives provide annual hours of operation for 2001, 2002, and 2003. Indicate if this is an estimate.
 Annual Rail Miles Travelled: Local-short haul and passenger trains provide annual rail miles travelled for 2001, 2002, and 2003. Indicate if this is an estimate.

California Air Resources Board - SSD/CPB/EES - P.O. Box 2815, Sacramento, California 95812 - Attn: Harold Holmes

(Please make additional copies if needed)

Company Name: _____

D. LOCOMOTIVE - FUEL CONSUMPTION

| Unit ID # (Carry-over from Sections B and C) | CARB DIESEL FUEL* (Gallons) | | | USEPA ON-ROAD DIESEL FUEL ** (Gallons) | | | OTHER DIESEL FUELS*** (Gallons) | | |
|---|--------------------------------|------|------|---|------|------|------------------------------------|------|------|
| | 2001 | 2002 | 2003 | 2001 | 2002 | 2003 | 2001 | 2002 | 2003 |
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| SUBTOTAL | | | | | | | | | |

* CARB Diesel Fuel: 500 ppmw sulfur maximum, low aromatics (~20% by volume average in-use).
 ** USEPA Onroad Diesel Fuel: 500 ppmw sulfur maximum, higher aromatics (~35% by volume average in-use).
 *** Other Diesel Fuels: O = OffRoad Diesel Fuel: 5,000 ppmw sulfur maximum, higher aromatics. B = Biodiesel Fuel E = Emulsified Fuel: U = Unknown Fuel.

**2004 Intrastate Locomotive Survey
CONFIDENTIAL INFORMATION SUBMITTAL FORM**

If you wish to designate any information contained in your survey data as **CONFIDENTIAL INFORMATION**, please provide the information requested below and return it with your completed Survey form.

In accordance with Title 17, California Code of Regulations (CCR), Sections 91000 to 91022, and the California Public Records Act (Government Code Section 6250 et seq.), the information that a company provides to the Air Resources Board (ARB) may be released (1) to the public upon request, except trade secrets which are not emissions data or other information which is exempt from disclosure or the disclosure of which is prohibited by law, (2) to the federal Environmental Protection Agency, which protects trade secrets as provided in Section 114(c) of the Clean Air Act and amendments thereto (42 USC 7401 et seq.) and in federal regulation, and (3) to other public agencies provided that those agencies preserve the protections afforded information which is identified as a trade secret, or otherwise exempt from disclosure by law (Section 39660(e)).

Trade Secrets as defined in Government Code 6254.7 are not public records and therefore will not be released to the public. However, the California Public Records Act provides that air pollution emission data are always public records, even if the data comes within the definition of trade secrets. On the other hand, the information used to calculate information is trade secret.

If any company believes that any of the information it may provide is a trade secret or otherwise exempt from disclosure under any provision of law, **it must identify the confidential information as such at the time of submission to the ARB and must provide the name, address, and telephone number of the individual to be consulted.** If ARB receives a request for disclosure or seeks to disclose the data claimed to be confidential, ARB may ask the company to provide documentation of its claim of trade secret or exemption at a later date. Data identified as confidential will not be disclosed unless ARB determines, in accordance with the above referenced regulations that the data does not qualify for a legal exemption from disclosure. The regulations establish substantial safeguards before any such disclosure.

In accordance with the provisions of Title 17, California Code of Regulations, Sections 91000 to 91022, and the California Public Records Act (Government Code Sections 6250 et seq.)

Company Name: _____ declares that all the information submitted in response to the California Air Resources Board's information request on the Survey is confidential "trade secret" information, and requests that it be protected as such from public disclosure. All inquiries pertaining to the confidentiality of this information should be directed to the following person:

| | |
|--------------------------|------------------|
| Date: | Mailing Address: |
| _____ (Signature) | _____ |
| _____ (Printed Name) | _____ |
| _____ (Title) | _____ |
| _____ (Telephone Number) | _____ |

**TITLE 17, CALIFORNIA CODE OF REGULATIONS,
SECTIONS 91000 TO 91100**

Subchapter 4. Disclosure of Public Records

Article 1. General

§91000. Scope and Purpose.

This subchapter shall apply to all requests to the state board under the California Public Records Act (Government Code Sections 6250 et seq.) for the disclosure of public records or for maintaining the confidentiality of data received by the state board. Written guidelines shall govern the internal review of such requests.

NOTE: Authority cited: Sections 39600 and 39601(a), Health and Safety Code.
Reference: California Public Records Act, Chapter 3.5 (commencing with Section 6250), Division 7, Government Code.

§91001. Disclosure Policy.

It is the policy of the state board that all records not exempted from disclosure by state law shall be open for public inspection with the least possible delay and expense to the requesting party.

NOTE: Authority cited: Sections 39600 and 39601(a), Health and Safety Code.
Reference: Section 6253, Government Code; Black Panther Party v. Kehoe (1974) 42 Cal.App.3d 645.

Article 2. Board's Requests for Information

§91010. Request Procedure.

The state board shall give notice to any person from whom it requests information that the information provided may be released (1) to the public upon request, except trade secrets which are not emission data or other information which is exempt from disclosure or the disclosure of which is prohibited by law, and (2) to the federal Environmental Protection Agency, which protects trade secrets as provided in Section 114(c) of the Clean Air Act and amendments thereto (42 USC 7401 et seq.) and in federal regulations.

NOTE: Authority cited: Sections 39600, 39601 and 39602, Health and Safety Code.
Reference: Sections 39701, 41510, 41511, 41512 and 42705, Health and Safety Code; and Section 6253, Government Code.

**TITLE 17, CALIFORNIA CODE OF REGULATIONS,
SECTIONS 91000 TO 91100**

§91011. Submissions of Confidential Data.

Any person submitting to the state board any records containing data claimed to be "trade secret" or otherwise exempt from disclosure under Government Code Section 6254 or 6254.7 or under other applicable provisions of law shall, at the time of submission, identify in writing the portions of the records containing such data as "confidential" and shall provide the name, address and telephone number of the individual to be contacted if the state board receives a request for disclosure of or seeks to disclose the data claimed to be confidential. Emission data shall not be identified as confidential. The state board shall not disclose data identified as confidential, except in accordance with the requirements of this subchapter or Section 39660(e) of the Health and Safety Code.

NOTE: Authority cited: Sections 39600 and 39601, Health and Safety Code. Reference: Sections 39660, 39701, 41500, 41511, 41512 and 42705, Health and Safety Code; Sections 6253, 6254 and 6254.7, Government Code; Natural Resources Defense Council v. EPA, 489 F.2d 390 (5th Cir. 1974) (6 ERC 1248); Northern California Police Practices Project v. Craig (1979) 90 Cal.App.3d 116; Uribe v. Howie (1971) 19 Cal.App.3d 194.

Article 3. Inspection of Public Records

§91020. Disclosure Policy.

§91021. Disclosure Procedure.

NOTE: Authority cited: Section 39601, Health and Safety Code. Reference: Sections 6253-6257, Government Code.

§91022. Disclosure of Confidential Data.

(a) This section shall apply to all data in the custody of the state board

(1) designated "trade secret" prior to the adoption of this subchapter,

(2) considered by the state board or identified by the person who submitted the data as confidential pursuant to this subchapter, or

(3) received from a federal, state or local agency, including an air pollution control district, with a confidential designation, subject to the following exceptions:

**TITLE 17, CALIFORNIA CODE OF REGULATIONS,
SECTIONS 91000 TO 91100**

(A) Except for the time limits specifically provided in subsection (b), only subsections (c) and (d) of this section shall apply to information submitted pursuant to Health and Safety Code section 39660(e).

(B) Appropriate portions of an application for approval, accreditation, or certification of a motor vehicle emission control device or system shall be kept confidential until such time as the approval, accreditation, or certification is granted, at which time the application (except for trade secret data) shall become a public record, except that estimates of sales volume of new model vehicles contained in an application shall be kept confidential for the model year, and then shall become public records. If an application is denied, it shall continue to be confidential but shall be subject to the provisions of this section.

(C) If disclosure of data obtained after August 9, 1984 from a state or local agency subject to the provisions of the Public Records Act is sought, the state board shall request that the agency which provided the data determine whether it is confidential. The state board shall request that it be notified of the agency's determination within ten days. The state board shall not release the data if the agency determines that it is confidential and so notifies the state board; provided, however, that the data may be released with the consent of the person who submitted it to the agency from which it was obtained by the state board.

(b) Upon receipt of a request from a member of the public that the state board disclose data claimed to be confidential or if the state board itself seeks to disclose such data, the state board shall inform the individual designated pursuant to Section 91011 by telephone and by mail that disclosure of the data is sought. The person claiming confidentiality shall file with the state board documentation in support of the claim of confidentiality. The documentation must be received within five (5) days from the date of the telephone contact or of receipt of the mailed notice, whichever first occurs. In the case of information submitted pursuant to Health and Safety Code section 39660(e), the documentation must be received within 30 days of the date notice was mailed pursuant to that section. The deadlines for filing the documentation may be extended by the state board upon a showing of good cause made within the deadline specified for receipt of the documentation.

(c) The documentation submitted in support of the claim of confidentiality shall include the following information:

- (1) the statutory provision(s) under which the claim of confidentiality is asserted;
- (2) a specific description of the data claimed to be entitled to confidential treatment;
- (3) the period of time for which confidential treatment is requested;
- (4) the extent to which the data has been disclosed to others and whether its confidentiality has been maintained or its release restricted;

**TITLE 17, CALIFORNIA CODE OF REGULATIONS,
SECTIONS 91000 TO 91100**

(5) confidentiality determinations, if any, made by other public agencies as to all or part of the data and a copy of any such determinations, if available; and

(6) whether it is asserted that the data is used to fabricate, produce, or compound an article of trade or to provide a service and that the disclosure of the data would result in harmful effects on the person's competitive position, and, if so, the nature and extent of such anticipated harmful effects.

(d) Documentation, as specified in subsection (c), in support of a claim of confidentiality may be submitted to the state board prior to the time disclosure is sought.

(e) The state board shall, within ten (10) days of the date it sought to disclose the data or received the request for disclosure, or within 20 days of that date if the state board determines that there are unusual circumstances as defined in Government Code Section 6256.1, review the request, if any, and supporting documentation, if received within the time limits specified in subsection (b) above, including any extension granted, and determine whether the data is entitled to confidential treatment pursuant to Government Code Section 6254, 6255 or 6254.7 or other applicable provisions of law and shall either:

(1) decline to disclose the data and, if a request was received, provide to the person making the request and to the person claiming the data is confidential a justification for the determination pursuant to Government Code Section 6255; or

(2) provide written notice to the person claiming the data is confidential and, if a request was received, to the person requesting the data that it has determined that the data is subject to disclosure, that it proposes to disclose the data, and that the data shall be released 21 days after receipt of the notice by the person claiming confidentiality, unless the state board is restrained from so doing by a court of competent jurisdiction. The state board shall release the data in accordance with the terms of the notice unless so restrained.

(f) Should judicial review be sought of a determination issued in accordance with subsection (e), either the person requesting data or the person claiming confidentiality, as appropriate, may be made a party to the litigation to justify the determination.

NOTE: Authority cited: Section 39601, Health and Safety Code.

Reference: Sections 6253, 6254, 6254.7, 6255, 6256, 6256.1, 6258 and 6259, Government Code.

If the Survey information is claimed as confidential, how will it be treated?

ARB has adopted regulations to protect the confidentiality of trade secrets (Title 17, CCR, sections 91000 to 91022). A summary of ARB's confidentiality regulations can be found attached to this survey on the "Confidential Information Submittal Form." You should fill out the form if you wish to designate any Survey information as confidential.

When do I need to return the Survey, and where do I send it?

Please return the Survey by **June 28, 2004** to:

California Air Resources Board
Attention: Harold Holmes
Stationary Source Division
P.O. Box 2815
Sacramento, California 95812-2815
CONFIDENTIAL MATERIALS ENCLOSED (if that's the case)

Who can I call if I have questions about the Survey?

If you have any questions, please contact:

Harold Holmes (916) 327-5607 hholmes@arb.ca.gov

APPENDIX D

CALIFORNIA AIR RESOURCES BOARD
CALIFORNIA RECREATIONAL HARBORCRAFT DIESEL FUEL CONSUMPTION

Methodology to Calculate Recreational California Harborcraft Diesel Fuel Consumption

APPENDIX D

**Estimation of Statewide Consumption of Diesel Fuel by
Recreational Harbor Craft Using ARB 2003 Emissions Inventory**

Assumptions:

- Average specific fuel consumption of 203 grams per kw-hr (Entec U.K., 7/2002)
- Average NOx emission factor of 12 grams per kw-hr (Entec U.K., 7/2002)
- Emissions from ARB's 2003 Emissions Inventory (Appendix X)
- All diesel fuel used by recreational craft is U.S. EPA onroad diesel fuel, except in the North Coast region (coastal areas north of the Bay Area)

Sample Calculation:

2.79 Ton NOx/day x 2000 lb NOx/Ton x 454 grams NOx/lb. x kw-hr/12 g NOx x
203 g fuel/kw-hr x lb fuel/454 g x gall fuel/7lb x 365.25 day/yr. = **4.9 million gallons**

Recreational Harbor Fuel Consumption by Region and Fuel Type (million gallons)

| California Region | All Diesel | CARB Diesel | EPA On-Road |
|---------------------------------|-------------------|--------------------|--------------------|
| S.F. Bay Area Air Basin | 0.41 | 0 | 0.41 |
| South Coast Air Basin | 1.78 | 0 | 1.78 |
| North Coast Air Basin | 0.07 | 0.07 | 0 |
| All Other Areas | 2.66 | 0 | 2.66 |
| Total Recreational Craft | 4.9 | 0.07 | 4.8 |

APPENDIX E

**CALIFORNIA AIR RESOURCES BOARD
CALIFORNIA HARBORCRAFT EMISSIONS INVENTORY**

Methodology to Calculate California Harborcraft Emissions

APPENDIX E

**Methodology to Calculate California Harborcraft Emissions
from ARB 2003 Emissions Inventory**

Assumptions:

- Harbor Craft Emissions from ARB's 2003 Emissions Inventory of "ships and commercial boats" as shown in tables below
- Total emissions for commercial harbor craft derived by summing the following subcategories: "commercial boats," "crew and supply boats," "ships maneuvering – tugboats," and "other."
- Some of these categories have "unspecified fuel." However, the proportions of the different pollutants for these categories indicates diesel fuel was. In addition, most commercial vessels are diesel.

NO_x Emissions (TPD)

| Vessel Type | Total | South Coast | North Coast | Bay Area | All Other |
|----------------------------|--------------|-------------|-------------|-------------|-------------|
| "Commercial Boats" | 19.87 | 8.00 | 2.55 | 5.56 | 3.76 |
| "Crew and Supply Boats" | 0.80 | -- | -- | -- | 0.8 |
| "Ships Maneuv.-Tugboats" | 2.22 | 1.66 | -- | 0.22 | 0.34 |
| "Other" | 1.08 | 0.94 | -- | -- | 0.14 |
| Total Commercial HC | 23.97 | 10.6 | 2.55 | 5.78 | 5.04 |
| Recreational Diesel | 2.79 | 1.01 | 0.04 | 0.23 | 1.51 |
| Total Harbor Craft | 26.8 | 11.6 | 2.59 | 6.00 | 6.55 |

PM Emissions (TPD)

| Vessel Type | Total | South Coast | North Coast | Bay Area | All Other |
|----------------------------|-------------|-------------|-------------|-------------|-------------|
| "Commercial Boats" | 1.06 | 0.1 | 0.27 | 0.32 | 0.37 |
| "Crew and Supply Boats" | 0.08 | -- | -- | -- | 0.08 |
| "Ships Maneuv.-Tugboats" | 0.06 | -- | -- | 0.02 | 0.04 |
| "Other" | 0.15 | 0.13 | -- | -- | 0.02 |
| Total Commercial HC | 1.35 | 0.23 | 0.27 | 0.34 | 0.51 |
| Recreational Diesel | 0.08 | 0.03 | 0 | 0.01 | 0.04 |
| Total Harbor Craft | 1.43 | 0.26 | 0.27 | 0.35 | 0.55 |

APPENDIX F

CALIFORNIA AIR RESOURCES BOARD
CALIFORNIA HARBORCRAFT EMISSIONS REDUCTIONS

Methodology to Calculate California Harborcraft Emissions Reductions

APPENDIX F

**Methodology to Calculate California Harborcraft Emissions Reductions
Using the ARB 2003 Emissions Inventory**
(Revised on September 20, 2004)

Assumptions:

- Emissions from ARB's 2003 Emissions Inventory (Appendix X)
- Emission reductions estimated based on 6% NO_x and 14% PM reduction from switching from U.S. EPA on-road diesel to CARB diesel
- Proportion of U.S. EPA and CARB diesel fuels currently in use based on 2002 ARB Commercial Harbor Craft Survey. For recreational craft, CARB diesel is assumed to be used only in the North Coast

Sample Calculation:

5.8 Ton NO_x/day x (16.8 million gallons EPA diesel/27 million gallons diesel total) x 6%
emission reduction = **0.22 TPD**

Harbor Craft NO_x Emission Reductions by Region*

| Harbor Craft Type | Emissions (TPD) | Ratio of EPA to Total Diesel Fuel | Estimated Emission Reduction % | Reductions (TPD) |
|--------------------------------|-----------------|-----------------------------------|--------------------------------|------------------|
| Commercial Harbor Craft | | | | |
| S.F. Bay Area Air Basin | 5.8 | 0.62 | 0.06 | 0.22 |
| South Coast Air Basin | 10.6 | 0.55 | 0.06 | 0.35 |
| North Coast Air Basin | 2.55 | 0 | 0.06 | 0 |
| All Other Areas | 5.0 | 0.61 | 0.06 | 0.18 |
| Total | 24.0 | | | 0.80 |
| Recreational Craft | | | | |
| S.F. Bay Area Air Basin | 0.23 | 1 | 0.06 | 0.01 |
| South Coast Air Basin | 1.01 | 1 | 0.06 | 0.06 |
| North Coast Air Basin | 0.04 | 0 | 0.06 | 0 |
| All Other Areas | 1.51 | 1 | 0.06 | 0.09 |
| Total | 2.79 | | 0.06 | 0.16 |
| Grand Total | 26.8 | | | 1.0 |

Harbor Craft PM Emission Reductions by Region*

| Harbor Craft Type | Emissions (TPD) | Ratio of EPA to Total Diesel Fuel | Estimated Emission Reduction | Reductions (TPD) |
|--------------------------------|------------------------|--|-------------------------------------|-------------------------|
| Commercial Harbor Craft | | | | |
| S.F. Bay Area Air Basin | 0.34 | 0.62 | 0.14 | 0.03 |
| South Coast Air Basin | 0.23 | 0.55 | 0.14 | 0.02 |
| North Coast Air Basin | 0.27 | 0 | 0.14 | 0 |
| All Other Areas | 0.51 | 0.61 | 0.14 | 0.04 |
| Total | 1.35 | | | 0.09 |
| | | | | |
| Recreational Craft | | | | |
| S.F. Bay Area Air Basin | 0.01 | 1 | 0.14 | <0.01 |
| South Coast Air Basin | 0.03 | 1 | 0.14 | <0.01 |
| North Coast Air Basin | 0 | 0 | 0.14 | 0 |
| All Other Areas | 0.04 | 1 | 0.14 | 0.01 |
| Total | 0.08 | | | 0.01 |
| | | | | |
| Grand Total | 1.43 | | | 0.10 |

Estimation of SO_x related PM Reductions from Harbor Craft Using ARB 2003 Emissions Inventory

Assumptions:

- SO_x emissions from ARB's 2003 Emissions Inventory
- SO_x emission reductions proportional to reductions in fuel sulfur content (assuming EPA onroad diesel is 350 ppm and CARB diesel is 10 ppm)
- Conversion of SO₂ to SO₄ (as 50% ammonium sulfate and 50% ammonium bisulfate) in atmosphere is 12%
- Ratio of grams sulfate (as 50% ammonium sulfate and 50% ammonium bisulfate) to grams SO₂ is 1.92
- Overall conversion factor (SO_x to PM) is 12% x 1.92 = 23%
- Proportion of U.S. EPA and CARB diesel fuels currently in use based on 2002 ARB Commercial Harbor Craft Survey.
- Diesel powered recreational craft SO_x emissions and reductions are negligible

A. Sample Calculations

1. SOx related PM Reduction:

0.98 Ton SOx/day (S.F. Bay Area) x 96% (SOx reduction per calculation below)
x 23% (SOx to PM conversion factor) = 0.22 TPD PM

2. SOx Reduction

Average sulfur before proposal = 350ppm x 0.62 + 10 ppm x 0.38 = 221 ppm

Average sulfur after proposed regulation = 10 ppm

Percent sulfur reduction = $221 - 10 / 221 = 95\%$

Harbor Craft SOx-Related PM Emission Reductions by Region*

| Harbor Craft Type | SOx Emissions (TPD) | Ratio of EPA to Total Diesel Fuel | SOx Reduction from Proposal | SOx to PM conversion | PM Reductions (TPD) |
|-------------------------|---------------------|-----------------------------------|-----------------------------|----------------------|---------------------|
| Commercial Harbor Craft | | | | | |
| S.F. Bay Air Basin | 0.98 | 0.62 | 95 | 23% | 0.21 |
| South Coast Air Basin | 0.22 | 0.55 | 95% | 23% | 0.05 |
| North Coast Air Basin | 0.40 | 0 | 0% | -- | 0 |
| All Other Areas | 0.34 | 0.61 | 95% | 23% | 0.07 |
| Total | 1.94 | | | | 0.33 |

APPENDIX G

CALIFORNIA AIR RESOURCES BOARD
HEALTH RISK ASSESSMENT METHODOLOGY
FOR HARBORCRAFT AND INTRASTATE LOCOMOTIVES

APPENDIX G

HEALTH RISK ASSESSMENT METHODOLOGY FOR HARBORCRAFT AND INTRASTATE LOCOMOTIVES

Methodology

This appendix presents the methodology used to estimate the potential cancer risk from exposure to diesel particulate matter (PM) emissions from intrastate locomotives and harbor craft activities. This methodology was developed to assist in the development of the *Proposed Regulatory Amendments Extending the California Motor Vehicle Diesel Standards to Diesel Fuel Used in Harborcraft and Intrastate Locomotives*. The assumptions used to determine these risks are not based on a specific intrastate locomotive or harbor craft activity pattern. Instead, source parameters that represent possible operating scenarios were used. These estimated risks are used to provide an approximate range of potential risk levels from intrastate locomotive and harbor craft activities. Actual risk levels will vary due to site specific parameters, including the number of locomotives or harbor craft, the operation or activity, emission rates, operating schedules, site configuration, site meteorology, and distance to receptors.

The methodology used in this risk assessment is consistent with the Tier-1 analysis presented in the OEHHA, Air Toxics Hot Spots Program Risk Assessment Guidelines: The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (OEHHA, 2003). These OEHHA guidelines and this assessment utilize health and exposure assessment information that is contained in the Air Toxics Hot Spot Program Risk Assessment Guidelines, Part II, Technical Support Document for Describing Available Cancer Potency Factors (OEHHA, 2003); and the Air Toxics Hot Spot Program Risk Assessment Guidelines, Part IV, Technical Support Document for Exposure Analysis and Stochastic Analysis (OEHHA 2000), respectively.

A. Source Description

To provide an estimate of the potential cancer risks associated with exposure to diesel PM emissions associated with intrastate locomotives and harbor craft, ARB staff developed two scenarios. The first scenario examined the potential cancer risk for excursion or ferry vessel activities at a port. The second scenario examined the potential cancer risk from the operation of a short-haul locomotive passing through a residential neighborhood.

In the first scenario, the excursion or ferry vessel activities were characterized as three point sources of emissions from the two diesel fueled propulsion engines and one diesel fueled auxiliary engine. The engine sizes at 100 percent load were estimated to be 750 horsepower (hp) for propulsion and 100 hp for auxiliary based on the ARB's statewide survey. The engines operation load factors are assumed to be 10 percent (idling) for the propulsion engines and 43 percent for the auxiliary engine. The hourly diesel PM emission rate for the propulsion engines was assumed to be 0.5 grams per brake horsepower per hour (g/bhp-hr) based on Bay Area Water District Authority emission testing. The test was performed in 2002 at MV Mare Island.

The auxiliary engine diesel PM emission rate used in this analysis is 0.84 g/bhp-hr based on the ARB OFFROAD emission factors for generators (engine population weighted average). The operating scenario was modeled as one vessel operating from 6:00 AM to 6:00 PM daily.

For the locomotive scenario, the emission source was modeled as a series of volume sources with the width of 30 meters along a 1-mile segment traveling at 40 miles per hour (mph) at a load setting of notch 5. The traffic volume for this source included 10 trains per day, each with 2 locomotives operating 24 hours per day for 365 days per year. The locomotive engine emission factor is 362 g/hr based on the fleet weighed average of notch 5 for eleven (11) locomotive models in California.

B. Dispersion Modeling Methods

The dispersion of diesel PM emissions was estimated using the United States Environmental Protection Agency (U.S. EPA) ISCST3 (version 00101). ISCST3 can estimate potential ambient annual average concentrations of diesel PM as a result of diesel PM emissions from point, area, volume, and pit sources.

The analyses used actual meteorological data collected at three meteorological sites, West Los Angeles (1981), Long Beach (1981), and Richmond (1998). Cartesian grid coordinate receptors were placed at specific incremental distances from the sources to determine the off-site impacts. Table 1 shows the dispersion modeling parameters used to model impacts of diesel PM emissions from an excursion or ferry vessel. Table 2 shows the dispersion modeling parameters used to model impacts of diesel PM emissions from short-haul locomotive operations.

Table 1: Dispersion Modeling Parameters for Excursion/Ferry Vessel Activities

| Modeling Parameters | |
|--|---|
| Model | ISCST3 (Version 00101) |
| Source Type | Point |
| Dispersion Coefficients | Urban |
| Number of Engines per Excursion Vessel | 2 propulsion engines, 1 auxiliary |
| Engine Horsepower (at 100% load) | 750 hp for propulsion, 100 hp for auxiliary |
| Engine Operation Load | 10% for propulsion (idling), 43% for auxiliary |
| Emission Factor | 0.50 g/bhp-hr for propulsion, 0.84 g/bhp-hr for auxiliary |
| Operation Schedule | 6 am to 6 pm every day, 1 vessel per hour |
| Receptor Height | 1.5 m |
| Stack Information: | |
| Stack Diameter | 8" for propulsion, 3" for auxiliary |
| Stack Height | 10 m for all engines |
| Exhaust Temperature | 350 °K for propulsion, 550 °K for auxiliary |
| Exhaust Velocity | 6 m/s for propulsion, 23 m/s for auxiliary |
| Meteorological Data | West Los Angeles (1981), Long Beach (1981), Richmond (1998) |
| Release Height | Same as the stack height |

Table 2: Dispersion Modeling Parameters for Short-Haul Locomotives

| Modeling Parameters | |
|------------------------------|--|
| Model | ISCST3 (Version 00101) |
| Source Type | Volume |
| Dimension of Modeling Domain | 1 mile segment with width of 30 m |
| Dispersion Coefficients | Urban |
| Traffic Volume | 10 trains/day, each with 2 locomotives |
| Engine's Emission Factor | 362 g/hr (Notch 5) |
| Train Travel Speed | 40 mph |
| Operation Schedule | 24 hr/day, 365 days/yr |
| Receptor Height | 1.5m |
| Meteorological Data | West L. A. (1981), Long Beach (1981), Richmond (1998) |
| Release Height | 5 m |

C. Health Risk Assessment Methods

The dispersion model-predicted offsite concentrations were used to estimate potential cancer risk due to emissions of diesel PM. Under current OEHHA recommended risk assessment methodology, to estimate potential cancer risks, the estimated maximum annual ground level concentration (GLC), in micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), is converted to a pollutant dose. Multiplication of the average daily inhalation dose over 70 years, in milligrams per kilogram of body weight per day (mg/kg-d), with the inhalation cancer potency factor developed by OEHHA will give the inhalation cancer risk. Unit risk factors (URF), in the units of inverse concentration, $(\mu\text{g}/\text{m}^3)^{-1}$, used in previous assessments can be used for assessing cancer inhalation risk directly from air concentrations. However breathing rates, expressed in units of liters per kilogram of body weight-day coupled with the air concentrations to estimate dose in mg/kg-d is recommended for assessing cancer risks. The diesel exhaust PM inhalation cancer potency factor used for this analysis is 1.1 with units of inverse dose as a potency slope, (i.e., $(\text{mg}/\text{kg-d})^{-1}$).

Table 3 shows the risk assessment parameters used in these analyses for excursion or ferry vessel and short-haul locomotive activities.

Table 3: Risk Assessment Parameters Used in Analyses

| | |
|-------------------------------------|--------------------------------------|
| Receptor Hypothetical Exposure Time | 70 years, 50 weeks per year |
| Adults Daily Breathing Rate Range | 271 – 393 l/kg body weight-day |
| Adults Body weight | 70 kg |
| Diesel PM Inhalation Potency Factor | 1.1 $(\text{mg}/\text{kg-day})^{-1}$ |

D. Health Risk Assessment Results

Table 4 presents the estimated range of potential cancer health risks at nearby receptor locations due to exposures to the diesel PM emissions from excursion or ferry vessel activities at a port. Table 5 presents the estimated range of potential cancer health risks at nearby receptor locations due to exposures to the diesel PM emissions from short-haul locomotive activities.

As is shown in Table 4, based on the analysis, the estimated potential cancer risks for persons exposed to the diesel PM emissions from a hypothetical excursion/ferry vessel in a port, ranged from 50 to 280 potential cancer cases in a million at a downwind distance of 200 meters away from the emission source. The low end represents the 65th percentile breathing rate results using the Richmond meteorological data and the high end represents the 95th percentile breathing rate results using the West L. A. meteorological data.

For the locomotive scenario, as shown in Table 5, operating a short-haul line resulted in potential cancer risks ranging from 2 to 12 in a million at a downwind distance of 200 meters away from the edge of the locomotive railroad activity.

Table 4: Estimated Cancer Risk (per million) from Excursion/Ferry Vessel Activities

| Downwind Distance (meter) | Downwind Distance (mile) | West L. A. | | Long Beach | | Richmond | |
|------------------------------|-----------------------------|------------|---------|------------|---------|----------|---------|
| | | 65th BR | 95th BR | 65th BR | 95th BR | 65th BR | 95th BR |
| 100 | 0.063 | 610 | 886 | 338 | 491 | 169 | 245 |
| 200 | 0.125 | 191 | 277 | 125 | 181 | 53 | 76 |
| 400 | 0.25 | 52 | 76 | 41 | 60 | 14 | 21 |
| 800 | 0.50 | 14 | 21 | 12 | 18 | 4 | 6 |
| 1200 | 0.75 | 7 | 10 | 6 | 9 | 2 | 3 |
| 1600 | 1.0 | 4 | 6 | 4 | 6 | 1 | 2 |
| 2400 | 1.5 | 2 | 3 | 2 | 3 | 1 | 1 |
| 3200 | 2.0 | 2 | 2 | 1 | 2 | 1 | 1 |
| 4000 | 2.5 | 1 | 2 | 1 | 1 | < 1 | 1 |
| 4800 | 3.0 | 1 | 1 | 1 | 1 | < 1 | 1 |

Notes:

1. An excursion or ferry vessel is equipped with two propulsion engines and an auxiliary engine.
2. The average horsepowers are estimated to be 750 hp and 100 hp for propulsion and auxiliary engines, respectively, based on the ARB's statewide survey.
3. The load for the propulsion engines at idling condition is 10%, and the load for the auxiliary engine is 43% based on the ARB's statewide survey.
4. The diesel PM emission factor for the propulsion engine is estimated as 0.5 g/bhp-hr based on the Bay Area Water Authority's testing, and the factor for the auxiliary is 0.84 g/bhp-hr based on the ARB's harborcraft estimates.
5. Assume that the each excursion/ferry takes an hour for loading and unloading and The activity takes place during 6am to 6pm, each day, 7days per week, and 52 weeks per year.
6. Cancer risks shown at OEHHA 65th and 95th percentile breathing rates

Table 5: Estimated Cancer Risk (per million) from Short-Haul Locomotive Activities

| Downwind Distance (meter) | Downwind Distance (mile) | West L. A. | | Long Beach | | Richmond | |
|------------------------------|-----------------------------|------------|---------|------------|---------|----------|---------|
| | | 65th BR | 95th BR | 65th BR | 95th BR | 65th BR | 95th BR |
| 20 | 0.013 | 7 | 10 | 5 | 7 | 2 | 3 |
| 40 | 0.025 | 7 | 10 | 4 | 6 | 2 | 3 |
| 60 | 0.038 | 10 | 14 | 4 | 5 | 2 | 3 |
| 80 | 0.050 | 10 | 14 | 6 | 8 | 3 | 4 |
| 100 | 0.063 | 9 | 13 | 7 | 11 | 3 | 5 |
| 200 | 0.125 | 8 | 12 | 4 | 6 | 2 | 3 |
| 300 | 0.188 | 6 | 8 | 3 | 4 | 1 | 2 |
| 400 | 0.25 | 4 | 6 | 2 | 3 | 1 | 2 |
| 800 | 0.50 | 2 | 3 | 1 | 2 | 1 | 1 |
| 1200 | 0.75 | 1 | 1 | 1 | 1 | <1 | <1 |
| 1600 | 1.0 | 1 | 1 | 1 | 1 | <1 | <1 |
| 2400 | 1.5 | <1 | 1 | <1 | 1 | <1 | <1 |
| 3200 | 2.0 | <1 | <1 | <1 | <1 | <1 | <1 |
| 4000 | 2.5 | <1 | <1 | <1 | <1 | <1 | <1 |
| 4800 | 3.0 | <1 | <1 | <1 | <1 | <1 | <1 |

Notes:

1. Assume that 10 trains per day and each train contains 2 locomotives.
2. The trains are traveling at 40 MPH at notch 5 setting.
3. The diesel PM emission factor = 362 g/hr based on the average of notch 5 for most common models seen at Roseville railyard.
4. Cancer risks shown at OEHHA 65th and 95th percentile breathing rates

References

OEHHA, 2000. Office of Environmental Health Hazard Assessment (OEHHA), *Air Toxics "Hot Spots" Program Risk Assessment Guidelines Part IV Technical Support Document for Exposure Assessment and Stochastic Analysis*. www.oehha.ca.gov/air/hot_spots/finalStoc.html. September 2000.

OEHHA, 2002. Office of Environmental Health Hazard Assessment (OEHHA), *Air Toxics Hot Spots Program Risk Assessment Guidelines: Part II Technical Support Document for Describing Available Cancer Potency Factors*. www.oehha.ca.gov/air/cancer_guide/TSD2.html. December 2002.

OEHHA, 2003. Office of Environmental Health Hazard Assessment (OEHHA), *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. www.oehha.ca.gov/air/hot_spots/HRsguide.html. August 2003.

APPENDIX H

CALIFORNIA AIR RESOURCES BOARD
REFERENCES FOR THE ISOR

References: ISOR: Proposed Regulatory Amendments Extending the California Standards for Motor Vehicle Diesel Fuel to Diesel Fuel Used in Harbor Craft and Intrastate Locomotives

- 1: Locomotive Emission Standards. Regulatory Support Document, U.S. EPA, Office of Mobile Sources, April 1998, Page 11.
- 2: Classification of railroad carriers is defined by the Surface Transportation Board, 49 CFR, Subtitle B, Chapter X, Subchapter C, Part 1201, General Instruction 1-1.
- 3: 46 CFR § 221.15
- 4: 50 CFR § 660.12
- 5: 46 CFR § 69.57
- 6: U.S. EPA Regulatory Update, EPA420-F-04-031, August 2004, page 3.
- 7: Statewide Commercial Harbor Craft Survey, ARB, March 2004, page 4.
- 8: ASTM D-975-03 (Standard Specification for Diesel Fuel Oils)
- 9: Regulatory Impact Analysis: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements, pages IV-6 through IV-12. EPA420-R-00-026, December 2000, U.S. EPA.
- 10: Statewide Commercial Harbor Craft Survey, March 2004, ARB, page 8.
- 11: California Transportation Fuels Historical Demand & Forecasted Demand, June 28, 2004, CEC.
- 12: 13 CCR sections 2281, 2282, and 2284
- 13: Findings of the Scientific Review Panel on THE REPORT ON DIESEL EXHAUST as adopted at the Panel's April 22, 1998, Meeting.
- 14: Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles, October 2000, ARB.
- 15: Resolution No. 03-22, October 23, 2003, ARB.
- 16: Letter to US EPA Region IX, Regional Administrator, Mr. Wayne Nastri, January 9, 2004.
- 17: <http://www.joinarnold.com/en/agenda/#D1>
- 18: 40 CFR § 80.2 (x)
- 19: Technical Support Document for Proposed Adoption of Regulations Limiting the Sulfur Content and the Aromatic Hydrocarbon Content of Motor Vehicle Diesel Fuel, October 1988, ARB
- 20: ASTM Standard D 975-03 is the last revision to this standard, 2003.
- 21: 40 CFR § 80.29 (a)
- 22: 40 CFR §80.500 through §80.620
- 23: SCAQMD Rule 431.2-1, Amended September 15, 2000.
- 24: Texas Administrative Code, Title 30, Part 1 Chapter 114 Subchapter H Division 2 Rule §114.319.
- 25: Regulatory Impact Analysis: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements, pages IV-6 through IV-12. EPA420-R-00-026, December 2000, U.S. EPA.
- 26: Multiple Air Toxics Exposure Study in the South Coast Air Basin: MATES-II. Final report (and appendices) prepared by the South Coast Air Quality Management District. March 2000. Table 5-3, Chapter 5, page 12.
- 27: Review of Diesel Particulate Matter Sampling Methods. Final Report. University of Minnesota., Kittelson, D.B., Arnold, M., Watts, W.F., 1999.
- 28: Findings of the Scientific Review Panel on The Report on Diesel Exhaust as adopted at the Panel's April 22, 1998, meeting.
- 29: Regulatory Impact Analysis: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements, Chapter II , pages II-74 through II-168 EPA420-R-00-026, December 2000, U.S. EPA.
- 30: Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant: Health Risk Assessment for Diesel Exhaust; Appendix III, Part B; 1998, OEHHA
- 31: Draft Report on the Environment, EPA600-R03-050, June 2003, U.S. EPA.

136 References: ISOR: Proposed Regulatory Amendments Extending the California Standards for Motor Vehicle Diesel Fuel to Diesel Fuel Used in Harbor Craft and Intrastate Locomotives

32. Review of the Ambient Air Quality Standard for Ozone (Public Release of Draft Health Benefits Chapter 10, August 31, 2004, Quantifying the Health Benefits of Reducing Ozone Exposure), OEHHA.
33. Diesel Fuel Effects on Locomotive Emissions, CIMAC, 2000,
34. ASTM Standard Test Method for Determination of the Aromatic Content and Polynuclear Aromatic Content of Diesel Fuels and Aviation Turbine Fuels by Supercritical Fluid Chromatography, 1996.
35. Report to the California Legislature on Air Pollutant Emissions from Marine Vessels; 1984, ARB.
36. Nationwide Emission benefits of A Low Sulfur Diesel Fuel, March 3, 1999, Engine Manufacturers Association.
37. Technical Support Document for Proposed Adoption of Regulations Limiting the Sulfur Content and the Aromatic Hydrocarbon Content of Motor Vehicle Diesel Fuel, October 1988, ARB.

TITLE 13. CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER PROPOSED 2004 AMENDMENTS REFINING THE CALIFORNIA PHASE 3 REFORMULATED GASOLINE REGULATIONS

The Air Resources Board (ARB or Board) will conduct a public hearing at the time and place noted below to consider proposed 2004 amendments refining the California Phase 3 Reformulated Gasoline (CaRFG3) regulations. The proposed amendments include clarifications, corrections, and improvements in compliance flexibility and enforceability.

| | |
|-------|---|
| Date | November 18, 2004 |
| Time | 9:00 a.m. |
| Place | California Environmental Protection Agency Air Resources Board Central Valley Auditorium, Second Floor 1001 I Street Sacramento, CA 95814 |

This item will be considered at a two-day meeting of the Board, which will commence at 9:00 a.m. on Thursday, November 18, 2004, and may continue at 8:30 a.m. on Friday, November 19, 2004. This item may not be considered until Friday, November 19, 2004. Please consult the agenda for the meeting, which will be available at least 10 days before November 18, 2004, and posted on the ARB's website, to determine the day on which this item will be considered.

If you have a disability-related accommodation need, please go to <http://www.arb.ca.gov/html/ada/ada.htm> for assistance or contact the ADA Coordinator at (916) 323-4916. If you are a person who needs assistance in a language other than English, please contact the Bilingual Coordinator at (916) 324-5049. TTY/TDD/Speech-to-Speech users may dial 7-1-1 for the California Relay Service

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW

Sections Affected: Proposed amendments to sections 2260, 2262, 2262.4, 2262.5, 2262.6, 2262.9, 2263, 2265 (and the incorporated "California Procedures for Evaluating Alternative Specifications for Phase 3 Reformulated Gasoline Using the California Predictive Model"), and 2266.5 of title 13, California Code of Regulations (CCR).

Background:

The Existing CaRFG3 Regulations

The ARB administers the CaRFG3 regulations, which were adopted in June 2000 following a December 1999 Board hearing. As subsequently amended, the CaRFG3 regulations prohibit California gasoline produced with the oxygenate methyl tertiary-butyl ether (MTBE) or other specified oxygenates other than ethanol starting December 31, 2003. The regulations establish CaRFG3 standards applicable the same date for the following eight gasoline properties – sulfur, benzene, olefin, aromatic hydrocarbon, and oxygen contents, the 50 percent distillation temperature, (T50), the 90 percent distillation temperature, (T90), and summertime Reid vapor pressure (RVP). In addition, the regulations establish standards for denatured ethanol sold for use in California gasoline.

The CaRFG regulations allow refiners to use a “Predictive Model” to specify alternative formulations. The Predictive Model is a set of mathematical equations that relate emissions rates of exhaust hydrocarbons, oxides of nitrogen (NOx), and potency weighted toxics for four toxic air contaminants (benzene, 1,3-butadiene, formaldehyde, and acetaldehyde) to the values of the eight regulated gasoline properties. An alternative gasoline formulation is acceptable if emissions of hydrocarbons, NOx, and potency-weighted toxics resulting from this formulation are no greater than emissions from gasoline having the specifications set forth in the CaRFG3 standards. Currently, most of the gasoline sold in California complies with the CaRFG3 regulations through the use of the Predictive Model.

When gasoline is oxygenated with ethanol, certain characteristics of the resulting blend make it generally infeasible to be transported through pipeline systems. Because of this, ethanol is typically added to gasoline at the terminal or in the delivery truck. The CaRFG regulations allow a refiner to ship non-oxygenated gasoline from the refinery without complying with the CaRFG standards if it is specially formulated to be combined with oxygenate “downstream” from the refinery and the resulting blend will meet all of the CaRFG standards. This allows entities adding oxygen downstream from the refinery to take advantage of the contribution the oxygenate can make to complying with the CaRFG standards, particularly by diluting the concentration of compounds like benzene. The nonoxygenated blend is called “California reformulated gasoline blendstock for oxygenate blending,” or “CARBOB.”

The Proposed Amendments

The staff is proposing a series of relatively minor amendments to the CaRFG3 regulations that would clarify current requirements, provide additional flexibility, correct errors, and generally improve enforceability of the regulations.

- Revising restrictions on blending CARBOB with other products downstream of the production or import facility. A CARBOB supplier would be allowed to enter into a

protocol with the ARB's Executive Officer permitting the blending of small amounts of transmix into CARBOB that is downstream from its production or import facility. Protocols covering the blending of small amounts of transmix into downstream gasoline are permitted under the existing regulations, subject to conditions that are identical to those proposed regarding transmix blending into CARBOB. A CARBOB supplier would also be permitted to blend limited amounts of California gasoline containing ethanol under specific conditions so long as the resulting CARBOB does not contain more than 0.1 percent by weight oxygen; the gasoline would have to meet the applicable cap limits for all other properties other than oxygen content. In addition, the Executive Officer would be allowed to develop protocols for the blending of California gasoline or other CARBOB into CARBOB for other situations.

- Changing the documentation requirements for denatured ethanol being supplied from one party to another. The amendments would give an importer of denatured ethanol an option to having to provide documentation identifying the name, location and operator of the facility or facilities at which the ethanol was produced and at which the denaturant was added to the ethanol. Under the option, the documentation would have to identify the date and time the ethanol was supplied and state that the supplier maintains a list of all the facilities at which the ethanol was produced and at which the denaturant was added to the ethanol.
- Eliminating a requirement that CARBOB importers sample and test each batch of imported CARBOB. A requirement that CARBOB producers sample and test each batch was eliminated in 2000, and staff believes a blanket requirement for importers of CARBOB is no longer necessary. Importers of either CARBOB or California gasoline would still have to sample and test for any properties for which an averaging compliance option is being used.
- Revising a provision designed to make gasoline produced in the Bay Area and received at a Southern California marine terminal in March subject to the Southern California March 1 start of the RVP season rather than the April 1 start date for Bay Area production and import facilities. Under the amendments, such gasoline would not longer be characterized as imported.
- Correcting the "California Procedures for Evaluating Alternative Specifications for Phase 3 Reformulated Gasoline Using the Predictive Model," which is incorporated by reference in the regulations, to reflect the Board's original intent that gasoline with an oxygen content within the range of 3.3 to 3.7 weight percent will be evaluated at a single oxygen content of 3.5 weight percent.
- Making various other minor clarifications of and improvements to the CaRFG3 regulations.

COMPARABLE FEDERAL REGULATIONS

The United States Environmental Protection Agency (U.S. EPA) administers the federal RFG regulations, which currently apply to about 80 percent of California's gasoline and are contained in 40 CFR §§ 80.40 and following. One of the requirements for federal RFG is that it contain at least 2.0 weight % oxygen year-round. California, on the other hand, requires a minimum oxygen content of 1.8 wt.% only during the wintertime in Los Angeles, Orange, Riverside, San Bernardino, Ventura, and Imperial counties. The use of oxygen in gasoline reduces emissions of carbon monoxide (CO) from the existing vehicle fleet, and ambient CO concentrations are the highest in the winter. Unhealthy levels of CO are no longer experienced in California outside the wintertime oxygenate areas. Except for the wintertime requirements, producers and importers of California gasoline may use the Predictive Model to reduce or eliminate oxygen as long as the combined specifications for the gasoline achieve an equivalent emissions performance for hydrocarbons, NOx, and potency-weighted toxics.

California has asked U.S. EPA to exercise its authority to waive the minimum oxygen requirement, but in June 2001 the agency denied the state's request. The State of California subsequently challenged the U.S. EPA's denial of the waiver request; and in July 2003, the Ninth Circuit Court of Appeals vacated this denial and directed U.S. EPA to reconsider California's waiver request giving with full consideration of the impacts on California's ability to meet federal standards for ozone and particulate matter. The federal agency has taken no action to date.

AVAILABILITY OF DOCUMENTS AND AGENCY CONTACT PERSONS

The ARB staff has prepared a Staff Report: Initial Statement of Reasons (ISOR) for the proposed regulatory action, which includes a summary of the environmental and economic impacts of the proposal. The report is entitled "Proposed 2004 Amendments Refining the California Phase 3 Reformulated Gasoline Regulations."

Copies of the ISOR and the full text of the proposed regulatory language, in underline and strikeout format to allow for comparison with the existing regulations, may be accessed on the ARB's web site listed below, or may be obtained from the Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, 1st Floor, Sacramento, CA 95814, (916) 322-2990 at least 45 days prior to the scheduled hearing (November 18, 2004).

Upon its completion, the Final Statement of Reasons (FSOR) will be available and copies may be requested from the agency contact persons in this notice, or may be accessed on the ARB's web site listed below.

Inquiries concerning the substance of the proposed regulatory action may be directed to the designated agency contact persons, Mr. Steven Brisby, Manager, Fuels Section, (916) 322-6019, or Mr. Dean C. Simeroth, Chief, Criteria Pollutants Branch, Stationary Source Division, at (916) 322-6020.

Further, the agency representative and designated back-up contact persons to whom *nonsubstantive inquiries concerning the proposed administrative action* may be directed are Artavia Edwards, Manager, Board Administration & Regulatory Coordination Unit, (916) 322-6070, or Amy Whiting, Regulations Coordinator, (916) 322-6533. The Board has compiled a record for this rulemaking action, which includes all the information upon which the proposal is based. This material is available for inspection upon request to the contact persons.

This notice, the ISOR and all subsequent regulatory documents, including the FSOR, when completed, are available on the ARB Internet site for this rulemaking at <http://www.arb.ca.gov/regact/carfg304/carfg304.htm>

COSTS TO PUBLIC AGENCIES AND TO BUSINESSES AND PERSONS AFFECTED

The determinations of the Board's Executive Officer concerning the costs or savings necessarily incurred by public agencies, private persons and businesses in reasonable compliance with the proposed regulations are presented below.

Pursuant to Government Code sections 11346.5(a)(5) and 11346.5(a)(6), the Executive Officer has determined that the proposed regulatory action will not create costs or savings to any state agency or in federal funding to the state, costs or mandate to any local agency or school district whether or not reimbursable by the state pursuant to Part 7 (commencing with section 17500), Division 4, Title 2 of the Government Code, or other *nondiscretionary savings to state or local agencies*.

In developing this regulatory proposal, the ARB staff evaluated the potential economic impacts on representative private persons or businesses. The ARB is not aware of any cost impacts that a representative private person or business would necessarily incur in reasonable compliance with the proposed action.

The Executive Officer has made an initial determination that the proposed regulatory action will not have a significant statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states, or on representative private persons.

In accordance with Government Code section 11346.3, the Executive Officer has determined that the proposed regulatory action will not affect the creation or elimination of jobs within the State of California, the creation of new businesses or elimination of existing businesses within the State of California, or the expansion of businesses currently doing business within the State of California. A detailed assessment of the economic impacts of the proposed regulatory action can be found in the ISOR.

The Executive Officer has also determined, pursuant to title 1, CCR, section 4, that the proposed regulatory action will affect small businesses. The proposed amendments would provide clarification and compliance flexibility and would improve the way the

regulations are administered. No negative economic impacts on small businesses are expected.

In accordance with Government Code sections 11346.3(c) and 11346.5(a)(11), the ARB's Executive Officer has found that the reporting requirements of the CaRFG regulations which apply to businesses are necessary for the health, safety, and welfare of the people of the State of California.

Before taking final action on the proposed regulatory action, the Board must determine that no reasonable alternative considered by the agency or that has otherwise been identified and brought to the attention of the board would be more effective in carrying out the purpose for which the action is proposed or would be as effective and less burdensome to affected private persons than the proposed action.

SUBMITTAL OF COMMENTS

The public may present comments relating to this matter orally or in writing at the hearing, and in writing or by e-mail before the hearing. To be considered by the Board, written submissions not physically submitted at the hearing must be received **no later than 12:00 noon, November 17, 2004**, and addressed to the following:

Postal mail is to be sent to:

Clerk of the Board
Air Resources Board
1001 I Street, 23rd Floor
Sacramento, California 95814

Electronic mail is to be sent to: carfg304@listserv.arb.ca.gov and received at the ARB **no later than 12:00 noon, November 17, 2004**.

Facsimile transmissions are to be transmitted to the Clerk of the Board at (916) 322-3928 and received at the ARB **no later than 12:00 noon, November 17, 2004**.

The Board requests but does not require that 30 copies of any written statement be submitted and that all written statements be filed at least 10 days prior to the hearing so that ARB staff and Board Members have time to fully consider each comment. The Board encourages members of the public to bring to the attention of staff in advance of the hearing any suggestions for modification of the proposed regulatory action.

STATUTORY AUTHORITY AND REFERENCES

This regulatory action is proposed under that authority granted in sections 39600, 39601, 43013, 43013.1, 43018, and 43101, 43830 Health and Safety Code, and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d

411, 121 Cal.Rptr. 249 (1975). This regulatory action is proposed to implement, interpret, and make specific sections 39000, 39001, 39002, 39003, 39010, 39500, 39515, 39516, 41511, 43000, 43013, 43013.1, 43016, 43018, 43021, 43101, 43830, and 43830.8, Health and Safety Code, and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975).

HEARING PROCEDURES

The public hearing will be conducted in accordance with the California Administrative Procedure Act, Title 2, Division 3, Part 1, Chapter 3.5 (commencing with section 11340) of the Government Code.

Following the public hearing, the Board may adopt the regulatory language as originally proposed or with nonsubstantial or grammatical modifications. The Board may also adopt the proposed regulatory language with other modifications if the text as modified is sufficiently related to the originally proposed text that the public was adequately placed on notice that the regulatory language as modified could result from the proposed regulatory action; in such event the full regulatory text with the modifications clearly indicated, will be made available to the public, for written comment, at least 15 days before it is adopted.

The public may request a copy of the modified regulatory text from the ARB's Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, 1st Floor, Sacramento, CA 95814, (916) 322-2990.

CALIFORNIA AIR RESOURCES BOARD


Catherine Witherspoon
Executive Officer

Date: September 21, 2004

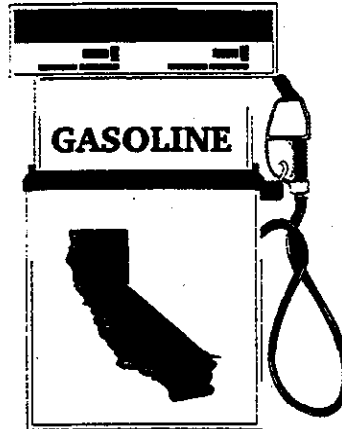
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California Environmental Protection Agency

 **Air Resources Board**

Proposed 2004 Amendments Refining the California Phase 3 Reformulated Gasoline Regulations

STAFF REPORT: INITIAL STATEMENT OF REASONS



Release Date: October 1, 2004

**State of California
California Environmental Protection Agency
AIR RESOURCES BOARD
Stationary Source Division**

**STAFF REPORT: INITIAL STATEMENT OF REASONS
PROPOSED 2004 AMENDMENTS REFINING THE CALIFORNIA
PHASE 3 REFORMULATED GASOLINE REGULATIONS**

**Public Hearing to Consider Amendments to the
California Reformulated Gasoline Regulations**

**Date of Release: October 1, 2004
Scheduled for Consideration: November 18-19, 2004**

Location:

**California Air Resources Board
Central Valley Auditorium, Second Floor
1001 I Street
Sacramento, California 95814**

This report has been reviewed by the staff of the Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use. This report is available for viewing or downloading from the Air Resources Board's Internet site;
<http://www.arb.ca.gov/regact/carfg304/carfg304.htm>

Acknowledgments

This report was prepared with the assistance and support from the other divisions and offices of the Air Resources Board. In addition, we would like to acknowledge the assistance and cooperation that we have received from many individuals and organizations.

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I. INTRODUCTION AND SUMMARY

A. Introduction

The California Phase 3 Reformulated Gasoline (CaRFG3) regulations were adopted June 16, 2000 following a December 9, 1999 hearing by the Air Resources Board (ARB). The CaRFG3 regulations prohibited production of California gasoline, after December 31, 2002, with the use of Methyl Tertiary-Butyl Ether (MTBE), established CaRFG3 standards, and established a CaRFG3 Predictive Model. The Predictive Model provides refiners with flexibility to use alternative formulations while preserving the benefits of the program. The regulations are contained in sections 2260-2273.5, title 13, California Code of Regulations.

The CaRFG3 regulations were adopted in response to the March 25, 1999 Executive Order D-5-99 in which he found that, on balance, there is significant risk to the environment from using MTBE in gasoline in California. The Executive Order directed the ARB to adopt CaRFG3 regulations to phase out the use of MTBE in California gasoline by no later than December 31, 2002 and provide additional flexibility to producers of RFG in lowering or removing oxygen while preserving the existing air quality benefits of the CaRFG2 program.

In response to the March 14, 2002 Executive Order D-52-02, the Board, at a July 25, 2002 hearing, approved amendments to the CaRFG3 regulations postponing the prohibition of the use of MTBE in California gasoline by one year. The Board also approved other amendments necessary to implement the postponement of the MTBE ban. These amendments included the one-year postponement of the dates in the current schedule for reducing residual levels of MTBE in CaRFG3 after the addition of MTBE is banned, and postponement of the imposition of the CaRFG3 limits for gasoline properties for one year, from December 31, 2002 to December 31, 2003. Additional amendments to the CaRFG3 regulations, which built on the amendments approved by the Board on July 25, 2002, were approved by the Board on December 12, 2002.

This report is the initial statement of reasons to support proposed additional amendments to the CaRFG3 regulations. The proposed amendments include:

- 1) a correction to the "California Procedures for Evaluating Alternative Specifications for Phase 3 Reformulated Gasoline Using the Predictive Model" that would make the "Procedures" reflect the intent of the Board and staff report in the original CaRFG3 rulemaking;
- 2) several amendments to the CaRFG3 regulations designed to provide or restore flexibility to suppliers of CARBOB and denatured ethanol;
- 3) an amendment clarifying the requirements for gasoline produced in Northern California and transported by marine vessel to Southern California; and
- 4) other miscellaneous changes, which would provide clarifications, corrections, or improvements in compliance flexibility or enforcement ability.

B. What Are the Proposed Amendments and Why Are They Necessary?**1. Correcting the "California Procedures for Evaluating Alternative Specifications for Phase 3 Reformulated Gasoline Using the Predictive Model"**

As adopted, the text of the "California Procedures for Evaluating Alternative Specifications for Phase 3 Reformulated Gasoline Using the Predictive Model" – which contains the actual regulatory provisions regarding the CaRFG3 Predictive Model – reflected the proposed treatment for the oxygen range of 2.5-2.9 weight percent. However, due to drafting errors the "Procedures" document did not reflect the proposed treatment for the oxygen range of 3.3-3.7 weight percent. Staff is proposing that the "Procedures" document be corrected to reflect the originally intended treatment for the oxygen range of 3.3-3.7 weight percent. An excerpted version of the "Procedures" document, showing our proposed corrections, is attached to this report as Appendix C.

2. Restoring or Providing Flexibility to CARBOB and Denatured Ethanol Suppliers

First, we are proposing the elimination of the sampling, testing, and recordkeeping requirement applicable only to importers of CARBOB by deleting the requirements of section 2266.5(c). Also, we are proposing an amendment allowing the Executive Officer to develop protocols for individual CARBOB suppliers to blend small amounts of transmix into CARBOB. This proposal is consistent with a similar provision in the Phase 2 CaRFG regulations for protocols to blend transmix into California gasoline. We are also proposing that CARBOB suppliers be permitted in limited specified circumstances to blend California gasoline into CARBOB so long as the resulting CARBOB does not contain more than 0.1 percent by weight oxygen. In addition, we are proposing amendments to the requirements regarding information that a producer or importer of denatured ethanol must provide to the person to whom the denatured is sold or supplied.

These various proposed amendments would provide consistency between requirements on importers and requirements on producers, lessen the need to transport and reprocess transmix and off-specification gasoline, and make it more practical to comply with the requirements. The resulting blends of CARBOBs and California gasolines would still have to meet the CaRFG3 specifications.

3. Reid Vapor Pressure Control Periods for California Gasoline Transported to Southern California by Marine Vessel

We are proposing amendments to section 2262.4(c)(4) that eliminate the unintended implication from the use of the word "imported" that additional testing requirements may apply. The objective of this provision was solely to make gasoline produced in the Bay Area and received at a Southern California marine terminal in March subject to the Southern California March 1 start of the RVP season rather than the April 1 start date for Bay Area production and import facilities.

4. Miscellaneous "Cleanup" Amendments to the CaRFG3 Amendments

Along with the proposed amendments described above, we are proposing several additional clarifications and corrections to the regulatory language to improve the way the regulations are administered.

C. How Were the Proposed Amendments Developed?

The staff held one preliminary public consultation meeting on February 25, 2004 and three additional workshops in 2004, where many of the CaRFG3 implementation issues were discussed. The proposed changes were developed based on input from participants and affected parties. The "Preliminary Draft Proposed Regulatory Amendments and Interim Guidance on CaRFG3 Implementation Issues" was posted prior to the first workshop, held on April 12, 2004. A revised version, contained in Appendix B, was issued prior to the second workshop, held on June 3, 2004.

D. What Alternatives Were Considered?

The only alternative is to not propose making the changes and corrections to the regulations. Since the proposed changes and corrections provide clarification and compliance flexibility with no significant negative impacts, this alternative was eliminated from further consideration.

E. What Other Issues Were Considered?

No other issues were raised for this rulemaking.

F. What Are the Emission Impacts of the Proposed Amendments?

There would be no significant impacts on emissions. The proposed changes would not significantly affect the formulation of California gasoline and, as such, would not adversely affect emissions. A small increase in CARBOB storage and transfer emissions may result where gasoline is blended into CARBOB, due to an increase in vapor pressure. There would potentially be smog-forming and particulate emission reductions due to proposed additional flexibility, which may reduce the transportation and reprocessing of transmix and California gasoline.

G. What are the Environmental Impacts of the Proposed Amendments?

1. Water quality.

There would be no significant impacts on water quality. The basic prohibitions against adding MTBE, and other oxygenates other than ethanol, would remain unchanged.

2. *Air Quality*

There should be no significant impacts on air quality, as the basic fuel standards would remain unchanged.

3. *Greenhouse Gas Emissions*

The proposed amendments would not have any negative impact on greenhouse gas emissions. There would potentially be carbon dioxide emission reductions due to proposed additional flexibility, which may reduce the transportation and reprocessing of transmix and California gasoline.

H. What is the Cost of the Proposed Amendments?

1. *Production Costs.*

There should be no negative impacts on the cost for production of California gasoline. Additional operational flexibility and reduced sampling, testing, and recordkeeping requirements could reduce the overall cost of production and operations.

2. *Fuel Supply and Price.*

There should be no negative impacts on the supply and price of California gasoline.

I. What are the Economic Impacts?

There should be no negative economic impacts associated with the proposed changes.

There would be no negative economic impacts for small businesses, as the actions of small businesses would not be affected by the proposed changes.

II. RECOMMENDATIONS.

The staff recommends that the Board adopt the proposed amendments to the California reformulated gasoline regulations, as contained in Appendix A, and including corrections to the "California Procedures for Evaluating Alternative Specifications for Phase 3 Reformulated Gasoline Using the Predictive Model," as contained in Appendix C.

III. PROPOSED AMENDMENTS TO THE CALIFORNIA REFORMULATED GASOLINE REGULATIONS

This chapter describes the proposed changes to the California Phase 3 Reformulated Gasoline (CaRFG3) regulations. These proposed changes include: (1) a correction to the "California Procedures for Evaluating Alternative Specifications for Phase 3 Reformulated Gasoline Using the Predictive Model" that would make the "Procedures" reflect the intent of the Board and staff in the original CaRFG3 rulemaking; (2) several amendments to the CaRFG3 regulations designed to provide or restore flexibility to suppliers of CARBOB and denatured ethanol; (3) an amendment clarifying the requirements on gasoline produced in Northern California and transported by marine vessel to Southern California; and (4) other miscellaneous changes, which would provide clarifications, corrections, or improvements in compliance flexibility.

A. Correcting the "California Procedures for Evaluating Alternative Specifications for Phase 3 Reformulated Gasoline Using the Predictive Model"

The CaRFG3 regulations were approved by the ARB at a December 9, 1999 hearing. The October 22, 1999 staff report for the rulemaking stated on page 33 that "for candidate CaRFG3 Predictive Model formulations that have an oxygen range of 2.5-2.9 weight percent...the candidate oxygen content would be treated simply as 2.7 weight percent. Similarly, the oxygen range of 3.3-3.7 weight percent would be treated as 3.5 weight percent. This could result in a higher percentage of CARBOB batches designated at [each] oxygen level, and a greater likelihood of fungibility."

As adopted, the text of the "California Procedures for Evaluating Alternative Specifications for Phase 3 Reformulated Gasoline Using the Predictive Model" – which contains the actual regulatory provisions regarding the CaRFG3 Predictive Model – reflected the proposed treatment for the oxygen range of 2.5-2.9 weight percent. However, due to drafting errors the "Procedures" document did not reflect the proposed treatment for the oxygen range of 3.3-3.7 weight percent. Staff is proposing that the "Procedures" document be resubmitted with corrections reflecting the originally intended treatment for the oxygen range of 3.3-3.7 weight percent.

Another correction would delete a sentence referring to Driveability Index. This sentence was overlooked when references to Driveability Index were removed from the final version of the CaRFG3 regulations in the original CaRFG3 rulemaking. The table of CaRFG3 standards would also be revised to reflect the changes described in III.D.3, below. An excerpted version of the "Procedures" document, showing our proposed corrections, is attached to this report as Appendix C.

B. Providing or Restoring Flexibility to CARBOB and Denatured Ethanol Suppliers

First, we are proposing the elimination the sampling, testing, and recordkeeping requirements applicable only to imported CARBOB by deleting the requirements of section 2266.5(c). The sampling, testing, and recordkeeping requirements would then be the same for importers of

California gasoline or CARBOB and producers of California gasoline or CARBOB, and would apply only to final blends of California gasoline or CARBOB subject to averaging limits.

Also, the CaRFG3 regulations currently prohibit the blending of anything except CARBOB into CARBOB. We are proposing an amendment allowing the Executive Officer to develop protocols for individual CARBOB suppliers to blend small amounts of transmix into CARBOB. The proposal is consistent with an allowance under the CaRFG2 regulations for protocols to blend transmix into California gasoline. We are also proposing that CARBOB suppliers be permitted in limited specified circumstances to blend California gasoline into CARBOB so long as the resulting CARBOB does not contain more than 0.1 percent by weight oxygen. In addition, the Executive Officer would be allowed to develop protocols for the blending of California gasoline or other CARBOB into CARBOB for other situations. These various proposed amendments would lessen the need to transport and reprocess transmix and off-specification gasoline. The resulting blends of CARBOBs and California gasolines would still have to meet the preexisting CaRFG3 specifications.

In addition, we are proposing amendments to the requirements regarding information that a producer or importer of denatured ethanol must provide to the person to whom the denatured is sold or supplied, in order to make it more practical to comply with the requirements. As the proposed alternative, the information would have to be kept and maintained by the supplier and made available upon request.

1. Sampling , Testing and Recordkeeping by Importers of CARBOB

Section 2266.5(c) requires each importer of CARBOB to sample, test, and keep records for the fuel properties of each final blend of imported CARBOB by collecting and analyzing a representative sample of the imported CARBOB taken from the final blend at its import facility. We are proposing the elimination of this sampling, testing, and recordkeeping requirement applicable only to imported CARBOB by deleting the requirements of section 2266.5(c). The staff believes that CARBOB importers are sufficiently knowledgeable that they are unlikely to import CARBOB that is not designed to comply with the requirements of the regulations. The sampling, testing, and recordkeeping requirements would then be the same for importers of California gasoline or CARBOB and producers of California gasoline or CARBOB, and would apply only to final blends of California gasoline or CARBOB subject to averaging limits. Section 2270 requires each producer or importer, that has elected to be subject to an average limit or a PM averaging limit, to sample, test, and keep records for sulfur, aromatic hydrocarbon, olefin and benzene contents, T50 and T90, as applicable, for each final blend of California gasoline or CARBOB.

2. Protocols for Adding Transmix to CARBOB and Other Situations

Under the California Phase 2 Reformulated Gasoline (CaRFG2) regulations, the Executive Officer was authorized to enter into a protocol with an individual gasoline supplier, allowing the supplier to blend small amounts of transmix into California gasoline downstream from the production or import facility. We are proposing that a new section 2266.5(f)(2)(B) be added, authorizing the Executive Officer to enter into similar protocols for blending small amounts of

transmix into downstream CARBOB, under the same conditions as applied in the preexisting transmix blending provisions.

3. Adding California Gasoline to CARBOB

There are various situations in which a gasoline supplier may end up with relatively small amounts of ethanol-blended California gasoline that has not been properly oxygenated, must be removed from a retail outlet for some legitimate operational reason, or results from calibrating meters for adding ethanol at terminals. Since the CaRFG3 regulations prohibit adding the gasoline to CARBOB at a terminal or bulk plant, it currently must be downgraded to transmix or transported back to a refinery for reprocessing. We are proposing amendments adding a new section 2266.5(f)(1)(E), which would allow limited amounts of off-specification California gasoline containing ethanol to be added to CARBOB at a terminal or bulk plant storage tank for specified operational reasons. The three operational reasons are that (1) the gasoline resulted from oxygenating CARBOB during calibration of oxygen blending equipment, (2) the gasoline resulted from the unintentional over- or under-oxygenation of CARBOB during a cargo tank loading, and (3) the gasoline was pumped out of a storage tank at a gasoline fueling facility for legitimate operational reasons. In each case, the non-oxygenate portion of the gasoline would have to meet the cap limits for CARBOB. The amendments would also require that the resulting blend of CARBOB cannot have an oxygen content exceeding 0.1 percent by weight, and specify how that oxygen content is to be determined prior to adding the gasoline. The oxygen limit would assure that the amendments would have a de minimis impact, and the other limitations are designed so that the mechanism will only be used for bona fide operational reasons.

We are also proposing a new section 2266.5(f)(2)(C), which would allow the Executive Officer to enter into protocols for blending California gasoline or other CARBOB to CARBOB in additional situations that are unforeseen at this time. These protocols would be limited to situations in which the Executive Officer determines that alternatives are not practical and the blending will not significantly affect the properties of the CARBOB to which the gasoline or CARBOB will be added.

4. Substitute for the Requirement of Documentation Accompanying the Transfer of Denatured Ethanol

In order to assist ARB inspectors in tracking the source of noncomplying ethanol, the CaRFG3 regulations currently require any person selling or supplying denatured ethanol from the California facility at which it was produced or imported to provide the customer with a document that identifies (1) "the name and address of the person selling or supplying the denatured ethanol," and (2) "the name, location and operator of the facility(ies) at which the ethanol was produced and at which the denaturant was added to the ethanol." We are proposing simplifying amendments to section 2262.9(c)(2) for California producers of denatured ethanol. These amendments replace the second requirement listed above with a direction that the person be identified as the producer. With respect to importers of denatured ethanol, the current requirements can be impractical where the ethanol may have been originally produced or denatured at any one of a number of out-of-state facilities. We are proposing amendments to section 2262.9(c)(2)(B) that would provide importers a potentially more practical option under which the required documentation would identify "the date and time the ethanol was

supplied...and state that the person selling or supplying the denatured ethanol...maintains a list...of all the facilities at which the ethanol was produced and at which the denaturant was added to the ethanol.”

C. Reid Vapor Pressure Control Periods for California Gasoline Transported to Southern California by Marine Vessel

Section 2262.4(c)(4) of the regulations currently states

For purposes of compliance with section 2262.4(b) [RVP compliance period for production and import facilities] only, gasoline that is produced in California and is transported to the South Coast Air Basin, Ventura County, or the San Diego Air Basin by marine vessel shall be treated as having been imported at the facility to which the gasoline is off-loaded from the marine vessel.

We are proposing amendments that eliminate the unintended implication from the use of the word “imported” that additional testing requirements may apply. The objective of this provision was solely to make gasoline produced in the Bay Area and received at a Southern California marine terminal in March subject to the Southern California March 1 start of the RVP season rather than the April 1 start date for Bay Area production and import facilities. To clarify the objective of the provision, we are proposing that section 2262.4(c)(4) be amended as shown in Appendix A.

D. Miscellaneous “Cleanup” Amendments to the CaRFG3 Amendments

Along with the proposed amendments described above, we are proposing several additional clarifications and corrections to the regulatory language to improve the way the regulations are administered.

1. Section 2260(a)(16) “Import Facility”

We are proposing a clarification of the definition of “import facility,” by defining it more specifically as the “storage tank” to which imported California gasoline or CARBOB is first delivered in California.

2. Section 2262, Footnote 2 on RVP Limits

Section 2262 contains a table entitled, “The California Reformulated Gasoline Phase 2 and Phase 3 Standards.” Footnote 2 to the table specifies the applicability of the RVP limits for CaRFG3. We are proposing amendments to Footnote 2 in which “7.2 psi” would be replaced with “7.20 psi” and “7.0 psi” would be replaced with “7.00 psi” to make the limits stated in the footnote consistent with the text in the table itself and the RVP test method.

3. Section 2262, Footnote 7 on Applicable Oxygen Content Cap

Footnote 7 provides, “If the gasoline contains more than 3.5 percent by weight oxygen but no more than 10 volume percent ethanol, the maximum oxygen content cap is 3.7 percent by weight.” For clarification, we are proposing that the text of footnote 7 be amended to read as

follows: "If the gasoline contains more than 3.5 percent by weight oxygen from ethanol, but no more than 10.0 percent by volume ethanol, then the maximum oxygen content cap is 3.7 percent by weight." Federal regulations allow up to 10 percent by volume ethanol in gasoline, and the increased oxygen content cap of 3.7 weight percent is only appropriate to the extent it is necessary to accommodate an ethanol content of a full 10.0 percent. An additional significant digit would be added to the specified ethanol content for the reasons described immediately below.

4. *Section 2262.5(b) Compliance With the Maximum Oxygen Content Cap Limit Standard*

In this section we are proposing that "ethanol content exceeding 10 percent by volume" be replaced with "ethanol content exceeding 10.0 percent by volume," since the test method for oxygen content specified in section 2263(b) yields results to the tenth of a percent.

5. *Section 2262.6(c)(2) and (3)*

Section 2262.6(a) contains prohibitions regarding MTBE in California gasoline starting December 31, 2003, and section 2262(c) contains comparable prohibitions regarding oxygenates other than MTBE or ethanol. The 11 oxygenates covered are identified in section 2262.6(c)(4). Section 2262(c)(1) prohibits the sale of California gasoline produced at a California production facility with the use of any of these other oxygenates, and sections 2262(c)(2) and (3) impose stringent limits on the amount of oxygen from the other oxygenates that California gasoline may contain. However, section 2262.6(c)(1) contains an exception for an oxygenate for which a multimedia analysis has been conducted and the California Environmental Policy Council has made a determination that use of the oxygenate will not cause a significant adverse impact on the public health or the environment. It follows that if use of a specific oxygenate is not prohibited by section 2262.6(c)(1) because of a multimedia evaluation and determination, there should be no limits in section 2262.6(c)(2) and (3) on the presence of oxygen from the oxygenate. However, this is not recognized in the current regulation. Staff is accordingly proposing that exceptions be made in section 2262(c)(2) and (3) for any oxygenate that is not prohibited by section 2262.6(c)(1). To date, no multimedia evaluation has been conducted for any of the 11 oxygenates covered by prohibition in section 2262.6(c)(1).

6. *Section 2262.9(a)(3) Standards for Products Represented as Appropriate for Use as a Denaturant in Ethanol*

We are proposing that the significant digits for the maximum permitted benzene, olefins, and aromatic hydrocarbon content of the denaturant in ethanol as specified in section 2262.(a)(3) be made consistent with the significant digits for these properties in the CaRFG3 standards as set forth in the table in section 2262.

Accordingly, in section 2262.9(a)(3)(A) we are proposing that "a benzene content exceeding 1.1 percent by volume" be replaced with "a benzene content exceeding 1.10 percent by volume." In section 2262.9(a)(3)(A)2. we are proposing that "an olefins content exceeding 10 percent by volume" be replaced with "an olefins content exceeding 10.0 percent by volume." And in section 2262.9(a)(3)(A)3. the proposed amendments would replace "an aromatic hydrocarbon

content exceeding 35 percent by volume” with “an aromatic hydrocarbon content exceeding 35.0 percent by volume.”

7. Section 2265(a) Election to Sell or Supply a Final Blend as a [California Phase 3 Reformulated Gasoline Predictive Model] Alternative Gasoline Formulation

Section 2265(a)(2) requires that a gasoline producer or importer using the CaRFG3 Predictive Model for a given batch of gasoline must notify the Executive Officer of, among other things, the “identity, location, and estimated volume” of the final blend in question when it is being supplied from the production or import facility. We are proposing that the requirement for the “estimated volume” be eliminated, because knowledge of the volume is not necessary to determine compliance with the regulations unless the producer or importer is using the Predictive Model averaging compliance option for one or more properties. Where averaging is being used, the producer or importer is separately required by section 2264(a)(2) and (d) to report the volume of the final blend, and this requirement would not be changed.

8. Section 2266.5(a)(6)(A) Determining Whether Downstream CARBOB Complies With the Cap Limits for California Gasoline Through the Use of CARBOB Cap Limits Derived from the CARBOB Model

Footnote 2 of the table states, “The CaRFG Phase 3 CARBOB cap limits for sulfur are phased in starting December 31, 2003, and December 31, 2004, in accordance with section 2261(b)(1)(A).” For consistency with section 2261(b)(1)(A), we are proposing to replace “December 31, 2004” with “December 31, 2005.” The December 31, 2005 date was inadvertently retained when the other CaRFG3 and MTBE phase-out implementation dates were postponed one year in the 2002 rulemaking.

9. 2266.5(g)(1)(C) Issuance of Certificate

This section states, “The executive officer shall provide each complying oxygen blender with a certificate...The certification shall constitute the oxygen blender’s certification pursuant to Health and Safety Code section 43021.” The Legislature has replaced Health and Safety Code section 43021 with Health and Safety Code section 43026, and we are proposing an amendment to reflect this change.

10. Section 2266.5(h)(2)(B) Blending to Meet a Cap Limit

Section 2266.5(h)(1) prohibits a person from adding most nonoxygenated blendstocks to California gasoline that has been supplied from the production or import facility unless the person can demonstrate the blendstock meets the CaRFG3 refinery limits and the person meets with regard to the blendstock all of the requirements applicable to the gasoline producers. This is designed to assure that all California gasoline is subject to the more stringent refinery limits at some point. Section 2266.5(h)(2)(B) makes a limited exception authorizing a person to “add nonoxygenate blendstock to California gasoline that does not comply with one or more of the applicable cap limits contained in section 2262, where the person obtains prior approval from the executive officer based on a demonstration that adding the blendstock is a reasonable means of bringing the gasoline into compliance with the cap limits.” We are proposing that this provision be expanded to cover oxygenated as well as nonoxygenated blendstock, and that it also serve as

an exception to section 2262.5(d), which restricts the addition of oxygenates to downstream gasoline. The proposed amendment would make it easier for persons to bring noncomplying downstream gasoline into compliance with the cap limits, while assuring that this mechanism would only be used where necessary and appropriate.

E. Alternatives

The only alternative that staff has identified is to not propose making the changes and corrections to the regulations. Since the proposed changes and corrections provide clarification and compliance flexibility with no significant negative impacts, this alternative was eliminated from further consideration.

IV. ENVIRONMENTAL IMPACTS OF THE PROPOSED AMENDMENTS TO THE CARFG3 REGULATIONS

This chapter presents a summary of the results of the analysis of the environmental effects of the proposed amendments. The proposed amendments would provide clarification and compliance flexibility and would improve the way the regulations are administered. The staff does not anticipate any significant adverse environmental effects associated with the proposed amendments.

The proposed amendments do not affect compliance with the requirements specified in Sections 43013.1 and 43830.8 of the California Health and Safety Code (H&SC), nor do they present any issues that were not addressed during the review of the CaRFG3 regulations by the California Environmental Policy Council in 2000. At that time, the Council determined that there will not be a significant adverse environmental impact on public health or the environment, including any impact on air, water, or soil, that is likely to result from the change in gasoline that is expected to be implemented to meet the CaRFG3 regulations approved by the ARB.

A. Effects on Water Quality

There would be no significant impacts on water quality. The basic prohibitions against adding MTBE, and other oxygenates other than ethanol, would remain unchanged.

B. Effects on Air Quality

There should be no significant impacts on air quality, as the basic fuel standards would remain unchanged.

C. Effects on Greenhouse Gas Emissions

The proposed amendments would not have any negative impact on greenhouse gas emissions. There would potentially be carbon dioxide emission reductions due to proposed additional flexibility, which may reduce the transportation and reprocessing of transmix and California gasoline.

D. Effects on Allowable Emissions

There are no significant additional emission impacts associated with the proposed amendments. There may be small, unquantifiable emission increases associated with the proposal that limited blending of California gasoline into CARBOB be allowed. Since CARBOB has a lower vapor pressure than California gasoline, CARBOB storage and transfer emissions are lower than California gasoline storage and transfer emissions. This is an emission benefit of Phase 3 California RFG over Phase 2 California RFG. If California gasoline is blended into CARBOB, some of that benefit will be lost. However, we believe that the blending of California gasoline into CARBOB would only affect a small fraction of the CARBOB supply. Also, employment of the proposed additional blending flexibility would reduce the transportation and reprocessing of transmix and California gasoline, resulting in a reduction of smog-forming and particulate emissions.

E. Other Environmental Impacts

The staff has concluded that the proposed amendments will not have any other significant adverse environmental impacts.

F. Effects of the Proposed CaRFG3 Amendments on the State Implementation Plan

There should be no effects of the proposed amendments on the State Implementation Plan, because there should be no significant impacts on air quality.

G. Environmental Justice and Neighborhood Impacts

There should be no environmental justice and neighborhood impacts of the proposed action. The proposed amendments would simply improve the implementation and flexibility of the current program.

V. ECONOMIC EFFECTS OF THE PROPOSED AMENDMENTS TO THE CARFG3 REGULATIONS

This chapter presents a summary of the staff's analysis of the economic effects of the proposed amendments. The proposed amendments would provide clarification and compliance flexibility and would improve the way the regulations are administered. Therefore, the staff does not anticipate any adverse economic effects associated with the proposed amendments.

A. Costs of Complying with the Proposed Regulation

There are no additional costs associated with proposed amendments. In some situations the additional compliance flexibility provided by the proposed amendments may lead to cost reductions.

B. Economic Effects on Small Businesses

Government Code section 11346.2(b)(4)(B) requires the ARB to describe any alternatives it has identified that would lessen any adverse impact on small business. In defining small business, Government Code section 11342(h) explicitly excludes refiners from the definition. Also the definition includes only businesses that are independently owned and, if in retail trade, gross less than \$2,000,000 per year. Thus, our analysis of the economic effects on small business is limited to the costs to certain gasoline retailers and jobbers, where a jobber is an individual or business that purchases wholesale gasoline and delivers and sells it to another party, usually a retailer or other end-user.

There would be no negative economic impacts for small businesses, as the actions of small businesses would not be adversely affected by the proposed changes.

APPENDIX A

PROPOSED REGULATION ORDER

Amendments to the California Phase 3 Gasoline (CaRFG3) Regulations

PROPOSED REGULATION ORDER

PROPOSED 2004 AMENDMENTS REFINING THE CALIFORNIA PHASE 3 REFORMULATED GASOLINE REGULATIONS

California Code of Regulations, Title 13, Division 3 Chapter 5. Standards for Motor Vehicle Fuels Article 1. Standards for Gasoline

Subarticle 2. Standards for Gasoline Sold Beginning March 1, 1996

Section 2260. Definitions.

(a) For the purposes of this subarticle, the following definitions apply:

* * * * *

(16) "Import facility" means the ~~facility at~~ storage tank to which imported California gasoline or CARBOB is first ~~received~~ delivered in California, including, in the case of gasoline or CARBOB imported by cargo tank and delivered directly to a facility for dispensing gasoline into motor vehicles, the cargo tank in which the gasoline or CARBOB is imported.

* * * * *

NOTE: Authority cited: sections 39600, 39601, 43013, 43013.1, 43018, and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975). Reference: sections 39000, 39001, 39002, 39003, 39010, 39500, 39515, 39516, 41511, 43000, 43013, 43013.1, 43016, 43018, and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975).

* * * * *

Section 2262. The California Reformulated Gasoline Phase 2 and Phase 3 Standards.

The CaRFG Phase 2 and CaRFG Phase 3 standards are set forth in the following table. For all properties but Reid vapor pressure (cap limit only) and oxygen content, the value of the regulated property must be less than or equal to the specified limit. With respect to the Reid vapor pressure cap limit and the oxygen content flat and cap limit, the limits are expressed as a range, and the Reid vapor pressure and oxygen content must be less than or equal to the upper limit, and more than or equal to the lower limit. A qualifying small refiner may comply with the small refiner CaRFG Phase 3 standards, in place of the CaRFG Phase 3 standards in this section, in accordance with section 2272.

The California Reformulated Gasoline Phase 2 and Phase 3 Standards

| <i>Property</i> | <i>Flat Limits</i> | | <i>Averaging Limits</i> | | <i>Cap Limits</i> | |
|--|----------------------|------------------------------------|-------------------------|----------------------|--|---|
| | <i>CaRFG Phase 2</i> | <i>CaRFG Phase 3</i> | <i>CaRFG Phase 2</i> | <i>CaRFG Phase 3</i> | <i>CaRFG Phase 2</i> | <i>CaRFG Phase 3</i> |
| Reid Vapor Pressure ¹ (pounds per square inch) | 7.00 | 7.00 or 6.90 ² | Not Applicable | Not Applicable | 7.00 ³ | 6.40 - 7.20 |
| Sulfur Content (parts per million by weight) | 40 | 20 | 30 | 15 | 80 | 60 ⁴ 30 ⁴ |
| Benzene Content (percent by volume) | 1.00 | 0.80 | 0.80 | 0.70 | 1.20 | 1.10 |
| Aromatics Content (percent by volume) | 25.0 | 25.0 | 22.0 | 22.0 | 30.0 ³ | 35.0 |
| Olefins Content (percent by volume) | 6.0 | 6.0 | 4.0 | 4.0 | 10.0 | 10.0 |
| T50 (degrees Fahrenheit) | 210 | 213 | 200 | 203 | 220 | 220 |
| T90 (degrees Fahrenheit) | 300 | 305 | 290 ⁵ | 295 | 330 | 330 |
| Oxygen Content (percent by weight) | 1.8 - 2.2 | 1.8 - 2.2 | Not Applicable | Not Applicable | 1.8 ⁶ - 3.5 0 ⁶ - 3.5 | 1.8 ⁶ -3.5 ⁷ 0 ⁶ - 3.5 ⁷ |
| Methyl tertiary-butyl ether (MTBE) and oxygenates other than ethanol | Not Applicable | Prohibited as provided in § 2262.6 | Not Applicable | Not Applicable | Not Applicable | Prohibited as provided in § 2262.6 |

¹ The Reid vapor pressure (RVP) standards apply only during the warmer weather months identified in section 2262.4.

² The 6.90 pounds per square inch (psi) flat limit applies only when a producer or importer is using the evaporative emissions model element of the CaRFG Phase 3 Predictive Model, in which case all predictions for evaporative emissions increases or decreases made using the evaporative emissions model are made relative to 6.90 psi and the gasoline may not exceed the maximum RVP cap limit of 7.20 psi. Where the evaporative emissions model element of the CaRFG Phase 3 Predictive Model is not used, the RVP of gasoline sold or supplied from the production or import facility may not exceed 7.00 psi.

³ For sales, supplies, or offers of California gasoline downstream of the production or import facility starting on the date on which early compliance with the CaRFG Phase 3 standards is permitted by the executive officer under section 2261(b)(3), the CaRFG Phase 2 cap limits for Reid vapor pressure and aromatics content shall be 7.20 psi and 35.0 percent by volume respectively.

- 4 The CaRFG Phase 3 sulfur content cap limits of 60 and 30 parts per million are phased in starting December 31,
2003, and December 31, 2005, respectively, in accordance with section 2261(b)(1)(A).
5 Designated alternative limit may not exceed 310.
6 The 1.8 percent by weight minimum oxygen content cap only applies during specified winter months in the
areas identified in section 2262.5(a).
7 If the gasoline contains more than 3.5 percent by weight oxygen from ethanol but no more than 10.0 volume
percent ethanol, the maximum oxygen content cap is 3.7 percent by weight.

NOTE: Authority cited: sections 39600, 39601, 43013, 43013.1, 43018, 43101, and 43830, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975). Reference: sections 39000, 39001, 39002, 39003, 39010, 39500, 39515, 39516, 41511, 43000, 43013, 43013.1, 43016, 43018, 43101, 43830, and 43830.8, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975).

* * * * *

Section 2262.4. Compliance With the CaRFG Phase 2 and CaRFG Phase 3 Standards for Reid Vapor Pressure.

(a) Compliance with the cap limits for Reid vapor pressure.

- (1) No person shall sell, offer for sale, supply, offer for supply, or transport California gasoline which exceeds the applicable cap limit for Reid vapor pressure within each of the air basins during the regulatory period set forth in section (a)(2).

(2) Regulatory Control Periods.

(A) April 1 through October 31 (May 1 through October 31 in 2003 and 2004):

South Coast Air Basin and Ventura County
San Diego Air Basin
Mojave Desert Air Basin
Salton Sea Air Basin

(B) May 1 through September 30:

Great Basin Valley Air Basin

(C) May 1 through October 31:

San Francisco Bay Area Air Basin
San Joaquin Valley Air Basin
Sacramento Valley Air Basin
Mountain Counties Air Basin
Lake Tahoe Air Basin

(D) June 1 through September 30:

North Coast Air Basin
Lake County Air Basin

Northeast Plateau Air Basin

(E) *June 1 through October 31:*

North Central Coast Air Basin

South Central Coast Air Basin (Excluding Ventura County)

(b) *Compliance by producers and importers with the flat limit for Reid vapor pressure.*

(1) *Reid vapor pressure standard for producers and importers.*

(A) In an air basin during the regulatory control periods specified in section (b)(2), no producer or importer shall sell, offer for sale, supply, or offer for supply from its production facility or import facility California gasoline which has a Reid vapor pressure exceeding the applicable flat limit set forth in section 2262 unless the gasoline has been reported as a PM alternative gasoline formulation pursuant to section 2265(a) using the evaporative emissions model element of the CaRFG Phase 3 Predictive Model.

(B) In an air basin during the regulatory control periods specified in section (b)(2), no producer or importer shall sell, offer for sale, supply, or offer for supply from its production facility or import facility California gasoline which has been reported as a PM alternative gasoline formulation pursuant to section 2265(a) using the evaporative emissions model element of the CaRFG Phase 3 Predictive Model if the gasoline has a Reid vapor pressure exceeding the PM flat limit for Reid vapor pressure in the identified PM alternative specifications.

(2) *Regulatory control periods for production and import facilities.*

(A) 1. *March 1 through October 31 (Except as otherwise provided in (A)2. and (A)3. below):*

South Coast Air Basin and Ventura County

San Diego Air Basin

Mojave Desert Air Basin

Salton Sea Air Basin

2. In the areas identified in section 2262.4(b)(2)(A)1., California gasoline that is supplied March 1 through March 31, 2003 from a production or import facility that is qualified under this subsection is not subject to the prohibitions of section 2262.4(b)(1), as long as the gasoline either is designated as subject to the CaRFG Phase 3 standards, or is subject to the CaRFG Phase 2 standards and also meets the prohibitions in sections 2262.6(a)(1) and 2262.6(c) regarding the use of oxygenates. In order for a production or import facility to be qualified, the producer or importer must notify the Executive Officer in writing by February 14, 2003 that it has elected to have the facility be subject to this subsection during March 2003.

3. In the areas identified in section 2262.4(b)(2)(A)1., California gasoline that is supplied March 1 through March 31, 2004 from a production or import facility that was not qualified under section 2262.4(b)(2)(A)2. is not subject to the prohibitions of section 2262.4(b)(1).

(B) *April 1 through September 30:*
Great Basin Valley Air Basin

(C) *April 1 through October 31:*
San Francisco Bay Area Air Basin
San Joaquin Valley Air Basin
Sacramento Valley Air Basin
Mountain Counties Air Basin
Lake Tahoe Air Basin

(D) *May 1 through September 30:*
North Coast Air Basin
Lake County Air Basin
Northeast Plateau Air Basin

(E) *May 1 through October 31:*
North Central Coast Air Basin
South Central Coast Air Basin (Excluding Ventura County)

(c) *Applicability.*

- (1) Section (a)(1) shall not apply to a transaction occurring in an air basin during a regulatory control period in section (a)(2) where the person selling, supplying, or offering the gasoline demonstrates as an affirmative defense that, prior to the transaction, he or she has taken reasonably prudent precautions to assure that the gasoline will be delivered to a retail service station or bulk purchaser-consumer's fueling facility when the station or facility is not subject to a regulatory control period in section (a)(2).
- (2) Section (b) shall not apply to a transaction occurring in an air basin during the applicable regulatory control period for producers and importers where the person selling, supplying, offering or transporting the gasoline demonstrates as an affirmative defense that, prior to the transaction, he or she has taken reasonably prudent precautions to assure that the gasoline will be delivered to a retail service station or bulk purchaser-consumer's fueling facility located in an air basin not then subject to the regulatory control period for producers and importers set forth in section (b)(2).
- (3) Section (a)(1) shall not apply to a transaction occurring in an air basin during the regulatory control period where the transaction involves the transfer of gasoline from a

stationary storage tank to a motor vehicle fuel tank and the person selling, supplying, or offering the gasoline demonstrates as an affirmative defense that the last delivery of gasoline to the stationary storage tank occurred more than fourteen days before the start of the regulatory control period.

- (4) ~~For purposes of compliance with section 2262.4(b) only, G~~gasoline that is produced in California, and is then transported to the South Coast Air Basin, Ventura County, or the San Diego Air Basin by marine vessel ~~shall be treated as having been imported at the facility to which the gasoline is off loaded from the marine vessel, shall be~~ subject to the regulatory control periods for production and import facilities identified in section 2262.4(b)(2)(A).

NOTE: Authority cited: sections 39600, 39601, 43013, 43013.1, 43018, and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975). Reference: sections 39000, 39001, 39002, 39003, 39010, 39500, 39515, 39516, 41511, 43000, 43013, 43013.1, 43016, 43018, 43101, 43830, and 43830.8, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975).

Section 2262.5. Compliance With the Standards for Oxygen Content.

- (a) *Compliance with the minimum oxygen content cap limit standard in specified areas in the wintertime.*

(1) Within the areas and periods set forth in section (a)(2), no person shall sell, offer for sale, supply, offer for supply, or transport California gasoline unless it has an oxygen content of not less than the minimum oxygen content cap limit in section 2262.

(2) (A) *November 1 through February 29:*

South Coast Area
Imperial County

(B) *October 1 through October 31, (1996 through 2002 only):*

South Coast Area

- (b) *Compliance with the maximum oxygen content cap limit standard.* No person shall sell, offer for sale, supply, or transport California gasoline which has an oxygen content exceeding the maximum oxygen content cap limit in section 2262, or which has an ethanol content exceeding 10.0 percent by volume.

* * * * *

NOTE: Authority cited: sections 39600, 39601, 43013, 43013.1, 43018, and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975). Reference: sections 39000, 39001, 39002, 39003, 39010, 39500, 39515, 39516, 41511, 43000,

43013, 43013.1, 43016, 43018, 43101, and 43830.8, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975).

Section 2262.6. Prohibition of MTBE and Oxygenates Other Than Ethanol in California Gasoline Starting December 31, 2003.

* * * * *

(c) Use of oxygenates other than ethanol or MTBE in California gasoline on or after December 31, 2003.

- (1) Starting December 31, 2003, no person shall sell, offer for sale, supply or offer for supply California gasoline which has been produced at a California production facility with the use of any oxygenate other than ethanol or MTBE unless a multimedia evaluation of use of the oxygenate in California gasoline has been conducted and the California Environmental Policy Council established by Public Resources Code section 71017 has determined that such use will not cause a significant adverse impact on the public health or the environment.
- (2) Starting December 31, 2003, no person shall sell, offer for sale, supply or offer for supply California gasoline which contains a total of more than 0.10 weight percent oxygen collectively from all of the oxygenates identified in section (c)(4), other than oxygenates not prohibited by section (c)(1).
- (3) Starting July 1, 2004, no person shall sell, offer for sale, supply or offer for supply California gasoline which contains a total of more than 0.06 weight percent oxygen collectively from all of the oxygenates identified in section (c)(4), other than oxygenates not prohibited by section (c)(1).
- (4) **Covered oxygenates.** Oxygen from the following oxygenates is covered by the prohibitions in section 2262.6(c)(1), (2) and (3):

Methanol
 Isopropanol
 n-Propanol
 n-Butanol
 iso-Butanol
 sec-Butanol
 tert-Butanol
 Tert-pentanol (*tert*-amylalcohol)
 Ethyl *tert*-butylether (ETBE)
 Diisopropylether (DIPE)
 Tert-amylmethylether (TAME)

- (5) The prohibitions in section 2262.6(c)(1) and (2), and in section 2262.6(c)(3), shall be phased in respectively as follows:
- (A) Starting December 31, 2003 and July 1, 2004 respectively for all sales, supplies, or offers of California gasoline by a producer or importer from its production facility or import facility.
 - (B) Starting February 14, 2004 and August 15, 2004 respectively for all other sales, supplies, offers or movements of California gasoline except for transactions directly involving:
 1. the fueling of motor vehicles at a retail outlet or bulk purchaser-consumer facility, or
 2. the delivery of gasoline from a bulk plant to a retail outlet or bulk purchaser-consumer facility.
 - (C) Starting March 31, 2004 and September 30, 2004 respectively for all remaining sales, supplies, offers or movements of California gasoline, including transactions directly involving the fueling of motor vehicles at a retail outlet or bulk purchaser-consumer facility.
- (6) ***Phase-in for low-throughput fueling facilities.*** The prohibitions in section 2262.6(c)(1) and (2), and in section 2262.6(c)(3), starting respectively on December 31, 2003 and July 1, 2004, shall not apply to transactions directly involving the fueling of motor vehicles at a retail outlet or bulk purchaser-consumer facility, where the person selling, offering, or supplying the gasoline demonstrates as an affirmative defense that the exceedance of the standard was caused by gasoline delivered to the retail outlet or bulk purchaser-consumer facility prior to the date on which the delivery became subject to the prohibition pursuant to the phase-in provisions in section 2262.6(c)(5).

NOTE: Authority cited: sections 39600, 39601, 43013, 43013.1, 43018, and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975). Reference: sections 39000, 39001, 39002, 39003, 39010, 39500, 39515, 39516, 41511, 43000, 43013, 43013.1, 43016, 43018, 43101, and 43830.8, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975).

* * * * *

Section 2262.9. Requirements Regarding Denatured Ethanol Intended For Use as a Blend Component in California Gasoline

(a) Standards.

- (1) **Standards for denatured ethanol.** Starting December 31, 2003, no person shall sell, offer for sale, supply or offer for supply denatured ethanol intended for blending with CARBOB or California gasoline that fails to comply with any of the following standards:

(A) Standards for properties regulated by the CaRFG Phase 3 standards.

1. A sulfur content not exceeding 10 parts per million;
2. A benzene content not exceeding 0.06 percent by volume; ~~or~~ and
3. An olefins content not exceeding 0.5 percent by volume; ~~or~~ and
4. An aromatic hydrocarbon content not exceeding 1.7 percent by volume.

* * * * *

(3) Standards for products represented as appropriate for use as a denaturant in ethanol.

- (A) Except as otherwise provided in section (a)(3)(B), starting December 31, 2003, no person shall sell, offer for sale, supply or offer for supply a product represented as appropriate for use as a denaturant in ethanol intended for blending with CARBOB or California gasoline, if the denaturant has:

1. A benzene content exceeding 1.10 percent by volume; or
2. An olefins content exceeding 10.0 percent by volume; or
3. An aromatic hydrocarbon content exceeding 35.0 percent by volume.

- (B) A person may sell, offer for sale, supply or offer for supply a product that is represented as only suitable for use as an ethanol denaturant in ethanol intended for blending with CARBOB or California gasoline if the denatured ethanol contains no more than a specified percentage of the denaturant that is less than 4.76 percent. In this case, the product must be prominently labeled as only lawful for use as a denaturant where the denatured ethanol contains no more than the specified percentage of the denaturant, and the seller, supplier or offeror must take reasonably prudent precautions to assure that the denaturant will not be used in concentrations greater than the specified percentage in ethanol intended for blending with CARBOB or California gasoline. If these conditions are met, the standards in section (a)(3)(A)

for the denaturant will be adjusted by multiplying the stated values by (4.76) max.%), where "max.%" is the maximum percentage of denaturant specified for the denatured ethanol.

* * * * *

(c) Documentation required for the transfer of denatured ethanol intended for use as a blend component in California gasoline.

- (1) (A) Starting December 31, 2003, and except as provided in section (c)(1)(B), on each occasion that any person transfers custody or title of denatured ethanol intended for use as a blend component in California gasoline, the transferor shall provide the transferee a document that prominently states that the denatured ethanol complies with the standards for denatured ethanol intended for use as a blend component in California gasoline.
- (B) Starting December 31, 2003, on each occasion that any person transfers custody or title of denatured ethanol that is intended to be added to CARBOB designated for blending with denatured ethanol exceeding any of the standards in section (a)(1)(A), the transferor shall provide the transferee a document that prominently identifies the maximum sulfur, benzene, olefin and aromatic hydrocarbon content of the denatured ethanol, and states that the denatured ethanol may only be lawfully added to CARBOB that is designated for blending with denatured ethanol having such properties.
- (2) Starting December 31, 2003, any person who sells or supplies denatured ethanol intended for use as a blend component in California gasoline from the California facility at which it was imported or produced shall provide the purchaser or recipient a document that identifies:
- (A) The name and address of the person selling or supplying the denatured ethanol, and identification of the person as the producer or importer of the denatured ethanol; and
- (B) With respect to imported denatured ethanol, the name, location and operator of the facility(ies) at which the ethanol was produced and at which the denaturant was added to the ethanol. As an alternative, the document provided to the purchaser or recipient may identify the date and time the ethanol was supplied from its import or production facility, and state that the person selling or supplying the denatured ethanol from the California facility at which it was imported or produced maintains at the facility a list of the name, location, and operator of all of the facility(ies) at which the ethanol was produced and at which the denaturant was added to the ethanol. In this case, the person shall for at least two years maintain such information, and records identifying the entities that produced the ethanol and added the denaturant in each batch of denatured ethanol imported to the facility; during that two year period, the person

shall make the information and records, available to the Executive Officer within five days after a request for the material.

NOTE: Authority cited: sections 39600, 39601, 43013, 43013.1, 43018, and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975). Reference: sections 39000, 39001, 39002, 39003, 39010, 39500, 39515, 39516, 41511, 43000, 43013, 43013.1, 43016, 43018, 43101, and 43830.8, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975).

Section 2263. Sampling Procedures and Test Methods

- (c) ***Sampling Procedures.*** In determining compliance with the standards set forth in this subarticle 2, an applicable sampling methodology set forth in 13 C.C.R. section 2296 shall be used.
- (b) ***Test Methods.***
- (c) In determining compliance with the gasoline standards set forth in this subarticle 2, including those in the sections identified in Table 1, the test methods presented in Table 1 shall be used. All identified test methods are incorporated herein by reference.

Table 1

| <i>Section</i> | <i>Gasoline Specification</i> | <i>Test Method</i> ^a |
|----------------|---|---|
| 2262 | Reid Vapor Pressure | ASTM D 323-58 ^b or 13 C.C.R. Section 2297 |
| 2262 | Sulfur Content | ASTM D 2622-94 ^{c, d} or ASTM D 5453-93 |
| 2262 | Benzene Content | ASTM D 5580-00 ^e |
| 2262 | Olefin Content | ASTM D 1319-95a ^f (Through December 31, 2001) ASTM D 6550-00 ^{g, h, i} (Starting January 1, 2002) |
| 2262 | Oxygen Content | ASTM D 4815-99 |
| 2262 | T90 and T50 | ASTM D 86-99aε1 |
| 2262 | Aromatic Hydrocarbon Content | ASTM D 5580-00 ^j |
| 2262.5(b) | Ethanol Content | ASTM D 4815-99 |
| 2262.6 | MTBE Content | ASTM D 4815-99 |
| 2262.6(c) | Oxygen from oxygenates identified in section 2262.6(c)(4) | ASTM D 4815-99 |

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NOTE: Authority cited: sections 39600, 39601, 43013, 43013.1, 43018, and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975). Reference: sections 39000, 39001, 39002, 39003, 39010, 39500, 39515, 39516, 41511, 43000, 43013, 43013.1, 43016, 43018, and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975).

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Section 2265. Gasoline Subject to PM Alternative Specifications Based on the California Predictive Model.

(a) Election to sell or supply a final blend as a PM alternative gasoline formulation.

- (1) In order to sell or supply from its production facility or import facility a final blend of California gasoline as a PM alternative gasoline formulation subject to PM alternative specifications, a producer or importer shall satisfy the requirements of this section (a).
- (2) The producer or importer shall evaluate the candidate PM alternative specifications for gasoline subject to the CaRFG Phase 2 standards in accordance with the Air Resources Board's "California Procedures for Evaluating Alternative Specifications for Phase 2 Reformulated Gasoline Using the California Predictive Model," as adopted April 20, 1995 and last amended December 11, 1998, which is incorporated herein by reference. The producer or importer shall evaluate the candidate PM alternative specifications for gasoline subject to the CaRFG Phase 3 standards in accordance with the Air Resources Board's "California Procedures for Evaluating Alternative Specifications for Phase 3 Reformulated Gasoline Using the California Predictive Model," as ~~last amended April 25, 2004~~ corrected [Insert date of correction], which is incorporated herein by reference (the two documents incorporated by reference in this section 2265(a)(2) are collectively referred to as the "Predictive Model Procedures"). If the PM alternative specifications meet the criteria for approval in the applicable Predictive Model Procedures, the producer shall notify the executive officer of: (A) The identity, and location, ~~and estimated volume~~ of the final blend; (B) the PM alternative specifications that will apply to the final blend, including for each specification whether it applies as a PM flat limit or a PM averaging limit; and (C) the numerical values for percent change in emissions for oxides of nitrogen, hydrocarbons, and potency-weighted toxic air contaminants as determined in accordance with the applicable Predictive Model Procedures. The notification shall be received by the executive officer before the start of physical transfer of the gasoline from the production or import facility, and in no case less than 12 hours before the producer or importer either completes physical transfer or commingles the final blend.
- (3) Once a producer or importer has notified the executive officer pursuant to this section 2265(a) that a final blend of California gasoline is being sold or supplied from a production or import facility as a PM alternative gasoline formulation, all final blends of California gasoline subsequently sold or supplied from that production or import facility shall be subject to the same PM alternative specifications until the producer or importer either (A) designates a final blend at that facility as a PM alternative gasoline formulation subject to different PM alternative specifications, (B) elects in accordance with section 2264.2 to have a final blend at that facility subject to flat limit compliance options and/or averaging compliance options, or (C) elects in accordance with section 2266(c) to sell a final blend at that facility as an alternative gasoline formulation.

- (4) The executive officer may enter into a written protocol with any individual producer or importer for the purposes of specifying how the requirements in section (a)(2) shall be applied to the producer's or importer's particular operations, as long as the executive officer reasonably determines that application of the regulatory requirements under the protocol is not less stringent or enforceable than application of the express terms of section (a)(2). Any such protocol shall include the producer's or importer's agreement to be bound by the terms of the protocol.
- (5) If, through no intentional or negligent conduct, a producer or importer cannot report within the time period specified in section (a)(2) above, the producer or importer may notify the executive officer of the required data as soon as reasonably possible and may provide a written explanation of the cause of the delay in reporting. If, based on the written explanation and the surrounding circumstances, the executive officer determines that the conditions of this section (a)(5) have been met, timely notification shall be deemed to have occurred.

* * * * *

NOTE: Authority cited: sections 39600, 39601, 43013, 43013.1, 43018, and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975). Reference: sections 39000, 39001, 39002, 39003, 39010, 39500, 39515, 39516, 41511, 43000, 43013, 43013.1, 43016, 43018, and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975).

* * * * *

Section 2266.5. Requirements Pertaining to California Reformulated Gasoline Blendstock for Oxygen Blending (CARBOB) and Downstream Blending.

(a) Application of the California gasoline standards to CARBOB.

- (1) **Applicability of standards and requirements to CARBOB.** All of the standards and requirements in sections 2261, 2262, 2262.3, 2262.4, 2262.5(a), (b), (c) and (e), 2262.6, 2264, 2264.2, 2265, 2266, 2267, 2268, 2270(b) and (e), 2271 and 2272 pertaining to California gasoline or transactions involving California gasoline also apply to CARBOB or transactions involving CARBOB. Whenever the term "California gasoline" is used in the sections identified in the preceding sentence, the term means "California gasoline or CARBOB." Whenever the term "gasoline" is used in section 2265(b)(1), the term means "California gasoline or CARBOB."

(2) Determining whether a final blend of CARBOB complies with the standards for California gasoline.

(A) General.

1. **Applicability.** This section (a)(2) governs the determination of whether a final blend of CARBOB complies with the standards for California gasoline that apply when the gasoline is sold or supplied from the production or import facility at which it was produced or imported. Section (a)(6) governs the determination of whether downstream CARBOB that has already been supplied from its production or import facility complies with the applicable cap limits for California gasoline.
2. Where a producer or importer has designated a final blend as CARBOB and has complied with all applicable provisions of this section 2266.5, the properties of the final blend for purposes of compliance with sections 2262, 2262.3, 2262.4, 2262.5, 2262.6, 2265 and 2266 shall be determined in accordance with section (a)(2)(B) or (a)(2)(C) as applicable.
3. If the producer or importer has not complied with all applicable provisions of this section 2266.5, the properties of the final blend for purposes of the producer's or importer's compliance with the limits for sulfur, benzene, aromatic hydrocarbons, olefins, T50, T90, and oxygen required by sections 2262.3, 2262.5, 2265 and 2266 shall be determined without using the CARBOB Model or adding oxygenate to the gasoline, and compliance with the flat limits for Reid vapor pressure and oxygenates required by sections 2262.4, 2262.6, 2265 and 2266 shall be determined in accordance with section (a)(2)(B) or (a)(2)(C) as applicable.

(B) *Determining whether a final blend of CARBOB complies with the standards for California gasoline by use of the CARBOB Model.*

1. A producer or importer may elect to have the CARBOB model used in determining whether a final blend designated as CARBOB complies with the standards applicable to California gasoline, by providing the notice in section (b)(1)(C). In this case, the CARBOB limits for the final blend shall be determined in accordance with the "Procedures for Using the California Model for California Reformulated Gasoline Blendstocks for Oxygenate Blending (CARBOB)," as adopted April 25, 2001. The CARBOB's compliance with the assigned CARBOB limit for a property shall constitute compliance with the corresponding finished gasoline limit – be it a section 2262 flat limit, PM flat limit, TC limit, or (if no designated alternative limit has been established) section 2262 or PM averaging limit. In addition, where the producer or importer has elected to use the CARBOB model for a given final blend that is not being transferred from its production or import facility during the Reid vapor pressure control period for that facility set forth in section 2262.4(a), the final blend must have a Reid vapor pressure no lower than the value used in the T50 CARBOB model.
2. Notwithstanding section (a)(2)(B)1., where a final blend of CARBOB is sampled and analyzed by a state board inspector in accordance with section 2263 using the methodology in (a)(2)(C), the results may be used to establish a violation of applicable standards for California gasoline.

(C) *Determining whether a final blend of CARBOB complies with the standards for California gasoline by oxygenate blending and testing.* Except as otherwise provided in section (a)(2)(B), the properties of a final blend of CARBOB shall be determined for purposes of compliance with sections 2262, 2262.3, 2262.4, 2262.5, 2262.6, 2265 and 2266 by adding the specified type and amount of oxygenate to a representative sample of the CARBOB and determining the properties and characteristics of the resulting gasoline in accordance with an applicable test method identified in section 2263(b) or permitted under section 2263(c). Where the producer or importer has in accordance with section (b)(1)(E) designated a range for oxygen from denatured ethanol of 1.8 wt.% to 2.2 wt.% (or a range that is within 1.8 wt. % and 2.2 wt.% and includes 2.0 wt.%), denatured ethanol equal to 5.7 vol.% of the blended volume shall be added; where the designated range for oxygen from denatured ethanol is 2.5 wt.% to 2.9 wt.% (or is within 2.5 wt.% and 2.9% and includes 2.7 wt.%), denatured ethanol equal to 7.7 vol.% of the blended volume shall be added; and where the designated range for oxygen from denatured ethanol is 3.3 wt.% to 3.7 wt.% (or is within 3.3 wt.% and 3.7 wt.% and includes 3.5 wt.%), denatured ethanol equal to 10.0 vol.% of the blended volume shall be added. In all other cases where the designated range for oxygen from denatured ethanol is no greater than 0.4 wt.%, the amount of denatured ethanol added shall be the volume

percent that results in an oxygen content at the midpoint of the range of oxygen, based on the following equation:

$$\text{Vol.\% Denatured Ethanol} = 620 \div [(218.8 \div \text{wt.\% oxygen}) - 0.40]$$

~~Where the producer or importer has in accordance with section (b)(1)(E) designated a range of amounts of oxygen that is greater than 0.4 wt.%, or an oxygenate other than denatured ethanol, the oxygenate shall be added in an amount that results in an oxygen content within 0.2 wt.% of the designated minimum oxygen level.~~

Where the producer or importer has in accordance with section (b)(1)(E) designated a range of amounts of oxygen that is greater than 0.4 wt.%, or an oxygenate other than denatured ethanol, the oxygenate shall be added in an amount that results in an oxygen content within 0.2 wt.% of the designated minimum oxygen level.

(D) Characteristics of denatured ethanol used in determining whether a final blend of CARBOB complies with the standards for California gasoline.

- 1. Default denatured ethanol characteristics on or after December 31, 2003 when the CARBOB Model is used.** Except as provided in section (a)(2)(D)3., where a producer or importer has elected to use the CARBOB Model for a final blend of CARBOB supplied from its production or import facility on or after December 31, 2003, the following default denatured ethanol specifications shall be specified for the CARBOB Model:

| | |
|-------------------------------|----------------------|
| Sulfur content: | 10 parts per million |
| Benzene content: | 0.06 volume percent |
| Olefin content: | 0.5 volume percent |
| Aromatic hydrocarbon content: | 1.7 volume percent |

- 2. Default denatured ethanol characteristics on or after December 31, 2003 when the CARBOB Model is not used.** Except as provided in section (a)(2)(D)3., where a producer or importer has not elected to use the CARBOB Model, denatured ethanol used as the oxygenate must have the following properties in determining whether CARBOB complies with the standards applicable to California gasoline when it is supplied from the production facility or import facility on or after December 31, 2003:

| | |
|-------------------------------|--------------------------|
| Sulfur content: | 3 - 10 parts per million |
| Benzene content: | 0 - 0.06 volume percent |
| Olefin content: | 0 - 0.5 volume percent |
| Aromatic hydrocarbon content: | 0 - 1.7 volume percent |

3. ***Producer- or importer-specified characteristics of denatured ethanol used in determining whether a final blend of CARBOB complies with the standards for California gasoline.***

- a. With respect to a final blend of CARBOB supplied from its production or import facility prior to December 31, 2003, the producer or importer must specify the properties of the oxygenate used in determining whether the final blend of CARBOB complies with the applicable California gasoline standards, by providing the notice in section (b)(1)(D). With respect to a final blend of CARBOB supplied from its production or import facility on or after December 31, 2003, the producer or importer may elect to specify the properties of the oxygenate in accordance with the preceding sentence. Where the producer or importer has elected to use the CARBOB model in connection with the final blend, the maximum value for each property identified in the section (b)(1)(D) notification shall be used for the CARBOB Model. Where the producer or importer has not elected to use the CARBOB model in connection with the final blend, the oxygenate used in oxygenate blending and testing in accordance with section (a)(2)(C)1. must not exceed the maximum value for each property identified in the section (b)(1)(D) notification; that oxygenate's specifications for each property may be under the maximum value for each property identified in the section (b)(1)(D) notification by no more than the following:

| | |
|-------------------------------|---------------------|
| Sulfur content: | 5 parts per million |
| Benzene content: | 0.06 volume percent |
| Olefin content: | 0.1 volume percent |
| Aromatic hydrocarbon content: | 1.0 volume percent |

- b. ***Maintaining oxygenate samples for use in compliance testing.*** A producer or importer who is specifying the properties of the oxygenate used in a final blend of CARBOB in accordance with the preceding section (a)(2)(D)3.a. must maintain at the production or import facility, while the final blend is at the facility, oxygenate meeting the required specifications in quantities that are sufficient to enable state board inspectors to use the oxygenate in compliance determinations.

- (E) ***Protocol for determining whether a final blend of CARBOB complies with the standards for California gasoline.*** The executive officer may enter into a written protocol with any individual producer or importer for the purpose of specifying a alternative method for determining whether a final blend of CARBOB complies with the standards for California gasoline, as long as the executive officer reasonably determines that application of the protocol is not less stringent or enforceable than application of the express terms of section (a)(2)(A)-(D). Any such protocol shall

include the producer's or importer's agreement to be bound by the terms of the protocol.

- (3) **Calculating the volume of a final blend of CARBOB.** Where a producer or importer has designated a final blend as CARBOB and has complied with all applicable provisions of this section 2266.5, the volume of a final blend shall be calculated for all purposes under section 2264 by adding the minimum designated amount of the oxygenate having the smallest volume designated by the producer or importer. If the producer or importer has not complied with any applicable provisions of this section 2266.5, the volume of the final blend for purposes of the refiner or producer's compliance with sections 2262, 2262.3, 2262.4, 2262.5, 2262.6, 2265 and 2266 shall be calculated without adding the amount of oxygenate to the CARBOB.
- (4) **Specifications for a final blend of CARBOB when the CARBOB model is not being used.** A producer or importer who has not elected to use the CARBOB model pursuant to section (a)(2)(B) with regard to a final blend of CARBOB may not sell, offer for sale, supply or offer for sale that final blend of CARBOB from its production facility or import facility where the sulfur, benzene, olefin or aromatic hydrocarbon content of the CARBOB, when multiplied by (1 minus the designated maximum volume percent, expressed as a decimal fraction, that the oxygenate will represent after it is added to the CARBOB), results in a sulfur, benzene, olefin or aromatic hydrocarbon content value exceeding the applicable limit for that property.
- (5) **Assignment of designated alternative limits for CARBOB and for the oxygenated California gasoline where the producer or importer has elected to use the CARBOB model.**
- (A) **Applicability.** This section (a)(5) applies where a producer or importer has elected to have the CARBOB model apply in connection with a final blend of CARBOB which is also subject to an averaging compliance option or a PM averaging compliance option for one or more properties.
- (B) **Assignment of CARBOB designated alternative limit.** The producer or importer may assign a CARBOB designated alternative limit for the final blend of CARBOB by satisfying the notification requirements of section (a)(5)(D). In no case shall a CARBOB designated alternative limit be less than the sulfur, benzene, olefin or aromatic hydrocarbon content, or T90 or T50, of the final blend shown by the sample and test of the CARBOB conducted pursuant to section 2270. The CARBOB designated alternative limit shall be treated as the designated alternative limit under section 2262.3(c)(2), and a violation of section 2262.3(c)(2) will exist when the CARBOB exceeds the CARBOB designated alternative limit.
- (C) **Determining the designated alternative limit for the final blend after the CARBOB is oxygenated.** Whenever a producer or importer has assigned a designated alternative

limit for a final blend of CARBOB, the designated alternative limit for the final blend after the CARBOB is oxygenated shall be determined in accordance with the "Procedures for Using the California Model for California Reformulated Gasoline Blendstocks for Oxygenate Blending (CARBOB)," as adopted April 25, 2001. This will be the final blend's designated alternative limit for purposes of compliance with sections 2262.3(c)(3) and 2264(b) and (c).

- (D) **Notification.** The producer or importer shall notify the executive officer of the CARBOB designated alternative limit, the designated alternative limit for the final blend after it is oxygenated, and all other information identified in section 2264(a)(2)(A), within the time limits set forth in section 2264(a)(2)(A) and subject to section 2264(a)(3) and (4).
- (6) **Determining whether downstream CARBOB complies with the cap limits for California gasoline.**
- (A) **Determining whether downstream CARBOB complies with the cap limits for California gasoline through the use of CARBOB cap limits derived from the CARBOB Model.** Whenever downstream CARBOB designated for ethanol blending has already been supplied from its production or import facility, the CARBOB's compliance with the cap limits for California gasoline may be determined by applying the CARBOB cap limits in the following table:

| <i>Property</i> | <i>CARBOB Cap Limits</i> | |
|--|--------------------------|------------------|
| | <i>CaRFG2</i> | <i>CaRFG3</i> |
| Reid Vapor Pressure ¹ (pounds per square inch) | 5.78 | 5.99 |
| Sulfur Content (parts per million by weight) | 89 | 66 ² |
| | | 32 ² |
| Benzene Content (percent by volume) | 1.33 | 1.22 |
| Aromatics Content (percent by volume) | 33.1 | 38.7 |
| Olefins Content (percent by volume) | 11.1 | 11.1 |
| T50 (degrees Fahrenheit) | 232 ³ | 232 ³ |
| | 237 ³ | 237 ³ |
| T90 (degrees Fahrenheit) | 335 | 335 |

¹ The Reid vapor pressure standards apply only during the warmer weather months identified in section 2262.4.

- 2 The CaRFG Phase 3 CARBOB cap limits for sulfur are phased in starting December 31, 2003, and
December 31, ~~2004~~ 2005, in accordance with section 2261(b)(1)(A).
- 3 The first number applies to CARBOB that is subject to the Reid vapor pressure standard pursuant
to section 2262.4, and the second number applies to CARBOB that is not subject to the Reid vapor
pressure standard.

(B) Determining whether downstream CARBOB complies with the cap limits for California gasoline by oxygenate blending and testing. Whenever downstream CARBOB designated for oxygenate blending has already been supplied from its production or import facility, the CARBOB's compliance with the cap limits for California gasoline may be determined by adding the specified type and amount of oxygenate to a representative sample of the CARBOB and determining the properties and characteristics of the resulting gasoline in accordance with an applicable test method identified in section 2263(b) or permitted under section 2263(c). Denatured ethanol used as the oxygenate must have the properties set forth in section (a)(2)(D)2. Where the designated range for oxygen from denatured ethanol is 1.8 wt.% to 2.2 wt.% (or is within 1.8 wt.% and 2.2 wt.% and includes 2.0 wt.%), denatured ethanol equal to 5.7 vol.% of the blended volume shall be added; where the designated range for oxygen from denatured ethanol is 2.5 wt.% to 2.9 wt.% (or is within 2.5 wt.% and 2.9 wt.% and includes 2.7 wt.%), denatured ethanol equal to 7.7 vol.% of the blended volume shall be added; and where the designated range for oxygen from denatured ethanol is 3.3 wt.% to 3.7 wt.% (or is within 3.3 wt.% and 3.7 wt.% and includes 3.5 wt.%), denatured ethanol equal to 10.0 vol.% of the blended volume shall be added. In all other cases where the designated range for oxygen from denatured ethanol is no greater than 0.4 wt.%, the amount of denatured ethanol added shall be the volume percent that results in an oxygen content at the midpoint of the range of oxygen, based on the following equation:

$$\text{Vol.\% Denatured Ethanol} = 620 \div [(218.8 \div \text{wt.\% oxygen}) - 0.40]$$

Where the designated a range of amounts of oxygen is greater than 0.4 wt.%, or an oxygenate other than denatured ethanol is designated, the oxygenate shall be added in an amount that results in an oxygen content within 0.2 wt.% of the designated minimum oxygen level.

(C) Protocols. A person may enter into a protocol with the executive officer for the purpose of identifying more stringent specifications for the denatured ethanol used pursuant to section (a)(6)(B), or different CARBOB cap limits under section (a)(6)(A), if the executive officer reasonably determines that the specifications or cap limits are reasonably premised on the person's program to assure that the denatured ethanol added to the CARBOB by oxygenate blenders will meet the more stringent specifications.

(b) Notification to ARB regarding the supply of CARBOB from the facility at which it was produced or imported.

(1) A producer or importer supplying a final blend of CARBOB from the facility at which the producer or importer produced or imported the CARBOB must notify the executive officer of the information set forth below, along with any information required under section 2265(a)(2) (for a PM alternative gasoline formulation) or 2266(c) (for a test-certified alternative gasoline formulation). The notification must be received by the executive officer before the start of physical transfer of the final blend of CARBOB from the production or import facility, and in no case less than 12 hours before the producer or importer either completes physical transfer or commingles the final blend.

(A) The identity and location of the final blend;

(B) The designation of the final blend as CARBOB;

(C) If the producer or importer is electing to use the CARBOB model to determine whether the final blend complies with the standards applicable to California gasoline when it is supplied from the production facility or import facility, a statement of that election and

1. Each of the CARBOB limits that will apply to the final blend for properties not subject to the averaging compliance option or the PM averaging compliance option; and
2. For any property subject to the averaging compliance option or the PM averaging compliance option, the averaging or PM averaging limit for the CARBOB (the CARBOB is subject to this limit only if no designated alternative limit is assigned to the CARBOB pursuant to section 2266.5(a)(5)(B));

(D) If the producer or importer is specifying, pursuant to section (a)(2)(D)3., the properties of the oxygenate to be added downstream by the oxygenate blender, a statement of that election, the type of oxygenate, and the oxygenate's specifications for the following properties:

- Maximum sulfur content (nearest part per million by weight)
- Maximum benzene content (nearest hundredth of a percent by volume)
- Maximum olefin content (nearest tenth of a percent by volume)
- Maximum aromatic hydrocarbon content (nearest tenth of a percent by volume)

(E) The designation of each oxygenate type or types and amount or range of amounts to be added to the CARBOB, and the applicable flat limit, PM alternative specification, or TC alternative specification for oxygen. The amount or range of amounts of oxygenate to be added shall be expressed as a volume percent of the gasoline after the oxygenate is added, in the nearest tenth of a percent. For any final blend of CARBOB except one that is subject to PM alternative specifications or TC alternative

specifications, the amount of oxygenate to be added must be such that the resulting California gasoline will have a minimum oxygen content no lower than 1.8 percent by weight and a maximum oxygen content no greater than 2.2 percent by weight. For a final blend of CARBOB that is subject to PM alternative specifications, the amount or range of amounts of oxygenate to be added must be such that the resulting California gasoline has an oxygen content that meets the oxygen content PM alternative specification for the final blend. For a final blend of CARBOB that is subject to TC alternative specifications, the amount or range of amounts of oxygenate to be added must be such that the resulting California gasoline has an oxygen content that meets the oxygen content alternative specification for the final blend;

- (2) **Applicability of notification to subsequent final blends.** The notification a producer or importer provides pursuant to section (b)(1)(B), (C), (D) and (E) for a final blend of CARBOB shall apply to all subsequent final blends of CARBOB or California gasoline supplied by the producer or importer from the same production or import facility until the producer or importer designates a final blend at that facility as either (i) California gasoline rather than CARBOB, or (ii) CARBOB subject to a new notification made pursuant to section (b)(1).
- (3) **Allowance of late notifications.** If, through no intentional or negligent conduct, a producer or importer cannot report within the time period specified in (b)(1) above, the producer or importer may notify the executive officer of the required data as soon as reasonably possible and may provide a written explanation of the cause of the delay in reporting. If, based on the written explanation and the surrounding circumstances, the executive officer determines that the conditions of this section (b)(3) have been met, timely notification shall be deemed to have occurred.
- (4) **Protocols.** The executive officer may enter into a written protocol with any individual producer or importer for the purpose of specifying how the requirements in section (b)(1) shall be applied to the producer's or importer's particular operations, as long as the executive officer reasonably determines that application of the regulatory requirements under the protocol is not less stringent or enforceable than application of the express terms of section (b)(1). Any such protocol shall include the producers or importer's agreement to be bound by the terms of the protocol.
- (c) **~~Sampling, testing and recordkeeping by importers of CARBOB.~~ [Reserved]**
- (1) **~~When sampling and testing is required.~~** Each importer of CARBOB shall sample and test for the sulfur, aromatic hydrocarbon, olefin, oxygen and benzene content, T50, T90, and, during the regulatory control periods identified in section 2262.4(a)(2) and (b)(2), the Reid vapor pressure, of each final blend of CARBOB which the importer has imported by tankship, pipeline, railway tankcars, trucks and trailers, or other means, by collecting and analyzing a representative sample of CARBOB taken from the final blend at its import facility. An importer who is electing to use the CARBOB model in

determining compliance shall analyze the CARBOB without adding oxygenate. In all other cases, the importer shall oxygenate and analyze the CARBOB in accordance with section (a)(2)(C).

- ~~(2) **Maintaining records.** Each importer required to sample and analyze a final blend of CARBOB pursuant to this section (c) shall maintain, for two years from the date of each sampling, records showing the sample date, identify of blend or product sampled, container or other vessel sampled, the final blend volume, and the sulfur, aromatic hydrocarbon, olefin, oxygen and benzene content, T50, T90, and Reid vapor pressure as determined in accordance with section (a)(2). All CARBOB imported by the importer and not tested as required by this section shall be deemed to have a Reid vapor pressure, sulfur, aromatic hydrocarbon, olefin, oxygen and benzene content, T50 and T90 exceeding the applicable flat limit or averaging limit standards specified in section 2262, unless the importer demonstrates that the CARBOB meets those standards and limit(s).~~
- ~~(3) **Production of records.** An importer shall provide to the executive officer any records required to be maintained by the importer pursuant to this section (c) within 20 days of a written request from the executive officer if the request is received before expiration of the period during which the records are required to be maintained. Whenever an importer fails to provide records regarding a final blend of CARBOB in accordance with the requirements of this section, the final blend of CARBOB shall be presumed to have been sold by the importer in violation of the applicable flat limit or averaging limit standards and compliance requirements in sections 2262, 2262.3(b) or (c), 2262.4(b), or 2262.5(c), unless the importer demonstrates that the CARBOB meets those standards and limit(s).~~
- ~~(4) **Protocols.** The executive officer may enter into a protocol with any importer for the purpose of specifying alternative sampling, testing, recordkeeping, or reporting requirements which shall satisfy the provisions of sections (c)(1) or (c)(2). The executive officer may only enter into such a protocol if s/he reasonably determines that application of the regulatory requirements under the protocol will be consistent with the state board's ability effectively to enforce the provisions of sections 2262, 2262.3(b) or (c), 2262.4(b), or 2262.5(c), and the PM averaging limit(s). Any such protocol shall include the importer's agreement to be bound by the terms of the protocol.~~

(d) Documentation required when CARBOB is transferred.

- (1) Required Documentation.** On each occasion when any person transfers custody or title of CARBOB, the transferor shall provide the transferee a document that prominently:
- (A) States that the CARBOB does not comply with the standards for California gasoline without the addition of oxygenate,
 - (B) Identifies the applicable flat limit, PM alternative specification, or TC alternative specification for oxygen, and

(C) Identifies, consistent with the notification made pursuant to section (b), the oxygenate type or types and amount or range of amounts that must be added to the CARBOB to make it comply with the standards for California gasoline. Where the producer or importer of the CARBOB has elected to specify the properties of the oxygenate pursuant to section (b)(1)(D), the document must also prominently identify the maximum permitted sulfur, benzene, olefin and aromatic hydrocarbon contents – not to exceed the maximum levels in the section (b)(1)(D) notification – of the oxygenate to be added to the CARBOB.

(2) **Compliance by pipeline operator.** A pipeline operator may comply with this requirement by the use of standardized product codes on pipeline tickets, where the code(s) specified for the CARBOB is identified in a manual that is distributed to transferees of the CARBOB and that sets forth all of the required information for the CARBOB.

(e) Restrictions on transferring CARBOB.

(1) **Required agreement by transferee.** No person may transfer ownership or custody of CARBOB to any other person unless the transferee has agreed in writing with the transferor that either:

(A) The transferee is a registered oxygenate blender and will add oxygenate of the type(s) and amount (or within the range of amounts) designated in accordance with section (b) before the CARBOB is transferred from a final distribution facility, or

(B) The transferee will take all reasonably prudent steps necessary to assure that the CARBOB is transferred to a registered oxygen blender who adds the type and amount (or within the range of amounts) of oxygenate designated in accordance with section (b) to the CARBOB before the CARBOB is transferred from a final distribution facility.

(2) **Prohibited sales of CARBOB from a final distribution facility.** No person may sell or supply CARBOB from a final distribution facility where the type and amount or range of amounts of oxygenate designated in accordance with section (b) has not been added to the CARBOB.

(f) Restrictions on blending CARBOB with other products.

(1) **Basic prohibition.** No person may combine any CARBOB that has been supplied from the facility at which it was produced or imported with any other CARBOB, gasoline, blendstock or oxygenate, except:

(A) *The specified oxygenate.*

1. The CARBOB may be blended with oxygenate of the type and amount (or within the range of amounts) specified by the producer or importer at the time the CARBOB was supplied from the production or import facility.
2. Where ethanol is the specified oxygenate and specifications for the ethanol are identified in the product transfer document for the CARBOB pursuant to section 2266.5(d)(1)(C), only ethanol meeting those specifications may be combined with the CARBOB.
3. Where ethanol is the specified oxygenate and specifications for the ethanol are not identified, only ethanol meeting the standards in section 2262.9(a) may be combined with the CARBOB.

(B) *Identically-specified CARBOB.* The CARBOB may be blended with other CARBOB for which the same oxygenate type, and the same amount (or range of amounts) of oxygen, was specified by the producer or importer at the time the CARBOB was supplied from the production or import facility. However, where specifications for the denatured ethanol to be added to the CARBOB have been established pursuant to section 2266.5(a)(2)(D)3, it may only be blended with other CARBOB for which the same denatured ethanol specifications have been set.

(C) *CARBOB specified for different oxygen level.* Where a person is changing from an initial to a new type of CARBOB stored in a storage tank at a terminal or bulk plant, and the conditions below are met; in this case, the CARBOB in the tank after the new type of CARBOB is added will be treated as that new type of CARBOB.

1. The change in service is for legitimate operational reasons and is not for the purpose of combining the different types of CARBOB;
2. The initial and new CARBOBs are designated for blending with different amounts (or ranges of amounts) of oxygen, and the change in oxygen content will not exceed 1.1 weight percent of the oxygenated gasoline blend;
3. The volume of the new CARBOB that is added to the tank is at least four times as large as the volume of the initial CARBOB in the tank, and
4. The sulfur content of the new CARBOB added to the tank is no more than 12 parts per million.

(D) *California gasoline not subject to RVP standard.* Where a person is changing from California gasoline to CARBOB as the product stored in a storage tank at a terminal or bulk plant and the conditions below are met; in this case the product in the tank,

pipe or manifold after the new product is added will be treated as the new type of product.

1. The change in service is for legitimate operational reasons and is not for the purpose of combining the California gasoline and CARBOB and
2. The resulting blend of product in the tank is supplied from the terminal or bulk plant during a time that it is not subject to the standards for Reid vapor pressure under section 2262.4.

(E) Limited amounts of California gasoline containing ethanol. A person may add California gasoline containing ethanol to CARBOB at a terminal or bulk plant if all of the following conditions are met, in which case the resulting mixture will continue to be treated as CARBOB.

1. The gasoline is added to the CARBOB for one of the following operational reasons:
 - a. The gasoline resulted from oxygenating CARBOB at the terminal or bulk plant during calibration of oxygenate blending equipment; or
 - b. The gasoline resulted from the unintentional over- or under-oxygenation of CARBOB during the loading of a cargo tank truck at the terminal or bulk plant; or
 - c. The gasoline was pumped out of a gasoline storage tank at a motor vehicle fueling facility for legitimate operational reasons.
2. The non-oxygenate portion of the gasoline complies with the applicable cap limits for CARBOB in section 2266.5(a)(6).
3. The resulting mixture of CARBOB has an oxygen content not exceeding 0.1 percent by weight.
 - a. The oxygen content of the mixture may be determined arithmetically by [i] using the volume of the CARBOB prior to mixing based on calibrated tank readings, [ii] using the volume of the gasoline added based on calibrated meter readings, [iii] using the volume of the denatured ethanol in the gasoline being added based on direct calibrated meter readings of the denatured ethanol if available, [iv] calculating weight percent oxygen of the gasoline being added from volume percent denatured ethanol based on the following formula:

$$\text{(wt.\% oxygen)} \approx 218.8 / \{ [620 / (\text{vol.\% deEtOH})] + 0.40 \}.$$

and [v] accounting for any oxygen in the CARBOB tank due to previous additions of gasoline to the tank.

b. If the meter readings described in section 2266.5(f)(1)(E)3.a.[iii] are not available, the oxygen content of the mixture may be determined arithmetically by [i] using the volume of the CARBOB prior to mixing based on calibrated tank readings, [ii] using the volume of the gasoline added based on calibrated meter readings, [iii] using the oxygen content of the gasoline in weight percent based on sampling and testing of the gasoline for denatured ethanol content in accordance with methods specified in section 2263, and [iv] accounting for any oxygen in the CARBOB tank due to previous additions of gasoline to the tank.

c. In making the determination described in section 2266.5(f)(1)(E)3.a. or b., the oxygen content of the mixture shall be calculated based on the following formula:

$$\text{(wt.\% oxygen)} \approx \frac{[(\text{volume CARBOB}) * (\text{wt.\% oxygen in CARBOB}) + (\text{volume gasoline}) * (\text{wt.\% oxygen in gasoline})]}{[(\text{volume CARBOB}) + (\text{volume gasoline})]}$$

4. Prior to the mixing, the operator of the terminal or bulk plant notifies the executive officer of the following:

a. The identity and location of the facility at which the mixing will take place;

b. The operational reason for adding the gasoline into the CARBOB;

c. The projected percentage oxygen content of the mixture.

5. The terminal or bulk plant operator maintains for two years records documenting the information identified in section 2266.5(f)(1)(E)4, and makes them available to the executive officer upon request.

(2) Protocols.

(A) Protocols covering the changeover in service of a storage tank. Notwithstanding section (f)(1), the executive officer may enter into a written protocol with any person to identify conditions under which the person may lawfully combine CARBOB with California gasoline or other CARBOB during a changeover in service of a storage tank for a legitimate operational business reason. The executive officer may only enter into such a protocol if he or she reasonably determines that commingling of the two products will be minimized as much as is reasonably practical. Any such

protocol shall include the person's agreement to be bound by the terms of the protocol.

(B) Protocols for blending transmix into CARBOB. Notwithstanding section (f)(1), the executive officer may enter into a written protocol with any person to identify conditions under which the person may lawfully blend transmix into CARBOB which has been supplied from its production or import facility. The executive officer may enter into such a protocol only if he or she reasonably determines that alternatives to the blending are not practical and the blending will not significantly affect the properties of the CARBOB gasoline into which the transmix is added. Any such protocol shall include the person's agreement to be bound by the terms of the protocol.

(C) Protocols In Other Situations. Notwithstanding section (f)(1), the executive officer may enter into a written protocol with any person to identify conditions under which the person may lawfully add California gasoline or other CARBOB to CARBOB in a storage tank at a terminal or bulk plant in situations other than those identified in sections 2266.5(f)(1)(C), (D), or (E), or (f)(2)(A) or (B). The executive officer may enter into such a protocol only if he or she reasonably determines that alternatives to the activity are not practical and the blending will not significantly affect the properties of the CARBOB into which the gasoline or CARBOB is added. The protocol shall include any of the conditions in section 2266.5(f)(1)(E) that the executive officer determines are necessary and appropriate. Any such protocol shall include the person's agreement to be bound by the terms of the protocol.

(g) Requirements for oxygenate blenders.

(1) Registration and Certification.

(A) Registration. Any oxygen blender must register with the executive officer by March 1, 1996, or at least 20 days before blending oxygenates with CARBOB, whichever occurs later. Thereafter, an oxygenate blender must register with the executive officer annually by January 1. The registration must be addressed to the attention of the Chief, Compliance Division, California Air Resources Board, P.O. Box 2815, Sacramento, CA, 95812.

(B) Required contents of registration. The registration must include the following:

1. The oxygen blender's contact name, telephone number, principal place of business which shall be a physical address and not a post office box, and any other place of business at which company records are maintained.
2. For each of the oxygen blender's oxygenate blending facilities, the facility name, physical location, contact name, and telephone number.

- (C) **Issuance of certificate.** The executive officer shall provide each complying oxygen blender with a certificate of registration compliance no later than June 30. The certification shall be effective from no later than July 1, through June 30 of the following year. The certification shall constitute the oxygen blender's certification pursuant to Health and Safety Code section ~~43021~~ 43026.
- (D) **Submittal of updated information.** Any oxygen blender must submit updated registration information to the executive officer at the address identified in section (g)(1)(A) within 30 days of any occasion when the registration information previously supplied becomes incomplete or inaccurate.
- (2) **Requirement to add oxygenate to CARBOB.** Whenever an oxygenate blender receives CARBOB from a transferor to whom the oxygenate blender has represented that he/she will add oxygenate to the CARBOB, the oxygenate blender must add to the CARBOB oxygenate of the type(s) and amount (or within the range of amounts) identified in the documentation accompanying the CARBOB. If the documentation identifies the permitted maximum sulfur, benzene, olefin and aromatic hydrocarbon contents of the oxygenate, the oxygenate blender must add an oxygenate that does not exceed the maximum permitted levels.
- (3) **Additional requirements for terminal blending.** Any oxygenate blender who makes a final blend of California reformulated gasoline by blending any oxygenate with any CARBOB in any gasoline storage tank, other than a truck used for delivering gasoline to retail outlets or bulk purchaser-consumer facilities, shall, for each such final blend, determine the oxygen content and volume of the final blend prior to its leaving the oxygen blending facility, by collecting and analyzing a representative sample of gasoline taken from the final blend, using methodology set forth in section 2263.
- (h) **Downstream blending of California gasoline with nonoxygenate blendstocks.**
- (1) **Basic prohibition.** No person may combine California gasoline which has been supplied from a production or import facility with any nonoxygenate blendstock, other than vapor recovery condensate, unless the person can affirmatively demonstrate that (1) the blendstock that is added to the California gasoline meets all of the California gasoline standards without regard to the properties of the gasoline to which the blendstock is added, and (2) the person meets with regard to the blendstock all requirements in this subarticle applicable to producers of California gasoline.
- (2) **Exceptions.**
- (A) **Protocols.** Notwithstanding section (i)(1), the executive officer may enter into a written protocol with any person to identify conditions under which the person may lawfully blend transmix into California gasoline which has been supplied from its

production or import facility. The executive officer may only enter into such a protocol if he or she reasonably determines that alternatives to the blending are not practical and the blending will not significantly affect the properties of the California gasoline into which the transmix is added. Any such protocol shall include the person's agreement to be bound by the terms of the protocol.

(B) **Blending to meet a cap limit.** Notwithstanding section (i)(1) or 2262.5(d), a person may add nonoxygenate or oxygenated blendstock to California gasoline that does not comply with one or more of the applicable cap limits contained in section 2262, where the person obtains the prior approval of the executive officer based on a demonstration that adding the blendstock is a reasonable means of bringing the gasoline into compliance with the cap limits.

(i) **Restrictions during the RVP season on blending gasoline containing ethanol with California gasoline not containing ethanol.**

(1) **Basic prohibition.** Within each air basin during the Reid vapor pressure cap limit periods specified in section 2262.4(a)(2), no person may combine California gasoline produced using ethanol with California gasoline produced without using ethanol, unless the person can affirmatively demonstrate that: (A) the resulting blend complies with the cap limit for Reid vapor pressure set forth in section 2262, or (B) the person has taken reasonably prudent precautions to assure that the gasoline is not subject to the Reid vapor pressure cap limit either because of sections 2261(d) or (f) or 2262.4(c)(1) or (c)(3), or because the gasoline is no longer California gasoline.

(2) **Exception.** Section 2266.5(i)(1) does not apply to combining California gasolines that are in a motor vehicle's fuel tank.

NOTE: Authority cited: sections 39600, 39601, 43013, 43013.1, 43018, and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975). Reference: sections 39000, 39001, 39002, 39003, 39010, 39500, 39515, 39516, 41511, 43000, 43013, 43013.1, 43016, 43018, 43021, and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975).

APPENDIX B**PRELIMINARY DRAFT PROPOSED REGULATORY
AMENDMENTS AND INTERIM GUIDANCE ON CaRFG3
IMPLEMENTATION ISSUES**

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**PRELIMINARY DRAFT PROPOSED REGULATORY AMENDMENTS AND
INTERIM GUIDANCE ON CaRFG3 IMPLEMENTATION ISSUES**

1. Adding Transmix to CARBOB.

Section 2266.5(h)(2)(A), title 13, California Code of Regulations – part of the Phase 3 California reformulated gasoline (CaRFG3) regulations – provides that notwithstanding the conditional prohibition of blending nonoxygenated blendstocks into downstream gasoline, “the Executive Officer may enter into a written protocol with any person to identify conditions under which the person may lawfully blend transmix into California gasoline which has been supplied from its production or import facility.” No such provision currently authorizes blending of transmix into downstream CARBOB notwithstanding the section 2266.5(f) restrictions on blending CARBOB with other products. The ARB staff plans later this year to propose an amendment that would allow the blending of transmix into downstream CARBOB under the same conditions as those that apply to the blending of transmix into downstream gasoline.

Staff expects to propose the following language as a new section 2266.5(f)(2)(B):

Section 2266.5. Requirements Pertaining to California Reformulated Gasoline Blendstock for Oxygen Blending (CARBOB) and Downstream Blending.

* * * * *

(f) Restrictions on blending CARBOB with other products.

* * * * *

(2)(B) Protocols for blending transmix into CARBOB. Notwithstanding section (f)(1), the executive officer may enter into a written protocol with any person to identify conditions under which the person may lawfully blend transmix into CARBOB which has been supplied from its production or import facility. The executive officer may enter into such a protocol only if he or she reasonably determines that alternatives to the blending are not practical and the blending will not significantly affect the properties of the CARBOB gasoline into which the transmix is added. Any such protocol shall include the person’s agreement to be bound by the terms of the protocol.

As an interim policy pending completion of the rulemaking, the staff would be prepared to enter into temporary protocols consistent with the proposal. Interested parties may contact the ARB’s Enforcement Division to obtain copies of any previously agreed-to protocols covering blending transmix into downstream gasoline.

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2. Adding California Gasoline to CARBOB

The ARB staff expects to propose the following amendments in the Fall 2004 CaRFG3 follow-up rulemaking.

Add as a new section 2266.5(f)(1)(E):

Section 2266.5. Requirements Pertaining to California Reformulated Gasoline Blendstock for Oxygen Blending (CARBOB) and Downstream Blending.

* * * * *

(f) Restrictions on blending CARBOB with other products.

- (1) **Basic prohibition.** No person may combine any CARBOB that has been supplied from the facility at which it was produced or imported with any other CARBOB, gasoline, blendstock or oxygenate, except:

* * * * *

(E) Limited amounts of California gasoline containing ethanol. A person may add California gasoline containing ethanol to CARBOB at a terminal or bulk plant if all of the following conditions are met, in which case the resulting mixture will continue to be treated as CARBOB.

1. The gasoline is added to the CARBOB for one of the following operational reasons:
 - a. The gasoline resulted from oxygenating CARBOB at the terminal or bulk plant during calibration of oxygenate blending equipment; or
 - b. The gasoline resulted from the unintentional over- or under-oxygenation of CARBOB during the loading of a cargo tank truck at the terminal or bulk plant; or
 - c. The gasoline was pumped out of a gasoline storage tank at a motor vehicle fueling facility for legitimate operational reasons.
2. The non-oxygenate portion of the gasoline complies with the applicable cap limits for CARBOB in section 2266.5(a)(6).
3. The resulting mixture of CARBOB has an oxygen content not exceeding 0.1 percent by weight.
 - a. The oxygen content of the mixture may be determined arithmetically by [i] using the volume of the CARBOB prior to mixing based on calibrated tank readings, [ii] using the volume of the gasoline added based on calibrated meter readings, [iii] using the volume of the denatured ethanol in the gasoline being added based on direct calibrated meter readings of the denatured ethanol if available, [iv] calculating weight

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percent oxygen of the gasoline being added from volume percent denatured ethanol based on the following formula:

$$\text{(wt. \% oxygen)} \approx 218.8 / \{ [620 / (\text{vol. \% deEtOH})] + 0.40 \},$$

and [v] accounting for any oxygen in the CARBOB tank due to previous additions of gasoline to the tank.

- b. If the meter readings described in section 2266.5(f)(1)(E)3.a.[iii] are not available, the oxygen content of the mixture may be determined arithmetically by [i] using the volume of the CARBOB prior to mixing based on calibrated tank readings, [ii] using the volume of the gasoline added based on calibrated meter readings, [iii] using the oxygen content of the gasoline in weight percent based on sampling and testing of the gasoline for denatured ethanol content in accordance with methods specified in section 2263, and [iv] accounting for any oxygen in the CARBOB tank due to previous additions of gasoline to the tank.
- c. In making the determination described in section 2266.5(f)(1)(E)3.a. or b., the oxygen content of the mixture shall be calculated based on the following formula:

$$\text{(wt. \% oxygen)} \approx \frac{[(\text{volume CARBOB}) * (\text{wt. \% oxygen in CARBOB}) + (\text{volume gasoline}) * (\text{wt. \% oxygen in gasoline})]}{[(\text{volume CARBOB}) + (\text{volume gasoline})]}.$$

4. Prior to the mixing, the operator of the terminal or bulk plant notifies the executive officer of the following:
- a. The identity and location of the facility at which the mixing will take place;
 - b. The operational reason for adding the gasoline into the CARBOB;
 - c. The projected percentage oxygen content of the mixture.
5. The terminal or bulk plant operator maintains for two years records documenting the information identified in section 2266.5(f)(1)(E)4, and makes them available to the executive officer upon request.

* * * * *

And add as a new section 2266.5(f)(2)(C):

(C) *Protocols In Other Situations.* Notwithstanding section (f)(1), the executive officer may enter into a written protocol with any person to identify conditions under which the person may lawfully add California gasoline or other CARBOB to CARBOB in a storage tank at a terminal or bulk plant in situations other than those identified in sections 2266.5(f)(1)(C), (D), or (E), or (f)(2)(A). The executive officer may enter into such a protocol only if he or she reasonably

determines that alternatives to the activity are not practical and the blending will not significantly affect the properties of the CARBOB into which the gasoline or CARBOB is added. The protocol shall include any of the conditions in section 2266.5(f)(1)(E) that the executive officer determines are necessary and appropriate. Any such protocol shall include the person's agreement to be bound by the terms of the protocol.

Modifications to the 4/9/04 draft version respond to comments from a stakeholder organization. A proposed formula approximating the calculation of oxygen content of the CARBOB-gasoline mixture in the case of zero-oxygen CARBOB where meter readings are not available has been expanded to include the oxygen content of nonzero-oxygen CARBOB, and to apply where meter readings are available as well.

As an interim policy pending completion of the rulemaking, the staff would be prepared to permit any affected party to use these mechanisms on a temporary basis if the party agrees in writing to be bound to the stated conditions.

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3. Substitute for Requirement for Documentation Accompanying the Transfer of Denatured Ethanol

Section 2262.9(c)(2) provides as follows:

Section 2262.9. Requirements Regarding Denatured Ethanol Intended For Use as a Blend Component in California Gasoline

* * * * *

(c) Documentation required for the transfer of denatured ethanol intended for use as a blend component in California gasoline.

* * * * *

- (2) Starting December 31, 2003, any person who sells or supplies denatured ethanol intended for use as a blend component in California gasoline from the California facility at which it was imported or produced shall provide the purchaser or recipient a document that identifies:
- (A) The name and address of the person selling or supplying the denatured ethanol, and
 - (B) The name, location and operator of the facility(ies) at which the ethanol was produced and at which the denaturant was added to the ethanol.

The ARB staff has concluded that compliance with the requirement in (c)(2)(B) is often impracticable because of the prevalence of commingling denatured ethanol from difference sources, and the commingling of neat ethanol before it reaches a California production facility that adds the denaturant.

Staff plans to propose an amendment to change the requirements as follows:

- (2) Starting December 31, 2003, any person who sells or supplies denatured ethanol intended for use as a blend component in California gasoline from the California facility at which it was imported or produced shall provide the purchaser or recipient a document that identifies:
- (A) The name and address of the person selling or supplying the denatured ethanol, and identification of the person as the producer or importer of the denatured ethanol; and
 - (B) With respect to imported denatured ethanol, the name, location and operator of the facility(ies) at which the ethanol was produced and at which the denaturant was added to the ethanol. As an

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alternative, the document provided to the purchaser or recipient may identify the date and time the ethanol was supplied from its import or production facility, and state that the person selling or supplying the denatured ethanol from the California facility at which it was imported or produced maintains at the facility a list of the name, location, and operator of all of the facilit(ies) at which the ethanol was produced and at which the denaturant was added to the ethanol. In this case, the person shall for at least two years maintain such information, and records identifying the entities that produced the ethanol and added the denaturant in each batch of denatured ethanol imported to the facility; during that two year period, the person shall make the information and records, available to the Executive Officer within five days after a request for the material.

As an interim policy pending completion of the rulemaking planned for this Fall, the staff is prepared accept compliance with the draft changes as an alternative for any person who first notifies the Executive Officer in writing of his or her election to comply with the alternative and to be bound by its terms.

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4. Reid Vapor Pressure Control Periods for California Gasoline Transported to Southern California by Marine Vessel.

Section 2262.4(c)(4) provides as follows:

Section 2262.4. Compliance With the CaRFG Phase 2 and CaRFG Phase 3 Standards for Reid Vapor Pressure.

* * * * *

(c) Applicability.

* * * * *

- (4) For purposes of compliance with section 2262.4(b) [RVP compliance period for production and import facilities] only, gasoline that is produced in California and is transported to the South Coast Air Basin, Ventura County, or the San Diego Air Basin by marine vessel shall be treated as having been imported at the facility to which the gasoline is off-loaded from the marine vessel.

The intent of this provision was to assure that gasoline produced in the Bay Area and received at a Southern California marine terminal in March would be subject to the Southern California March 1 start of the RVP season rather than the April 1 start date for Bay Area production and import facilities. However, the provision has had the unintended consequence of triggering the section 2270 testing requirements that apply to imported gasoline but not gasoline produced in California. Accordingly, the staff plans to propose the following substitute language, which would achieve the original intent but would not characterize the gasoline as imported for any purposes.

- (4) ~~For purposes of compliance with section 2262.4(b) only, G~~gasoline that is produced in California, and is then transported to the South Coast Air Basin, Ventura County, or the San Diego Air Basin by marine vessel ~~shall be treated as having been imported at the facility to which the gasoline is off-loaded from the marine vessel, shall be subject to the regulatory control periods for production and import facilities identified in section 2262.4(b)(2)(A).~~

As an interim policy pending completion of the rulemaking, the staff plans to apply section 2262.4(c)(4) as modified above.

APPENDIX C**CALIFORNIA PROCEDURES FOR EVALUATING
ALTERNATIVE SPECIFICATIONS FOR PHASE 3
REFORMULATED GASOLINE USING THE PREDICTIVE
MODEL**

State of California
California Environmental Protection Agency
AIR RESOURCES BOARD

**California Procedures for Evaluating
Alternative Specifications for Phase 3 Reformulated Gasoline
Using the California Predictive Model**

Adopted: June 16, 2000
Amended: April 25, 2001
Amended: [Insert date of amendment]

Note: The proposed amendments are shown in underline to indicate additions and ~~strikeout~~ to indicate deletions compared to the Procedures as amended April 25, 2001. Preexisting underlined text has generally been changed to italics to avoid having that text confused with text that is underlined because it is being added.

Only those portions affected by the proposed amendments are shown. The symbol **** * * * *** means that intervening text not proposed to be amended is not shown.

* * * * *

I. INTRODUCTION**A. Purpose and Applicability**

1. The predictive model prescribed in this document may be used to evaluate gasoline specifications as alternatives to the Phase 3 California Reformulated Gasoline (RFG) flat and averaging limits in the gasoline specifications set forth in Title 13, California Code of Regulations (13 CCR), section 2262.

This procedure:

- ◆ prescribes the range of specifications that may be utilized to select a set of candidate Phase 3 RFG alternative gasoline specifications for evaluation,
 - ◆ defines the Phase 3 RFG reference specifications,
 - ◆ prescribes the calculations to be used to predict the emissions from the candidate fuel specifications and the reference Phase 3 RFG specifications,
 - ◆ prescribes the calculations to be used to compare the emissions resulting from the candidate fuel specifications to the reference Phase 3 RFG specifications,
 - ◆ establishes the requirements for the demonstration and approval of the candidate fuel specifications as an alternative Phase 3 RFG formulation, and
 - ◆ establishes the notification requirements.
2. Gasoline properties for which alternative gasoline specifications may be set by this procedure include all eight Phase 3 RFG properties.
 3. The Phase 3 RFG specifications, established in 13 CCR, section 2262, are shown in Table 1.

Table 1
Properties and Specifications for Phase 3 Reformulated Gasoline

| Fuel Property | Units | Flat Limit | Averaging Limit | Cap Limit |
|-------------------------------------|--------------|-------------------------|-----------------|-----------------------|
| Reid vapor pressure (RVP) | psi, max. | 6.90 ¹ /7.00 | none | 7.20 |
| Sulfur (SUL) | ppmw, max. | 20 | 15 | 60/30 ³ |
| Benzene (BENZ) | vol.%, max. | 0.80/1.00 ² | 0.70 | 1.10 |
| Aromatic HC (AROM) | vol.%, max. | 25.0/35.0 ² | 22.0 | 35.0 |
| Olefin (OLEF) | vol.%, max. | 6.0 | 4.0 | 10.0 |
| Oxygen (OXY) | wt. % | 1.8 (min) | none | 1.8(min) ⁴ |
| | | 2.2 (max) | | 3.5(max) ⁵ |
| Temperature at 50 % distilled (T50) | deg. F, max. | 213/220 ² | 203 | 220 |
| Temperature at 90% distilled (T90) | deg. F, max. | 305/312 ² | 295 | 330 |

¹ Applicable during the summer months identified in 13 CCR, sections 2262.4(b). If the applicant elects to comply with the regulatory option which provides for the use of the evaporative HC emissions model, the flat RVP limit is 6.90. That is, all predictions for evaporative emissions increases or decreases made using the evaporative HC emissions models are made relative to 6.90 psi. If the applicant elects to comply with the regulatory option which provides for the use of only the exhaust HC emissions model, the flat RVP limit and the candidate fuel RVP specification is 7.00. Also, under the federal Reformulated Gasoline Regulations, the U.S. EPA enforces a minimum RVP limit of 6.4 psi.

The exhaust models contain an RVP term, but this has been made constant by fixing the RVP for both the reference and candidate fuels at 7.00 psi in the calculation of the standardized RVP values used in the exhaust emission equations. This fixing of the RVP takes RVP out of the exhaust models as a fuel property which effects exhaust emissions. Thus, RVP effects only evaporative HC emissions.

² The higher value is the small refiner CaRFG flat limit for qualifying small refiners only, as specified in section 2272.

³ The Phase 3 RFG sulfur content cap limits of 60 and 30 parts per million are phased in starting December 31, 2002 2003, and December 31, 2004 2005, respectively, in accordance with section 2261(b)(1)(A).

⁴ Applicable only during specified winter months in the areas identified in 13 CCR, section 2262.5(a).

⁵ If the gasoline contains more than 3.5 percent by weight oxygen from ethanol but not more than 10.0 volume percent ethanol, the maximum oxygen content cap is 3.7 percent by weight.

* * * * *

B. Synopsis of Procedure

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4. Determination of Emissions Equivalency

The candidate fuel specifications are deemed equivalent to the reference fuel specifications if, for each pollutant (NO_x, total OFP or exhaust HC, and potency-weighted toxics (PWT)), the predicted percent change in emissions between the candidate fuel specifications and the reference Phase 3 RFG specifications is equal to or less than 0.04%. If the applicant has elected to use the evaporative HC emissions model in the evaluation of the emissions equivalency, the 0.04% criteria must be met for NO_x, OFP, and PWT. If the applicant has elected not to use the evaporative HC emissions model, the 0.04% criteria must be met for NO_x, exhaust HC, and PWT. If, for any of the three pollutants in the criteria, the predicted percent change in emissions between the candidate fuel specifications and the reference Phase 3 RFG specifications is equal to or greater than 0.05%, the candidate specifications are deemed unacceptable and may not be a substitute for Phase 3 RFG. [Note: All final values of the percent change in emissions shall be reported to the nearest hundredth using conventional rounding.] ~~In addition to satisfying the 0.04% emissions difference criteria, the candidate fuel specifications are required to meet the Phase 3 RFG specification for driveability index (DI) of 1225.~~

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III. GENERAL EQUATIONS FOR CALCULATING PERCENT CHANGES IN EMISSIONS

A. Summary and Explanation

- ◆ The applicant will first select which of two compliance options he/she wishes to be subject to. The first compliance option, referred to as the exhaust and evap model option, uses the exhaust HC emissions models, the evaporative HC emissions changes models, and the CO adjustment factor in determining the HC emissions equivalency of the candidate fuel specifications. The second option, referred to as the exhaust-only option, uses only the exhaust HC emissions model in the determination of the HC emissions equivalency of the candidate fuel specifications. (See III.B)

The exhaust and evap model option may only be used for final blends of California gasoline or CARBOB where some part of the final blend is physically transferred from its production or import facility during the Reid vapor pressure control period for the production or import facility set forth in section 2262.4, title 13, California Code of Regulations, or within 15 days before the start of such period.

- ◆ The applicant will select a candidate specification for each property, and will identify whether the specification represents a flat limit or an averaging limit. The Phase 3 RFG reference specification is identified for each property using the flat/average limit compliance option selected for the corresponding candidate specification. (See III.B.)
- ◆ The selected candidate specifications and the comparable Phase 3 RFG reference specifications are inserted into the predictive model equations to determine the predicted candidate and reference emissions by Tech class. (See III.C.)
- ◆ Because oxygen is specified in the form of a range, emissions predictions are, in a majority of the cases, made for two oxygen levels, the upper level of the specified range for the candidate fuel specifications and the lower level. The emissions of the candidate fuel are compared to the emissions of the reference fuel at both of these oxygen levels. The only two three cases where two emissions predictions are not made for the candidate fuel specifications is if the oxygen range of the candidate fuel specifications is within the range of 1.8 to 2.2 percent (inclusive), or within the range of 2.5 to 2.9 percent (inclusive), or within the range of 3.3 to 3.7 percent (inclusive). In these cases, the predicted emissions for the candidate fuel specifications are compared to the predicted emissions for the reference fuel specifications at only one oxygen level.
- ◆ For NO_x and exhaust HC, the ratio of the predicted emissions for the candidate fuel specifications to the predicted emissions for the reference fuel specifications is emissions weighted according to the relative contribution of each technology class. These emissions-weighted ratios are summed, reduced by 1, and multiplied by 100 to represent the Tech class-weighted percent change in emissions. The resulting values represent the predicted percent change in NO_x or exhaust HC emissions between the candidate fuel specifications and reference fuel specifications. (See III.D.)
- ◆ If the exhaust and evap model option has been selected, the predicted percent change in evaporative HC emissions between the candidate fuel specifications and the reference fuel specifications is computed using the equations given in Section VII.A. The predicted change is computed for each evaporative emissions process. (See VII.A)
- ◆ If the exhaust and evap model option has been selected, the credit resulting from the reduction of CO emissions is calculated in accordance with the equation given in Section IX.A. (See IX.A)
- ◆ If the exhaust and evap model option has been selected, the predicted percent changes in exhaust HC emissions, evaporative HC emissions, and the CO credit are combined in accordance with the equation given in Section X to yield the predicted percent change in ozone-forming potential

(OFF) between the reference fuel specifications and the candidate fuel specifications. (See X)

- ◆ For exhaust toxics emissions, the predicted emissions for the candidate fuel specifications and the reference fuel specifications (for each pollutant and each Tech class) are VMT weighted and potency-weighted, in accordance with the equations given in VI.B. (See VI.B)
- ◆ The evaporative benzene emissions predictions for the reference fuel specifications and the candidate fuel specifications are calculated in accordance with the equations given in Section VIII.A. Note that emissions predictions for evaporative benzene emissions are made even if the applicant is not using the compliance option which provides for the use of the evaporative HC emissions models. (See VIII.A)
- ◆ For both the reference fuel specifications and the candidate fuel specifications, the VMT and potency-weighted exhaust toxics emissions predictions are combined with the potency-weighted evaporative benzene emissions predictions, in accordance with the equations given in Sections XI.A and XI.B. This yields the total potency-weighted toxics emissions prediction for the reference fuel specifications and for the candidate fuel specifications. (See XI.A and XI.B)
- ◆ The percent change in the predicted total potency-weighted toxics emissions between the reference fuel specifications and the candidate fuel specifications is calculated in accordance with the equation given in Section XI.C. (See XI.C)

B. Selection by Applicant of Candidate and Reference Specifications

The applicant shall first select which of two compliance options he/she wishes to be subject to. The first compliance option uses the exhaust HC emissions models, the evaporative HC emissions models, and the CO adjustment factor in determining the HC emissions equivalency of the candidate fuel specifications. The second option uses only the exhaust HC emissions model in the determination of the HC emissions equivalency of the candidate fuel specifications.

If the applicant selects the first compliance option, the applicable Phase 3 RVP limits are a flat limit of 6.90 and a cap limit of 7.20. That is, if the applicant elects to use the evaporative HC emissions predictive model, all evaporative HC emissions changes predicted by the model for the candidate fuel will be based on the use of 6.90 psi as the RVP of the Phase 3 reference fuel. If the applicant selects the second compliance option, the applicable Phase 3 RVP limit is a flat (and cap) limit of 7.00.

Next, the applicant shall, for each fuel property, select a candidate specification and indicate whether this specification represents a flat limit or an

averaging limit. The appropriate corresponding Phase 3 RFG reference specifications (flat or average) are then identified. Table 7 provides an optional worksheet to assist the applicant in selecting the candidate and reference specifications. These steps are summarized below.

1. Identify the value of the candidate specification for each fuel property and insert the values into Table 7. The candidate specifications may have any value for RVP, sulfur, benzene, aromatic hydrocarbons, olefins, T50, and T90 as long as each specification is less than or equal to the cap limits shown in Table 1. Note that, if the applicant is not using the compliance option which provides for the use of the evaporative HC emissions models, no value is entered for RVP into the "Candidate Fuel Specifications" column of Table 7 (In this case the RVP is 7.00). The candidate specification may have any value for oxygen as long as the specification is within the range of the cap limits shown in Table 1.
2. The oxygen contents of the candidate fuel specifications can be found from Table 6. Note that, because oxygen is specified in the form of a range, there are usually two candidate fuel specifications for oxygen, the upper end of the range (maximum) and the lower end of the range (minimum). There are ~~two~~ three exceptions to this, in which case it is assumed that the candidate fuel specifications have a single oxygen content. If the oxygen range of the candidate fuel specifications is within the range of 1.8 to 2.2 percent (inclusive), the oxygen content of the candidate fuel specifications is assumed to be 2.0 percent. If the oxygen range of the candidate fuel specifications is within the range of 2.5 to 2.9 percent (inclusive), the oxygen content of the candidate fuel specifications is assumed to be 2.7 percent. If the oxygen range of the candidate fuel specifications is within the range of 3.3 to 3.7 percent (inclusive), the oxygen content of the candidate fuel specifications is assumed to be 3.5 percent. Also, the predictive model equations assume that only one oxygenate is being blended into the gasoline. Thus, it is assumed that the total oxygen content is equal to either the total oxygen content as MTBE or the total oxygen content as ethanol. If the refiner is blending both MTBE and ethanol into a gasoline, a small error will be introduced in the predictive model predictions for formaldehyde and acetaldehyde.
3. The hot soak benzene emissions model contains an MTBE content term. Thus, for hot soak benzene emissions predictions, it is necessary to specify the oxygen content as MTBE for the candidate and reference fuel. Table 6 is used as in 2. above, using the oxygen content as MTBE of the candidate fuel, to specify the oxygen content as MTBE for the candidate and reference fuel specifications. That is, the relevant oxygen content value is the oxygen content as MTBE, not the total oxygen content as in the case of the exhaust emissions predictions. The result is that, if the candidate fuel does not contain MTBE, the oxygen content as MTBE for the reference fuel is 2.0 percent, and the oxygen content as MTBE for the candidate fuel is zero percent. The reason it is assumed that the

reference fuel contains MTBE is that MTBE was the oxygenate used while the Phase 2 regulations were in effect, and this assumption helps ensure that potency-weighted toxics emissions from Phase 3 gasoline will not be greater than those from Phase 2 gasoline.

4. For each property other than oxygen and RVP, indicate whether the candidate specification will represent a flat limit or an averaging limit.
5. For each candidate specification identified in 1., identify the appropriate corresponding Phase 3 RFG reference specifications (flat or average). Circle the appropriate flat or average limit for the reference fuel in Table 7. The circled values are the reference specifications which will be used in the predictive model.
6. Table 6 gives the oxygen contents of the reference fuel specifications. Because oxygen is specified in the form of a range, there are two reference fuel oxygen specifications. In most cases they are the same, but in two cases they are not. These two cases are: 1) If the minimum oxygen content of the candidate fuel specifications is within 1.8 to 2.2 percent (inclusive) and the maximum oxygen content of the candidate is greater than 2.2 percent, and 2) If the minimum oxygen content of the candidate fuel specifications is less than 1.8 percent and the maximum oxygen content of the candidate is between 1.8 and 2.2 percent (inclusive). In case 1), the oxygen contents of the reference fuel specifications are 1.8 and 2.0 percent. In case 2), the oxygen contents of the reference fuel specifications are 2.0 and 2.2 percent. (See Table 6)

Examples:

If you elect to meet a sulfur limit of 10 for the candidate fuel and elect to comply with a flat limit, the reference fuel sulfur limit would be 20. However, if you elect to meet a sulfur limit of 10 on average, the reference fuel sulfur limit would be 15.

If the oxygen range of the candidate fuel specifications is 2.0 percent to 2.5 percent, the maximum oxygen content of the candidate fuel is 2.5 percent and the minimum oxygen content of the candidate fuel is 2.0 percent. The maximum oxygen content of the reference fuel is 2.0 percent and the minimum oxygen content of the reference fuel is 1.8 percent. The predicted emissions from the candidate fuel specifications with 2.5 percent oxygen are compared to the predicted emissions from the reference fuel specifications with 2.0 percent oxygen, and the predicted emissions from the candidate fuel specifications with 2.0 percent oxygen are compared to the predicted emissions from the reference fuel specifications with 1.8 percent oxygen. These comparisons are described by row 2 of Table 6.

Table 6
Candidate and Reference Specifications for Oxygen

| Oxygen Content for Candidate Fuel Specified by Applicant | | Number of Reference vs Candidate Comparisons Required | Values to be Used in Comparison in Equations | |
|--|---------------------------|---|--|------------|
| Minimum | maximum | | Candidate | Reference |
| $\geq 1.8,$ ≤ 2.2 | $\geq 1.8,$ ≤ 2.2 | 1 | 2.0 | 2.0 |
| $\geq 1.8,$ ≤ 2.2 | > 2.2 | 2 | minimum | 1.8 |
| | | | maximum | 2.0 |
| < 1.8 | $\geq 1.8,$ ≤ 2.2 | 2 | minimum | 2.0 |
| | | | maximum | 2.2 |
| < 1.8 | > 2.2 | 2 | minimum | 2.0 |
| | | | maximum | 2.0 |
| < 1.8 | < 1.8 | 2 | minimum | 2.0 |
| | | | maximum | 2.0 |
| $\geq 2.5,$ ≤ 2.9 | $\geq 2.5,$ ≤ 2.9 | 1 | 2.7 | 2.0 |
| $> 2.2,$ < 2.5 | > 2.2 | 2 | minimum | 2.0 |
| | | | maximum | 2.0 |
| $\geq 2.5,$ ≤ 3.3 | > 2.9 | 2 | minimum | 2.0 |
| | | | maximum | 2.0 |
| ≥ 3.3 ≤ 3.7 | ≥ 3.3 ≤ 3.7 | 1 | <u>3.5</u> | <u>2.0</u> |

* * * * *

TITLE 17. CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER AMENDMENTS TO THE NONVEHICULAR SOURCE, CONSUMER PRODUCTS, AND ARCHITECTURAL COATINGS FEE REGULATIONS

The Air Resources Board (the Board or ARB) will conduct a public hearing at the time and place noted below to consider adoption of amendments to the Nonvehicular Source, Consumer Products, and Architectural Coatings Fee Regulations. The amendments would establish a process for assessing supplemental fees for the 2004-2005 and subsequent fiscal years.

DATE: November 18, 2004

TIME: 9:00 a.m.

Location: California Environmental Protection Agency
Air Resources Board
Central Valley Auditorium, Second Floor
1001 I Street
Sacramento, CA 95814

This item will be considered at a two-day meeting of the Board which will commence at 9:00 a.m. on November 18, 2004, and may continue at 8:30 a.m. on November 19, 2004. This item may not be considered until November 19, 2004. Please consult the agenda for the meeting, which will be available at least 10 days before November 18, 2004, to determine the day on which this item will be considered.

If you have a disability-related accommodation need, please go to <http://www.arb.ca.gov/html/ada/ada.htm> for assistance or contact the ADA Coordinator at (916) 323-4916. If you are a person who needs assistance in a language other than English, please contact the Bilingual Coordinator at (916) 324-5049. TTY/TDD/Speech-to-Speech users may dial 7-1-1 for the California Relay Service.

INFORMATIVE DIGEST OF PROPOSED ACTION/POLICY STATEMENT OVERVIEW

Sections Affected: Proposed adoption of new sections 90805 and 90806; and proposed amendments to sections 90800.8 and 90803, title 17, California Code of Regulations (CCR).

Background:

In 2003, the Legislature enacted AB10X (Stats. 2003, Chapter 1X), which amended section 39612 and added section 39613 to the Health and Safety Code. AB 10X made a number of changes to existing law, including:
(1) increasing the cap on stationary source fees from \$3 million to \$13 million for

fiscal year (FY) 2003-2004, and allowing the limitation on the total amount of funds collected from stationary sources to be adjusted annually thereafter for inflation; and (2) expanding the universe of stationary sources subject to the fees by specifying that the fees are to be collected from stationary point sources (i.e. facilities) authorized by district permits to emit 250 tons (instead of the previous 500 tons) or more per year of any nonattainment pollutant or its precursors.

In addition, AB 10X authorized the ARB for the first time to assess fees on manufacturers of consumer products and architectural coatings. The fees may be assessed on those manufacturers whose total sales of consumer products or architectural coatings will result in the emission in California of 250 tons per year or greater of volatile organic compounds (VOCs). The ARB must use these fees solely to mitigate or reduce air pollution in the State created by consumer products and architectural coatings.

In July 2003, the Board approved regulations to collect the fees authorized by AB10X. The regulations assess uniform fees (on a dollar per ton basis) on large nonvehicular sources (facilities) and large manufacturers of consumer products and architectural coatings. The full text of the current regulations can be found on the ARB's web site at <http://www.arb.ca.gov/regact/feereg03/feereg03.htm>.

For FY 2003-2004, the Legislature authorized the ARB to collect \$17.4 million in fees from facilities and manufacturers of consumer products and architectural coatings. For FY 2004-2005, the Legislature authorized the ARB to collect an additional \$2.6 million, for a total of \$20 million in fees.

Description of Proposed Regulatory Action

In this rulemaking the staff is proposing amendments to the existing fee regulations. Proposed new section 90805 provides for the collection of supplemental fees from facilities. The supplemental fees would be collected only in fiscal years where the State Legislature has authorized the ARB to collect fees in excess of \$17.4 million. Any amount in excess of \$17.4 million would be collected from facilities. The remaining \$17.4 million would continue to be collected on a uniform basis from facilities, manufacturers of consumer products, and manufacturers of architectural coatings, as specified in the existing regulations. The proposed amendments also clarify that under no circumstances will the total amount of fees collected from facilities exceed the amount authorized by Health and Safety Code section 39612(f) or other provisions of State law.

The proposed amendments follow the same basic procedures as the existing regulations with the exception that they apply only to facilities. The facilities subject to the supplemental fees are the same facilities that must pay fees under the existing regulations.

As with the existing regulations, the proposed amendments would allow each district the option to collect the supplemental fees instead of having the ARB

collect them. Districts who choose this option would follow the same process specified in the existing regulations. For FY 2004-2005, however, the proposed amendments specify that the ARB is to collect the supplemental fees because it is likely that only limited time will remain in this fiscal year by the date the amendments are approved by the Office of Administrative Law and become legally operative. The supplemental fees for FY 2004-2005 will be based on the emissions data submitted by facilities under the existing regulations.

The staff is also proposing the adoption of a new section 90806, which includes two new provisions in order to address possible future changes in State law. The first provision directs the ARB Executive Officer to comply with any future direction from the Legislature that particular amounts or percentages are to be collected from the categories of nonvehicular sources, consumer products, or architectural coatings. The second provision directs the ARB Executive Officer to use any modified emissions threshold (i.e., different from the existing 250 tons per year threshold) enacted by the Legislature. These provisions would apply to both the existing fees and the supplemental fees, and would allow the ARB to comply with possible future changes in State law without having to modify the regulations.

Finally, the proposed amendments modify existing sections 90800.8(c)(1) and 90803, title 17, CCR, to reference the new supplemental fee provisions. These modifications will insure that all of the regulatory fee provisions work together with no contradictions.

There are no federal regulations that are comparable to the proposed fee regulations.

AVAILABILITY OF DOCUMENTS AND AGENCY CONTACT PERSONS

The Board staff has prepared a Staff Report: Initial Statement of Reasons (ISOR) for the proposed action, which includes a summary of the potential environmental and economic impacts, and environmental justice considerations of the proposal. The report is entitled: "Initial Statement of Reasons for Proposed Amendments to the NonVehicular Source, Consumer Products, and Architectural Coatings Fee Regulations".

Copies of the ISOR and the full text of the proposed regulatory language may be accessed on the ARB's web site listed below, or may be obtained from the Board's Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, 1st Floor, Sacramento, CA 95814, (916) 322-2990, at least 45 days prior to the scheduled hearing (November 18, 2004).

Upon its completion, the Final Statement of Reasons (FSOR) will be available and copies may be requested from the agency contact persons identified in this notice, or may be accessed on the web site listed below.

Inquiries concerning the substance of the proposed regulatory action may be directed to the designated agency contact persons: Mr. Don Rake, Planning and Technical Support Division, (916) 322-7304, e-mail drake@arb.ca.gov, or Mr. Michael FitzGibbon, Planning and Technical Support Division, (916) 445-6243, e-mail mfitzgib@arb.ca.gov.

Further, the agency representative and designated back-up contact persons to whom non-substantive inquiries concerning the proposed administrative action may be directed are Artavia Edwards, Manager, Board Administration and Regulatory Coordination Unit, (916) 322-6070, or Amy Whiting, Regulations Coordinator, (916) 322-6533. The Board staff has compiled a record for this rulemaking action, which includes all information upon which the proposal is based. This material is available for inspection upon request to the contact persons.

This notice, the ISOR, and all subsequent regulatory documents, including the FSOR, when completed, are available on the ARB Internet site for this rulemaking at www.arb.ca.go/regact/feereq04/feereq04.htm.

COSTS TO PUBLIC AGENCIES, BUSINESSES, AND PERSONS AFFECTED

The determinations of the Board's Executive Officer concerning the costs or savings necessarily incurred by public agencies and private persons and businesses in reasonable compliance with the proposed regulations are presented below.

The Board's Executive Officer has determined that the regulations will not create costs or savings, as defined in Government Code sections 11346.5(a)(5) and 11346.5(a)(6), to any state agency or in federal funding to the state, costs or mandate to any local agency or school district whether or not reimbursable by the state pursuant to Part 7 (commencing with section 17500), Division 4, Title 2 of the Government Code, except as discussed below, or other non-discretionary savings to state or local agencies.

The proposed regulatory action will impose a mandate upon and create costs to some local agencies. For FY 2004-2005, facilities operated by three local agencies have been identified as being subject to the supplemental fees. The aggregate cost to these three local agencies should be approximately \$20,000 for FY 2004-2005 in addition to about \$80,000 that will be paid in fees under the existing regulation. These costs, as well as any fees that may be paid in subsequent fiscal years by any local agency, are not reimbursable state mandated costs pursuant to Part 7 (commencing with section 17500), Division 4, Title 2 of the Government Code, because the fee regulations apply generally to all facilities in the State which emit 250 tons or more per year of nonattainment pollutants or their precursors and, therefore, do not impose unique requirements on local government agencies.

The Board's Executive Officer has also determined that individual districts may incur some administrative costs as a result of the proposed regulatory action if a district chooses to collect fees from facilities instead of the ARB collecting fees. However, districts are not mandated by the proposed regulations to collect the fees; a district would incur no administrative costs unless it chooses to collect the fees itself. In addition, any administrative costs incurred by a district are not reimbursable state mandated costs because of the districts' authority to recover the costs through fee assessments; Health and Safety Code sections 39612(e) and 39612(f)(1), and section 90800.9(c), title 17, CCR, authorize districts to recover these administrative costs from facilities subject to the fees.

In developing this regulatory proposal, the ARB staff evaluated the potential economic impact on private persons and businesses. The Executive Officer has initially determined that there will be a potential cost impact on private persons or businesses directly affected as a result of the proposed regulatory action.

The Executive Officer has made an initial determination that the proposed regulatory action will not have a significant statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other States, or on representative private persons. In fiscal year 2004-2005, approximately 82 facilities in the State are expected to be assessed under the proposed regulations. Among the operators of these facilities are major oil and gas producers, utilities, and major manufacturing enterprises. The proposed regulatory action would result in an increased cost to individual facilities of \$6,000 to \$225,000, which is in addition to the \$24,000 to \$900,000 paid under the existing regulation.

In accordance with Government Code section 11346.3, the Executive Officer has initially determined that the proposed regulatory action will have minimal or no impacts on the creation or elimination of jobs within the State of California, minimal or no impacts on the creation of new businesses or the elimination of existing businesses within the State of California, and minimal or no impacts on the expansion of businesses currently doing business within the State of California. A detailed assessment of the economic impacts of the proposed regulatory action can be found in the ISOR.

The Executive Officer has also determined, pursuant to title 1, CCR section 4, that the proposed regulations will not affect small businesses. No facilities subject to the proposed regulations are considered to be small businesses.

Before taking final action on the proposed regulations, the ARB must determine that no reasonable alternative considered by the agency or that has otherwise been identified and brought to the attention of the agency would be more effective in carrying out the purpose for which the action is proposed or would be as effective and less burdensome to affected private persons or businesses than the proposed action.

SUBMITTAL OF COMMENTS

The public may present comments relating to this matter orally or in writing at the hearing, and in writing or by e-mail before the hearing. To be considered by the Board, written submissions not physically submitted at the hearing must be received no later than **12:00 noon, November 17, 2004**, and addressed to the following:

Postal mail is to be sent to:

Clerk of the Board
Air Resources Board
1001 I Street, 23rd Floor
Sacramento, CA 95814

Electronic mail is to be sent to: **feereg04@listserv.arb.ca.gov** and received at the ARB by **no later than 12:00 noon, November 17, 2004**.

Facsimile submissions are to be transmitted to the Clerk of the Board at (916) 322-3928 and received at the ARB **no later than 12:00 noon, November 17, 2004**.

The Board requests, but does not require, 30 copies of any written statement be submitted and that all written statements be filed at least 10 days prior to the hearing so that ARB staff and Board Members have time to fully consider each comment. The ARB encourages members of the public to bring any suggestions for modification of the proposed regulatory action to the attention of staff in advance of the hearing.

STATUTORY AUTHORITY AND REFERENCES

This regulatory action is proposed under that authority granted in sections 39600, 39601, 39612 and 39613 of the Health and Safety Code. This action is proposed to implement, interpret, or make specific sections 39002, 39500, 39600, 39612, and 39613 of the Health and Safety Code.

HEARING PROCEDURES

The public hearing to consider this matter will be conducted in accordance with the California Administrative Procedure Act, Title 2, Division 3, Part 1, Chapter 3.5 (commencing with section 11340) of the Government Code.

Following the public hearing, the ARB may adopt the regulatory language as originally proposed or with nonsubstantial or grammatical modifications. The ARB may also adopt the proposed regulatory language with other modifications if the text as modified is sufficiently related to the originally proposed text that the public was adequately placed on notice that the regulatory language as modified could result from the proposed regulatory action. In the event that such

modifications are made, the full regulatory text, with the modifications clearly indicated, will be made available to the public for written comment at least 15 days before it is adopted.

The public may request a copy of the modified regulatory text from the ARB's Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, 1st Floor, Sacramento, California 95814, (916) 322-2990.

CALIFORNIA AIR RESOURCES BOARD



for Catherine Witherspoon
Executive Officer

Date: September 21, 2004

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Web-site at www.arb.ca.gov.

State of California**California Environmental Protection Agency****AIR RESOURCES BOARD****Staff Report****INITIAL STATEMENT OF REASONS FOR
PROPOSED AMENDMENTS TO THE NONVEHICULAR SOURCE,
CONSUMER PRODUCTS, AND ARCHITECTURAL COATINGS FEE
REGULATIONS**

Date of Release: October 1, 2004
Scheduled for Consideration: November 18, 2004

Prepared by:

**Emission Inventory Branch
Planning and Technical Support Division**

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of ways you can reduce demand and cut energy costs, see our Web-site at <http://www.arb.ca.gov>.

State of California
California Environmental Protection Agency
AIR RESOURCES BOARD

Staff Report

**INITIAL STATEMENT OF REASONS FOR
PROPOSED AMENDMENTS TO THE NONVEHICULAR SOURCE, CONSUMER
PRODUCTS, AND ARCHITECTURAL COATINGS FEE REGULATIONS**

Air Resources Board Public Hearing

November 18-19, 2004
Air Resources Board
Central Valley Auditorium
1001 I Street
Sacramento, California 95814

Principal Author

Don Rake
Emission Inventory Analysis Section
Planning and Technical Support Division

Reviewed and Approved by:

Michael FitzGibbon, Manager, Emission Inventory Analysis Section
Bob Fletcher, Chief, Planning and Technical Support Division

This report was prepared with the help of other staff from the Air Resources Board. We particularly thank Robert Jenne of the ARB's Office of Legal Affairs and Judy Tanimoto of the ARB's Administrative Services Division for their contributions.

This report and related materials for this rulemaking are available on the ARB Internet site for this rulemaking at www.arb.ca.gov/regact/feereg04/feereg04.htm. In addition, written copies may be obtained from the Board's Public Information Office, 1001 I Street, 1st Floor, Environmental Services Center, Sacramento, California 95814, (916) 322-2990.

This report has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

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- A. Proposed Amendments to the Nonvehicular Source, Consumer Products, and Architectural Coatings Fee Regulations
- B. Public Workshop Notice
- C. Nexus Calculations for Consumer Products and Architectural Coatings for FY 2004-2005
- D. California Business Impacts of Proposed Amendments to the Proposed Amendments to the Nonvehicular Source, Consumer Products, and Architectural Coatings Fee Regulations
- E. Facility Fees Data for FY 2003-2004 and Preliminary Facility Fees Data for FY 2004-2005

I.

INTRODUCTION AND BACKGROUND

The Legislature enacted Health and Safety Code section 39612 as part of the California Clean Air Act of 1988. As originally enacted, section 39612 empowered the Air Resources Board (ARB or Board) to assess fees on nonvehicular sources (i.e. facilities) that were authorized by air pollution control and air quality management districts (districts) permits to emit 500 tons or more per year of any nonattainment pollutant or its precursors. The total amount of assessed fees was capped at \$3 million, and the fees were to be used by the ARB only for the purposes of recovering the costs of additional State programs related to nonvehicular sources.

Pursuant to Health and Safety Code section 39612, the Board approved the California Clean Air Act (CCAA) Nonvehicular Source Fee Regulations in 1989. The original regulations included the fee rate and amounts to be remitted to the ARB by the districts for the first year of the program, fiscal year 1989-90. In each subsequent year between 1990 and 1996, the Board approved amendments to the fee regulations identifying the amount of fees to be collected by each district for the following fiscal year. In 1998, the Board adopted amendments for fiscal years 1997-1998 and 1998-1999, which eliminated the need for annual rulemakings. The 1998 amendments established a process under which the ARB Executive Officer identifies the fees to be assessed in each fiscal year and notifies the districts and affected facilities. The process also insures that districts and affected facilities have the opportunity to provide input on the amount of the assessments.

In 2003, the Legislature enacted AB10X (Stats. 2003, Chapter 1X), which amended section 39612 and added section 39613 to the Health and Safety Code. AB 10X made a number of changes to existing law, including: (1) increasing the cap on stationary source fees from \$3 million to \$13 million for fiscal year (FY) 2003-2004, and allowing the limitation on the total amount of funds collected from stationary sources to be adjusted annually thereafter for inflation; and (2) expanding the universe of stationary sources subject to the fees by specifying that the fees are to be collected from stationary point sources (i.e. facilities) authorized by district permits to emit 250 tons (instead of the previous 500 tons) or more per year of any nonattainment pollutant or its precursors.

In addition, AB 10X authorized the ARB for the first time to assess fees on manufacturers of consumer products and architectural coatings. The fees may be assessed on those manufacturers whose total sales of consumer products or architectural coatings will result in the emission in California of 250 tons per year or greater of volatile organic compounds (VOCs). The ARB must use these fees solely to mitigate or reduce air pollution in the State created by consumer products and architectural coatings.

In July 2003, the Board approved regulations to collect the fees authorized by AB10X. The regulations assess uniform fees (on a dollar per ton basis) on large nonvehicular sources (facilities) and large manufacturers of consumer products and architectural coatings. The full text of the current regulations can be found on the ARB's web site at <http://www.arb.ca.gov/regact/feereg03/feereg03.htm>.

For FY 2003-2004, the Legislature authorized the ARB to collect \$17.4 million in fees from facilities and manufacturers of consumer products and architectural coatings. For FY 2004-2005, the Legislature authorized the ARB to collect an additional \$2.6 million, for a total of \$20 million in fees.

In this rulemaking, the staff is proposing amendments to the existing fee regulations which implemented the provisions of sections 39612 and 39613 of the Health and Safety Code. The proposal provides for the assessment of supplemental fees in excess of \$17.4 million to be assessed and collected from facilities. The remaining \$17.4 million would continue to be collected on a uniform basis as specified in the existing regulations.

The staff's proposal was the subject of a public workshop held on September 14, 2004. For the public workshop, the staff notified representatives of the districts, all facilities and manufacturers of consumer products and architectural coatings currently subject to the fee regulations, and other interested parties who have expressed an interest in these rulemaking activities. A copy of the workshop notice is included as Appendix B.

II.

PROPOSED AMENDMENTS TO THE NONVEHICULAR SOURCE, CONSUMER PRODUCTS, AND ARCHITECTURAL COATINGS FEE REGULATIONS

A. OVERVIEW OF THE PROPOSED AMENDMENTS

The proposed amendments establish a procedure to collect supplemental fees from facilities. The supplemental fees would be collected only in fiscal years where the State Legislature has authorized the ARB to collect fees in excess of \$17.4 million. The amount in excess of \$17.4 million would be collected as supplemental fees from facilities, and the remaining \$17.4 million would continue to be collected on a uniform basis as specified in the existing regulations.

The supplemental fees would be collected beginning in FY 2004-2005. The procedure would assure that the affected sources continue to have the opportunity to provide input on the fee assessments on an annual basis. The proposed amendments follow the same basic procedures as the existing regulations, with one significant exception. The proposed supplemental fees would be assessed only on large stationary sources ("facilities") which emit 250 tons or more per year of nonattainment pollutants or precursors. The rationale for assessing the fees only on facilities is discussed below.

The provisions of the existing fee regulations will not be changed, other than to add the mechanism to assess the supplemental fee on facilities. A complete copy of the proposed regulations is presented in Appendix A. The proposed amendments are shown in underline to indicate additions and ~~strikeout~~ to indicate deletions from the existing fee regulations.

B. RATIONALE FOR ASSESSING SUPPLEMENTAL FEES ONLY ON FACILITIES

The ARB staff is proposing that the supplemental fees be assessed solely on facilities in order to avoid fee "nexus" problems regarding consumer products and architectural coatings manufacturers.

California law requires that there must be an adequate "nexus" between a fee and the program activities funded by the fee. If an adequate nexus does not exist, the "fee" may be an illegal "tax." Health and Safety Code section 39613 specifically states that the fees collected from manufacturers of consumer products and architectural coatings are to be used solely to mitigate or reduce air pollution in the State created by consumer products and architectural coatings, as determined by the Board. The nexus for the fee regulations reflects the point at which the fees assessed on a source category (i.e. consumer products and architectural coatings) are greater than the resources expended on the control of emissions from that source category.

In last year's rulemaking the ARB staff used two different approaches to calculate the nexus for consumer products and architectural coatings. The first method was based

on emissions and the second was based on a determination of program costs.¹ Based on these two methods the ARB staff determined that the nexus for consumer products and architectural coatings would be between \$7.6 million and \$8.9 million. The low end of this range (\$7.6 million) was calculated using an emissions-based approach, and the high end (\$8.9 million) was calculated by determining the program costs for the ARB's consumer products and architectural coatings programs.

There are year-to-year changes in data that can affect the emissions-based nexus calculations for consumer products and architectural coatings. The emissions-based nexus is influenced by changes in the emissions inventory and changes in the portion of the ARB's budget authorized for stationary sources. (The ARB's program cost analysis is not affected because the workload, personnel, and overall program costs are expected to remain the same for the foreseeable future.) In FY 2004-2005, the ARB's stationary source budget was reduced from \$39.6 million to \$38.2 million. In addition, the emission inventory also changed; the percentage of the stationary source emissions from consumer products was less in FY 2004-2005 than it was in FY 2003-2004. Using the same methodology to calculate the emissions as last year's rulemaking (see Appendix C), the emissions-based nexus for FY 2004-2005 for consumer products and architectural coatings would be approximately \$6.9 million. Since the nexus calculations using program costs is unchanged, the nexus for consumer products and architectural coatings would be between \$6.9 million and \$8.9 million for FY 2004-2005.

For facilities, California law also requires that an adequate nexus must exist. However, the nexus for facilities is significantly higher than it is for consumer products and architectural coatings, because the emissions contributions from facilities is significantly higher. The emissions-based nexus for facilities would be approximately \$26 million for FY 2004-2005. However, section 39612(f) imposes a cap on the fees for facilities at \$13 million for FY 2003-2004. In each subsequent year, this limitation can be increased by an amount not to exceed the annual percentage change in the California Consumer Price Index as compiled and reported by the Department of Industrial Relations. Thus, as a practical matter, the nexus for facilities is the statutorily-mandated cap.

For FY 2003-2004, the ARB staff billed facilities approximately \$10.8 million and large manufacturers of consumer products and architectural coatings approximately \$6.6 million. The sum of these two amounts equals the authorized recovery of \$17.4 million. If the ARB had been authorized to collect only a total of \$17.4 million for FY 2004-2005, the ARB staff would have billed facilities about \$10.6 million and large manufacturers of consumer products and architectural coatings about \$6.8 million (based on preliminary data). (Fees are assessed only on those manufacturers whose total sales of consumer products or architectural coatings will result in the emission in California of 250 tons per year or greater of volatile organic compounds. Fees are not assessed on all manufacturers or on all emissions.) These amounts would have been

¹ ARB Staff Report, "Initial Statement of Reasons for Proposed Amendments to the California Clean Air Act Nonvehicular Source Fee Regulations, June 6, 2003 and the ARB report entitled "Consumer Products and Architectural Coatings Program Costs," November 13, 2003.

within the emissions-based nexus for all categories.

In FY 2003-2004, the Budget Act shifted \$17.4 million of the ARB's Stationary Source budget from the General Fund to fee supported programs. For FY 2004-2005, an additional \$2.6 million budget shift from the General Fund to fees was included in the Budget Act, resulting in a total of a \$20 million shift in funding to fees. The ARB anticipates that this will be a permanent change to ARB's baseline budget. If the ARB were to collect the entire \$20 million from all source categories under the existing regulations, the fees assessed on manufacturers of consumer products and architectural coatings would be approximately \$7.8 million and would significantly exceed the lower emissions-based threshold for the nexus determination. Assessing the entire \$2.6 million on facilities (up to the statutory cap specified in Health and Safety Code section 39612(f)) would avoid any potential nexus problems with consumer products and architectural coatings, because these sources would only pay approximately \$6.8 million.

Although the ARB could collect the \$7.8 million from consumer products and architectural coatings manufacturers and still be within the \$8.9 million nexus threshold based on program costs, the staff's proposal reflects a conservative approach by insuring that lower emissions-based nexus threshold will not be exceeded. The proposal also insures that the emissions-based nexus will not be exceeded in future years if the Legislature continues to authorize the ARB to collect fees in excess of \$17.4 million. Finally, this approach is consistent with discussions between ARB staff and Legislative staff regarding the fee provisions in the FY 2004-2005 State budget.

C. PROPOSED AMENDMENTS TO FEE REQUIREMENTS FOR FISCAL YEAR 2004-2005 AND SUBSEQUENT FISCAL YEARS

The proposed amendments follow the same basic procedures as the existing fee regulations with the exception that they apply only to facilities. The facilities subject to the supplemental fees are the same ones that must pay fees under the existing regulations. The supplemental fees would be collected only in fiscal years where the State Legislature has authorized the ARB to collect fees in excess of \$17.4 million. The amount in excess of \$17.4 million would be collected as supplemental fees from facilities.

Proposed new section 90805 outlines the basic procedures for the supplemental fees and includes the following provisions:

- specifies that the proposed amendments apply in any fiscal year in which the Legislature has authorized the Board to collect fees in excess of \$17.4 million;
- clarifies that under no circumstances will the total amount of fees collected from facilities exceed the amount authorized by Health and Safety Code section 39612(f) or other provisions of State law;

- authorizes an increase in revenues consistent with changes in the California Consumer Price Index, if necessary to collect the revenues authorized by the Legislature for any fiscal year;
- authorizes an adjustment amount of revenues, not to exceed three percent, to recover unforeseen reductions in supplemental fee collections due to unexpected business closure and bankruptcies (The same three percent adjustment amount is also specified in the existing regulations.);
- specifies that the facilities subject to the supplemental fees are the same facilities that are subject to the existing fee regulations;
- specifies the procedures to be used to calculate the fee per ton and the individual fees per facility (These procedures are the same as those specified in the existing regulations.);
- provides for a preliminary and final determination of supplemental fees that allows for review by the districts and each affected facility; and
- specifies the timeframe for submittal of the fees to the Board for both existing and newly identified facilities and sets forth the procedures for assessing late fees (These provisions also parallel those specified in the existing regulations).

As with the existing regulations, the proposed amendments (section 90805(e)) would allow each district the option to collect the supplemental fees instead of having the ARB collect them. Districts who choose this option would follow the same process specified in the existing regulations. For FY 2004-2005, however, the proposed amendments specify that the ARB is to collect the supplemental fees because it is likely that only limited time will remain in this fiscal year by the date the amendments are approved by the Office of Administrative Law and become legally operative. The supplemental fees for FY 2004-2005 will be based on the emissions data submitted by facilities under the existing regulations.

The staff is also proposing the adoption of a new section 90806, which includes two new provisions in order to address possible future changes in State law. The first provision directs the ARB Executive Officer to comply with any future direction from the Legislature that particular amounts or percentages are to be collected from the categories of nonvehicular sources, consumer products, or architectural coatings. The second provision directs the ARB Executive Officer to use any modified emissions threshold (i.e. different from the existing 250 tons per year threshold) enacted by the Legislature. These provisions would apply to both the existing fees and the supplemental fees, and would allow the ARB to comply with possible future changes in State law without having to modify the regulations.

Finally, the proposed amendments modify existing sections 90800.8(c) and 90803, title 17, CCR, to reference the new supplemental fee provisions. These modifications

will insure that all of the regulatory fee provisions work together with no contradictions.

D. ESTIMATED SUPPLEMENTAL FEES FOR FISCAL YEAR 2004-2005

The supplemental fee on facilities would be calculated as follows. The amount of emissions is approximate because, at the time this report was written, emissions from affected sources are still preliminary and have not yet been finalized.

$$\text{Supplemental Fee per ton} = \frac{S + A - C}{SE}$$

Where

S = The needed supplemental fee revenues.

SE = The total tons of nonattainment pollutants or precursors individually emitted in annual amounts of 250 tons or more from all permitted facilities in the state.

A = The adjustment amount.

C = Carry-over balance.

Sample calculation:

S = \$2.6 million

SE = 116,500 tons

A = 3 percent of \$2.6 million, or \$78,000

C = 0

Supplemental Fee per ton = \$23 per ton

The dollar amount to be transmitted to the state board, in addition to the amount remitted under section 90800.8(c)(7), would be calculated in accordance with the following formula:

$$\text{Amount to be transmitted} = SF * SD = \$2.678 \text{ million}$$

Where SF = \$23 per ton
SD = 116,500 tons

A preliminary determination of the estimated supplemental fees that would be assessed under this proposal can be found in Appendix E. Appendix E also shows the fees assessed for FY 2003-2004 and preliminary estimated fees for FY 2004-2005.

III.

POTENTIAL IMPACTS

A. ENVIRONMENTAL IMPACTS

The California Environmental Quality Act (CEQA) and ARB policy require an analysis to determine the potential adverse environmental impacts of proposed regulations. Because the ARB's program involving the adoption of regulations has been certified by the Secretary of Resources (Public Resources Code, Section 21080.5, Exemption of specified regulatory programs), the CEQA environmental analysis requirements are allowed to be included in the ARB Staff Report (i.e. this Initial Statement of Reasons) in lieu of preparing an environmental impact report or negative declaration. In addition, the ARB will respond in writing to all significant environmental points raised by the public during the public review period or at the Board hearing. These responses will be contained in the Final Statement of Reasons for the proposed amendments to the fee regulations.

Staff evaluated the potential environmental impacts from the proposed rulemaking action, and determined that no significant adverse environmental impacts are likely to occur. There may be an environmental benefit because additional fees could provide an incentive for sources to reduce emissions.

B. ECONOMIC IMPACTS

The effect of this proposal is that facilities would pay more than they would under the existing regulations (and consumer products and architectural coatings manufacturers would pay correspondingly less) in any fiscal year where the Legislature has authorized the ARB to collect fees in excess of \$17.4 million. The total statewide dollar cost to California businesses would remain unchanged; the proposed amendments would simply redistribute some of these costs from one group of businesses (i.e. consumer products and architectural coatings) to another (i.e. facilities). The amount of this redistribution would vary from year to year depending on the State budget authorized by the Legislature. For FY 2003-2004, the Legislature authorized the ARB to collect \$17.4 million in fees from facilities and manufacturers of consumer products and architectural coatings. For FY 2004-2005, the Legislature authorized the ARB to collect an additional \$2.6 million, for a total of \$20 million in fees.

Under the existing regulations, the ARB would collect the entire \$20 million on a uniform basis from all sources subject to the regulations, and facilities would pay approximately \$12.2 million of this amount (based on the ARB's preliminary estimate of their emissions). Under the proposed amendments the ARB would still collect \$20 million in fees, but facilities would pay approximately \$13.2 million for FY 2004-2005. This represents a fee increase of \$1 million for facilities, with a corresponding \$1 million decrease in the amount paid by consumer products and architectural coatings manufacturers.

1. Public Agencies

Local agencies will incur some costs as a result of the proposed regulations. The Board's Executive Officer has determined that the regulations will not create costs or savings, as defined in Government Code sections 11346.5(a)(5) and 11346.5(a)(6), to any state agency or in federal funding to the state, costs or mandate to any local agency or school district whether or not reimbursable by the state pursuant to Part 7 (commencing with section 17500), division 4, title 2 of the Government Code, except as discussed below, or other non-discretionary savings to state or local agencies. Individual districts may incur some administrative costs as a result of the proposed regulatory action if a district chooses to collect fees from facilities instead of the ARB. However, districts are not mandated by the proposed regulations to collect the fees; a district would incur no administrative costs unless it chooses to collect the fees itself. In addition, any administrative costs incurred by a district are not reimbursable State mandated costs because of the districts' authority to recover the costs through fee assessments; HSC section 39612(e) and (f)(1), and section 90800.9(c)(4), title 17, CCR, authorize districts to recover these administrative costs from facilities subject to the fees.

No State agencies have been identified as operating facilities that would be subject to the supplemental facility fees for fiscal year 2004-2005. Three local agencies (the Los Angeles Department of Water and Power, the Imperial Irrigation District, and the City of Long Beach SERRF Project) have been identified as being potentially subject to the supplemental fees. The combined costs to these local agencies for fiscal year 2004-2005 are expected to be approximately \$20,000 for the amendments proposed. The total cost to the local agencies (which include the amounts assessed pursuant to the original regulations) is approximately \$100,000. Local agencies are required to pay permit fees but these costs would not be reimbursable State mandated costs pursuant to Government Code section 17500 et seq. because the fee regulations apply generally to all facilities in the State which emit 250 tons or more per year of nonattainment pollutants or their precursors and, therefore, do not impose unique requirements on local government agencies.

2. Businesses

The proposed regulations would require the collection of supplemental fees from specified facilities based on the sources' emissions. The fee per facility will be determined based on the amount of emissions. The cost to affected businesses will therefore vary according to the magnitude of emissions. The cost of the supplemental fees to an individual facility is estimated to range from a minimum of approximately \$6,000 to a maximum of approximately \$225,000 (see Appendix E). The total fees, including amounts assessed pursuant to the original regulations, would range from about \$29,000 to \$1,100,000.

The staff believes that the adoption of the fee program will not have a significant adverse economic impact on businesses subject to the fees. The affected industries are among the largest in California and the nation, both in size and financial strength. A detailed analysis of the economic impact of the proposed regulations on businesses is included in Appendix D.

In FY 2004-2005, a total of 82 facilities are affected by the proposed supplemental fee regulations. Among the operators of these businesses are major oil and gas producers, utilities, and major manufacturing enterprises. It is estimated that the average return on owners' equity for all affected businesses for which financial data are available would have declined by less than 0.01 percent in FY 2004-2005. The staff believes that the proposed regulatory action will not affect the creation or elimination of jobs within the State of California, the creation of new businesses or the elimination of existing businesses within California, or the expansion of businesses currently doing business within California. The proposed regulations will also have no significant impact on the ability of California businesses to compete with businesses in other state.

C. EVALUATION OF ALTERNATIVES

Government Code Section 11346.14 in part requires a description of the alternatives to the proposed regulations that the ARB considered. The ARB staff identified the following alternatives:

1. Assess supplemental fees on all industry types for which fees are authorized.

Increased fees could be imposed under the existing regulations, which imposes uniform fees (on a dollar per ton basis) on large facilities and on manufacturers of consumer products and architectural coatings. This option was not chosen because of fee nexus considerations on consumer products and architectural coatings manufacturers. (See discussion above in Section II B)

2. Do not collect the full budgeted fee amount.

The proposed increase in fees of \$2.6 million reflects the amount of General Funds cut from the ARB's budget for fiscal year 2004-2005. To not offset the \$2.6 million reduction would restrict the ARB's existing ability to mitigate and control pollution, thereby endangering public health.

D. ENVIRONMENTAL JUSTICE

State law defines environmental justice as the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies. The proposed fees could have the impact of businesses reducing their emissions in order to reduce their fees and could thereby have a beneficial impact on air quality. The proposed fees are also

necessary to ensure the ongoing operation of ARB's Environmental Justice Programs which are expressly aimed at improving air quality in disproportionately affected areas.

IV.

RECOMMENDATION

To provide the additional funding authorized by the State budget for FY 2004-2005, the staff recommends that the Board adopt the proposed amendments to the Nonvehicular Source, Consumer Products, and Architectural Coatings Fee Regulations to provide for the collection of supplemental fees for FY 2004-2005 and subsequent fiscal years. This would be effected by adopting new sections 90805 and 90806; and amending sections 90800.8 and 90803, title 17, CCR, as contained in Appendix A.

V.

REFERENCES

The Complete Administrative Rulemaking file submitted to the Office of Administrative Law for the 2003 Amendments to the California Nonvehicular Source Fee Regulations. (Note: Many of the rulemaking documents can be found at the following internet address: <http://www.arb.ca.gov/regact/feereg03/feereg03.htm>)

Budget Act of 2004, Chapter 208, Statutes of 2004.

California Consumer Price Index Tables
<http://www.dir.ca.gov/DLSR/CPI/EntireCCPI.PDF>

Appendix A

**PROPOSED AMENDMENTS TO THE NONVEHICULAR SOURCE,
CONSUMER PRODUCTS, AND ARCHITECTURAL COATINGS FEE REGULATIONS**

Proposed Regulation Order

**AMENDMENTS TO THE NONVEHICULAR SOURCE, CONSUMER PRODUCTS, AND
ARCHITECTURAL COATINGS FEE REGULATIONS**

Note: The proposed amendments are shown in underline to indicate additions and ~~strikeout~~ to show deletions.

Adopt new sections 90805 and 90806 and amend sections 90800.8 and 90803, title 17, California Code of Regulations (CCR), Division 3, Chapter 1, Subchapter 3.8, to read as follows:

90800.75. Operative Date.

The amendments to this subchapter filed with the Secretary of State on February 5, 2004 are operative on February 5, 2004.

NOTE: Authority cited: Sections 39600, 39601, 39612, and 39613, Health and Safety Code. Reference: Sections 39002, 39500, 39600, 39612, and 39613, Health and Safety Code

90800.8. Fee Requirements for the 2003-2004 and Subsequent Fiscal Years.

(a) *Applicability.*

(1) This subchapter applies to:

(A) Any facility that emits 250 tons or more annually of any nonattainment pollutant or precursor, as provided in section 90800.8(c)(4), and

(B) Any consumer products or architectural coatings manufacturer for which the total sales of the manufacturer's consumer products or architectural coatings resulted in VOC emissions of 250 tons or more during a calendar year, as provided in section 90800.8(c)(5).

(2) 2003-2004 Fiscal Year.

(A) *Notification to Districts, Facilities, Consumer Products Manufacturers, and Architectural Coatings Manufacturers.* No later than 30 days after the operative date of this section, the Executive Officer shall provide written notice to each district, facility operator, consumer products manufacturer, and architectural coatings manufacturer of his/her 2003-2004 fiscal year fee determinations, as of July 24, 2003, for all of the items in section (c)(1) through (c)(7). The written notices may reflect modifications to the determinations based on information received by the

Executive Officer after July 24, 2003, in which case the notices shall include a brief explanation of the modifications.

(B) *Transmittal of the Fees to the State Board.* Each facility operator, consumer products manufacturer, and architectural coatings manufacturer that is notified by the Executive Officer that it must remit a specified dollar amount to the state board for the 2003-2004 fiscal year shall transmit that dollar amount to the state board for deposit into the Air Pollution Control Fund within 60 days after receipt by the operator or manufacturer of the fee determination notice. The fees shall be in addition to permit and other fees already authorized to be collected from such sources.

(3) *2004-2005 and Subsequent Fiscal Years.* Sections (b) through (e) apply for the 2004-2005 fiscal year and for any subsequent fiscal year in which the state board is authorized by state law to impose fees on nonvehicular sources, consumer products manufacturers, and architectural coatings manufacturers.

(4) *Expenditure of Fees.* The fees collected from facilities are to be expended by the state board only for the purposes of recovering costs of additional state programs related to nonvehicular sources. The fees collected from consumer products manufacturers and architectural coatings manufacturers are to be expended by the state board solely to mitigate or reduce air pollution in the state created by consumer products and architectural coatings.

(b) *Submittal of Information by Districts.* No later than April 1 of the preceding fiscal year, each district shall submit all of the information identified in section (c)(4) to the Executive Officer in writing.

(c) *Preliminary Determination of Fees to be Assessed.* No later than May 1 of the preceding fiscal year, the Executive Officer shall make preliminary determinations of all of the items in sections 90800.8 (c)(1) through (c)(7) and 90805(b), and shall provide written notice of the preliminary determinations to each district and to each facility operator, consumer products manufacturer, and architectural coatings manufacturer identified in accordance with section (c)(4) or (c)(5). The notice shall state that written comments regarding the preliminary determinations received by the Executive Officer by July 1 of the fiscal year will be considered by the Executive Officer in reaching final determinations.

(1) *Needed Revenues.* Except as provided in section 90805, ~~the~~ revenues needed to recover the costs of the state board for additional state programs related to nonvehicular sources, consumer products, and architectural coatings in the fiscal year. The revenues shall not exceed the amount authorized by state law for any fiscal year, and for the 2003-

2004 fiscal year shall not exceed the amount specified in subdivision (f)(1) of Health and Safety Code section 39612 or such other amount as specified by the State Legislature. For fiscal year 2004-2005 and subsequent fiscal years, the total revenues collected from facilities may include a percentage increase in revenues by an amount not to exceed the annual percentage change in the California Consumer Price Index, as provided in Health and Safety Code section 39612(f)(2), if such an increase is necessary to collect the revenues authorized by the State Legislature for any fiscal year.

(2) *Adjustment Amount.* An additional adjustment amount, not to exceed 3 percent of the needed revenues, designed to recover unforeseen reductions in collections due to unexpected business closures and bankruptcies.

(3) *Carry-over Balance.* The amount collected in the previous fiscal year in excess of or less than the needed revenues for that fiscal year.

(4) (A) *Emissions of Facilities Subject to Fees.* Except as otherwise provided in subsections (c)(4)(B) and (c)(4)(C), for each district, (1.) the name and address of each permitted facility that emitted 250 tons or more of any nonattainment pollutant or precursor during the most recent calendar year for which emission estimates are available for all affected districts, and (2.) the total tons of each identified facility's emissions during the referenced calendar year of all nonattainment pollutants or precursors that were individually emitted by the facility in an amount of 250 tons or more in the year.

(B) For the South Coast Air Quality Management District (SCAQMD) only, the amount of each facility's emissions specified in subsection (c)(4)(A) shall be determined on a fiscal year instead of a calendar year basis. Emissions from facilities in the SCAQMD shall be determined for the fiscal year that begins during the most recent calendar year for which emission estimates are available for all affected districts. For example, if the 2001 calendar year is the most recent calendar year for which emission estimates are available for all affected districts, then all districts except the SCAQMD would identify facilities and submit facility emissions for the 2001 calendar year, and the SCAQMD would identify facilities and submit facility emissions for the 2001-2002 fiscal year.

(C) A facility shall not be included if its emissions would otherwise be included solely because the facility is in a district which is designated in section 60201 as not having attained the state ambient air quality standard for ozone solely as a result of ozone transport identified in section 70500, title 17, California Code of Regulations.

(5) **Consumer Products Manufacturers and Architectural Coatings Manufacturers Subject to Fees.** Any consumer products or architectural coatings manufacturer for which the total sales of the manufacturer's consumer products or architectural coatings resulted in VOC emissions in the State of 250 tons or more during the same calendar year identified for facilities pursuant to section 90800.8(c)(4)(A).

(6) **Fee per ton.** The fee per ton for the fiscal year, calculated in accordance with the following formula:

$$\text{Fee per ton} = \frac{R + A - C}{E}$$

Where

R = The needed revenues identified in accordance with section (c)(1)

A = The adjustment amount identified in accordance with section (c)(2)

C = Carry-over balance determined in accordance with section (c)(3)

E = The total tons of nonattainment pollutants or precursors individually emitted in annual amounts of 250 tons or more from all permitted facilities in the state identified in accordance with section (c)(4), plus the total tons of VOCs emitted in annual amounts of 250 tons or more from consumer products and architectural coatings sold in the state as identified in accordance with section (c)(5).

(7) **Amount to be Remitted From Each Facility Operator, Consumer Products Manufacturer, or Architectural Coatings Manufacturer.** The dollar amount to be transmitted to the state board, calculated in accordance with the following formula:

$$\text{Amount to be transmitted} = F * D$$

Where

F = Fee per ton as calculated in accordance with section (c)(6)

D = The tons of nonattainment pollutants or precursors individually emitted in annual amounts of 250 tons or more from a permitted facility identified in accordance with section (c)(4), or the tons of VOCs emitted in annual amounts of 250 tons or more for a manufacturer, as identified in accordance with section (c)(5)

(d) ***Final Determination of Fees to be Assessed.*** No later than August 1 of the fiscal year, after considering any comments submitted by July 1 of the fiscal year, the Executive Officer shall make final determinations of all of the items in section (c)(1) through (c)(7), and shall provide a written fee determination notice to each district and to each facility operator, consumer products manufacturer, and architectural coatings manufacturer identified in accordance with section (c)(4) or (c)(5).

(e) ***Transmittal of the Fees to the State Board.***

(1) Each facility operator, consumer products manufacturer, and architectural coatings manufacturer that is notified pursuant to section (d) that it must remit a specified dollar amount to the state board shall transmit that dollar amount to the state board for deposit into the Air Pollution Control Fund within 60 days after receipt of the fee determination notice as specified in section 90802(a). The amount transmitted shall be collected by the state board from the facilities and manufacturers identified in the Executive Officer's final determination as meeting the criteria in section (c)(4) or (c)(5). The fees shall be in addition to permit and other fees already authorized to be collected from such sources.

(2) (A) ***Newly Identified Facilities:*** In addition to the amount transmitted in accordance with section (e)(1), the Executive Officer shall, for any facility identified by the Executive Officer as meeting the criteria in section (c)(4) after the Executive Officer's notification under section (d), notify the facility operator and collect for deposit into the Air Pollution Control Fund the dollar amount equal to the fee per ton calculated using the formula in section (c)(6) multiplied by the total tons of the facility's emissions, during the year used to determine emissions in accordance with section (c)(4), of all nonattainment pollutants or precursors that were individually emitted by the facility in an amount of 250 tons or more in the year. The operator of each newly identified facility shall transmit the assessed dollar amount to the state board within 60 days after receipt of the fee determination notice from the Executive Officer. The amount collected by the state board from the newly identified facility shall be in addition to permit and other fees already authorized to be collected from the facility.

(B) ***Newly Identified Manufacturers.*** The Executive Officer shall, for any consumer products manufacturer or architectural coatings manufacturer identified by the Executive Officer as meeting the criteria in section (c)(5) after the Executive Officer's notification under section (d), notify the consumer products manufacturer or architectural coatings manufacturer and collect for deposit into the Air Pollution Control Fund the dollar amount equal to the fee per ton calculated using the formula in section (c)(6) multiplied by the total tons of VOCs emitted from consumer

products or architectural coatings sold by such manufacturer during the calendar year used to determine emissions in accordance with section (c)(5). Each newly identified manufacturer shall transmit the assessed dollar amount to the state board within 60 days after receipt of the fee determination notice from the Executive Officer. The amount collected by the state board from the newly identified manufacturer shall be in addition to permit and other fees already authorized to be collected from the manufacturer.

NOTE: Authority cited: Sections 39600, 39601, 39612, and 39613, Health and Safety Code. Reference: Sections 39002, 39500, 39600, 39612, and 39613, Health and Safety Code.

90800.9. Optional Process for Districts to Collect Fees from Facilities.

- (a) Notwithstanding the provisions of sections 90800.8 and 90802, each district shall have the option for any fiscal year to collect fees from facilities within the district instead of having the state board collect the fees. A district that chooses to collect fees from facilities pursuant to this section shall follow the process set forth below in section 90800.9(b) or (c). For districts that do not choose to collect fees from facilities, the Executive Officer shall follow the process specified in sections 90800.8 and 90802. Districts shall not have the option to collect fees from consumer products manufacturers and architectural coatings manufacturers.
- (b) *2003-2004 Fiscal Year.*
- (1) *Notification.* A district that chooses to collect fees from facilities for the 2003-2004 fiscal year shall notify the Executive Officer no later than 10 days after the operative date of this section. No later than 30 days after the operative date of this section, the Executive Officer shall provide written notice to each district and facility operator, as specified in section 90800.8(a)(2)(A).
- (2) *Collection and Transmittal of Fees to the State Board.* Each facility operator notified under section 90800.8(a)(2)(A) shall transmit the specified dollar amount to the district within 60 days of notification. No later than 90 days after notification under section 90800.8(a)(2)(A), each district shall transmit the fees to the state board for deposit in the Air Pollution Control Fund. The amount transmitted shall be collected by the district from all facilities in the district that are identified in the Executive Officer's notification. The fees shall be in addition to permit and other fees already authorized to be collected from such sources. Districts shall assess late fees and may recover administrative costs for the 2003-2004 fiscal year as provided in sections 90800.9 (c)(3) and (c)(4).

- (c) **2004-2005 and Subsequent Fiscal Years.** A district that chooses to collect fees on facilities for the 2004-2005 fiscal year or any subsequent fiscal year shall notify the Executive Officer on or before April 1 of the preceding fiscal year, and the district and the Executive Officer shall follow the process set forth below in subsections (c)(1) through (c)(5).
- (1) **Notification to Districts by the Executive Officer.** No later than May 1 of the preceding fiscal year, the Executive Officer shall notify the district of the preliminary determination of fees to be assessed on each facility as provided in section 90800.8(c). No later than August 1, of the fiscal year, the Executive Officer shall notify the district of the final determination of fees to be assessed on each facility as provided in section 90800.8(d).
- (2) **Notification to Facilities by the District.** Each district shall notify and assess the operator of each facility subject to permit fees, as provided for in this subchapter, in writing of the fee due. The fee shall be past due 60 days after receipt by the operator of the fee determination notice.
- (3) **Late Fees.** Each district shall assess an additional fee on operators failing to pay the fee within 60 days of receipt of the fee determination notice. The district shall set the late fee in an amount sufficient to pay the district's additional expenses incurred by the operator's untimely payment.
- (4) **Recovery of Administrative Costs.** Each district may recover administrative costs to the district of collecting the fees pursuant to this subchapter. At the request of the Executive Officer, a district shall provide to the Executive Officer, within 30 days of the request, substantiation of administrative costs.
- (5) **Collection and Transmittal of Fees to the State Board.** Each district that is notified pursuant to section 90800.9(c)(1) that it must remit a specified dollar amount to the state board shall transmit that dollar amount to the state board by January 1 of the fiscal year for deposit into the Air Pollution Control Fund. The amount transmitted shall be collected by the district from the facilities in the district that are identified in the Executive Officer's final fee determination as meeting the criteria in section 90800.8(c)(4). The fees shall be in addition to permit and other fees already authorized to be collected from such sources.
- (d) **Newly Identified Facilities.** In addition to the amounts transmitted in accordance with section 90800.9(b)(2) and (c)(5), a district shall, for any facility identified by the Executive Officer as meeting the criteria in section 90800.8(c)(4) after the Executive Officer's notification under section 90800.8(a)(2)(A) or 90800.8(d), transmit to the state board for deposit into

the Air Pollution Control Fund the dollar amount equal to the fee per ton calculated using the formula in section 90800.8(c)(6) multiplied by the total tons of the facility's emissions, during the year used to determine emissions in accordance with section 90800.8(c)(4), of all nonattainment pollutants or precursors that were individually emitted by the facility in an amount of 250 tons or more in the year. The operator of each newly identified facility shall transmit the assessed dollar amount to the district within 60 days after receipt of the fee determination notice from the Executive Officer. The amount transmitted shall be collected by the district from the newly identified facility, and shall be in addition to permit and other fees already authorized to be collected from the facility. The district shall transmit any fees received from the facility to the state board by January 1 of the fiscal year, or, for fees received by the district on or after December 31, within 30 days after receiving the fees from the facility.

NOTE: Authority cited: Sections 39600, 39601, 39612, and 39613, Health and Safety Code. Reference: Sections 39002, 39500, 39600, 39612, and 39613, Health and Safety Code.

90801. Definitions.

For the purposes of this subchapter, the following definitions apply:

- (a) "Architectural Coating" means a coating to be applied to stationary structures or their appurtenances at the site of installation, to portable buildings at the site of installation, to pavements, or to curbs. Coatings applied in shop applications or to non-stationary structures such as airplanes, ships, boats, railcars, and automobiles, and adhesives are not considered architectural coatings for the purposes of this subchapter.
- (b) "Architectural Coatings Manufacturer" means: (1) any company or person that imports, manufactures, produces, packages, or repackages architectural coatings for sale or distribution in the State of California; and (2) for an architectural coatings manufacturer under the control of a holding or parent company, the holding or parent company.
- (c) "Company" means any firm, association, partnership, business trust, corporation, joint-stock company, limited liability company, or similar organization.
- (d) "Consumer Product" means a chemically formulated product used by household and institutional consumers including, but not limited to, detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products; but does not include other paint products, furniture coatings, or architectural coatings. As used in this subchapter, the term "consumer product" shall also refer to aerosol adhesives, including aerosol adhesives used for consumer,

industrial, and commercial uses.

- (e) "Consumer Products Manufacturer" means: (1) any company, firm, or establishment which is listed on a consumer product's label; if the label lists two companies, firms, or establishments, the consumer products manufacturer is the party which the product was "manufactured for" or "distributed by", as noted on the label; and (2) for a consumer products manufacturer under the control of a holding or parent company, the holding or parent company.
- (f) "District" means an air pollution control district or an air quality management district created or continued in existence pursuant to Part 3 (commencing with section 40000), Division 26, Health and Safety Code.
- (g) "Executive Officer" means the Executive Officer of the state board or his or her delegate.
- (h) "Facility" means any nonvehicular source which requires a permit from the district.
- (i) "Holding or parent company" means any company that has control over another company. For the purposes of this subchapter, a company has control over another company if:
 - (1) the company directly or indirectly or acting through one or more other persons owns, controls, or has power to vote more than 50 percent of the voting securities of the other company; or
 - (2) the company controls in any manner the election of a majority of the directors or trustees or individuals exercising similar functions of the other company; or
 - (3) the company has the power to exercise, directly or indirectly, a controlling influence over the management or policies of the other company.
- (j) "Nonattainment pollutant" means any substance for which an area is designated in sections 60200-60209 as not having attained a state ambient air quality standard listed in section 70200, Title 17, California Code of Regulations, as of July 1 of the fiscal year for which fees are being collected.

- (k) "Nonattainment pollutants and precursors" shall be defined as follows:

| Substance <i>(as listed in section 70200, Title 17, CCR):</i> | <i>nonattainment pollutant/precursor:</i> |
|---|--|
| Ozone | reactive organic gases |
| Sulfur Dioxide | oxides of nitrogen |
| Sulfates | oxides of sulfur |
| Nitrogen Dioxide | oxides of nitrogen |
| Carbon Monoxide | carbon monoxide |
| Suspended Particulate Matter (PM10) | suspended particulate matter (PM10), oxides of nitrogen, oxides of sulfur reactive organic gases |
| Visibility Reducing Particles | suspended particulate matter (PM10), oxides of nitrogen, oxides of sulfur reactive organic gases |
| Hydrogen Sulfide | hydrogen sulfide |
| Lead | lead |

- (l) "Nonattainment precursor" means any substance which reacts in the atmosphere to contribute to the production of a nonattainment pollutant or pollutants in an area designated in sections 60200-60209 as not having attained a state ambient air quality standard listed in section 70200, Title 17, California Code of Regulations, as of July 1 of the fiscal year for which fees are being collected.
- (m) "Operator" means the person who owns or operates a facility or part of a facility.
- (n) "Volatile Organic Compound" or "VOC" means any compound containing at least one atom of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, and excluding the following:
- (1) methane, methylene chloride (dichloromethane), 1,1,1-trichloroethane (methyl chloroform), trichlorofluoromethane (CFC-11), dichlorodifluoromethane (CFC-12), 1,1,2-trichloro-1,1,2-trifluoroethane (CFC-113), 1,2-dichloro-1,1,2,2-tetrafluoroethane (CFC-114), chloropentafluoroethane (CFC-115), chlorodifluoromethane (HCFC-22), 1,1,1-trifluoro-2,2-dichloroethane (HCFC-123), 1,1-dichloro-1-fluoroethane (HCFC-141b), 1-chloro-1,1-difluoroethane (HCFC-142b), 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124), trifluoromethane (HFC-23), 1,1,2,2-tetrafluoroethane (HFC-134), 1,1,1,2-tetrafluoroethane (HFC-

134a), pentafluoroethane (HFC-125), 1,1,1-trifluoroethane (HFC-143a), 1,1-difluoroethane (HFC-152a), cyclic, branched, or linear completely methylated siloxanes, the following classes of perfluorocarbons:

- (A) cyclic, branched, or linear, completely fluorinated alkanes;
 - (B) cyclic, branched, or linear, completely fluorinated ethers with no unsaturations;
 - (C) cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and
 - (D) sulfur-containing perfluorocarbons with no unsaturations and with the sulfur bonds to carbon and fluorine; and
- (2) the following low-reactive organic compounds which have been exempted by the U.S. EPA: acetone, ethane, methyl acetate, parachlorobenzotrifluoride (1-chloro-4-trifluoromethyl benzene), and perchloroethylene (tetrachloroethylene).

NOTE: Authority cited: Sections 39600, 39601, 39612, and 39613, Health and Safety Code. Reference: Sections 39002, 39500, 39600, 39612, and 39613, Health and Safety Code.

90802. Fee Payment and Collection.

- (a) The Executive Officer shall notify and assess the operator of each facility, each consumer products manufacturer, and each architectural coatings manufacturer subject to fees, in writing of the fee due as provided in subsections (a)(2), (c), (d), and (e)(2) of section 90800.8. At the request of a holding or parent company, the Executive Officer shall provide separate written notice of their individual fee determinations to each consumer products or architectural coatings manufacturer within the holding or parent company. The fee shall be past due 60 days after receipt by the operator or manufacturer of the fee determination notice.
- (b) *Late Fees.* The Executive Officer shall assess an additional fee on operators, consumer products manufacturers, and architectural coatings manufacturers failing to pay the fee within 60 days of receipt of the fee determination notice. The Executive Officer shall set the late fee in an amount sufficient to pay the state board's additional expenses incurred by the operator's or manufacturer's untimely payment.
- (c) Any fees submitted to the state which exceed or are less than the costs to the state of additional state programs authorized or required by State Legislature shall be carried over by the state for adjustment to the fees assessed in the subsequent fiscal year.

NOTE: Authority cited: Sections 39600, 39601, 39612, and 39613, Health and Safety Code. Reference: Sections 39002, 39500, 39600, 39612, and 39613, Health and Safety Code.

90803. Failure of Facility to Pay Fees.

For districts exercising the option to collect fees as provided in sections 90800.9 or 90805, in the event any district is unable to collect the assessed fee from any source due to circumstances beyond the control of the district, including but not limited to facility closure, emission quantification errors, or refusal of the operator to pay despite permit revocation and/or other enforcement action, such district shall notify the Executive Officer. For demonstrated good cause, the district may be relieved from that portion of the fees the district is required to collect and remit to the state as set forth in sections 90800.8 and 90800.9. Nothing herein shall relieve the operator from any obligation to pay any fees assessed pursuant to these regulations.

NOTE: Authority cited: Sections 39600, 39601, 39612, and 39613, Health and Safety Code. Reference: Sections 39002, 39500, 39600, 39612, and 39613, Health and Safety Code.

90804. Severability.

Each part of this subchapter is deemed severable, and in the event that any part of this subchapter is held to be invalid, the remainder of this subchapter shall continue in full force and effect.

NOTE: Authority cited: Sections 39600, 39601, 39612, and 39613, Health and Safety Code. Reference: Sections 39002, 39500, 39600, 39612, and 39613, Health and Safety Code.

90805. Supplemental Fee Assessments for Facilities

(a) Applicability. This section applies in any fiscal year in which the State Legislature has authorized the state board to collect fees in excess of \$17.4 million to recover the costs of additional state programs related to nonvehicular sources, consumer products, and architectural coatings.

(b) Determination of Supplemental Fees to be Assessed

(1) Needed Supplemental Fees. The Executive Officer shall determine the needed revenues as specified in section 90800.8(c)(1). If the needed revenues are equal to or less than \$17.4 million, the revenues shall be collected from facilities, consumer products manufacturers, and architectural coatings manufacturers as provided in sections 90800.8 to 90803. If the needed revenues are in excess of \$17.4 million, the amount in excess of \$17.4 million shall be collected as supplemental fees from facilities, as provided in the following subsections. The total revenues collected from facilities pursuant to this subchapter:

(A) shall not exceed the amount authorized by Health and Safety Code section 39612(f) or other provisions of State law, and

(B) may include a percentage increase in revenues by an amount not to exceed the annual percentage change in the California Consumer Price Index, as provided in Health and Safety Code section 39612(f)(2), if such an increase is necessary to collect the revenues authorized by the State Legislature for any fiscal year.

(2) Adjustment Amount. An additional adjustment amount, not to exceed 3 percent of the needed supplemental fee revenues, designed to recover unforeseen reductions in collections due to unexpected business closures and bankruptcies.

(3) Carry-over Balance. The amount of supplemental fees collected in the previous fiscal year in excess of or less than the needed supplemental fee revenues for that fiscal year.

(4) Emissions of Facilities Subject to Supplemental Fees. Any facility identified in section 90800.8(c)(4) is subject to the supplemental fee. The total emissions of each facility subject to the fee shall be determined as provided in section 90800.8(c)(4).

(5) Supplemental Fee per ton. The supplemental fee per ton for the fiscal year shall be calculated in accordance with the following formula:

$$\text{Supplemental Fee per ton} = \frac{S + A - C}{SE}$$

Where

S = The needed supplemental fee revenues identified in accordance with section 90805(b)(1).

SE = The total tons of nonattainment pollutants or precursors individually emitted in annual amounts of 250 tons or more from all permitted facilities in the state identified in accordance with section 90800.8(c)(4).

A = The adjustment amount identified in accordance with section (b)(2).

C = Carry-over balance determined in accordance with section (b)(3).

(6) Supplemental Fee Amount to be Remitted from each Facility Operator. The dollar amount to be transmitted to the state board, in addition to the amount remitted under section 90800.8(c)(7), shall be calculated in accordance with the following formula:

$$\text{Amount to be transmitted} = \text{SF} * \text{SD}$$

Where

SF = Fee per ton as calculated in accordance with section 90805(b)(5).

SD = The tons of nonattainment pollutants or precursors individually emitted in annual amounts of 250 tons or more from a permitted facility identified in accordance with section 90800.8(c)(4).

(c) Preliminary and Final Determination of Supplemental Fees to be Assessed.

(1) The Executive Officer shall make a preliminary determination of the supplemental fees to be assessed as specified in section 90800.8(c).

(2) The Executive Officer shall make a final determination of the supplemental fees to be assessed as specified in section 90805(b), and shall provide a written final fee determination notice to each district and to each facility operator identified in accordance with section 90800.8(c)(4).

(3) The Executive Officer may include the preliminary and final supplemental fee determinations in the written notices provided under sections 90800.8(c) and 90800.8(d), or may use separate notices for the supplemental fees.

(4) For the 2004-2005 fiscal year, the Executive Officer is not required to provide a preliminary determination notice for the supplemental fees, and the final supplemental fee determination notice shall be provided no later than 30 days after the operative date of this section. For the 2005-2006 and subsequent fiscal years, the fee determination notices shall be provided within the time periods specified in sections 90800.8(c) and 90800.8(d), or as soon thereafter as practicable.

(d) Transmittal of the Supplemental Fees to the State Board

(1) Each facility operator that is notified pursuant to section 90805(c) that it must remit a specified dollar amount to the state board shall transmit that dollar amount to the state board for deposit into the Air Pollution Control Fund within 60 days after receipt of the fee determination notice. The supplemental fees shall be in addition to any other fees already authorized to be collected from such sources, including the fees collected pursuant to sections 90800.8 and 90802.

(2) *Newly Identified Facilities.* Newly identified facilities are subject to the supplemental fees in the same manner that they are subject to the fees collected pursuant to sections 90800.8(e)(2)(A) and 90802. The Executive Officer shall collect the supplemental fees using the process for newly identified facilities specified in section 90800.8(e)(2)(A). The operator of each newly identified facility shall transmit the assessed dollar amount to the state board within 60 days after receipt of the fee determination notice from the Executive Officer.

(e) Optional Process for Districts to Collect Supplemental Fees from Facilities

(1) *2004-2005 Fiscal Year.* Districts shall not have the option to collect supplemental fees from facilities for the 2004-2005 fiscal year.

(2) *2005-2006 and Subsequent Fiscal Years.* Beginning with the 2005-2006 fiscal year, each district shall have the option for any fiscal year to collect supplemental fees from facilities instead of having the state board collect the fees. A district that chooses to collect the supplemental fees shall follow the process specified in section 90800.9(c) and (d) for fees collected pursuant to sections 90800.8 and 90802.

(f) Fee Payment and Collection.

(1) The Executive Officer shall notify and assess the operator of each facility subject to the supplemental fees in writing of the fee due as provided in this section. The fee shall be past due 60 days after receipt by the operator of the fee determination notice.

(2) *Late Fees.* The Executive Officer shall assess an additional fee on operators failing to pay the supplemental fee within 60 days of receipt of the fee determination notice. The Executive Officer shall set the late fee in an amount sufficient to pay the state board's additional expenses incurred by the operator's untimely payment.

(3) Any supplemental fees submitted to the state which exceed or are less than the costs to the state of additional state programs authorized or

required by the State Legislature shall be carried over by the state for adjustment to the supplemental fees assessed in the subsequent fiscal year.

NOTE: Authority cited: Sections 39600, 39601, 39612, and 39613, Health and Safety Code. Reference: Sections 39002, 39500, 39600, 39612, and 39613, Health and Safety Code.

90806. Compliance with State Legislature Modifications

- (a) If the State Legislature in any fiscal year specifies particular amounts or percentages that are to be collected from the categories of nonvehicular sources, consumer products, or architectural coatings, the Executive Officer shall comply with the Legislature's direction notwithstanding the provisions of this subchapter.
- (b) If the State Legislature modifies the 250 tons per year threshold specified in section 39612(d) or section 39613 of the Health and Safety Code, the modified threshold for nonvehicular sources, consumer products, or architectural coatings that is specified by the State Legislature shall be used in this subchapter instead of the existing 250 tons per year threshold.

NOTE: Authority cited: Sections 39600, 39601, 39612, and 39613, Health and Safety Code. Reference: Sections 39002, 39500, 39600, 39612, and 39613, Health and Safety Code.

Appendix B

PUBLIC WORKSHOP NOTICE



Terry Tamminen
Agency Secretary

Air Resources Board

Alan C. Lloyd, Ph.D.

Chairman

1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov



Arnold Schwarzenegger
Governor

August 31, 2004

Dear Sir or Madam:

The Air Resources Board (ARB/Board) invites you to participate in a public workshop to discuss proposed amendments to the nonvehicular source, consumer products, and architectural coatings fee regulations. The amendments are necessary to implement provisions of the fiscal year (FY) 2004-2005 budget that shifts an additional \$2.6 million from the ARB's General Fund support to fees. The workshop is scheduled as follows:

Date: Tuesday, September 14, 2004
Time: 1:30 p.m. to 3:30 p.m.
Location: Air Resources Board
Monitoring and Laboratory Division
1309 T Street
Sacramento, California 95814

For FY 2003-2004, to partially offset a General Fund reduction, the Legislature authorized the ARB to collect \$17.4 million in fees, which resulted in a cost-per-ton of approximately \$86.50. The FY 2004-2005 budget was enacted with a \$2.6 million increase to the AB 10X fees authorized by the Legislature for FY 2003-2004, making the total assessment \$20 million for this year. The proposed fee increase offsets a \$2.6 million reduction to the General Fund support for the ARB.

The Board approved the existing regulations in July 2003. The regulations assessed fees on large nonvehicular sources (facilities) and large manufacturers of consumer products and architectural coatings. The full text of the existing regulations can be found on the ARB's web site: <http://www.arb.ca.gov/regact/feereg03/feereg03.htm>.

The ARB staff is proposing to assess the entire \$2.6 million increase on large facilities that emit 250 tons or more per year of nonattainment pollutants or precursors. Based on the emissions data for FY 2004-2005, we estimate the supplemental fee to be approximately \$23.00/ton. The final fee is subject to change pending confirmation of emissions subject to the fees. The remaining \$17.4 million in fees would continue to be collected on a uniform basis as specified in the existing regulations. The Board is tentatively scheduled to consider the proposal at its November 18, 2004, public hearing.

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Website: <http://www.arb.ca.gov>.

California Environmental Protection Agency

Sir/Madam
August 31, 2004
Page 2

At the workshop, ARB staff will present an overview of the modifications to the existing fee regulations. A copy of the proposed regulations is attached. At least 45 days before the hearing, the ARB staff will post the staff report and proposed regulations on the web site at: http://www.arb.ca.gov/emisinv/nscpac_fees/nscpac_fees.htm.

The workshop will also be available through an internet webcast at the following address: <http://www.calepa.ca.gov/broadcast>. You may send questions on-line during the workshop by e-mail to onair@arb.ca.gov. The workshop title should be placed in the subject line, followed by your question in the body of the e-mail. To participate by teleconference, please call 1-888-889-6348, using the pass code FEES. The leader for the call will be Ms. Sue Wyman.

If you have special accommodation needs that cannot be met by attending the workshop via the webcast site shown above, or if you have language needs, please contact Ms. Wyman at (916) 445-9477 or by e-mail at swyman@arb.ca.gov, as soon as possible. TTY/TDD/Speech-to-Speech users may dial 7-1-1 for the California Relay Service to attend the workshop by telephone.

Sincerely,

/s/

Robert D. Fletcher, Chief
Planning and Technical Support Division

Attachment

cc: Mr. Don Rake, Air Pollution Specialist
Emissions Inventory Analysis Section
Planning and Technical Support Division
Air Resources Board

Mr. Michael FitzGibbon, Manager
Emission Inventory Analysis Section
Planning and Technical Support Division
Air Resources Board

Ms. Sue Wyman, Air Pollution Specialist
Environmental Justice Section
Air Resources Board

Appendix C

**NEXUS CALCULATIONS FOR CONSUMER PRODUCTS AND
ARCHITECTURAL COATINGS FOR FY 2004-2005**

Appendix C

Nexus Calculations For Consumer Products And Architectural Coatings For FY 2004-2005

A. Nexus Based on Emission Inventory Contribution

The emission inventory is crucial to the development and application of the proposed fee regulations. It is through the classifications within the emission inventory that the emission base is established for the fee regulations. More importantly, through the emission inventory, we determine which facilities and manufacturers emit pollution in excess of the 250 tons per year threshold established by the fee regulations.

The following is a description of how the ARB determined the appropriate emissions inventory base for the fee regulations. It is identical to the method used in last year's rulemaking on the amendments to the fee regulations

Stationary Sources

The major categories listed in ARB's stationary source emission inventory are:

1. Power Plants;
2. Petroleum Refining/Marketing;
3. Fuel Combustion (Boilers, Turbines, and Engines);
4. Industrial Processes (Food/Ag, Chemical, Mineral, Metal, etc.);
5. Waste Disposal (Open Burning, Landfills, Sewage Treatment, etc.);
6. Solvent Use (Cleaning Operations);
7. Non-Architectural Paints and Coatings;
8. Printing Emissions;
9. Adhesives and Sealants;
10. Electronics;
11. Consumer Products;
12. Architectural Coatings;
13. Pesticides;
14. Asphalt Paving/Roofing;
15. Residential (Natural Gas Water Heaters, Gas Stoves, Fireplaces, etc.);
16. Farming Operations;
17. Construction and Demolition;
18. Dust (Windblown, Paved and Unpaved Roads); and
19. Fires (Automotive and Structural).

To determine the appropriate emission base for purposes of the fee regulations, staff eliminated the source categories for which few or no resources are allocated to controlling emissions. Emissions from the following sources have been eliminated for fee purposes because the ARB either expends little or no resources on controlling these categories or they are covered under ARB's mobile source program:

1. Windblown, Paved and Unpaved Roads, and Farming Operations Dust;
2. Asphalt Paving/Roofing;
3. Livestock Waste;
4. Construction and Demolition;
5. Pesticides;
6. Fires (Automobile and Structural);
7. Residential Fireplace and Water Heaters; and
8. Cooking.

The total emissions from the eight omitted categories are 1,280,041 tons per year in 2002. The remaining stationary source emissions of 750,414 tons per year are from those sources that the stationary source program focuses resources on controlling emissions.

Of the 750,414 tons per year of emissions from applicable sources in 2002, 648,083 tons per year, or 86 percent, are emitted from facilities (510,601 tons per year) and consumer products and architectural coatings (137,482 tons per year). Compared with the previous year, emissions from consumer products and architectural coatings dropped at a faster rate than emissions from facilities. The remaining 102,331 tons per year are emitted from other areawide sources such as agricultural and prescribed burning not subject to the fee regulations. Therefore, based on the emission inventory contribution of facilities, consumer products, and architectural coatings, these sources could reasonably be expected to support up to \$32.9 million or 86 percent of the State's fiscal year 2004-2005 budgeted expenditure of \$38.2 million on stationary source related activities.

Using the same logic to determine the relative share of fees that could be paid by subcategories of sources (in this case facilities, and consumer products and architectural coatings) leads to the following estimates:

- Facilities could be assessed up to 68 percent of total program costs (approximately \$26 million), up to the legislatively mandated cap of \$13 million per year plus changes in the California Consumer Price Index. The most recent annual percentage change in the CCPI was 2.3%, therefore the legislatively mandated cap is now at \$13,299,000.
- Consumer products and architectural coatings could be assessed up to 18 percent of total program costs (compared with 19 percent for fiscal year 2003-2004), or approximately \$6.9 million in fiscal year 2004-2005.

B. Nexus Based on Program Costs

After the fiscal year 2003-2004 emissions based nexus analysis contained in the Initial Statement of Reasons (ISOR) was released on June 6, 2003, some industry commenters expressed concern that this emissions-based approach may overstate the

ARB's actual costs for the consumer products and architectural coatings programs. These commenters believed that a different approach should be used—one that identifies the cost of specific personnel and other resources devoted to these programs.

In response to this request, staff prepared and added to the rulemaking record a document entitled "*Consumer Products and Architectural Coatings Program Costs*." In this document, dated November 13, 2003, the ARB calculated consumer products and architectural coatings program costs by: (1) identifying by each ARB division the employment classifications of the 67 staff working on consumer products and architectural coatings; (2) determining the actual cost for each of the individual staff positions including annual salaries, benefits, and operating costs; (3) identifying other annual costs, by division, such as laboratory equipment maintenance contracts, laboratory supplies, laboratory facility leases, and other ongoing contracts; and (4) including the 15.7 percent annual overhead cost. This detailed programmatic analysis shows that the annual cost of the consumer products and architectural coatings programs is \$8.9 million. The program costs are the same for FY 2004-2005 because the workload, personnel, and other program costs are essentially unchanged and expected to remain so for the foreseeable future.

Appendix D

**CALIFORNIA BUSINESS IMPACTS OF
PROPOSED AMENDMENTS TO THE NONVEHICULAR SOURCE, CONSUMER
PRODUCTS, AND ARCHITECTURAL COATINGS FEE REGULATIONS**

Appendix D

California Business Impacts of Proposed Amendments to the Nonvehicular Source, Consumer Products, and Architectural Coatings Fee Regulations

Introduction

The existing fee regulations provide for the collection of uniform fees (on a dollar per ton basis) on large nonvehicular sources (facilities) and large manufacturers of consumer products and architectural coatings. The proposed amendments establish a mechanism to collect supplemental fees from facilities. The supplemental fees would be collected only in fiscal years where the State Legislature has authorized the Air Resources Board (ARB) to collect fees in excess of \$17.4 million. Any amount in excess of \$17.4 million would be collected from facilities. The remaining \$17.4 million would continue to be collected on a uniform basis from facilities, manufacturers of consumer products, and manufacturers of architectural coatings, as specified in the existing regulations.

The effect of this proposal is that facilities would pay more than they would under the existing regulations (and consumer products and architectural coatings manufacturers would pay correspondingly less) in any fiscal year where the Legislature has authorized the ARB to collect fees in excess of \$17.4 million. The total statewide dollar cost to California businesses would remain unchanged; the proposed amendments would simply redistribute some of these costs from one group of businesses (i.e. consumer products and architectural coatings) to another (i.e. facilities). The amount of this redistribution would vary from year to year depending on the State budget authorized by the Legislature. For FY 2003-2004, the Legislature authorized the ARB to collect \$17.4 million in fees from facilities and manufacturers of consumer products and architectural coatings. For FY 2004-2005, the Legislature authorized the ARB to collect an additional \$2.6 million, for a total of \$20 million in fees. Under the existing regulations, the ARB would collect the entire \$20 million on a uniform basis from all sources subject to the regulations, and facilities would pay approximately \$12.2 million of this amount (based on the ARB's preliminary estimate of their emissions). Under the proposed amendments the ARB would still collect \$20 million in fees, but facilities would pay approximately \$13.2 million for FY 2004-2005. This represents a fee increase of \$1 million for facilities, with a corresponding \$1 million decrease in the amount to be paid by consumer products and architectural coatings manufacturers.

This section evaluates the potential economic impacts of the proposed fee regulations for nonvehicular sources, consumer products, and architectural coatings on business enterprises in California. Section 11346.3 of the Government Code requires that, in proposing to adopt or amend any administrative regulations, State agencies shall assess the potential for adverse economic impacts on California business enterprises and individuals. The assessment shall include a consideration of the impact of the proposed or amended regulations on the ability of California businesses to compete

with businesses in other states, the impact on California jobs, and the impact on California business expansion, elimination, or creation.

This analysis is based on a comparison of the annual return on owner's equity (ROE) for affected businesses before and after the inclusion of the fees. The analysis also uses publicly available information to assess the impacts on competitiveness, jobs, and business expansion, elimination, or creation. The purpose of this analysis is to indicate whether or not the annual fee would have significant adverse impacts on California businesses and individuals.

Affected Businesses

The proposed fee regulations impact all permitted facilities located in nonattainment areas that directly emit 250 tons or more per year of any nonattainment pollutant or its precursors. The ARB has identified 82 businesses that are subject to the proposed supplemental fee regulations. A company might own one or several businesses. The affected businesses fall into different industry classifications. A list of the industries we have identified is provided in Table 1.

Table 1
List of Industries with Affected Businesses

| SIC Code | Industry |
|----------|-------------------------------------|
| 1311 | CRUDE PETROLEUM AND NATURAL GAS |
| 1321 | NATURAL GAS LIQUIDS |
| 1442 | CONSTRUCTION SAND AND GRAVEL |
| 1474 | POTASH/SODA/BORATE MINERALS |
| 2421 | SAWMILLS & PLANING MILLS, GNL |
| 2611 | PULP MILLS |
| 2819 | INDUSTRIAL INORGANIC CHEMICALS, NEC |
| 2873 | NITROGENOUS FERTILIZERS |
| 2911 | PETROLEUM REFINING |
| 2999 | PETROLEUM & COAL PRODUCTS, NEC |
| 3086 | PLASTICS FOAM PRODUCTS |
| 3088 | PLASTICS PLUMBING FIXTURES |
| 3211 | FLAT GLASS |
| 3221 | GLASS CONTAINERS |
| 3241 | CEMENT, HYDRAULIC |
| 3273 | READY-MIXED CONCRETE |
| 3295 | MINERALS, GROUND OR TREATED |
| 3296 | MINERAL WOOL |
| 3312 | BLAST FURNACES AND STEEL MILLS |
| 3411 | METAL CANS |
| 3463 | NONFERROUS FORGINGS |

| | |
|------|------------------------------------|
| 3711 | MOTOR VEHICLES AND CAR BODIES |
| 3713 | TRUCK AND BUS BODIES |
| 4911 | ELECTRIC SERVICES |
| 4922 | NATURAL GAS TRANSMISSION |
| 4923 | GAS TRANSMISSION/DISTRIBUTION |
| 4931 | ELECTRIC & OTHER SERVICES COMBINED |
| 4953 | REFUSE SYSTEMS |
| 9199 | GENERAL GOVERNMENT, NEC |
| 9711 | NATIONAL SECURITY |

Study Approach

The approach used in evaluating the potential economic impact of the proposed annual fee on California businesses is as follows:

- (1) All affected businesses are identified from the ARB's 2002 emission inventory database. Standard Industrial Classification (SIC) codes reported by these businesses are listed in Table 1 above.
- (2) A sample of two to three typical businesses was selected from the list of affected facilities.
- (3) Annual fees for the fee program are estimated for each of these businesses based on the fee rates adopted by the Board for the FY 2003-2004.
- (4) The total annual fee for each business is adjusted for both federal and state taxes.
- (5) These adjusted fees are subtracted from net profit data and the results used to calculate the Return on Owners' Equity (ROE). The resulting ROE is then compared with the ROE before the subtraction of the adjusted fees to determine the impact on the profitability of the businesses. A reduction of more than 10 percent in profitability is considered to indicate a potential for significant adverse economic impacts. This threshold is consistent with the thresholds used by the U.S. Environmental Protection Agency and others.

Assumptions

Using financial data from 2000-2002, staff calculated the ROEs, before and after the subtraction of the adjusted fees, for the selected businesses from each category. These calculations were based on the following assumptions:

- (1) All affected businesses are subject to federal and state tax rates of 35 percent and 9.3 percent, respectively; and
- (2) Affected businesses neither increase the prices of their products nor lower their costs of doing business through cost-cutting measures because of the fee regulations.

These assumptions, though reasonable, might not be applicable to all affected businesses.

Potential Impact on Business

California businesses are affected by the proposed annual fee regulations to the extent that the implementation of the estimated fees reduces their profitability. Using ROE to measure profitability, we found that the average ROE for selected businesses from all categories would have declined by less than 0.01 percent in 2000-2002. This represents a small decline in the average profitability of the affected businesses. Assuming the fees continue in future years, their impact on business profitability is expected to be of the same magnitude.

First, some businesses are subject to higher fees than others due to the type of industry in which they are involved, the number of facilities which they operate, and the type and number of their devices and emitting processes. For individual facilities, the supplemental fee ranges from about \$6,000 to \$225,000. Second, the performance of businesses may vary from year to year. Hence, the 2000-2002 financial data used may not be representative of a typical-year performance for some businesses.

The potential impacts estimated here might be high because affected businesses probably would not absorb all of the increase in their costs of doing business. They would be able to either pass some of the cost on to consumers in the form of higher prices, reduce their costs, or both.

Potential Impact on Consumers

No noticeable change in consumer prices is expected from the estimated fees for FY 2004-2005. This is because the proposed fees would have only a small impact on the profitability of affected businesses. The impact would have been less if we had used the incremental change in annual fees for nonvehicular sources rather than the total annual fees in this analysis.

Potential Impact on Employment

Since the estimated fees impose a small cost impact on businesses, we expect no significant change in employment due to the imposition of the fees. However, the fees may impose a hardship on some businesses operating with little or no margin of profitability, affecting the creation of jobs in California.

Impact on Business Creation, Elimination, or Expansion

No change is expected to occur in the status of California businesses as a result of the proposed fees. This is because the fees have no significant impact on the profitability of businesses in California. However, should the fees impose hardship on California businesses operating with little or no margin of profitability, some affected businesses may decide not to expand in California.

Impact on Business Competitiveness

The proposed fees would have no material impact on the ability of California businesses to compete with businesses in other states. This is because the estimated fees do not impose a significant cost impact on California businesses.

Conclusion

Affected businesses are owned and operated by large companies. These businesses would appear to be able to absorb the costs of the proposed annual fee regulations without a significant adverse impact on their profitability. Assuming the fees continue in future years, the expected impact would be of the same magnitude.

Since the estimated fees impose no significant cost impact on businesses, we expect no significant change in employment; business creation, elimination, or expansion; and business competitiveness.

Appendix E

**FACILITY FEES DATA FOR FY 2003-2004 AND
PRELIMINARY FACILITY FEES DATA FOR FY 2004-2005**

Facility Fees Data for FY 2003-2004 and Preliminary Facility Fees Data for FY 2004-2005

| District | Facility Name | FY 2003-2004 Facility Fees | | | FY 2004-2005 Facility Fees | Supplemental Facility Fees | Total Fees |
|----------|--|----------------------------|----------------------------------|-----------------------------|----------------------------------|---------------------------------|---|
| | | 2001 Billable Emissions | \$17.4 Million (Approx \$84/ton) | 2002 Billable Emissions (1) | \$17.4 million (Approx \$91/ton) | \$2.6 million (Approx \$23/ton) | \$20.0m (Approx \$114/ton for Facilities) |
| BA | Valero Refining Company | 8,674 | \$728,876 | 9,790 | \$890,890 | \$225,170 | \$1,116,060 |
| MOJ | Cemex - Black Mountain Quarry | 6,752 | \$567,371 | 5,187 | \$472,017 | \$119,301 | \$591,318 |
| BA | Tesoro Refining and Marketing | 6,349 | \$533,506 | 6,044 | \$550,004 | \$139,012 | \$689,016 |
| SC | Chevron Products Co. | 5,632 | \$473,257 | 6,400 | \$582,400 | \$147,200 | \$729,600 |
| SC | AES Alamos, LLC. | 5,296 | \$445,023 | 2,497 | \$227,227 | \$57,431 | \$284,658 |
| BA | Shell Martinez Refining Company | 4,829 | \$405,781 | 5,295 | \$481,845 | \$121,785 | \$603,630 |
| BA | Chevron Products Company | 4,609 | \$387,294 | 5,529 | \$503,139 | \$127,167 | \$630,306 |
| KER | California Portland Cement Co. | 4,348 | \$365,362 | 4,200 | \$382,200 | \$96,600 | \$478,800 |
| SC | ExxonMobil Oil Corp. | 4,320 | \$363,010 | 5,046 | \$459,186 | \$116,058 | \$575,244 |
| MOJ | TXI Riverside Cement Company | 4,186 | \$351,750 | 6,079 | \$553,189 | \$139,817 | \$693,006 |
| SC | AES Redondo Beach, LLC. | 3,425 | \$287,803 | 380 | \$34,580 | \$8,740 | \$43,320 |
| SLO | Conoco Phillips Tosco Santa Maria Refinery | 3,739 | \$314,188 | 3,760 | \$342,160 | \$86,480 | \$428,640 |
| NCU | PG&E-Humboldt Bay Plant | 3,700 | \$310,911 | 903 | \$82,173 | \$20,769 | \$102,942 |
| SC | BP West Coast Products, LLC. | 3,536 | \$297,130 | 3,014 | \$274,274 | \$69,322 | \$343,596 |
| BA | Mirant Delta, LLC. | 3,459 | \$290,660 | 733 | \$66,703 | \$16,859 | \$83,562 |
| BA | Hanson Permanente Cement | 2,490 | \$209,235 | 1,792 | \$163,072 | \$41,216 | \$204,288 |
| SC | Conoco Phillips | 2,450 | \$205,874 | 2,212 | \$201,292 | \$50,876 | \$252,168 |
| MOJ | Mitsubishi Cement 2000 | 2,243 | \$188,479 | 2,845 | \$258,895 | \$65,435 | \$324,330 |
| MBU | Duke Energy Moss Landing LLC. | 2,173 | \$182,597 | 297 | \$27,027 | \$6,831 | \$33,858 |
| SC | Equilon Enterprises LLC. | 2,094 | \$175,959 | 1,697 | \$154,427 | \$39,031 | \$193,458 |
| BA | Conoco PhillipsTosco Refining Company | 1,945 | \$163,438 | 2,134 | \$194,194 | \$49,082 | \$243,276 |
| MOJ | Southern California Gas Co. | 1,917 | \$161,086 | 1,917 | \$174,447 | \$44,091 | \$218,538 |
| MOJ | IMC Chemicals, Inc. | 1,786 | \$150,078 | 2,352 | \$214,032 | \$54,096 | \$268,128 |
| KER | National Cement Co. | 1,659 | \$139,406 | 1,441 | \$131,131 | \$33,143 | \$164,274 |
| MBU | RMC Pacific Materials | 1,502 | \$126,213 | 1,544 | \$140,504 | \$35,512 | \$176,016 |
| BA | Phillips 66 Company - San Francisco | 1,459 | \$122,600 | 2,134 | \$194,194 | \$49,082 | \$243,276 |
| SJU | Guardian Industries Corp. | 1,402 | \$117,810 | 1,431 | \$130,221 | \$32,913 | \$163,134 |
| MOJ | Reliant Energy | 1,291 | \$108,483 | 909 | \$82,719 | \$20,907 | \$103,626 |
| SJU | Occidental of Elk Hills, Inc. | 1,276 | \$107,222 | 753 | \$68,523 | \$17,319 | \$85,842 |
| SC | California Portland Cement Co. | 1,257 | \$105,626 | 975 | \$88,725 | \$22,425 | \$111,150 |
| SC | Conoco Phillips Tosco Refining Company | 1,257 | \$105,626 | 1,455 | \$132,405 | \$33,465 | \$165,870 |

Facility Fees Data for FY 2003-2004 and Preliminary Facility Fees Data for FY 2004-2005

| District | Facility Name | FY 2003-2004 Facility Fees | | | FY 2004-2005 Facility Fees | Supplemental Facility Fees | Total Fees |
|----------|---------------------------------|----------------------------|----------------------------------|-----------------------------|----------------------------------|---------------------------------|---|
| | | 2001 Billable Emissions | \$17.4 Million (Approx \$84/ton) | 2002 Billable Emissions (1) | \$17.4 million (Approx \$91/ton) | \$2.6 million (Approx \$23/ton) | \$20.0m (Approx \$114/ton for Facilities) |
| SJU | Pilkington North America, Inc. | 1,240 | \$104,197 | 1,249 | \$113,659 | \$28,727 | \$142,386 |
| SB | Cellite Corporation | 1,218 | \$102,349 | 1,111 | \$101,101 | \$25,553 | \$126,654 |
| BA | Mirant Delta, LLC. | 1,164 | \$97,811 | 733 | \$66,703 | \$16,859 | \$83,562 |
| SD | Cabrillo Power I LLC., Encina | 1,164 | \$97,811 | 276 | \$25,116 | \$6,348 | \$31,464 |
| MOJ | Southern California Gas Co. | 1,157 | \$97,223 | 1,157 | \$105,287 | \$26,611 | \$131,898 |
| MOJ | PG&E Topock Compressor Station | 1,140 | \$95,794 | 1,140 | \$103,740 | \$26,220 | \$129,960 |
| SC | Ultramar Inc. | 1,034 | \$86,887 | 950 | \$86,450 | \$21,850 | \$108,300 |
| SJU | Aera Energy LLC. | 989 | \$83,106 | 1,127 | \$102,557 | \$25,921 | \$128,478 |
| KER | Lehigh Southwest Cement Co. | 962 | \$80,837 | 882 | \$80,262 | \$20,286 | \$100,548 |
| SC | El Segundo Power, LLC. | 951 | \$79,913 | 831 | \$75,621 | \$19,113 | \$94,734 |
| KER | U.S. Borax | 883 | \$74,198 | 1,005 | \$91,455 | \$23,115 | \$114,570 |
| SLO | Duke Energy Morro Bay | 838 | \$70,417 | 288 | \$26,208 | \$6,624 | \$32,832 |
| SJU | Owens-Brockway Glass Container | 760 | \$63,863 | 571 | \$51,961 | \$13,133 | \$65,094 |
| SJU | Gallo Glass Company | 625 | \$52,519 | 267 | \$24,297 | \$6,141 | \$30,438 |
| MOJ | PG&E Hinkley Compressor Station | 579 | \$48,653 | 579 | \$52,689 | \$13,317 | \$66,006 |
| MOJ | AFG Industries Inc. | 578 | \$48,569 | 578 | \$52,598 | \$13,294 | \$65,892 |
| BA | Mirant Potrero, LLC. | 568 | \$47,729 | 0 | \$0 | \$0 | \$0 |
| SJU | Chevron USA Inc. | 545 | \$45,796 | 591 | \$53,781 | \$13,593 | \$67,374 |
| SHA | Lehigh Southwest Cement Co. | 494 | \$41,511 | 527 | \$47,957 | \$12,121 | \$60,078 |
| SJU | Saint-Gobain Containers, Inc. | 489 | \$41,091 | 518 | \$47,138 | \$11,914 | \$59,052 |
| SJU | Chevron USA Inc. | 484 | \$40,671 | 591 | \$53,781 | \$13,593 | \$67,374 |
| BA | Owens-Brockway Glass Container | 483 | \$40,586 | 558 | \$50,778 | \$12,834 | \$63,612 |
| SHA | Wheelabrator Shasta E.C.I. | 477 | \$40,082 | 592 | \$53,872 | \$13,616 | \$67,488 |
| SJU | Kern River Cogeneration Co. | 470 | \$39,494 | 579 | \$52,689 | \$13,317 | \$66,006 |
| SJU | Sycamore Cogeneration Co. | 448 | \$37,645 | 472 | \$42,952 | \$10,856 | \$53,808 |
| SC | Southern California Edison Co. | 435 | \$36,553 | 319 | \$29,029 | \$7,337 | \$36,366 |
| SJU | Aera Energy LLC. | 423 | \$35,545 | 361 | \$32,851 | \$8,303 | \$41,154 |
| BA | New United Motor Manufacturing | 413 | \$34,704 | 581 | \$52,871 | \$13,363 | \$66,234 |
| COL | PG&E Delevan Compressor Station | 387 | \$32,520 | 356 | \$32,396 | \$8,188 | \$40,584 |
| SC | MCP Foods Inc. | 386 | \$32,436 | 0 | \$0 | \$0 | \$0 |
| SC | Reliant Energy Etiwanda, LLC. | 361 | \$30,335 | 0 | \$0 | \$0 | \$0 |
| NCU | Samoa-Pacific Cellulose, LLC. | 339 | \$28,486 | 351 | \$31,941 | \$8,073 | \$40,014 |

Facility Fees Data for FY 2003-2004 and Preliminary Facility Fees Data for FY 2004-2005

| District | Facility Name | FY 2003-2004 Facility Fees | | | FY 2004-2005 Facility Fees | Supplemental Facility Fees | Total Fees |
|---------------------|---|----------------------------|----------------------------------|-----------------------------|----------------------------------|---------------------------------|---|
| | | 2001 Billable Emissions | \$17.4 Million (Approx \$84/ton) | 2002 Billable Emissions (1) | \$17.4 million (Approx \$91/ton) | \$2.6 million (Approx \$23/ton) | \$20.0m (Approx \$114/ton for Facilities) |
| SJU | Covanta Stanislaus, Inc. | 339 | \$28,486 | 337 | \$30,667 | \$7,751 | \$38,418 |
| SC | Lasco Bathware (formerly Tomkins Industries Inc.) | 328 | \$27,562 | 278 | \$25,298 | \$6,394 | \$31,692 |
| SC | Long Beach City, SERRF Project | 315 | \$26,469 | 316 | \$28,756 | \$7,268 | \$36,024 |
| BA | Gilroy Energy Center, LLC. | 311 | \$26,133 | 261 | \$23,751 | \$6,003 | \$29,754 |
| MOJ | Southern California Gas Co. | 311 | \$26,133 | 0 | \$0 | \$0 | \$0 |
| BA | Rhodia Inc. | 307 | \$25,797 | 358 | \$32,578 | \$8,234 | \$40,812 |
| SJV | Chevron USA Inc. | 252 | \$21,176 | 401 | \$36,491 | \$9,223 | \$45,714 |
| SC | LA City, DWP Scattergood Generation | 304 | \$25,545 | 311 | \$28,301 | \$7,153 | \$35,454 |
| MOJ | ACE Cogeneration Co. | 295 | \$24,789 | 296 | \$26,936 | \$6,808 | \$33,744 |
| SD | Duke Energy-South Bay Power Plant | 294 | \$24,705 | 0 | \$0 | \$0 | \$0 |
| SC | BP Wilmington | 291 | \$24,453 | 3,014 | \$274,274 | \$69,322 | \$343,596 |
| SC | Tabc, Inc. | 286 | \$24,033 | 278 | \$25,298 | \$6,394 | \$31,692 |
| BA | Ball Metal Beverage Container | 279 | \$23,444 | 280 | \$25,480 | \$6,440 | \$31,920 |
| SB | Orcutt Hill I.C. Engines | 279 | \$23,444 | 0 | \$0 | \$0 | \$0 |
| IMP | Imperial Irrigation District | 271 | \$22,772 | 272 | \$24,752 | \$6,256 | \$31,008 |
| SHA | Pacific Gas & Electric | 254 | \$21,344 | 254 | \$23,114 | \$5,842 | \$28,956 |
| | Total Facilities | 128,255 | \$10,777,270 | 116,541 | 10,605,231 | \$2,680,443 | \$13,285,674 |
| (1) as of 9/14/2004 | | | | | | | |

TITLE 17. CALIFORNIA AIR RESOURCES BOARD**NOTICE OF PUBLIC HEARING TO CONSIDER PROPOSED AMENDMENTS TO THE
EFFECTIVE AND OPERATIVE DATES FOR ENHANCED VAPOR RECOVERY
STANDARDS IN THE REGULATION FOR CERTIFICATION OF VAPOR RECOVERY
SYSTEMS OF GASOLINE DISPENSING FACILITIES
(SERVICE STATIONS)**

The Air Resources Board (ARB or Board) will conduct a public hearing at the time and place noted below to consider adoption of amendments to the regulations for certification of vapor recovery systems installed at gasoline dispensing facilities (service stations and similar facilities).

DATE: November 18, 2004

TIME: 9:00 a.m.

PLACE: California Environmental Protection Agency
Air Resources Board
Central Valley Auditorium, Second Floor
1001 I Street
Sacramento, California 95814

This item will be considered at a two-day meeting of the ARB, which will commence at 9:00 a.m., November 18, 2004, and may continue at 8:30 a.m., November 19, 2004. This item may not be considered until November 19, 2004. Please consult the agenda for the meeting, which will be available at least 10 days before November 18, 2004, to determine the time when this item will be considered.

If you have a disability-related accommodation need, please go to <http://www.arb.ca.gov/html/ada/ada.htm> for assistance or contact the ADA Coordinator at (916) 323-4916. If you are a person who needs assistance in a language other than English, contact the Bilingual Coordinator at (916) 324-5049. TTY/TDD/Speech-to-Speech users may dial 7-1-1 for the California Relay Service.

**INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT
OVERVIEW**

Sections Affected: Proposed amendments to section 94011, title 17, California Code of Regulations (CCR), and Table 2-1 in the Vapor Recovery Certification Procedure, CP-201, as last amended July 22, 2004.

Background:

The Air Resources Board (Board or ARB) certifies the vapor recovery equipment that is used in service stations, also referred to as gasoline dispensing facilities (GDFs). Control of

the emissions of air pollutants from GDFs is necessary to reduce hydrocarbon emissions that lead to the formation of ozone and to control emissions of benzene, a constituent of gasoline vapor that has been identified as a toxic air contaminant. The ARB is currently implementing the Enhanced Vapor Recovery (EVR) program, which requires that vapor recovery systems be compatible with fueling vehicles equipped with onboard refueling vapor recovery (ORVR) by April 1, 2005. The EVR program also requires several additional vapor recovery system standards to be met by April 1, 2009.

Need for Amendment and Adoption

Gasoline marketers, service station operators, air pollution control districts and many vapor recovery equipment manufacturers have notified the ARB that more time is needed for existing service stations to upgrade equipment to meet the April 1, 2005, ORVR compatibility deadline. Gasoline marketers have been waiting for a manufacturer to develop and obtain the ARB's certification of a vapor recovery system that meets all EVR requirements to avoid having to upgrade equipment twice, once to meet the April 1, 2005, ORVR compatibility and then a second time to meet the remaining EVR standards.

The first EVR Phase II system is expected to be certified by November 2004 at the earliest. Under the current ORVR compatibility deadline, existing service stations would have four months or less to complete the required upgrades once an EVR Phase II system is certified. During this time, an estimated 3,500 stations will need to choose an EVR or ORVR compatible system, apply and obtain permits, retain a contractor, and install the vapor recovery equipment. Because obtaining the necessary permits alone may take one to three months, it is not feasible to upgrade thousands of service stations by the current April 1, 2005, deadline.

EVR effective and operative dates applicable to new facilities have been delayed previously when it has taken longer than anticipated to certify a system complying with all EVR requirements. The existing regulations allow the Executive Officer to issue executive orders allowing continued installation of pre-EVR systems when the Executive Officer determines that EVR systems are not commercially available. Executive Order G-70-203 extended the EVR Phase II system deadline for new installations from April 1, 2004, to October 1, 2004. Executive Order G-70-205 further extended the EVR Phase II implementation date to January 1, 2005, and the in-station diagnostics (ISD) implementation date to April 1, 2005. These Executive Order actions are not reflected in the effective and operative dates in the regulation and clarification is needed. The proposed action would make the required clarifications.

Summary of Staff Proposal

Staff proposes to amend the regulations to extend the ORVR compatibility deadline for existing GDFs by one year to April 1, 2006, and to amend other EVR regulation compliance dates to be consistent with the extensions provided in Executive Orders G-70-203 and G-70-205. Staff has determined that a one-year extension will provide sufficient time for all stations to comply with all of the EVR requirements in an orderly process. Specifically, an extension would also enable the installation of a full EVR Phase II system before the

ORVR compatibility deadline. Staff also proposes to amend the effective date for in-station diagnostics (ISD) for medium throughput stations to April 1, 2006, to maintain the ISD phase-in schedule.

Staff's proposal would change the implementation schedule of the Enhanced Vapor Recovery program. This proposal does not impose additional standards or relax existing standards, but provides more time for gasoline dispensing facility operators to comply with existing requirements.

ARB staff proposes to revise Table 2-1 of CP-201, "Certification Procedure for Vapor Recovery Systems at Gasoline Dispensing Facilities," and to amend title 17, CCR, sections 94011, which incorporates CP-201 by reference.

COMPARABLE FEDERAL REGULATIONS

There are no comparable federal regulations that certify gasoline recovery systems for service stations; however, changes to ARB vapor recovery regulations have a national impact. ARB certification is required by most other states which mandate Phase I or Phase II vapor recovery at service stations.

AVAILABILITY OF DOCUMENTS AND AGENCY CONTACT PERSONS

The ARB staff has prepared a Staff Report: Initial Statement of Reasons (ISOR) for the proposed regulatory action that includes a summary of the environmental and economic impacts of the proposal. The report is entitled: "Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Public Hearing to Consider Proposed Amendments to the Effective and Operative Dates for Enhanced Vapor Recovery Standards in the Regulation for Certification of Vapor Recovery Systems of Gasoline Dispensing Facilities (Service Stations)."

Copies of the ISOR and full text of the proposed regulatory language, in underline and strike-out format to allow for comparison with the existing regulations, may be obtained from the ARB's Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, 1st Floor, Sacramento, California 95814, (916) 322-2990, at least 45 days prior to the scheduled hearing (November 18, 2004).

Upon its completion, the Final Statement of Reasons (FSOR) will be available and copies may be requested from the agency contact persons in this notice, or may be accessed on the web site listed below.

Requests for printed documents and inquiries concerning the substance of the proposed regulations may be directed to the designated agency contact persons: Cindy Castronovo or George Lew, Engineering and Certification Branch, Monitoring and Laboratory Division, at (916) 327-0900.

Further, the agency representative and designated back-up contact person to whom non-substantive inquiries concerning the proposed administrative action may be directed are

Artavia Edwards, Manager, Board Administration and Regulatory Coordination Unit, (916) 322-6070, or Amy Whiting, Regulations Coordinator, (916) 322-6533. The Board has compiled a record for this rulemaking action, which includes all the information upon which the proposal is based. This material is available for inspection upon request to the contact persons.

This notice, the ISOR, and all subsequent regulatory documents, including the FSOR, when completed, are available on the ARB Internet site for this rulemaking at <http://www.arb.ca.gov/reqact/ORVRext/ORVRext.htm>.

COSTS TO PUBLIC AGENCIES AND TO BUSINESSES AND PERSONS AFFECTED

The determinations of the Board's Executive Officer concerning the cost or savings necessarily incurred by public agencies and private persons and businesses in reasonable compliance with the proposed regulatory action are presented below.

In developing this regulatory proposal, the ARB staff evaluated the potential economic impacts on representative private persons and businesses. The ARB has determined that affected gasoline station operators may each save \$1,500 to \$22,000 by having the option to upgrade once to a vapor recovery system that meets the ORVR requirement and all other EVR requirements. The ARB is not aware of any costs that a representative private person or business would necessarily incur in reasonable compliance with the proposed action. Gasoline dispensing facilities operated by state and local agencies, such as the Department of General Services, California Highway Patrol or Caltrans, may realize similar cost savings.

Pursuant to Government Code sections 11346.5(a)(5) and 11346.5(a)(6), the Executive Officer has determined that the proposed regulatory action will not create costs or savings, to any state agency or in federal funding to the state, costs or mandate to any local agency or school district whether or not reimbursable by the state pursuant to part 7 (commencing with section 17500), division 4, title 2 of the Government Code, except as discussed above, or other nondiscretionary savings to state or local agencies.

The Executive Officer has made an initial determination that the proposed regulatory action will not have a significant statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states, or on representative private persons.

In accordance with Government Code section 11346.3, the Executive Officer has initially determined that the proposed amendments will not affect the creation or elimination of jobs within the State of California, the creation of new businesses and the elimination of existing businesses within the State of California, and the expansion of businesses currently doing business within the State of California. A detailed assessment of the economic impacts of the proposed regulatory action can be found in the ISOR.

The Executive Officer has also determined, pursuant to title 1, CCR, section 4, that the proposed regulatory action will affect small businesses that own or operate gasoline dispensing facilities (service stations).

In accordance with Government Code sections 11346.3(c) and 11346.5(a)(11), the Executive Officer has found that the reporting requirements in the regulations and incorporated documents that apply to businesses are necessary for the health, safety, and welfare of the people of the State of California.

Before taking final action on the proposed regulatory action, the ARB must determine that no reasonable alternative considered by the ARB or that has otherwise been identified and brought to the attention of the ARB would be more effective in carrying out the purpose for which the action is proposed or would be as effective and less burdensome to affected private persons or businesses than the proposed action.

A detailed assessment of the economic impacts of the proposed regulatory action can be found in the ISOR.

SUBMITTAL OF COMMENTS

The public may present comments relating to this matter orally or in writing at the hearing, and in writing, or by e-mail before the hearing. To be considered by the Board, written submissions not physically submitted at the hearing must be received no later than **12:00 noon November 17, 2004**, and addressed to the following:

Postal Mail is to be sent to:

Clerk of the Board
Air Resources Board
1001 I Street, 23rd Floor
Sacramento, CA 95814

Electronic mail is to be sent to: ORVRext@listserv.arb.ca.gov and received at the ARB no later than **12:00 noon, November 17, 2004**.

Facsimile submissions are to be transmitted to the Clerk of the Board at (916) 322-3928 and received at the ARB no later than **12:00 noon, November 17, 2004**.

The Board requests, but does not require, 30 copies of any written statement be submitted and that all written statements be filed at least 10 days prior to the hearing so that ARB staff and Board Members have time to fully consider each comment. The ARB encourages members of the public to bring any suggestions for modification of the proposed regulatory action to the attention of staff in advance of the hearing.

STATUTORY AUTHORITY AND REFERENCES

This regulatory action is proposed under the authority granted to the ARB in sections 39600, 39601, 39607, and 41954 of the Health and Safety Code. This action is proposed to implement, interpret, or make specific sections 39515, 41952, 41954, 41956.1, 41959, 41960 and 41960.2 of the Health and Safety Code.

HEARING PROCEDURES

The public hearing will be conducted in accordance with the California Administrative Procedure Act, title 2, division 3, part 1, chapter 3.5 (commencing with section 11340) of the Government Code.

Following the public hearing, the ARB may adopt the regulatory language as originally proposed or with nonsubstantial or grammatical modifications. The ARB may also adopt the proposed regulatory language with other modifications if the modifications are sufficiently related to the originally proposed text that the public was adequately placed on notice that the regulatory language as modified could result from the proposed regulatory action. In the event that such modifications are made, the full regulatory text, with the modifications clearly indicated, will be made available to the public for written comment at least 15 days before it is adopted.

The public may request a copy of the modified regulatory text from the ARB's Public Information Office, Visitors and Environmental Services Center, 1001 I Street, First Floor, Sacramento, California 95814, (916) 322-2990.

California Air Resources Board


Catherine Witherspoon
Executive Officer

Date: September 21, 2004

"The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Web-site at www.arb.ca.gov."

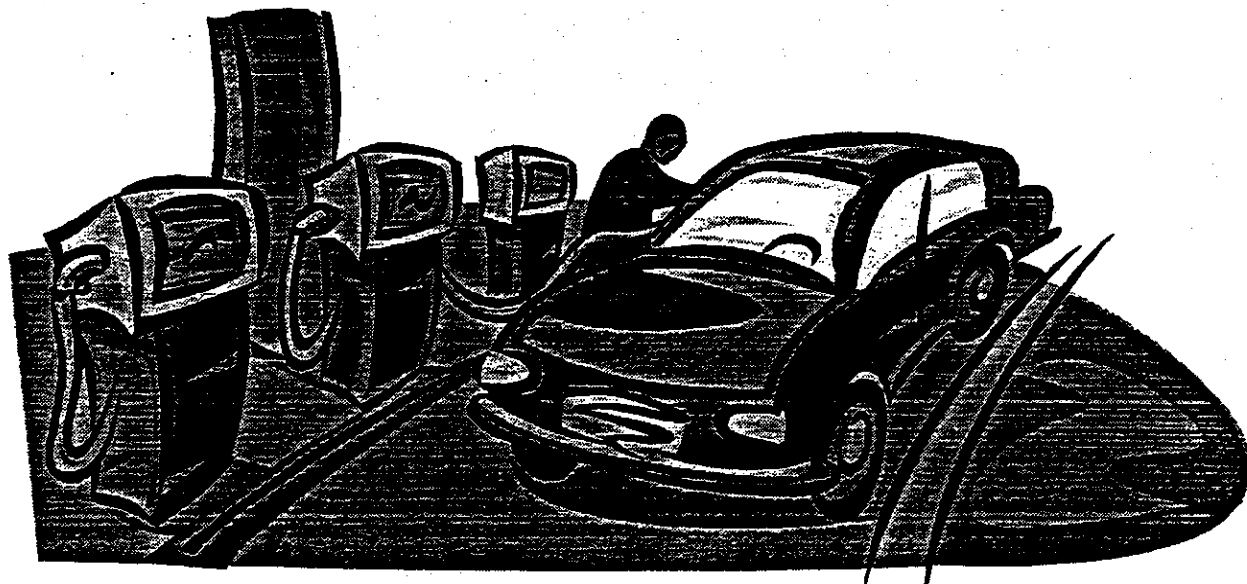
California Environmental Protection Agency

 **Air Resources Board**

HEARING NOTICE AND STAFF REPORT

**INITIAL STATEMENT OF REASONS FOR PROPOSED RULEMAKING,
PUBLIC HEARING TO CONSIDER PROPOSED AMENDMENTS TO THE
EFFECTIVE AND OPERATIVE DATES FOR ENHANCED VAPOR
RECOVERY STANDARDS IN THE REGULATION FOR CERTIFICATION
OF VAPOR RECOVERY SYSTEMS OF GASOLINE DISPENSING
FACILITIES (SERVICE STATIONS)**

October 1, 2004



TITLE 17. CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER PROPOSED AMENDMENTS TO THE EFFECTIVE AND OPERATIVE DATES FOR ENHANCED VAPOR RECOVERY STANDARDS IN THE REGULATION FOR CERTIFICATION OF VAPOR RECOVERY SYSTEMS OF GASOLINE DISPENSING FACILITIES (SERVICE STATIONS)

The Air Resources Board (ARB or Board) will conduct a public hearing at the time and place noted below to consider adoption of amendments to the regulations for certification of vapor recovery systems installed at gasoline dispensing facilities (service stations and similar facilities).

DATE: November 18, 2004

TIME: 9:00 a.m.

PLACE: California Environmental Protection Agency
Air Resources Board
Central Valley Auditorium, Second Floor
1001 I Street
Sacramento, California 95814

This item will be considered at a two-day meeting of the ARB, which will commence at 9:00 a.m., November 18, 2004, and may continue at 8:30 a.m., November 19, 2004. This item may not be considered until November 19, 2004. Please consult the agenda for the meeting, which will be available at least 10 days before November 18, 2004, to determine the time when this item will be considered.

If you have a disability-related accommodation need, please go to <http://www.arb.ca.gov/html/ada/ada.htm> for assistance or contact the ADA Coordinator at (916) 323-4916. If you are a person who needs assistance in a language other than English, contact the Bilingual Coordinator at (916) 324-5049. TTY/TDD/Speech-to-Speech users may dial 7-1-1 for the California Relay Service.

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW

Sections Affected: Proposed amendments to section 94011, title 17, California Code of Regulations (CCR), and Table 2-1 in the Vapor Recovery Certification Procedure, CP-201, as last amended July 22, 2004.

Background:

The Air Resources Board (Board or ARB) certifies the vapor recovery equipment that is used in service stations, also referred to as gasoline dispensing facilities (GDFs). Control of

the emissions of air pollutants from GDFs is necessary to reduce hydrocarbon emissions that lead to the formation of ozone and to control emissions of benzene, a constituent of gasoline vapor that has been identified as a toxic air contaminant. The ARB is currently implementing the Enhanced Vapor Recovery (EVR) program, which requires that vapor recovery systems be compatible with fueling vehicles equipped with onboard refueling vapor recovery (ORVR) by April 1, 2005. The EVR program also requires several additional vapor recovery system standards to be met by April 1, 2009.

Need for Amendment and Adoption

Gasoline marketers, service station operators, air pollution control districts and many vapor recovery equipment manufacturers have notified the ARB that more time is needed for existing service stations to upgrade equipment to meet the April 1, 2005, ORVR compatibility deadline. Gasoline marketers have been waiting for a manufacturer to develop and obtain the ARB's certification of a vapor recovery system that meets all EVR requirements to avoid having to upgrade equipment twice, once to meet the April 1, 2005, ORVR compatibility and then a second time to meet the remaining EVR standards.

The first EVR Phase II system is expected to be certified by November 2004 at the earliest. Under the current ORVR compatibility deadline, existing service stations would have four months or less to complete the required upgrades once an EVR Phase II system is certified. During this time, an estimated 3,500 stations will need to choose an EVR or ORVR compatible system, apply and obtain permits, retain a contractor, and install the vapor recovery equipment. Because obtaining the necessary permits alone may take one to three months, it is not feasible to upgrade thousands of service stations by the current April 1, 2005, deadline.

EVR effective and operative dates applicable to new facilities have been delayed previously when it has taken longer than anticipated to certify a system complying with all EVR requirements. The existing regulations allow the Executive Officer to issue executive orders allowing continued installation of pre-EVR systems when the Executive Officer determines that EVR systems are not commercially available. Executive Order G-70-203 extended the EVR Phase II system deadline for new installations from April 1, 2004, to October 1, 2004. Executive Order G-70-205 further extended the EVR Phase II implementation date to January 1, 2005, and the in-station diagnostics (ISD) implementation date to April 1, 2005. These Executive Order actions are not reflected in the effective and operative dates in the regulation and clarification is needed. The proposed action would make the required clarifications.

Summary of Staff Proposal

Staff proposes to amend the regulations to extend the ORVR compatibility deadline for existing GDFs by one year to April 1, 2006, and to amend other EVR regulation compliance dates to be consistent with the extensions provided in Executive Orders G-70-203 and G-70-205. Staff has determined that a one-year extension will provide sufficient time for all stations to comply with all of the EVR requirements in an orderly process. Specifically, an extension would also enable the installation of a full EVR Phase II system before the

ORVR compatibility deadline. Staff also proposes to amend the effective date for in-station diagnostics (ISD) for medium throughput stations to April 1, 2006, to maintain the ISD phase-in schedule.

Staff's proposal would change the implementation schedule of the Enhanced Vapor Recovery program. This proposal does not impose additional standards or relax existing standards, but provides more time for gasoline dispensing facility operators to comply with existing requirements.

ARB staff proposes to revise Table 2-1 of CP-201, "Certification Procedure for Vapor Recovery Systems at Gasoline Dispensing Facilities," and to amend title 17, CCR, sections 94011, which incorporates CP-201 by reference.

COMPARABLE FEDERAL REGULATIONS

There are no comparable federal regulations that certify gasoline recovery systems for service stations; however, changes to ARB vapor recovery regulations have a national impact. ARB certification is required by most other states which mandate Phase I or Phase II vapor recovery at service stations.

AVAILABILITY OF DOCUMENTS AND AGENCY CONTACT PERSONS

The ARB staff has prepared a Staff Report: Initial Statement of Reasons (ISOR) for the proposed regulatory action that includes a summary of the environmental and economic impacts of the proposal. The report is entitled: "Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Public Hearing to Consider Proposed Amendments to the Effective and Operative Dates for Enhanced Vapor Recovery Standards in the Regulation for Certification of Vapor Recovery Systems of Gasoline Dispensing Facilities (Service Stations)."

Copies of the ISOR and full text of the proposed regulatory language, in underline and strike-out format to allow for comparison with the existing regulations, may be obtained from the ARB's Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, 1st Floor, Sacramento, California 95814, (916) 322-2990, at least 45 days prior to the scheduled hearing (November 18, 2004).

Upon its completion, the Final Statement of Reasons (FSOR) will be available and copies may be requested from the agency contact persons in this notice, or may be accessed on the web site listed below.

Requests for printed documents and inquiries concerning the substance of the proposed regulations may be directed to the designated agency contact persons: Cindy Castronovo or George Lew, Engineering and Certification Branch, Monitoring and Laboratory Division, at (916) 327-0900.

Further, the agency representative and designated back-up contact person to whom non-substantive inquiries concerning the proposed administrative action may be directed are

Artavia Edwards, Manager, Board Administration and Regulatory Coordination Unit, (916) 322-6070, or Amy Whiting, Regulations Coordinator, (916) 322-6533. The Board has compiled a record for this rulemaking action, which includes all the information upon which the proposal is based. This material is available for inspection upon request to the contact persons.

This notice, the ISOR, and all subsequent regulatory documents, including the FSOR, when completed, are available on the ARB Internet site for this rulemaking at <http://www.arb.ca.gov/regact/ORVRExt/ORVRExt.htm>.

COSTS TO PUBLIC AGENCIES AND TO BUSINESSES AND PERSONS AFFECTED

The determinations of the Board's Executive Officer concerning the cost or savings necessarily incurred by public agencies and private persons and businesses in reasonable compliance with the proposed regulatory action are presented below.

In developing this regulatory proposal, the ARB staff evaluated the potential economic impacts on representative private persons and businesses. The ARB has determined that affected gasoline station operators may each save \$1,500 to \$22,000 by having the option to upgrade once to a vapor recovery system that meets the ORVR requirement and all other EVR requirements. The ARB is not aware of any costs that a representative private person or business would necessarily incur in reasonable compliance with the proposed action. Gasoline dispensing facilities operated by state and local agencies, such as the Department of General Services, California Highway Patrol or Caltrans, may realize similar cost savings.

Pursuant to Government Code sections 11346.5(a)(5) and 11346.5(a)(6), the Executive Officer has determined that the proposed regulatory action will not create costs or savings, to any state agency or in federal funding to the state, costs or mandate to any local agency or school district whether or not reimbursable by the state pursuant to part 7 (commencing with section 17500), division 4, title 2 of the Government Code, except as discussed above, or other nondiscretionary savings to state or local agencies.

The Executive Officer has made an initial determination that the proposed regulatory action will not have a significant statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states, or on representative private persons.

In accordance with Government Code section 11346.3, the Executive Officer has initially determined that the proposed amendments will not affect the creation or elimination of jobs within the State of California, the creation of new businesses and the elimination of existing businesses within the State of California, and the expansion of businesses currently doing business within the State of California. A detailed assessment of the economic impacts of the proposed regulatory action can be found in the ISOR.

The Executive Officer has also determined, pursuant to title 1, CCR, section 4, that the proposed regulatory action will affect small businesses that own or operate gasoline dispensing facilities (service stations).

In accordance with Government Code sections 11346.3(c) and 11346.5(a)(11), the Executive Officer has found that the reporting requirements in the regulations and incorporated documents that apply to businesses are necessary for the health, safety, and welfare of the people of the State of California.

Before taking final action on the proposed regulatory action, the ARB must determine that no reasonable alternative considered by the ARB or that has otherwise been identified and brought to the attention of the ARB would be more effective in carrying out the purpose for which the action is proposed or would be as effective and less burdensome to affected private persons or businesses than the proposed action.

A detailed assessment of the economic impacts of the proposed regulatory action can be found in the ISOR.

SUBMITTAL OF COMMENTS

The public may present comments relating to this matter orally or in writing at the hearing, and in writing, or by e-mail before the hearing. To be considered by the Board, written submissions not physically submitted at the hearing must be received no later than 12:00 noon November 17, 2004, and addressed to the following:

Postal Mail is to be sent to:

Clerk of the Board
Air Resources Board
1001 I Street, 23rd Floor
Sacramento, CA 95814

Electronic mail is to be sent to: ORVRext@listserv.arb.ca.gov and received at the ARB no later than 12:00 noon, November 17, 2004.

Facsimile submissions are to be transmitted to the Clerk of the Board at (916) 322-3928 and received at the ARB no later than 12:00 noon, November 17, 2004.

The Board requests, but does not require, 30 copies of any written statement be submitted and that all written statements be filed at least 10 days prior to the hearing so that ARB staff and Board Members have time to fully consider each comment. The ARB encourages members of the public to bring any suggestions for modification of the proposed regulatory action to the attention of staff in advance of the hearing.

STATUTORY AUTHORITY AND REFERENCES

This regulatory action is proposed under the authority granted to the ARB in sections 39600, 39601, 39607, and 41954 of the Health and Safety Code. This action is proposed to implement, interpret, or make specific sections 39515, 41952, 41954, 41956.1, 41959, 41960 and 41960.2 of the Health and Safety Code.

HEARING PROCEDURES

The public hearing will be conducted in accordance with the California Administrative Procedure Act, title 2, division 3, part 1, chapter 3.5 (commencing with section 11340) of the Government Code.

Following the public hearing, the ARB may adopt the regulatory language as originally proposed or with nonsubstantial or grammatical modifications. The ARB may also adopt the proposed regulatory language with other modifications if the modifications are sufficiently related to the originally proposed text that the public was adequately placed on notice that the regulatory language as modified could result from the proposed regulatory action. In the event that such modifications are made, the full regulatory text, with the modifications clearly indicated, will be made available to the public for written comment at least 15 days before it is adopted.

The public may request a copy of the modified regulatory text from the ARB's Public Information Office, Visitors and Environmental Services Center, 1001 I Street, First Floor, Sacramento, California 95814, (916) 322-2990.

California Air Resources Board


Catherine Witherspoon
Executive Officer

Date: September 21, 2004

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California Environmental Protection Agency

 **Air Resources Board**

**STAFF REPORT:
INITIAL STATEMENT OF REASONS FOR PROPOSED RULEMAKING,
PUBLIC HEARING TO CONSIDER PROPOSED AMENDMENTS TO THE EFFECTIVE AND
OPERATIVE DATES FOR ENHANCED VAPOR RECOVERY STANDARDS IN THE
REGULATION FOR CERTIFICATION OF VAPOR RECOVERY SYSTEMS OF GASOLINE
DISPENSING FACILITIES (SERVICE STATIONS)**

Date of Release: October 1, 2004

Scheduled for Consideration: November 18 or 19, 2004

**Location: California Environmental Protection Agency (Cal-EPA)
Headquarters Building
1001 I Street
Sacramento, CA 95814**

**Air Resources Board
P.O. Box 2815
Sacramento, CA 95812**

This report has been reviewed by the staff of the California Air Resources Board and approved for publication. Publication does not signify that the contents reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

**STAFF REPORT:
INITIAL STATEMENT OF REASONS FOR PROPOSED RULE MAKING,
PUBLIC HEARING TO CONSIDER PROPOSED AMENDMENTS TO THE EFFECTIVE
AND OPERATIVE DATES FOR ENHANCED VAPOR RECOVERY STANDARDS IN
THE REGULATION FOR CERTIFICATION OF VAPOR RECOVERY SYSTEMS OF
DISPENSING FACILITIES
(GASOLINE SERVICE STATIONS)**

Prepared by:

**Cindy Castronovo
Monitoring and Laboratory Division**

Reviewed by:

**William V. Loscutoff, Chief, Monitoring and Laboratory Division
George Lew, Chief, Engineering and Certification Branch
Kirk Oliver, Senior Staff Counsel**

ACKNOWLEDGEMENTS

Staff wishes to acknowledge the participation and assistance of individuals from the following organizations in providing input on proposed amendments:

American Petroleum Institute (API)
Automotive Trade Organizations of California (AUTO-CA)
California Air Pollution Control Districts
California Air Pollution Control Officers Association (CAPCOA)
CAPCOA Vapor Recovery Committee
California Independent Oil Marketers Association (CIOMA)
California Retail Management Association
California Service Station & Automotive Repair Association (CSSARA)
San Diego Service Station Coalition (SDSSC)
Western States Petroleum Association (WSPA)

Staff appreciates the input from the following petroleum marketers:

BP-ARCO
Chevron Products Company
Circle K Stores
Conoco-Phillips
Cross Petroleum
Shell Oil Products US
Tesei Petroleum

Staff would especially like to thank the individual service station owners who took the time to come to the workshop and/or provide comments.

Staff also appreciates the input from the following vapor recovery equipment manufacturers:

ARID Technologies
EZ-Flo Nozzle & Equipment Company
Healy Systems, Inc.
Husky Corporation
OPW Fueling Products

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I. INTRODUCTION AND RECOMMENDATIONS

Introduction

Staff's proposal would change the implementation schedule of the Enhanced Vapor Recovery program. This proposal does not impose additional standards or relax existing standards, but provides more time for gasoline dispensing facility operators to comply with existing requirements.

In March of 2000, the Air Resources Board ("ARB" or "Board") approved the Enhanced Vapor Recovery (EVR) regulations. The EVR regulations established new standards for vapor recovery systems to reduce emissions during storage and transfer of gasoline at gasoline dispensing facilities (service stations). The EVR standards apply to both new and existing facilities and are being phased in from 2001 to 2009. In December 2002, the Board approved amendments to the EVR regulations, including revisions to operative and effective dates of several EVR standards to allow more time to develop and certify EVR vapor recovery systems. However, the April 1, 2005 deadline for all stations to comply with the Onboard Refueling Vapor Recovery (ORVR) compatibility standard (one module of the EVR program) did not change because ORVR compatible systems have been certified and available since 1998.

At that December 2002 hearing, stakeholders raised concerns that the amended EVR schedule could result in gasoline service stations having to upgrade equipment twice, once to meet ORVR compatibility and then a second time to meet full EVR standards. In Resolution 02-35, the Board directed staff to determine the adequacy of lead-time after certification of the first full EVR system in order to avoid the need to upgrade twice.

Since December 2002, several EVR standard effective dates have been delayed again as it has taken longer than anticipated to certify a full EVR system. The existing regulations allow the Executive Officer to allow continued installation of pre-EVR systems when EVR systems are not commercially available. Executive Order G-70-203 extended the EVR Phase II system deadline for new installations from April 1, 2004 to October 1, 2004. Executive Order G-70-205 further extended the EVR Phase II implementation date to January 1, 2005.

At the July 22, 2004 board meeting approving the unihose dispenser amendments, stakeholders again pointed out that the unavailability of EVR Phase II systems would lead to two equipment upgrades for full EVR compliance. Gasoline marketers requested a one-year extension for the ORVR compatibility requirement to April 2006 to allow station owners the option for only one equipment upgrade. The California Air Pollution Control Officers Association (CAPCOA) also testified in favor of an ORVR compatibility extension, primarily to facilitate orderly implementation of the ORVR compatibility requirement. CAPCOA suggested increments of progress to assure all stations will be in compliance by April 2006. Staff agreed to gather input from all stakeholders on the suggested ORVR extension, assess the economic and

environmental impacts of an ORVR compatibility delay and return to the Board in November with a recommendation.

Staff maintains that the EVR program is cost-effective even if two equipment upgrades are needed. This is because the costs for equipment upgrades for ORVR compatibility serve as a down payment for a full EVR system. Staff agrees that costs associated with permitting and station downtime will double if two upgrades are required, and avoiding this is desirable.

Staff recommends that the ORVR compatibility date be extended one year to April 1, 2006 to provide sufficient time for all stations to comply. An extension would also allow stations to install a full EVR Phase II system before the ORVR compatibility deadline, thus complying with both ORVR and EVR Phase II requirements with one station modification. Staff has calculated emission reductions of 1.9 tons/day would be foregone for one year, however, installation of full EVR systems in advance of the full EVR deadline could result in early emission reductions of up to 8.3 tons/day for 2006, 2007 and 2008.

Recommendation

Staff proposes to modify the regulations to extend the ORVR compatibility deadline to April 1, 2006 and amend other EVR regulation dates to be consistent with the extensions provided in Executive Orders G-70-203 and G-70-205. Because a full EVR Phase II system will be available soon, this action will provide station owners with the option to upgrade vapor recovery equipment once to achieve full EVR compliance.

Staff recommends that the Board adopt the following:

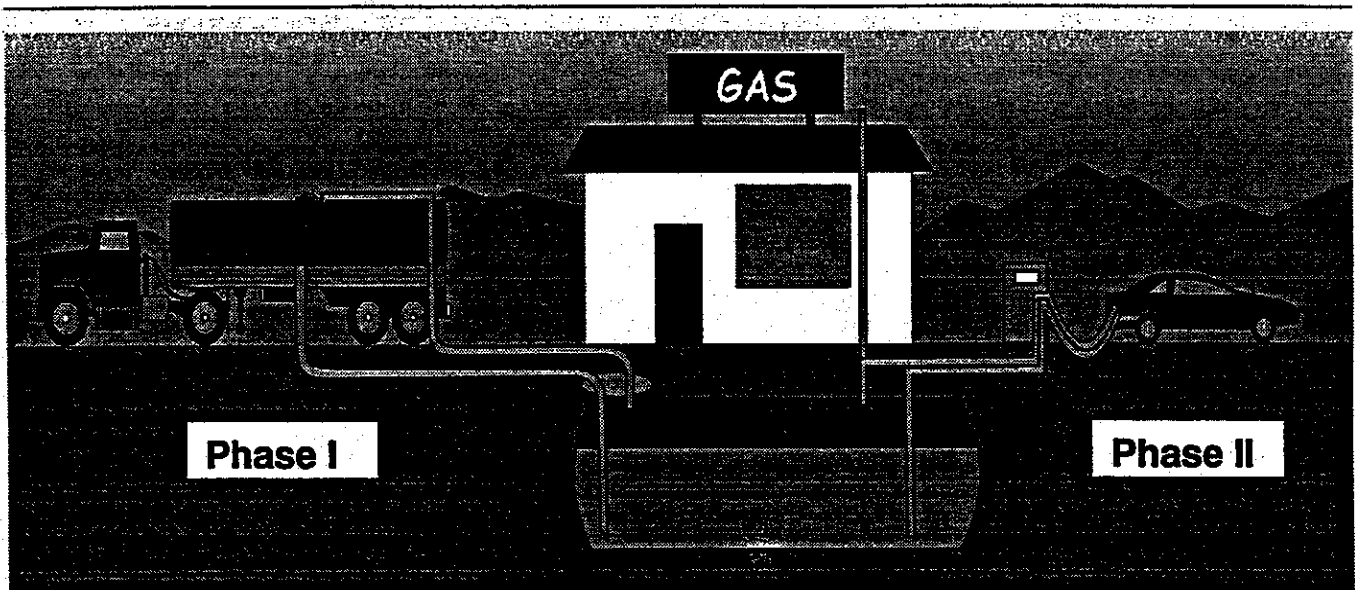
1. Amendments to the California Code of Regulations to incorporate the proposed certification and test procedures by reference (Appendix 1); and
2. Amendments to the incorporated vapor recovery system certification procedure (Appendix 2).

II. BACKGROUND

A. Vapor Recovery Program Overview

Gasoline vapor emissions are controlled during two types of gasoline transfer. As illustrated in Figure II-1, Phase I vapor recovery collects vapors when a tanker truck fills the service station underground tank. Phase II vapor recovery collects vapors during vehicle refueling. The vapor recovery collection efficiency during both of these transfers is determined through certification of vapor recovery systems. Vapor recovery systems serve both as control for reactive organic gases (ROG) and as control for benzene, a toxic air contaminant.

Figure II-1
Phase I and Phase II Vapor Recovery Systems at Service Stations



The ARB and the air pollution control and management districts (districts) share implementation of the vapor recovery program. ARB staff certifies prototype Phase I and Phase II vapor recovery systems installed at operating station test sites. District rules and state law require that only ARB-certified systems be installed. District staff inspects and tests the vapor recovery system upon installation during the permit process and conducts regular inspections to check that systems are operating as certified.

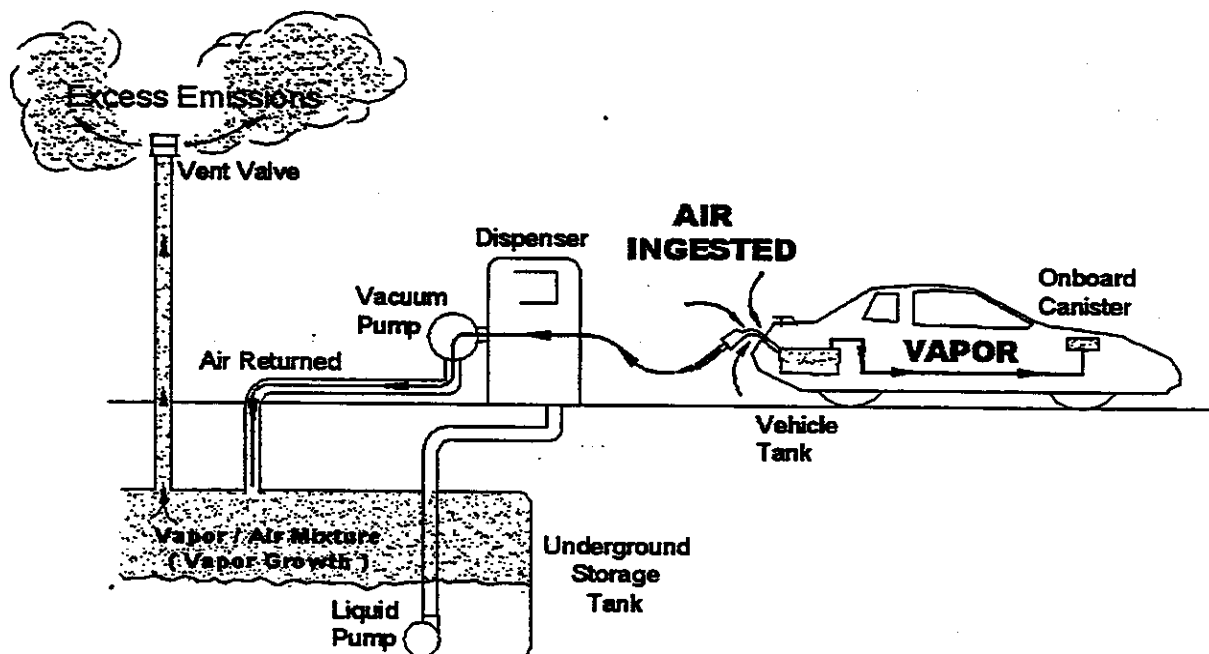
The vapor recovery requirements affect a multitude of stakeholders. These include the vapor recovery equipment manufacturers, gasoline marketers who purchase this equipment, contractors who install and maintain vapor recovery systems, and air pollution control districts who enforce vapor recovery rules. In addition, California certified systems are required by most other states and many countries.

B. ORVR Compatibility Requirement

Federal regulations require that vehicles be equipped with Onboard Refueling Vapor Recovery (ORVR) beginning in the 1998 model year and phased in over several years. ORVR works by routing gasoline vapors displaced during vehicle fueling to the onboard canister on the vehicle. For a non-ORVR vehicle, these displaced vapors are captured by the facility's Phase II vapor recovery system. Thus, ORVR and Phase II equipment seek to control the same emissions – the vapors displaced from the vehicle fuel tank during gasoline refueling.

ARB field tests have shown that fueling ORVR vehicles with some currently certified Phase II vapor recovery systems can lead to excess emissions. This is because some Phase II systems draw air into the underground storage tank (UST) during fueling of an ORVR vehicle. The air ingestion leads to vapor growth in the UST with corresponding fugitive and vent emissions of gasoline vapor shown as excess emissions in Figure II-2 below.

Figure II-2
Phase II Vapor Recovery System Incompatible with ORVR Vehicles



In recognition of the need for Phase II/ORVR compatibility, amendments to Health and Safety Code section 41954 (c)(1)(C), effective January 1, 2001, require that all Phase II systems be certified to be ORVR compatible.

The ORVR compatibility standard eliminates the excess emissions which can occur during fueling of an ORVR vehicle with a Phase II vapor recovery system that is not ORVR compatible. Compatibility is determined by verifying that the Phase II system can refuel ORVR vehicles without causing the vapor recovery system emissions to exceed the 0.38 lbs/1000 gallon performance standard.

Since 1998, ARB has certified several Phase II vapor recovery systems as being ORVR compatible. Systems were tested to verify that the Phase II system either 1) prevented ingestion of excess air when fueling an ORVR vehicle or 2) allowed air ingestion, but provided a method to control emissions related to vapor growth. The four ORVR systems that are commercially available are listed below.

**Table II-1
Currently Certified ORVR Compatible Phase II Vapor Recovery Systems**

| Phase II System | ARB Executive Order & Approval Letters |
|-----------------|--|
| Healy | G-70-186, G-70-191 |
| Balance | G-70-52, Letter 03-04 |
| Hirt | G-70-177-AA, Letter 03-06 |
| Gilbarco/OPW* | G-70-204* |

*anticipated certification by October 2004

C. EVR Emission Reductions

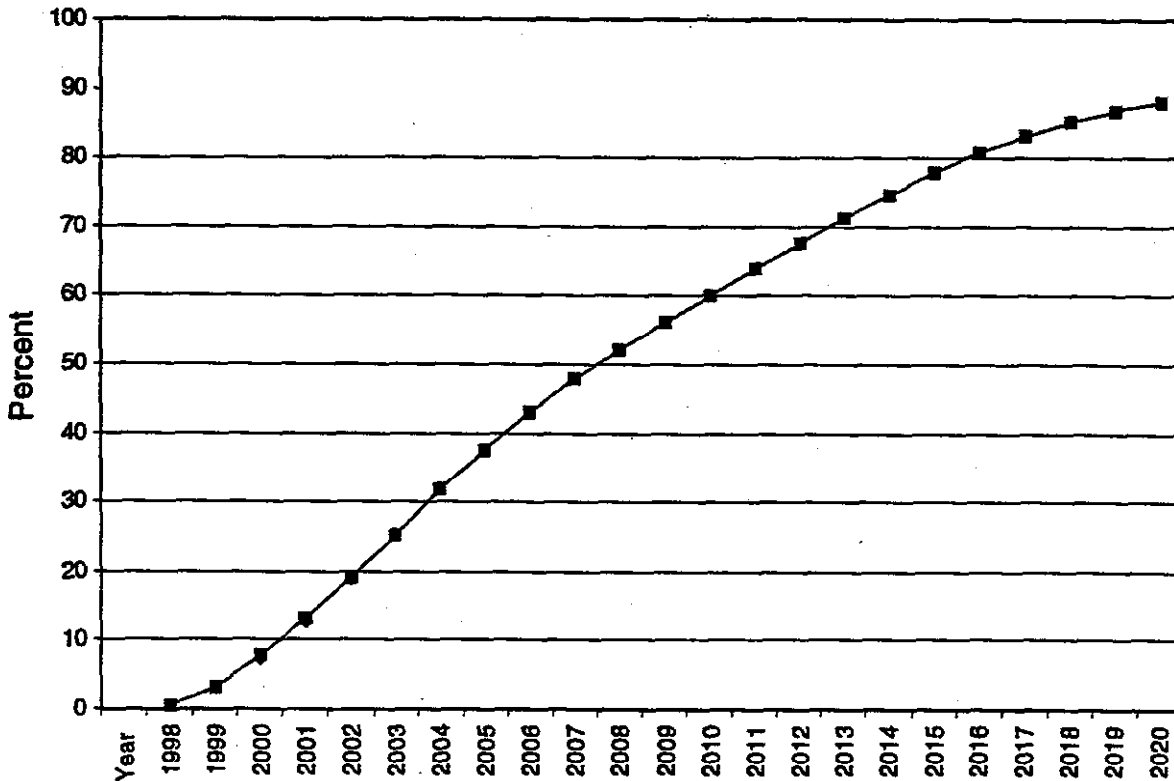
The EVR program will achieve 25.7 tons/day of ROG emission reductions by 2010. The EVR requirements can be characterized in six EVR modules. Module 1 contains the standards for EVR Phase I systems. Modules 2 through 5 comprise the EVR Phase II system requirements. Module 6 is for in-station diagnostics (ISD), which monitors the performance of the Phase I and Phase II systems. Table II-2 summarizes the emission reductions associated with each module to be achieved by 2010.

**Table II-2
EVR Emission Reduction Summary**

| Module | Description | 2010 ROG Reductions Statewide, tons/day |
|--------|--------------------------|--|
| 1 | Phase I | 5.5 |
| 2 | Phase II | 3.1 |
| 3 | ORVR Compatibility | 4.5 |
| 4 | Liquid Retention | 0.2 |
| 5 | Spillage/Dripless Nozzle | 3.9 |
| 6 | In-Station Diagnostics | 8.5 |
| | Total | 25.7 |

The emission reductions associated with ORVR compatibility vary for each year depending on the percentage of fuel dispensed to ORVR equipped vehicles. The predicted penetration of ORVR vehicles in the California fleet is provided in Figure II-3. This curve was developed using information on vehicle miles traveled obtained from the Department of Motor Vehicles. Details on the calculations are provided in Reference 1.

Figure II-3
Predicted ORVR Vehicle Penetration in California Vehicles



The ORVR vehicle penetration can be combined with emission factors developed from field tests to estimate annual emission reductions achieved through ORVR compatibility. The calculations originally described in the February 4, 2000 staff report (Reference 2) and updated in the EVR Technology Review Report (Reference 3) have been modified further as described below.

Previously, the ORVR emission calculations assumed that 55% of the state's gasoline throughput was dispensed at gasoline dispensing facilities (GDFs) with non-compatible vapor recovery systems. As of April 1, 2003, new installations have been required to have ORVR-compatible systems and some existing stations have already converted their vapor recovery systems to be ORVR compatible. The South Coast Air Quality Management District (SCAQMD) staff estimates that about two-thirds of the 3400

existing stations in the SCAQMD are ORVR compatible or in the process of converting to ORVR compatibility. If we assume that one-third of the existing stations statewide use assist systems that are not ORVR compatible and that these stations are estimated to dispense 40% of the state's gasoline throughput, then the emissions remaining due to ORVR incompatibility are 1.9 tons/day in 2005 as shown in Table II-3.

Table II-3
Estimated Excess Emissions due to Incompatibility of Phase II Vapor Recovery Systems Fueling ORVR Vehicles

| Year | Percent of Vehicle Miles Traveled by ORVR Vehicles | Excess Emissions Calculated in 2002 (55% of throughput at non-ORVR compatible stations) | Excess Emissions Calculated in 2004 (40% of throughput at non-ORVR compatible stations) |
|-------------|--|---|---|
| 1998 | 0.48 | 0.0 | 0.0 |
| 1999 | 3.19 | 0.2 | 0.1 |
| 2000 | 7.88 | 0.4 | 0.3 |
| 2001 | 13.27 | 0.8 | 0.6 |
| 2002 | 19.11 | 1.1 | 0.9 |
| 2003 | 25.11 | 1.6 | 1.2 |
| 2004 | 31.79 | 2.0 | 1.6 |
| 2005 | 37.66 | 2.5 | 1.9 |
| 2006 | 43.04 | 2.9 | 2.2 |
| 2007 | 47.84 | 3.3 | 2.6 |
| 2008 | 52.11 | 3.7 | 2.9 |
| 2009 | 56.15 | 4.1 | 3.2 |
| 2010 | 60.10 | 4.5 | 3.5 |

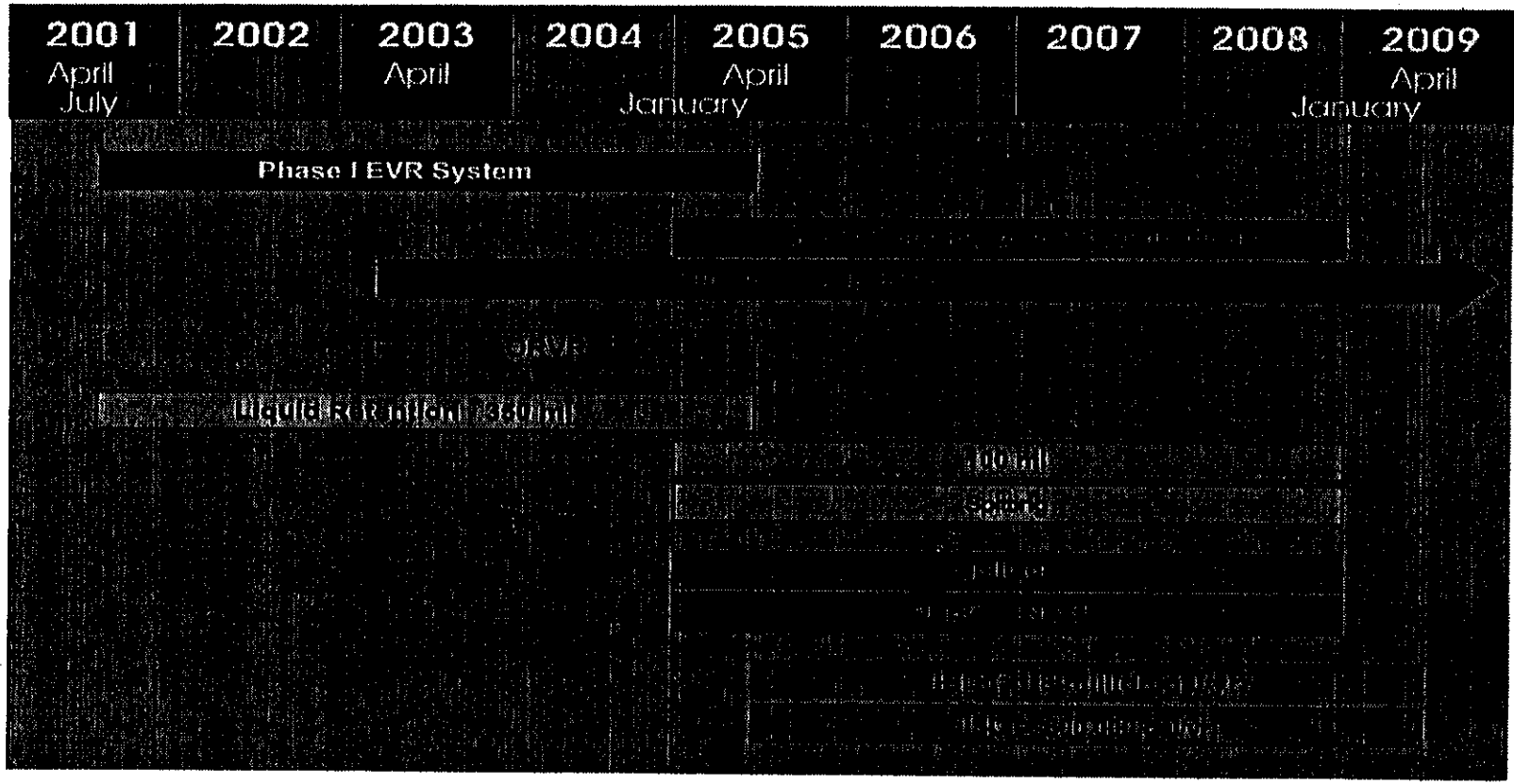
F. EVR Implementation Schedule





The EVR standards are being phased in over several years and apply both to new and existing facilities. New facilities must meet EVR requirements in effect at time of installation. Existing facilities may use equipment installed prior to the effective date of an EVR standard for a period of up to four years after the effective date. This is commonly referred to as the "4-year clock."

Figure II-1 shows the current EVR implementation timeline. The beginning of each colored bar shows the date when new stations must comply. The final compliance date for all facilities to meet a standard is the date at the end of the colored bar.

The current EVR timeline also reflects changes in EVR implementation dates provided by Executive Officer action in Executive Orders G-70-203 and G-70-205, which resulted in the delay of EVR implementation dates associated with Phase II vapor recovery to October 1, 2004 and January 1, 2005 respectively.

**Figure II-1
Current EVR Timeline**



-  Dotted box: time between start of 4-year clock and operative date
-  Start of solid bar: date required for new or modified facilities (operative date)
-  End of solid bar: date required for existing facilities (installed before start of bar)
-  Not required for dispensers installed before April 2003

E. Legal Authorities

Section 41954 of the Health and Safety Code (Appendix 3 contains a copy of section 41954) requires ARB to adopt procedures and performance standards for controlling gasoline emissions from gasoline marketing operations, including transfer and storage operations to achieve and maintain ambient air quality standards. This section also authorizes ARB, in cooperation with districts, to certify vapor recovery systems that meet the performance standards. Section 39607(d) of the Health and Safety Code (HSC) requires ARB to adopt test procedures to determine compliance with ARB and the districts' non-vehicular standards. State law (HSC section 41954) requires districts to use ARB test procedures or their equivalent for determining compliance with performance standards and specifications established by ARB.

To comply with state law, the Board adopted the certification and test procedures found in title 17, Code of Regulations, sections 94110 to 94015 and 94101 to 94165. These regulations reference procedures for certifying vapor recovery systems and test procedures for verifying compliance with performance standards and specifications.

F. Comparable Federal Regulations

There are no comparable federal regulations that certify gasoline vapor recovery systems for service stations; however, changes to ARB vapor recovery certification regulations may have a national impact. ARB certification is required by most other states that mandate the installation of vapor recovery systems in gasoline dispensing facilities.

III. RULE DEVELOPMENT PROCESS AND PUBLIC OUTREACH EFFORTS

The staff proposal was communicated to and discussed with Enhanced Vapor Recovery stakeholders through a public workshop, individual meetings, an EVR Advisory, ARB's web site, and a listserve via the internet.

A. Workshops

A workshop was held on August 19, 2004 in Sacramento. The workshop notice requested specific information regarding number of stations needing to upgrade to ORVR compatibility, time needed to complete the upgrade process, and effect of the proposed delay on vapor recovery equipment manufacturers. The workshop audio was broadcast over the internet and the workshop presentation posted on the vapor recovery webpage. Twenty-nine stakeholders attended the workshop and four e-mail comments were received from internet participants. The workshop attendees included representatives from air pollution control districts, equipment manufacturers, petroleum marketers and individuals who own and operate service stations.

B. Meetings

Staff has met with stakeholders on several vapor recovery issues in the past year. Meetings where the ORVR compatibility deadline was discussed are summarized below.

**Table III-1
ORVR Compatibility Meetings Held in 2004**

| Stakeholder | Date(s) |
|---|--|
| American Petroleum Institute (API) | March 9, March 16, March 30 |
| CA Independent Oil Marketers (CIOMA) | March 9, May 21 |
| CAPCOA Vapor Recovery Committee | April 15, June 4, July 15 |
| Healy Systems | February 4 |
| Western States Petroleum Association (WSPA) | January 20, March 9, March 16, March 30, April 14, June 4 |

C. EVR Advisory

Advisory 327, entitled "Enhanced Vapor Recovery Implementation Update" and dated September 10, 2004, was provided to stakeholders through a mail-out, e-mail listserve and webpage posting. The advisory alerted affected parties that extensions to EVR implementation dates were to be considered at the November board meeting and comments were encouraged on the staff's proposal to be made available on October 1, 2004.

D. Internet

Stakeholders were encouraged to join the vapor recovery list-serve to receive electronic mail (e-mail) notifications when new materials are posted on the vapor recovery webpage (www.arb.ca.gov/vapor/vapor.htm). The workshop notices, agendas, and presentations, as well as the letters to the manufacturers are all available on the webpage. Stakeholders were encouraged to submit formal comments by letter, but they were also permitted and encouraged to address questions and comments to staff via e-mail.

IV. REASONS FOR AND SUMMARY OF PROPOSED AMENDMENTS OF THE CERTIFICATION PROCEDURE (CP-201)

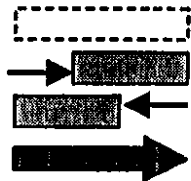
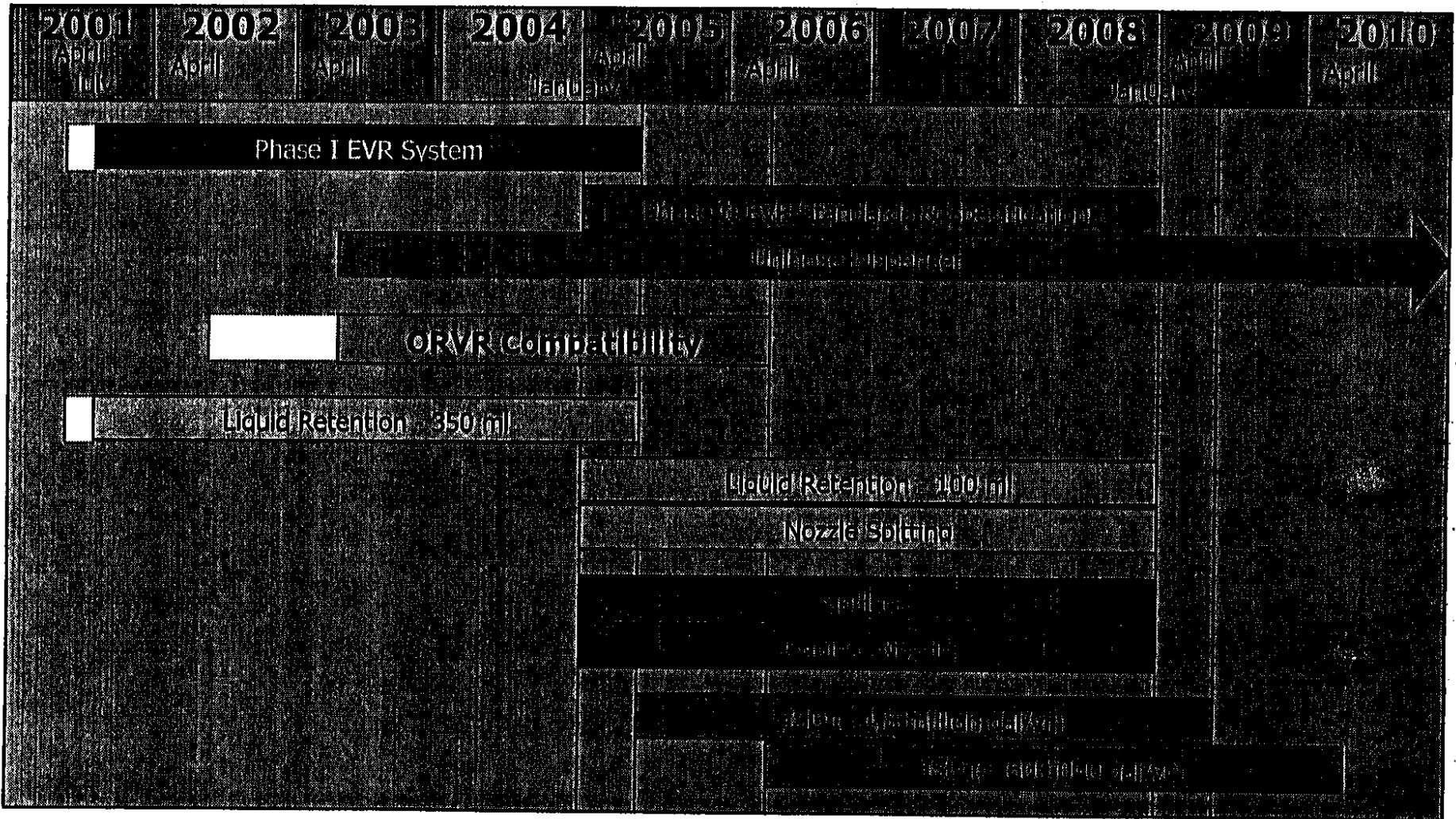
The proposed amendments will extend the ORVR compatibility requirement deadline for 12 months; from April 1, 2005 to April 1, 2006. This is 16 months after the expected certification of the first EVR Phase II system. Staff has concluded that 16 months is sufficient time for the estimated 3500 stations to upgrade either to an ORVR compatible system or a full EVR Phase II system.

The proposed amendments also formalize changes in effective and operative dates affected by ARB Executive Officer actions as described in Executive Orders G-70-203 and G-70-205. The proposal also changes the in-station diagnostics (ISD) effective date for medium throughput facilities to maintain the one-year timeframe after ISD is required for high throughput facilities. The ISD phase-in provides an opportunity to evaluate ISD system performance before full ISD implementation.

CP-201, "Certification Procedure for Vapor Recovery Systems at Gasoline Dispensing Facilities," contains the EVR program operative dates. Staff proposes revisions to Table 2-1 of CP-201 as shown in Appendix 2. The proposed changes are summarized in the revised EVR timeline shown in Figure IV-1.

Certification of an EVR Phase II system has taken longer than staff had anticipated. As a result, many stations that have not yet made ORVR upgrades will not have the option of making one upgrade to their station which meets both ORVR and EVR requirements. Thus many stations will have to upgrade twice, once for ORVR by April 1, 2005, and again for EVR by April 1, 2009. The delay of the ORVR deadline by one year will allow station owners the choice of satisfying both ORVR and EVR requirements at one time, at a reduced cost and inconvenience. The rationale for this change is discussed in more detail below.

Figure IV-1 PROPOSED EVR TIMELINE



Dotted box: time between start of 4-year clock and operative date
 Start of solid bar: date required for new or modified facilities (operative date)
 End of solid bar: date required for existing facilities (installed before start of bar)
 Not required for dispensers installed before April 2003

A. Time needed to Make Existing Stations ORVR compatible

Based on information gathered from districts, petroleum marketers and vapor recovery equipment manufacturers, staff has determined that 12 additional months are needed to make all stations in California compatible with fueling ORVR vehicles. This timeframe is based on the number of stations remaining to be upgraded, time necessary to choose systems and plan station upgrades, time needed to obtain construction, district and other necessary permits, time to obtain and schedule contractors and time to install compliant vapor recovery systems.

1. Number of stations to be upgraded

The US Department of Energy estimates there are 9,750 gasoline dispensing facilities statewide (Reference 4). Approximately 3400 (35%) are located in the South Coast Air Quality Management District (SCAQMD). The SCAQMD permitting staff estimates that 2000 of the GDFs have ORVR compatible systems, 300 are in the permit process to upgrade to ORVR compatible systems and 1100 have not yet submitted paperwork, but need to upgrade. This is consistent with the Western States Petroleum Association (WSPA) survey of four large air pollution control districts in California that indicates that 35-40% of the retail facilities are not ORVR compatible and conclude that approximately 3500 facilities statewide need ORVR compatibility upgrades (Reference 5).

2. Time to choose system, plan upgrade and prepare permit application

Gasoline marketers commented at the workshop that at least two months is needed after the first EVR Phase II system is certified for operators to review the certified system features, make decisions on which system (EVR or ORVR) is best for their facility, determine commercial availability of the system and prepare permit applications.

3. Time to obtain necessary permits

Station operators have commented that obtaining permits from air pollution control districts can vary from two weeks to over three months under normal conditions. These time periods could be longer if hundreds of stations are seeking permits at the same time.

4. Time to schedule contractors

Gasoline marketers are currently scheduling contractors for upgrading to EVR Phase I systems by the April 2005 deadline, as well as to conduct work for other agency requirements, such as UST work required by the State Water Resources Control Board. Although it appears that contractors remain available in southern California, one oil

company indicated that northern California contractors are currently experiencing backlogs. One contractor advised in August 2004 that jobs were scheduled through December 2004 and predicted a 6-8 month backlog by the end of August.

B. Previous Board Direction Regarding Avoiding Two Equipment Upgrades

During the comment period for the December 2002 EVR Technology Review amendments, gasoline marketers expressed concern that existing facilities may be forced to upgrade equipment twice; once by April 2005 to meet the ORVR compatibility deadline, and again by April 2007 to meet the full EVR requirements. In Resolution 02-35, the Board directed staff to:

"assess, following the initial certification of the first EVR Phase II system, the adequacy of the lead time to install complying certified EVR Phase II systems prior to the deadlines for complying with on-board refueling vapor recovery (ORVR) requirements. It is the intent of the Board that the assessment determine the adequacy of lead time in order to minimize the necessity that existing gasoline dispensing facilities (service stations or GDFs) will need to upgrade vapor recovery systems or equipment more than once in order to comply with both the EVR Phase II standards and specifications and ORVR. The Executive Officer and Board staff are directed to consult with the Districts, WSPA and other stakeholders in preparing the assessment and to report the findings to the Board within three months of the initial certification of the first EVR Phase II system."

At the time of the December 2002 board meeting, staff was anticipating testing a full EVR system beginning in January 2003. Unfortunately, delays in the equipment manufacturers completing certification testing prevented having a certified EVR Phase II system available and installed by the adopted deadline of April 1, 2004. Because a system would not be commercially available at the regulation deadline, the Executive Officer extended the EVR Phase II deadline by 6 months to October 1, 2004 as allowed under section 19.2 of CP-201. The Executive Officer issued a second extension to January 1, 2005 as an EVR Phase II system was not commercially available by October 1, 2004.

The history of changes to the EVR Phase II system deadline and the effect on the time available between the EVR Phase II deadline and the ORVR deadline are provided in Table IV-1.

**Table IV-1
History of Amendments to EVR Phase II System Deadlines**

| Action Taken | Adoption Date | ORVR Compatibility required for existing GDFs | EVR Phase II required for new GDFs | Time between ORVR deadline and required first EVR Phase II System |
|------------------------------|----------------------|--|---|--|
| Board Approval 3/22/2000 | 2/1/2001 | 4/1/2005 | 4/1/2003 | 24 months |
| Board Approval 12/12/2002 | 3/7/2003* | 4/1/2005 | 4/1/2004 | 12 months |
| EO Approval** | 3/11/2004 | 4/1/2005 | 10/1/2004 | 6 months |
| EO Approval** | 8/30/2004 | 4/1/2005 | 1/1/2005 | 3 months |

*adopted via emergency regulation

** extended by ARB Executive Officer as per section 19.2 of CP-201 as certified EVR Phase II system not commercially available.

C. Risk Associated with Installing ORVR Compatible vs. Full EVR Systems

It is expected that the four certified ORVR Compatible Phase II systems available now will eventually be upgraded and certified as full EVR Phase II systems. However, there are no guarantees that these systems will eventually become certified to all EVR standards. Table IV-2 compares the currently available ORVR compatible systems and assesses the probability that the system will complete the additional steps needed to achieve full EVR compliance.

**Table IV-2
Status of ORVR Compatible Systems Becoming Compatible with Full EVR Phase II Systems**

| ORVR System | Status Toward Full EVR | Additional Equipment to Convert ORVR system to Full EVR | Comments |
|--------------------|--|--|--|
| Healy | Completed operational test and preparing Executive Order (without ISD). System with ISD completing testing | Nozzles, Clean Air Separator and ISD | Healy EVR Executive Order expected November 2004 |
| OPW Membrane | Full EVR system sealed and under test | Nozzles and ISD | OPW/Gilbarco ORVR Certification anticipated October 2004 |
| Balance | Application under review | Nozzles and ISD and possible processor | Processor may or may not be needed to meet pressure limits |
| Hirt | R&D site approved Application anticipated | Nozzles and ISD | |

Gasoline marketers prefer to minimize the risk on their significant capital investment for upgrading vapor recovery equipment. The worst-case scenario would be to install an ORVR compatible system now and then have to replace the entire system in 4 years because the ORVR compatible system could not be modified to meet full EVR requirements. The Healy ORVR system is currently the lowest risk system, as the Healy EVR Phase II system has met all certification testing requirements and the Executive Order is being finalized. Stations that install a Healy ORVR compatible system now would need to update the Healy nozzles, add the Clean Air Separator and install ISD by 2008. The OPW Membrane is also likely to be part of a full EVR system. Stations currently operating with a Gilbarco VaporVac Phase II system can add the OPW membrane processor to achieve ORVR compatibility now, and add EVR nozzles and ISD systems by 2008 for full EVR compliance. Stations operating with balance systems will need EVR nozzles, ISD, and possibly a vapor processor for to meet full EVR. The Hirt system already meets pressure limits, and would need EVR nozzles and ISD to comprise a full EVR system.

D. Comparison of Costs for One vs. Two Upgrades

In the 2002 EVR Technology review, staff estimated that the total equipment and

installation costs to upgrade a station with 6 dispensers (12 fueling points) to full EVR Phase II and ISD compliance would be approximately \$43,000 (Reference 3). The staff's analysis assumed only one upgrade would be needed. The data in Table IV-3 indicate that estimated costs associated with two system upgrades range from \$38,800 to \$50,800 depending on the system chosen. Thus, staff concludes that the two-step approach to full EVR compliance remains cost-effective. The cost assumptions and calculations are provided in Appendix 4. Note that staff's assumptions do not include equipment discounts from retail prices that are often available to station operators.

Table IV-3
Estimated Equipment and Installation Costs to Upgrade Gilbarco VaporVac Station with 12 Fueling Points (Unihose) to ORVR Compatibility and EVR in Two Steps

| ORVR System | Estimated ORVR system conversion cost | Additional Equipment to Convert ORVR system to Full EVR | Additional EVR system conversion cost | Total cost for Two Upgrades |
|--------------|---------------------------------------|---|---------------------------------------|-----------------------------|
| Healy | \$16,800 | EVR Nozzles, Clean Air Separator and ISD | \$28,000 | \$44,600 |
| OPW Membrane | \$22,800 | EVR Nozzles and ISD | \$22,800 | \$45,600 |
| Balance | \$16,000 | EVR Nozzles, ISD and possible processor | \$22,800 | \$38,800 |
| | | | \$34,800 with processor | \$50,800 with processor |

Under staff's proposal, station operators would have the option of upgrading stations once to a full EVR Phase II system. The cost of converting to a Healy EVR Phase II system is estimated at approximately \$40,700 for a station with six dispensers. The difference in cost from the two upgrades estimate is the cost to replace the ORVR nozzles with EVR nozzles estimated at approximately \$4,000. Note that nozzles and hanging hardware (hoses, etc.) have a working life of approximately one to three years and thus would need to be replaced anyway.

Table IV-4
Estimated Equipment and Installation Costs to Upgrade Gilbarco VaporVac Station with 12 Fueling Points to Full EVR in One Step

| EVR Phase II System | Estimated EVR system conversion cost |
|---------------------|--------------------------------------|
| Healy with ISD | \$40,700 |

Staff's analysis does not include costs associated with obtaining permits (estimated at \$1500 in Reference 6) or loss of business associated with shutdown of the station during equipment installation. Staff recognizes that these costs are real and significant and would be minimized for one equipment upgrade to full EVR compliance.

E. Delay in Certifying the First EVR Phase II System

The Board recognized in March 2000 that many of the EVR standards are technology forcing. The EVR Technology Review Report presented to the Board in December 2002 provided evidence from ARB and equipment manufacturers that EVR standards could technically be met. The EVR amendments also provide stringent certification testing to address concerns regarding durability of pre-EVR systems. Systems seeking certification must be installed in operating service stations and pass many field tests. Real-world certification testing of vapor recovery equipment over a minimum six-month period shows that it is difficult for vapor recovery systems to maintain compliance with the EVR standards over the certification test period.

At the time of the December 2002 EVR Technology Review Board meeting, there were fourteen approved EVR Phase II research and development test sites where seven vapor recovery system manufacturers were collecting data to support their certification applications. On July 29, 2003, the first EVR Phase II site was sealed for the minimum six-month operational test. Since that time, one other EVR Phase II system has been sealed but has had difficulties in completing the operational test. At this writing, only the Healy EVR Phase II system has successfully made it through the certification operational test period.

V. ECONOMIC AND ENVIRONMENTAL IMPACTS

A. Economic Impact of Proposed Amendments

The proposed amendments will provide cost savings for station owners by providing an option to avoid two vapor recovery system upgrades to meet full EVR Phase II requirements. Cost savings are estimated to range from \$1,500 to \$22,000. The lower end of the range represents costs for two upgrades for the Healy EVR system as installation of the currently certified Healy ORVR system serves as a down payment towards a full Healy EVR system. The excess costs are due to permitting for the EVR upgrade to the Healy ORVR system. The upper end of the range could apply to a station that purchased a vapor processor for an ORVR system that was never certified to be part of a full EVR system. This station would need to replace the ORVR compatible system with a full EVR system by October 2008.

The extension of the ORVR compatibility requirement could provide additional cost savings to operators if more ORVR compatible or EVR certified systems are certified in the next year, providing a more competitive market and possibly reducing system prices.

Service station operators commented at the workshop that a combination of several factors in recent years has made staying in business difficult, especially for small business owners. These include increased energy costs, liability expenses, worker's compensation, health insurance and a possible future increase in the minimum wage. One station operator estimated that compliance costs for environmental regulations range from \$20,000 to \$80,000 every two years, not counting loss of business due to downtime.

The proposed amendments will affect vapor recovery equipment manufacturers in different ways. Manufacturers who have already certified ORVR compatible systems may be adversely affected by the delay in the ORVR deadline as it will delay product sales and allow more time for their competitors to certify ORVR compatible systems. Equipment manufacturers who have recently entered the ORVR compatible system certification process will benefit from the delay if they can get systems certified before the new ORVR deadline.

Environmental Impacts of Proposed Amendments

Staff's analysis shows that there would be some emission reductions forgone in 2005 due to the 12 month delay, but early implementation to full EVR systems would achieve more emission reductions than originally claimed in 2006, 2007 and 2008. The emission reductions lost in 2005 could be minimized if significant numbers of stations

are held to an earlier compliance date, as suggested by the CAPCOA increments of progress.

The emission reductions attributed to ORVR compatibility at the time of the 2002 EVR Tech Review were 4.5 tons/day of 2010 ROG emissions. These emissions assumed that 55% of the state's gasoline throughput was dispensed through the two main brands of assist systems. Recent data from districts suggest that 3500 of the 9750 stations in the state have one of these two assist systems (Gilbarco or Wayne) and still need ORVR compatible upgrades. If all of these stations were upgraded to full EVR systems by April 2006, the emission reductions would be 8.3 tons/day (includes ISD emission reductions) as shown in Table V-1. This "best-case" scenario would provide early emission reductions of 8.3 tons/day for 2006, 2007 and 2008. Note that actual "best case" emission reductions before 2010 would be slightly lower as emissions are based on total state gasoline throughput growth factors.

**Table V-1
EVR Phase II and ISD 2010 ROG Emission Reductions by System Type***

| Module | Description | Gilbarco ROG Reductions Statewide tons/day | Wayne ROG Reductions Statewide tons/day | ROG Reductions for Early EVR Implementation Statewide tons/day |
|--------|--------------------------|---|--|--|
| 2 | Phase II | 3.0 | 0.1 | 3.1 |
| 3 | ORVR Compatibility | 4.3 | 0.2 | NA |
| 4 | Liquid Retention | 0.1 | 0.0 | 0.1 |
| 5 | Spillage/Dripless Nozzle | 1.4 | 0.8 | 2.2 |
| 6 | In-Station Diagnostics | 1.9 | 1.0 | 2.9 |
| | Total | 10.6 | 2.1 | 8.3 |

* NOTE: Modules 2 and 3 emissions from ARB baseline and simulated ORVR field tests
 Modules 4 and 5 emissions are prorated by system throughput
 Module 6 emissions calculated using ARB-district audit results as per App. 3 of 2002 EVR Tech Review
 Reductions are estimated based on Gilbarco and Wayne systems because those are the predominant assist systems used in California

VI. OUTSTANDING ISSUES

1. ORVR Compatibility Increments of Progress

The California Air Pollution Control Officers Association (CAPCOA) agrees that the April 1, 2005 ORVR compatibility deadline cannot reasonably be met and supports an extension through a change in ARB regulations. CAPCOA recommends that permitting and installation milestones be included in the regulation amendments to help reduce adverse air quality impacts resulting from the proposed delay and minimize compliance difficulties that may arise from a last minute crunch given the limited number of available vendors and contractors. Gasoline marketers associations, including the Western States Petroleum Association (WSPA) and California Independent Oil Marketers Association (CIOMA), endorse the proposed CAPCOA schedule (Reference 5). The CAPCOA schedule is provided in Appendix 5.

ARB staff also supports the CAPCOA proposal; however, there are legal reasons why the proposed CAPCOA schedule cannot be incorporated into the vapor recovery regulations. The air pollution control districts have the primary authority for regulation of stationary sources, which includes permit program requirements. The ARB's role is to set standards for vapor recovery systems and certify systems to those standards. The ARB does not have the legal authority to adopt timelines for district permitting activities.

Staff alerted stakeholders to the legal conflict at the August 19, 2004 workshop. At that time, CIOMA suggested that the CAPCOA schedule could be implemented using a Memorandum of Agreement (MOA). Concerns were raised regarding statewide uniformity if some parties did not commit to the MOA.

2. Extension Hurts Manufacturers of ORVR Compatible Systems

Staff expects opposition to the ORVR compatibility extension from vapor recovery system manufacturers that currently market ORVR compatible systems. However, only one manufacturer of balance system components has commented thus far in opposition to the proposed amendments. Healy Systems opposed the extension in testimony at the July 22, 2004 board meeting; however, Healy retracted their statements in comments at the August 19, 2004 workshop. Healy stated that, after further investigation, they agree that the time remaining before April 2005 is insufficient to upgrade the large number of stations that are currently incompatible with fueling ORVR vehicles.

VII. ALTERNATIVES CONSIDERED

We have considered as an alternative the option of not adopting the proposed vapor recovery amendments. Keeping the current EVR schedule would be detrimental, as it is likely that some service station operators would not have enough time to comply. Also, small business owners have commented that they would be most likely to face delays as stations owned by major oil companies have an advantage in securing equipment orders and contractors. In addition, operators wishing to conduct only one equipment upgrade to meet full EVR requirements will not have that option without the proposed amendments.

VIII. REFERENCES

1. April 16, 2002 ARB Memorandum from Joe Guerrero to George Lew regarding Updated ORVR Penetration Calculations
2. Staff Report: Initial Statement of Reasons for Proposed Amendments to the Vapor Recovery Certification and Test Procedures for Gasoline Loading and Motor Vehicle Gasoline Refueling at Service Stations, February 4, 2000, Air Resources Board
3. EVR Technology Review Report, October 2002, Monitoring and Laboratory Division, Air Resources Board
3. California Petroleum Profile at US Department of Energy website <<http://tonto.eia.doe.gov/oog/info/state/ca.html>>, visited on September 10, 2004
5. September 3, 2004 letter from Jay McKeeman of the California Independent Oil Marketers Association, Steve Arita of the Western States Petroleum Association, Will Woods of the Automotive Trade Organizations of California, Jim Lantry of the San Diego Service Station Coalition and Dennis DeCota of the California Service Station & Automotive Repair Association to Cindy Castronovo of the Air Resources Board regarding WSPA/CIOMA/AUTO-CA/SDSSC/CSSARA Comments on CARB ORVR Compatibility Extension Workshop held on August 19, 2004
6. January 30, 2004 letter from Jay McKeeman of California Independent Oil Marketers Association and Joe Sparano of Western States Petroleum Association to Diane Johnston of the Air Resources Board regarding Governor's retrospective review of regulations adopted, amended or repealed since January 6, 1999
7. Executive Order G-70-203 dated March 11, 2004 entitled "Modification of Enhanced Vapor Recovery Operative and Effective Dates relating to the Finding that EVR Phase II Vapor Recovery Systems are not Commercially Available"
8. September 1, 2004 letter from William V. Loscutoff enclosing Executive Order G-70-205 dated August 30, 2004 entitled "Modification of Enhanced Vapor Recovery Operative and Effective Dates relating to the Finding that EVR Phase II Vapor Recovery Systems are not Commercially Available"

Appendix 1

Proposed Amendments to Title 17, California Code of Regulations

PROPOSED REGULATION ORDER

Note: **Strikeout** indicates deleted text; **underline** indicates inserted text.

Amend Title 17, California Code of Regulations, section 94011 to read:

§ 94011. Certification of Vapor Recovery Systems of Dispensing Facilities.

The certification of gasoline vapor recovery systems at dispensing facilities (service stations) shall be accomplished in accordance with the Air Resources Board's CP-201, "Certification Procedure for Vapor Recovery Systems at Gasoline Dispensing Facilities" which is herein incorporated by reference. (Adopted: December 9, 1975, as last amended ~~August 2, 2004~~ [date of amendment to be inserted]).

The following test procedures (TP) cited in CP-201 are also incorporated by reference.

TP-201.1 – "Volumetric Efficiency for Phase I Systems" (Adopted: April 12, 1996, as last amended October 8, 2003)

TP-201.1A – "Emission Factor For Phase I Systems at Dispensing Facilities" (Adopted: April 12, 1996, as last amended February 1, 2001)

TP-201.1B – "Static Torque of Rotatable Phase I Adaptors" (Adopted: July 3, 2002, as last amended October 8, 2003)

TP-201.1C – "Leak Rate of Drop Tube/Drain Valve Assembly" (Adopted: July 3, 2002, as last amended October 8, 2003)

TP-201.1D – "Leak Rate of Drop Tube Overfill Prevention" (Adopted: February 1, 2001, as last amended October 8, 2003)

TP-201.1E – "Leak Rate and Cracking Pressure of Pressure/Vacuum Relief Vent Valves" (Adopted: October 8, 2003)

TP-201.2 – "Efficiency and Emission Factor for Phase II Systems" (Adopted: April 12, 1996, as last amended October 8, 2003)

TP-201.2A – "Determination of Vehicle Matrix for Phase II Systems" (Adopted: April 12, 1996, as amended February 1, 2001)

TP-201.2B – "Flow and Pressure Measurement of Vapor Recovery Equipment" (Adopted: April 12, 1996, as last amended October 8, 2003)

TP-201.2C – “Spillage from Phase II Systems” (Adopted: April 12, 1996, as last amended February 1, 2001)

TP-201.2D – “Post-Fueling Drips from Nozzle Spouts” (Adopted: February 1, 2001, as last amended October 8, 2003)

TP-201.2E – “Gasoline Liquid Retention in Nozzles and Hoses” (Adopted: February 1, 2001)

TP-201.2F – “Pressure-Related Fugitive Emissions” (Adopted: February 1, 2001, as last amended October 8, 2003)

TP-201.2G – “Bend Radius Determination for Underground Storage Tank Vapor Recovery Components” (Adopted: October 8, 2003)

TP-201.2H – “Determination of Hazardous Air Pollutants from Vapor Recovery Processors” (Adopted: February 1, 2001)

TP-201.2I – “Test Procedure for In-Station Diagnostic Systems” (Adopted: October 8, 2003)

TP-201.2J – “Pressure Drop Bench Testing of Vapor Recovery Components” (Adopted: October 8, 2003)

TP-201.3 – “Determination of 2 Inch WC Static Pressure Performance of Vapor Recovery Systems of Dispensing Facilities” (Adopted: April 12, 1996, as last amended March 17, 1999)

TP-201.3A – “Determination of 5 Inch WC Static Pressure Performance of Vapor Recovery Systems of Dispensing Facilities” (Adopted: April 12, 1996)

TP-201.3B - “Determination of Static Pressure Performance of Vapor Recovery Systems of Dispensing Facilities with Above-Ground Storage Tanks” (Adopted: April 12, 1996)

TP-201.3C – “Determination of Vapor Piping Connections to Underground Gasoline Storage Tanks (Tie-Tank Test)” (Adopted: March 17, 1999)

TP-201.4 – “Dynamic Back Pressure” (Adopted: April 12, 1996, as last amended July 3, 2002)

TP-201.5 – “Air to Liquid Volume Ratio” (Adopted: April 12, 1996, as last amended February 1, 2001)

TP-201.6 – “Determination of Liquid Removal of Phase II Vapor Recovery

Systems of Dispensing Facilities" (Adopted: April 12, 1996, as last amended April 28, 2000)

**TP-201.6C – "Compliance Determination of Liquid Removal Rate"
(Adopted: July 3, 2002)**

TP-201.7 – "Continuous Pressure Monitoring" (Adopted: October 8, 2003)

NOTE: Authority cited: Sections 39600, 39601, 39607 and 41954, Health and Safety Code. Reference: Sections 39515, 41952, 41954, 41956.1, 41959, 41960 and 41960.2, Health and Safety Code.

Appendix 2

Proposed Amendments to the EVR Effective and Operative Dates

California Environmental Protection Agency

 Air Resources Board

Vapor Recovery Certification Procedure

CP - 201

Certification Procedure for
Vapor Recovery Systems at
Gasoline Dispensing Facilities

Adopted: December 9, 1975
Amended: March 30, 1976
Amended: August 9, 1978
Amended: December 4, 1981
Amended: September 1, 1982
Amended: April 12, 1996
Amended: April 28, 2000
Amended: February 1, 2001
Amended: June 1, 2001
Amended: July 25, 2001
Amended: July 3, 2002
Amended: March 7, 2003
Amended: July 1, 2003
Amended: October 8, 2003
Amended: July 22, 2004
Amended:

Note: The only portion of this procedure being amended is Table 2-1, the balance of the text remains as amended on July 22, 2004. The text is shown in ~~strikeout~~ to indicate text that is proposed for deletion and underline to indicate text that is proposed for additions. [Bracketed text] is not part of the proposed amendments.

**Table 2-1
Effective and Operative Dates for
Performance Standards and Specifications**

| Performance Type | Requirement | Sec. | Effective Date | Operative Date |
|---|--|---------------|--|--|
| All Phase I Standards and Specifications | As specified in Table 3-1 | 3 | April 1, 2001 | July 1, 2001 |
| ORVR Compatibility | Interaction When Refueling ORVR Vehicles Shall Meet the applicable Efficiency or Emission Standard, Including ORVR Penetrations to 80% | 4.1, 4.4 | April 1, 2001 <u>April 1, 2002</u> | April 1, 2003 |
| Nozzle Criteria | Post-Refueling Drips ≤ 3 drop/refueling | 4.7 | <u>January 1, 2005^[1]</u> April 1, 2004 | <u>January 1, 2005^[1]</u> April 1, 2004 |
| Liquid Retention | ≤ 350 ml/1,000 gals. | 4.8 | April 1, 2001 | July 1, 2001 |
| Liquid Retention Nozzle Spitting | ≤ 100 ml/1,000 gals. ≤ 1.0 ml /nozzle/fueling | 4.8 | <u>January 1, 2005^[1]</u> April 1, 2004 | <u>January 1, 2005^[1]</u> April 1, 2004 |
| Spillage (including drips from spout) | ≤ 0.24 pounds/1,000 gallons | 4.3 | <u>January 1, 2005^[1]</u> April 1, 2004 | <u>January 1, 2005^[1]</u> April 1, 2004 |
| For GDF > 1.8 mil. gal/yr. | ISD Requirements | 10 | <u>April 1, 2005^[1]</u> April 1, 2004 | <u>April 1, 2005^[1]</u> April 1, 2004 |
| For GDF > 600,000 gal/yr. | ISD Requirements | 10.1 | <u>April 1, 2006^[1]</u> April 1, 2004 | <u>April 1, 2006^[1]</u> April 1, 2004 |
| Unihose | One Hose/Nozzle per Dispenser Side | 4.11 | Not applicable | April 1, 2003 |
| All other Phase II Standards and Specifications | As specified in Tables 4-1 through 8-2. | 4,5,6, 7,8 | <u>January 1, 2005^[1]</u> April 1, 2004 | <u>January 1, 2005^[1]</u> April 1, 2004 |

^[1] These amendments formalize dates already extended by Executive Officer action in Executive Orders G-70-203 and G-70-205 pursuant to section 19.2.

Appendix 3

Vapor Recovery Health and Safety Code Statutes

H&S 41950 Vapor Recovery Systems for Stationary Gas Tanks

41950. (a) Except as provided in subdivisions (b) and (e), no person shall install or maintain any stationary gasoline tank with a capacity of 250 gallons or more which is not equipped for loading through a permanent submerged fill pipe, unless such tank is a pressure tank as described in Section 41951, or is equipped with a vapor recovery system as described in Section 41952 or with a floating roof as described in Section 41953, or unless such tank is equipped with other apparatus of equal efficiency which has been approved by the air pollution control officer in whose district the tank is located.

(b) Subdivision (a) shall not apply to any stationary tanks installed prior to December 31, 1970.

(c) For the purpose of this section, "gasoline" means any petroleum distillate having a Reid vapor pressure of four pounds or greater.

(d) For the purpose of this section, "submerged fill pipe" means any fill pipe which has its discharge opening entirely submerged when the liquid level is six inches above the bottom of the tank. "Submerged fill pipe," when applied to a tank which is loaded from the side, means any fill pipe which has its discharge opening entirely submerged when the liquid level is 18 inches above the bottom of the tank.

(e) Subdivision (a) shall not apply to any stationary tank which is used primarily for the fueling of implements of husbandry.

(Added by Stats. 1975, Ch. 957.)

H&S 41951 Definition of Pressure Tank

41951. A "pressure tank" is a tank which maintains working pressure sufficient at all times to prevent hydrocarbon vapor or gas loss to the atmosphere.

(Added by Stats. 1975, Ch. 957.)

H&S 41952 Definition of Vapor Recovery System

41952. A "vapor recovery system" consists of a vapor gathering system capable of collecting the hydrocarbon vapors and gases discharged and a vapor disposal system capable of processing such

hydrocarbon vapors and gases so as to prevent their emission into the atmosphere, with all tank gauging and sampling devices gastight except when gauging or sampling is taking place.

(Added by Stats. 1975, Ch. 957.)

H&S 41953 Definition of Floating Roof

41953. A "floating roof" consists of a pontoon-type or double-deck-type roof, resting on the surface of the liquid contents and equipped with a closure seal, or seals, to close the space between the roof edge and tank wall. The control equipment required by this section shall not be used if the gasoline or petroleum distillate has a vapor pressure of 11.0 pounds per square inch absolute or greater under actual storage conditions. All tank gauging and sampling devices shall be gastight except when gauging or sampling is taking place.

(Added by Stats. 1975, Ch. 957.)

H&S 41954 ARB Shall Certify Vapor Recovery Systems

41954. (a) The state board shall adopt procedures for determining the compliance of any system designed for the control of gasoline vapor emissions during gasoline marketing operations, including storage and transfer operations, with performance standards that are reasonable and necessary to achieve or maintain any applicable ambient air quality standard.

(b) The state board shall, after a public hearing, adopt additional performance standards that are reasonable and necessary to ensure that systems for the control of gasoline vapors resulting from motor vehicle fueling operations do not cause excessive gasoline liquid spillage and excessive evaporative emissions from liquid retained in the dispensing nozzle or vapor return hose between refueling events, when used in a proper manner. To the maximum extent practicable, the additional performance standards shall allow flexibility in the design of gasoline vapor recovery systems and their components.

(c) (1) The state board shall certify, in cooperation with the districts, only those gasoline vapor control systems that it determines will meet the following requirements, if properly installed and maintained:

(A) The systems will meet the requirements of subdivision (a).

(B) With respect to any system designed to control gasoline vapors

during vehicle refueling, that system, based on an engineering evaluation of that system's component qualities, design, and test performance, can be expected, with a high degree of certainty, to comply with that system's certification conditions over the warranty period specified by the board.

(C) With respect to any system designed to control gasoline vapors during vehicle refueling, that system shall be compatible with vehicles equipped with onboard refueling vapor recovery (ORVR) systems.

(2) The state board shall enumerate the specifications used for issuing the certification. After a system has been certified, if circumstances beyond the control of the state board cause the system to no longer meet the required specifications or standards, the state board shall revoke or modify the certification.

(d) The state board shall test, or contract for testing, gasoline vapor control systems for the purpose of determining whether those systems may be certified.

(e) The state board shall charge a reasonable fee for certification, not to exceed its actual costs therefor. Payment of the fee shall be a condition of certification.

(f) No person shall offer for sale, sell, or install any new or rebuilt gasoline vapor control system, or any component of the system, unless the system or component has been certified by the state board and is clearly identified by a permanent identification of the certified manufacturer or rebuilder.

(g) (1) Except as authorized by other provisions of law and except as provided in this subdivision, no district may adopt, after July 1, 1995, stricter procedures or performance standards than those adopted by the state board pursuant to subdivision (a), and no district may enforce any of those stricter procedures or performance standards.

(2) Any stricter procedures or performance standards shall not require the retrofitting, removal, or replacement of any existing system, which is installed and operating in compliance with applicable requirements, within four years from the effective date of those procedures or performance standards, except that existing requirements for retrofitting, removal, or replacement of nozzles with nozzles containing vapor-check valves may be enforced commencing July 1, 1998.

(3) Any stricter procedures or performance standards shall not be

implemented until at least two systems meeting the stricter performance standards have been certified by the state board.

(4) If the certification of a gasoline vapor control system, or a component thereof, is revoked or modified, no district shall require a currently installed system, or component thereof, to be removed for a period of four years from the date of revocation or modification.

(h) No district shall require the use of test procedures for testing the performance of a gasoline vapor control system unless those test procedures have been adopted by the state board or have been determined by the state board to be equivalent to those adopted by the state board, except that test procedures used by a district prior to January 1, 1996, may continue to be used until January 1, 1998, without state board approval.

(i) With respect to those vapor control systems subject to certification by the state board, there shall be no criminal or civil proceedings commenced or maintained for failure to comply with any statute, rule, or regulation requiring a specified vapor recovery efficiency if the vapor control equipment which has been installed to comply with applicable vapor recovery requirements meets both of the following requirements:

(1) Has been certified by the state board at an efficiency or emission factor required by applicable statutes, rules, or regulations.

(2) Is installed, operated, and maintained in accordance with the requirements set forth in the document certification and the instructions of the equipment manufacturer.

(Amended by Stats. 2000, Ch. 729, Sec. 14.)

References at the time of publication (see page iii):

Regulations:

17, CCR, sections 94006, 94010, 94011, 94012, 94013, 94014, 94015, 94148, 94149, 94150, 94151, 94152, 94153, 94154, 94155, 94156, 94157, 94158, 94159, 94160, 94163

H&S 41955 Certification Required by Other Agencies

41955. Prior to state board certification of a gasoline vapor control system pursuant to Section 41954, the manufacturer of the system shall submit the system to, or, if appropriate, the components

of the system as requested by, the Division of Measurement Standards of the Department of Food and Agriculture and the State Fire Marshal for their certification.

(Added by Stats. 1976, Ch. 1030.)

H&S 41956 Other Agencies to Adopt Rules for Certification

41956. (a) As soon as possible after the effective date of this section, the State Fire Marshal and the Division of Measurement Standards, after consulting with the state board, shall adopt rules and regulations for the certification of gasoline vapor control systems and components thereof.

(b) The State Fire Marshal shall be the only agency responsible for determining whether any component or system creates a fire hazard. The division shall be the only agency responsible for the measurement accuracy aspects, including gasoline recirculation of any component or system.

(c) Within 120 days after the effective date of this subdivision, the Division of Measurement Standards, shall, after public hearing, adopt rules and regulations containing additional performance standards and standardized certification and compliance test procedures which are reasonable and necessary to prevent gasoline recirculation in systems for the control of gasoline vapors resulting from motor vehicle fueling operations.

(Amended by Stats. 1981, Ch. 902.)

H&S 41956.1 Revision of Standards for Vapor Recovery Systems

41956.1. (a) Whenever the state board, the Division of Measurement Standards of the Department of Food and Agriculture, or the State Fire Marshal revises performance or certification standards or revokes a certification, any systems or any system components certified under procedures in effect prior to the adoption of revised standards or the revocation of the certification and installed prior to the effective date of the revised standards or revocation may continue to be used in gasoline marketing operations for a period of four years after the effective date of the revised standards or the revocation of the certification. However, all necessary repair or replacement parts or components shall be certified.

(b) Notwithstanding subdivision (a), whenever the State Fire

Marshal determines that a system or a system component creates a hazard to public health and welfare, the State Fire Marshal may prevent use of the particular system or component.

(c) Notwithstanding subdivision (a), the Division of Measurement Standards may prohibit the use of any system or any system component if it determines on the basis of test procedures adopted pursuant to subdivision (c) of Section 41956, that use of the system or component will result in gasoline recirculation.

(Amended by Stats. 1996, Ch. 426, Sec. 2.)

References at the time of publication (see page iii):

Regulations: 17, CCR, section 94011

H&S 41957 Division of Industrial Safety Responsibilities

41957. The Division of Occupational Safety and Health of the Department of Industrial Relations is the only agency responsible for determining whether any gasoline vapor control system, or component thereof, creates a safety hazard other than a fire hazard.

If the division determines that a system, or component thereof, creates a safety hazard other than a fire hazard, that system or component may not be used until the division has certified that the system or component, as the case may be, does not create that hazard.

The division, in consultation with the state board, shall adopt the necessary rules and regulations for the certification if the certification is required.

(Amended by Stats. 1981, Ch. 714.)

H&S 41958 Rules Shall Allow for Flexibility in Design

41958. To the maximum extent practicable, the rules and regulations adopted pursuant to Sections 41956 and 41957 shall allow flexibility in the design of gasoline vapor control systems and their components. The rules and regulations shall set forth the performance standards as to safety and measurement accuracy and the minimum procedures to be followed in testing the system or component for compliance with the performance standards.

The State Fire Marshal, the Division of Occupational Safety and

Health, and the Division of Measurement Standards shall certify any system or component which complies with their adopted rules and regulations. Any one of the state agencies may certify a system or component on the basis of results of tests performed by any entity retained by the manufacturer of the system or component or by the state agency. The requirements for the certification of a system or component shall not require that it be tested, approved, or listed by any private entity, except that certification testing regarding recirculation of gasoline shall include testing by an independent testing laboratory.

(Amended by Stats. 1982, Ch. 466, Sec. 72.)

H&S 41959 Certification Testing

41959. Certification testing of gasoline vapor control systems and their components by the state board, the State Fire Marshal, the Division of Measurement Standards, and the Division of Occupational Safety and Health may be conducted simultaneously.

(Amended by Stats. 1981, Ch. 714.)

References at the time of publication (see page iii):

Regulations: 17, CCR, sections 94010, 94011, 94012, 94013

H&S 41960 Certification by State Agencies Sufficient

41960. (a) Certification of a gasoline vapor recovery system for safety and measurement accuracy by the State Fire Marshal and the Division of Measurement Standards and, if necessary, by the Division of Occupational Safety and Health shall permit its installation wherever required in the state, if the system is also certified by the state board.

(b) Except as otherwise provided in subdivision (g) of Section 41954, no local or regional authority shall prohibit the installation of a certified system without obtaining concurrence from the state agency responsible for the aspects of the system which the local or regional authority disapproves.

(Amended by Stats. 1996, Ch. 426, Sec. 3.)

References at the time of publication (see page iii):

Regulations: 17, CCR, sections 94011, 94012, 94013

H&S 41960.1 Operation in Accordance with Standards

41960.1. (a) All vapor control systems for the control of gasoline vapors resulting from motor vehicle fueling operations shall be operated in accordance with the applicable standards established by the State Fire Marshal or the Division of Measurement Standards pursuant to Sections 41956 to 41958, inclusive.

(b) When a sealer or any authorized employee of the Division of Measurement Standards determines, on the basis of applicable test procedures of the division, adopted after public hearing, that an individual system or component for the control of gasoline vapors resulting from motor vehicle fueling operations does not meet the applicable standards established by the Division of Measurement Standards, he or she shall take the appropriate action specified in Section 12506 of the Business and Professions Code.

(c) When a deputy State Fire Marshal or any authorized employee of a fire district or local or regional firefighting agency determines that a component of a system for the control of gasoline vapors resulting from motor vehicle fueling operations does not meet the applicable standards established by the State Fire Marshal, he or she shall mark the component "out of order." No person shall use or permit the use of the component until the component has been repaired, replaced, or adjusted, as necessary, and either the component has been inspected by a representative of the agency employing the person originally marking the component, or the person using or permitting use of the component has been expressly authorized by the agency to use the component pending reinspection.

(Added by Stats. 1981, Ch. 902.)

H&S 41960.2 Maintenance of Installed Systems

41960.2. (a) All installed systems for the control of gasoline vapors resulting from motor vehicle fueling operations shall be maintained in good working order in accordance with the manufacturer's specifications of the system certified pursuant to Section 41954.

(b) Whenever a gasoline vapor recovery control system is repaired or rebuilt by someone other than the original manufacturer or its authorized representative, the person shall permanently affix a plate to the vapor recovery control system that identifies the repairer or rebuilder and specifies that only certified equipment was used. In

addition, a rebuilder of a vapor control system shall remove any identification of the original manufacturer if the removal does not affect the continued safety or performance of the vapor control system.

(c) (1) The executive officer of the state board shall identify and list equipment defects in systems for the control of gasoline vapors resulting from motor vehicle fueling operations that substantially impair the effectiveness of the systems in reducing air contaminants. The defects shall be identified and listed for each certified system and shall be specified in the applicable certification documents for each system.

(2) On or before January 1, 2001, and at least once every three years thereafter, the list required to be prepared pursuant to paragraph (1) shall be reviewed by the executive officer at a public workshop to determine whether the list requires an update to reflect changes in equipment technology or performance.

(3) Notwithstanding the timeframes for the executive officer's review of the list, as specified in paragraph (2), the executive officer may initiate a public review of the list upon a written request that demonstrates, to the satisfaction of the executive officer, the need for such a review. If the executive officer determines that an update is required, the update shall be completed no later than 12 months after the date of the determination.

(d) When a district determines that a component contains a defect specified pursuant to subdivision (c), the district shall mark the component "Out of Order." No person shall use or permit the use of the component until the component has been repaired, replaced, or adjusted, as necessary, and the district has reinspected the component or has authorized use of the component pending reinspection.

(e) Where a district determines that a component is not in good working order but does not contain a defect specified pursuant to subdivision (c), the district shall provide the operator with a notice specifying the basis on which the component is not in good working order. If, within seven days, the operator provides the district with adequate evidence that the component is in good working order, the operator shall not be subject to liability under this division.

(Amended by Stats. 1999, Ch. 501, Sec. 1.)

References at the time of publication (see page iii):

Regulations: 17, CCR, sections 94006, 94010, 94011

H&S 41960.3 Telephone Number for Reporting Problems

41960.3. (a) Each district which requires the installation of systems for the control of gasoline vapors resulting from motor vehicle fueling operations shall establish a toll free telephone number for use by the public in reporting problems experienced with the systems. Districts within an air basin or adjacent air basin may enter into a cooperative program to implement this requirement. All complaints received by a district shall be recorded on a standardized form which shall be established by the state board, in consultation with districts, the State Fire Marshal, and the Division of Measurement Standards in the Department of Food and Agriculture. The operating instructions required by Section 41960.4 shall be posted at all service stations at which systems for the control of gasoline vapors resulting from motor vehicle fueling operations are installed and shall include a prominent display of the toll free telephone number for complaints in the district in which the station is located.

(b) Upon receipt of each complaint, the district shall diligently either investigate the complaint or refer the complaint for investigation by the state or local agency which properly has jurisdiction over the primary subject of the complaint. When the investigation has been completed, the investigating agency shall take such remedial action as is appropriate and shall advise the complainant of the findings and disposition of the investigation. A copy of the complaint and response to the complaint shall be forwarded to the state board.

(Amended by Stats. 1986, Ch. 194, Sec. 1.)

H&S 41960.4 Operating Instructions

41960.4. The operator of each service station utilizing a system for the control of gasoline vapors resulting from motor vehicle fueling operations shall conspicuously post operating instructions for the system in the gasoline dispensing area. The instructions shall clearly describe how to fuel vehicles correctly with vapor recovery nozzles utilized at the station and shall include a warning that repeated attempts to continue dispensing, after the system having indicated that the vehicle fuel tank is full, may result in spillage or recirculation of gasoline.

(Added by Stats. 1981, Ch. 902.)

H&S 41960.5 Nozzle Size Requirements

41960.5. (a) No retailer, as defined in Section 20999 of the Business and Professions Code, shall allow the operation of any gasoline pump from which leaded gasoline is dispensed, or which is labeled as providing leaded gasoline, unless the pump is equipped with a nozzle spout meeting the required specifications for leaded gasoline nozzle spouts set forth in Title 40, Code of Federal Regulations, Section 80.22(f)(1).

(b) For the purpose of this section, "leaded gasoline" means gasoline which is produced with the use of any lead additive or which contains more than 0.05 gram of lead per gallon or more than 0.005 gram of phosphorus per gallon.

(Added by Stats. 1987, Ch. 592, Sec. 2.)

H&S 41960.6 Fuel Pump Nozzles

41960.6. (a) No retailer, as defined in subdivision (g) of Section 20999 of the Business and Professions Code, shall, on or after July 1, 1992, allow the operation of a pump, including any pump owned or operated by the state, or any county, city and county, or city, equipped with a nozzle from which gasoline or diesel fuel is dispensed, unless the nozzle is equipped with an operating hold open latch. Any hold open latch determined to be inoperative by the local fire marshal or district official shall be repaired or replaced by the retailer, within 48 hours after notification to the retailer of that determination, to avoid any applicable penalty or fine.

(b) For purposes of this section, a "hold open latch" means any device which is an integral part of the nozzle and is manufactured specifically for the purpose of dispensing fuel without requiring the consumer's physical contact with the nozzle.

(c) Subdivision (a) does not apply to nozzles at facilities which are primarily in operation to refuel marine vessels or aircraft.

(d) Nothing in this section shall affect the current authority of any local fire marshal to establish and maintain fire safety provisions for his or her jurisdiction.

(Added by Stats. 1991, Ch. 468, Sec. 2.)

H&S 41961 Fees for Certification

41961. The State Fire Marshal, the Division of Measurement Standards, and the Division of Occupational Safety and Health may charge a reasonable fee for certification of a gasoline vapor control system or a component thereof, not to exceed their respective estimated costs therefor. Payment of the fee may be made a condition of certification. All money collected by the State Fire Marshal pursuant to this section shall be deposited in the State Fire Marshal Licensing and Certification Fund established pursuant to Section 13137, and shall be available to the State Fire Marshal upon appropriation by the Legislature to carry out the purposes of this article.

(Amended by Stats. 1992, Ch. 306, Sec. 5. Effective January 1, 1993. Operative July 1, 1993, by Sec. 6 of Ch. 306.)

H&S 41962 Vapor Recovery Systems on Cargo Tank Vehicles

41962. (a) Notwithstanding Section 34002 of the Vehicle Code, the state board shall adopt test procedures to determine the compliance of vapor recovery systems of cargo tanks on tank vehicles used to transport gasoline with vapor emission standards which are reasonable and necessary to achieve or maintain any applicable ambient air quality standard. The performance standards and test procedures adopted by the state board shall be consistent with the regulations adopted by the Commissioner of the California Highway Patrol and the State Fire Marshal pursuant to Division 14.7 (commencing with Section 34001) of the Vehicle Code.

(b) The state board may test, or contract for testing, the vapor recovery system of any cargo tank of any tank vehicle used to transport gasoline. The state board shall certify the cargo tank vapor recovery system upon its determination that the system, if properly installed and maintained, will meet the requirements of subdivision (a). The state board shall enumerate the specifications used for issuing such certification. After a cargo tank vapor recovery system has been certified, if circumstances beyond control of the state board cause the system to no longer meet the required specifications, the certification may be revoked or modified.

(c) Upon verification of certification pursuant to subdivision (b), which shall be done annually, the state board shall send a verified copy of the certification to the registered owner of the tank vehicle, which copy shall be retained in the tank vehicle as evidence of certification of its vapor recovery system. For each system certified,

the state board shall issue a nontransferable and nonremovable decal to be placed on the cargo tank where the decal can be readily seen.

(d) With respect to any tank vehicle operated within a district, the state board, upon request of the district, shall send to the district, free of charge, a certified copy of the certification and test results of any cargo tank vapor recovery system on the tank vehicle.

(e) The state board may contract with the Department of the California Highway Patrol to carry out the responsibilities imposed by subdivisions (b), (c), and (d).

(f) The state board shall charge a reasonable fee for certification, not to exceed its estimated costs therefor. Payment of the fee shall be a condition of certification. The fees may be collected by the Department of the California Highway Patrol and deposited in the Motor Vehicle Account in the State Transportation Fund. The Department of the California Highway Patrol shall transfer to the Air Pollution Control Fund the amount of those fees necessary to reimburse the state board for the costs of administering the certification program.

(g) No person shall operate, or allow the operation of, a tank vehicle transporting gasoline and required to have a vapor recovery system, unless the system thereon has been certified by the state board and is installed and maintained in compliance with the state board's requirements for certification. Tank vehicles used exclusively to service gasoline storage tanks which are not required to have gasoline vapor controls are exempt from the certification requirement.

(h) Performance standards of any district for cargo tank vapor recovery systems on tank vehicles used to transport gasoline shall be identical with those adopted by the state board therefor and no district shall adopt test procedures for, or require certification of, cargo tank vapor recovery systems. No district may impose any fees on, or require any permit of, tank vehicles with vapor recovery systems. However, nothing in this section shall be construed to prohibit a district from inspecting and testing cargo tank vapor recovery systems on tank vehicles for the purposes of enforcing this section or any rule and regulation adopted thereunder that are applicable to such systems and to the loading and unloading of cargo tanks on tank vehicles.

(i) The Legislature hereby declares that the purposes of this section regarding cargo tank vapor recovery systems on tank vehicles

are (1) to remove from the districts the authority to certify, except as specified in subdivision (b), such systems and to charge fees therefor, and (2) to grant such authority to the state board, which shall have the primary responsibility to assure that such systems are operated in compliance with its standards and procedures adopted pursuant to subdivision (a).

(Amended by Stats. 1982, Ch. 1255, Sec. 2. Operative July 1, 1983, or earlier, by Sec. 27.5 of Ch. 1255.)

References at the time of publication (see page iii):

Regulations: 17, CCR, sections 94014, 94015

Appendix 4
Cost Calculations

COST ASSUMPTIONS AND CALCULATIONS

I. Cost Assumptions for Table IV-3, Estimated Equipment and Installation Costs to Upgrade Gilbarco VaporVac Station with 12 Fueling Points (Unihose) to ORVR Compatibility and EVR in Two Steps

A. Healy ORVR Compatibility Conversion Costs (Source: Healy Systems):

| | |
|--|-------------------|
| Equipment Costs Per Dispenser | |
| 2 ORVR nozzles @ \$300 each | = \$600 |
| 1 vapor pump, etc. @ \$1670 each | = \$1,670 |
| 1 dispenser-related equipment @ \$200 each | = <u>\$200</u> |
| Total Equipment Costs/Dispenser | = \$2,470 |
| Installation Cost Per Dispenser | = \$300 |
| | |
| Total Healy ORVR Equipment and Installation Costs/Dispenser | = \$2,770 |
| Total Cost for 12 Fueling Points (6 unihose dispensers) | = \$16,620 |

B. OPW Membrane ORVR Compatibility Conversion Costs (Source: OPW)

| | |
|--|-------------------|
| Equipment Cost per Facility | = \$18,800 |
| Installation Cost per Facility | = <u>\$ 4,000</u> |
| Total OPW ORVR Equipment and Installation Cost/Facility | = \$22,800 |

C. Balance ORVR Compatibility Conversion Costs (Reference 6 and Healy):

| | |
|--|-------------------|
| Equipment Costs Per Dispenser | |
| 2 balance nozzles @ \$200 each | = \$400 |
| 2 sets hoses, etc. @ \$230 each set | = \$460 |
| 1 balance retrofit kit @ \$1400 each | = <u>\$1400</u> |
| Total Equipment Costs/Dispenser | = \$2,260 |
| Installation Cost Per Dispenser | = \$400 |
| | |
| Total balance ORVR Equipment and Installation Costs/Dispenser | = \$2,660 |
| Total Cost for 12 Fueling Points (6 unihose dispensers) | = \$15,960 |

D. Healy EVR Conversion Costs (Healy):

| | |
|---|-----------------|
| Equipment Costs Per Dispenser | |
| 2 EVR nozzles @ \$315 each | = <u>\$630</u> |
| Total Equipment Costs/Dispenser | = \$630 |
| Installation Cost Per Dispenser | = \$50 |
| Total Healy ORVR Equipment and Installation Costs/Dispenser | = \$680 |
| Total Dispenser Cost for 12 Fueling Points (6 unihose) | = \$4,080 |
| Equipment Cost for Clean Air Separator | = \$6900 |
| Installation Cost for Clean Air Separator | = <u>\$2000</u> |
| Total Cost for Clean Air Separator per Facility | = \$8,900 |

E. OPW EVR Conversion Costs (ARB estimate):

| | |
|--|----------------|
| Equipment Costs Per Dispenser | |
| 2 EVR nozzles @ \$350 each | = \$700 |
| 2 sets hoses, etc. @ \$260 each set | = <u>\$520</u> |
| Total Equipment Costs/Dispenser | = \$1220 |
| Installation Cost Per Dispenser | = \$75 |
| Total OPW EVR Equipment and Installation Costs/Dispenser | = \$1,295 |
| Total Dispenser Cost for 12 Fueling Points (6 unihose) | = \$7,770 |

F. Balance EVR Conversion Costs (ARB estimate):

| | |
|---|-----------------|
| Equipment Costs Per Dispenser | |
| 2 EVR nozzles @ \$350 each | = \$700 |
| 2 sets hoses, etc. @ \$260 each set | = <u>\$520</u> |
| Total Equipment Costs/Dispenser | = \$1220 |
| Installation Cost Per Dispenser | = \$75 |
| Total Healy ORVR Equipment and Installation Costs/Dispenser | = \$1,295 |
| Total Dispenser Cost for 12 Fueling Points (6 unihose) | = \$7,770 |
| Equipment Cost for balance processor | = \$10,000 |
| Installation Cost for balance processor | = <u>\$2000</u> |
| Total Cost for balance processor per Facility | = \$12,000 |

EVR Conversion Cost Summary

| ORVR System | Equipment to Convert to EVR | Processor | ISD* | EVR Nozzles & Hoses | TOTAL |
|--------------|--|-----------|----------|---------------------|----------|
| Healy | Add Healy processor, ISD & Healy EVR nozzles | \$8,900 | \$15,000 | \$4,080 | \$27,980 |
| OPW Membrane | Add ISD & EVR nozzles | NA | \$15,000 | \$7,770 | \$22,770 |
| balance | Add processor, ISD & EVR balance nozzles | \$12,000 | \$15,000 | \$7,770 | \$34,770 |

*ISD costs for station with 6 dispensers from 2002 EVR Technology Review

II. Cost Assumptions for Table IV-3, Estimated Equipment and Installation Costs to Upgrade Gilbarco Assist Station with 12 Fueling Points (Unihose) to EVR Phase II Compliance in One Step

A. Healy EVR Conversion Costs (Source: Healy Systems):

| | |
|--|-----------|
| Equipment Costs Per Dispenser | |
| 2 EVR nozzles @ \$315 each | = \$630 |
| 1 vapor pump, etc. @ \$1500 each | = \$1,670 |
| 1 dispenser-related equipment @ \$200 each | = \$200 |
| Total Equipment Costs/Dispenser | = \$2,500 |

Installation Cost Per Dispenser = \$300

Total Healy ORVR Equipment and Installation Costs/Dispenser = \$2,800
Total Cost for 12 Fueling Points (6 unihose dispensers) = \$16,800

Equipment Cost for Clean Air Separator = \$6900
 Installation Cost for Clean Air Separator = \$2000
Total Cost for Clean Air Separator per Facility = \$8,900

| EVR | Equipment to Convert to EVR | Dispenser Modifications | Clean Air Separator | ISD* | TOTAL |
|-------|---|-------------------------|---------------------|----------|----------|
| Healy | Dispenser modifications, processor, ISD & Healy EVR nozzles | \$16,800 | \$8,900 | \$15,000 | \$40,700 |

Appendix 5

CAPCOA Proposed Implementation Schedule

**ORVR Compliance Schedule as suggested in July 20, 2004, letter
Signed by Larry Greene, CAPCOA President**

**Proposed Schedule for Modifying Assist Phase II Systems to be Compatible with
Vehicles Equipped with On-board Refueling Vapor Recovery (ORVR)**

1. By February 1, 2005, each gasoline dispensing facility (GDF) owner subject to the ORVR retrofit requirements must submit a complete application showing how compliance with the ORVR requirements will be met and permit fees to the district for each affected GDF.
 - (a) A GDF owner of 10 or less affected GDFs within a district shall provide as part of each application a compliance plan showing that construction at the GDF will be completed and the GDF will have successfully passed all applicable performance tests by March 1, 2006. A construction schedule shall be submitted for each affected GDF.
 - (b) A GDF owner of more than 10 affected GDFs within a district shall provide as part of the application a compliance plan showing the following:
 - (i) Construction will be completed and the GDF will have successfully passed all applicable performance tests for 40% or more of the GDFs and the district notified in writing by no later than 120 days after the construction authorization is issued or August 1, 2005, whichever is later.

Construction will be completed and the GDF will have successfully passed all applicable performance tests for an additional 30% or more of the GDFs and the district notified in writing by no later than 120 days after the construction authorization is issued or December 1, 2005, whichever is later.

Construction will be completed and the GDF will have successfully passed all applicable performance tests for the remaining 30% of the GDFs and the district notified in writing by no later than 120 days after the construction authorization is issued or April 1, 2006, whichever is later.
2. Not more than 30 days after the district issues the construction authorization, the GDF owner shall sign a contract with the contractor who will install the ORVR compatible system in accordance with the compliance plan.
3. The GDF shall comply with the compliance plan submitted to the district.

CALIFORNIA AIR RESOURCES BOARD**NOTICE OF PUBLIC MEETING TO CONSIDER THE APPROVAL OF A
PROPOSED LIST OF MEASURES TO REDUCE PARTICULATE MATTER –
PM10 and PM2.5 (IMPLEMENTATION OF SENATE BILL 656, SHER 2003)**

The Air Resources Board (the Board or ARB) will conduct a public meeting at the time and place noted below to consider the approval of a proposed list of measures to reduce inhalable particulate matter (PM10) and the subset of fine particles (PM2.5). The list was prepared to meet the requirements of Senate Bill 656 (SB 656, Sher 2003).

DATE: November 18, 2004

TIME: 9:00 a.m.

PLACE: California Environmental Protection Agency
Air Resources Board
1001 I Street
Central Valley Auditorium
Sacramento, California 95814

This item will be considered at a two-day meeting of the Board, which will commence at 9:00 a.m., November 18, 2004, and will continue at 8:30 a.m., November 19, 2004. This item may be considered on November 19, 2004. Please consult the agenda for the meeting, which will be available at least 10 days before November 18, 2004, to determine the day on which this item will be considered.

If you have a disability-related accommodation need, please go to <http://www.arb.ca.gov/html/ada/ada.htm> for assistance or contact the ADA Coordinator at (916) 323-4916. If you are a person who needs assistance in a language other than English, please contact the Bilingual Coordinator at (916) 324-5049. TTY/TDD/Speech-to-Speech users may dial 7-1-1 for the California Relay Service.

In 2003, the Legislature enacted SB 656, codified as Health and Safety Code (H&SC) section 39614, to reduce public exposure to PM10 and PM2.5 (collectively referred to as PM). SB 656 requires ARB, in consultation with local air pollution control and air quality management districts (air districts), to develop and adopt a list of the most readily available, feasible, and cost-effective control measures that could be employed by ARB and the air districts to reduce PM. The goal is to make progress toward attainment of State and national PM10 and PM2.5 standards. The proposed control measures are to be based on rules, regulations, and programs

existing in California as of January 1, 2004 to reduce emissions from new, modified, and existing stationary, area-wide, and mobile sources. By July 31, 2005, the bill requires the ARB and air districts to adopt implementation schedules for appropriate ARB and air district measures. Finally, no later than January 1, 2009, the ARB must prepare a report describing actions taken to fulfill the requirements of the legislation as well as recommendations for further actions to assist in achieving the State PM standards. The bill requirements sunset on January 1, 2011, unless extended.

ARB staff has developed a proposed list of readily available, feasible, and cost-effective air measures existing in California as of January 1, 2004, that could be adopted by air districts to make progress towards attainment of the State and federal standards. For information purposes, we provide a summary of measures that ARB has adopted prior to January 1, 2004. We also include a summary of measures that ARB is considering for development as part of our State Implementation Plan obligation for PM₁₀ and ozone, as well as our Diesel Risk Reduction Program.

The proposed list of air district measures is comprised of measures for stationary sources, area-wide sources, transportation-related programs, and incentive programs. The list includes measures in the following categories: 1) wood-burning fireplaces and heaters, 2) non-agricultural open burning, 3) fugitive dust, 4) stationary combustion sources, 5) composting and related operations, 6) storage, transfer, and dispensing operations, 7) leaks and releases, 8) product manufacturing, 9) coatings, 10) solvent cleaning and degreasing, 11) miscellaneous activities, 12) general rules to reduce directly emitted PM, and 13) programs to reduce PM emissions from mobile sources (transportation-related programs and incentive programs). The list of air district measures provides a menu of control strategy options to address the many different types of PM problems that exist throughout California. For example, although most air districts do not meet the State PM₁₀ standards, some are closer to attainment than others. In addition, the size (coarse versus fine) and chemical composition of PM varies by region and season. In some areas, fugitive dust events may lead to high PM concentrations. In other areas, the fine fraction may drive PM concentrations, and the major contributors may be the secondary formation of PM_{2.5} caused by the reaction of precursor gases.

The ARB summaries focus on mobile source and fuels measures, consumer product regulations, and airborne toxic control measures for diesel PM. The summary of ARB measures adopted prior to January 1, 2004 includes measures in the following categories: 1) diesel-fueled engines and vehicles, 2) smoke management, 3) non-diesel mobile sources, 4) non-diesel fuels, 5) consumer products, 6) vapor recovery, and 7) distributed generation guidelines for electrical generation technologies. As mentioned above, the second summary describes

measures that ARB has proposed for development as part of our State Implementation Plan obligation for PM10 and ozone, as well as our Diesel Risk Reduction Program.

Once the Board adopts the proposed list of air district measures, air districts must adopt implementation schedules by July 31, 2005. The implementation schedules will identify the selected subset of measures, and the dates for final adoption, implementation, and the sequencing of selected control measures. In developing the implementation schedule, H&SC section 39614 (d)(2) specifically requires each air district to prioritize measures that the air district is considering from the list based on the effect individual measures will have on public health, air quality, emission reductions, and cost-effectiveness. Consideration is also given to the impact of selected measures on other criteria pollutants, as well as to the benefits accruing from measures adopted as part of ongoing ARB statewide efforts. The development of air district implementation schedules begins with an assessment of the nature and severity of the PM problem in each area. This is followed by an evaluation of the cost-effectiveness of a subset of measures appropriate to the specific needs of the area. Finally, an air district will select and prioritize a list of measures designed to most cost-effectively make progress towards attaining the PM standards.

ARB staff will present a written staff report at the meeting. Copies of the report may be obtained from the Board's Public Information Office, 1001 "I" Street, 1st Floor, Environmental Services Center, Sacramento, CA 95814, (916) 322-2990, no later than October 22, 2004. The report may also be obtained from ARB's internet site at <http://www.arb.ca.gov/pm/pmmeasures/pmmeasures.htm>.

Interested members of the public may also present comments orally or in writing at the meeting, and in writing or by e-mail before the meeting. To be considered by the Board, written comment submissions not physically submitted at the meeting must be received no later than 12:00 noon, November 17, 2004, and addressed to the following:

Postal mail is to be sent to:

Clerk of the Board
Air Resources Board
1001 "I" Street, 23rd Floor
Sacramento, California 95814

Electronic mail is to be sent to listpmmea@listserv.arb.ca.gov and received at the ARB no later than 12:00 noon, November 17, 2004.

Facsimile submissions are to be transmitted to the Clerk of the Board at (916) 322-3928 and received at the ARB no later than 12:00 noon, November 17, 2004.

The Board requests, but does not require 30 copies of any written submission. Also, the ARB requests that written and e-mail statements be filed at least 10 days prior to the meeting so that ARB staff and Board members have time to fully consider each comment. Further inquiries regarding this matter should be directed to Ms. Karen Magliano, Manager of the Particulate Matter Analysis Section, Planning and Technical Support Division at (916) 322-7137 or by e-mail at kmaglian@arb.ca.gov, or Dr. Patricia Velasco, Air Pollution Specialist, Planning and Technical Support Division at (916) 323-7560 or by e-mail at pvelasco@arb.ca.gov.

CALIFORNIA AIR RESOURCES BOARD


Catherine Witherspoon
Executive Officer

Date: 10/19/04

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Web-site at www.arb.ca.gov.

State of California**California Environmental Protection Agency****AIR RESOURCES BOARD****Staff Report****Proposed List of Measures to Reduce
Particulate Matter – PM10 and PM2.5
(Implementation of Senate Bill 656, Sher 2003)**

Release Date: October 18, 2004

Meeting Date: November 18-19, 2004

Planning and Technical Support Division

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of ways you can reduce demand and cut energy costs, see our Web-site at <http://www.arb.ca.gov>.

State of California
California Environmental Protection Agency
AIR RESOURCES BOARD

Staff Report

**Proposed List of Measures to Reduce Particulate Matter
(Implementation of Senate Bill 656, Sher 2003)**

Air Resources Board Meeting
Begins November 18, 2004 at 9:00 a.m.
and may continue November 19, 2004 at 8:30 a.m.
Air Resources Board
Central Valley Auditorium
1001 I Street
Sacramento, California 95814

This report has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.

This report and related materials are available for download from the Air Resources Board's Internet site at:
<http://www.arb.ca.gov/pm/pmmeasures/pmmeasures.htm>. In addition, written copies may be obtained from the Board's Public Information Office, 1001 I Street, 1st Floor, Environmental Services Center, Sacramento, California 95814, (916) 322-2990.

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<http://www.arb.ca.gov/html/ada/ada.htm> for assistance or contact the ADA Coordinator at (916) 323-4916. If you are a person who needs assistance in a language other than English, please go to:
<http://inside.arb.ca.gov/as/eeo/languageaccess.htm> or contact the Bilingual Coordinator at (916) 324-5049.

Questions

If you have questions concerning this report, please contact:

Ms. Karen Magliano
Manager, PM Analysis Section.
Phone: (916) 322-7137
Email: kmaglian@arb.ca.gov

or

Patricia Velasco, Ph.D.
Project Lead
Phone: (916) 323-7560
Email: pvelasco@arb.ca.gov

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I. INTRODUCTION

A. Background

Reducing particulate matter air pollution is one of the California Air Resources Board's (ARB or Board) highest public health priorities. Exposure to particulate pollution is linked to increased frequency and severity of asthma attacks, pneumonia and bronchitis, and even premature death in people with pre-existing cardiac or respiratory disease. Those most sensitive to particle pollution include infants and children, the elderly, and persons with heart and lung disease. Particulate matter pollution consists of very small liquid and solid particles suspended in the air and includes particles smaller than 10 microns in size (PM10), as well as the subset of fine particles smaller than 2.5 microns in size (PM2.5). Particles with a size between 2.5 and 10 microns are often referred to as coarse particles.

In 2003, the Legislature enacted Senate Bill 656 (SB 656, Sher), codified as Health and Safety Code (H&SC) section 39614, to reduce public exposure to PM10 and PM2.5. SB 656 requires ARB, in consultation with local air pollution control and air quality management districts (air districts), to develop and adopt, by January 1, 2005, a list of the most readily available, feasible, and cost-effective control measures that could be employed by ARB and the air districts to reduce PM10 and PM2.5 (collectively referred to as PM). The goal is to make progress toward attainment of State and national PM10 and PM2.5 standards.

The proposed control measures are to be based on rules, regulations, and programs existing in California as of January 1, 2004 to reduce emissions from new, modified, and existing stationary, area, and mobile sources. By July 31, 2005, the bill requires the ARB and air districts to adopt implementation schedules for appropriate ARB and air district measures. Finally, no later than January 1, 2009, the ARB must prepare a report describing actions taken to fulfill the requirements of the legislation as well as recommendations for further actions to assist in achieving the State PM standards. The bill requirements sunset on January 1, 2011, unless extended.

B. Scope of the PM Problem

1. *PM Standards*

The U.S. Environmental Protection Agency (U.S. EPA) and the ARB have adopted ambient air quality standards for PM10 and PM2.5 (Table 1). California's standards are the most health-protective standards in the nation, and are designed to provide additional protection for the most sensitive groups of people, including infants and children, the elderly, and persons with heart or lung disease. Attainment of California's standards is expected to result in the yearly prevention of an estimated 6,500 premature deaths, approximately

400,000 incidences of lower respiratory symptoms among children ages seven to fourteen, and over two million lost work days.

Table 1. State and National Particulate Matter Ambient Air Quality Standards. The levels of the standards are expressed in micrograms per cubic meter ($\mu\text{g}/\text{m}^3$).

| | California ($\mu\text{g}/\text{m}^3$) | National ($\mu\text{g}/\text{m}^3$) |
|--------------|--|--|
| PM10 | | |
| Annual | 20 | 50 |
| 24-hour | 50 | 150 |
| PM2.5 | | |
| Annual | 12 | 15 |
| 24-hour | — | 65 |

Virtually the entire State is nonattainment for the State PM10 standard, with most urban areas and several isolated sub-areas nonattainment for the State PM2.5 standard (Figure 1). With respect to the national standards, the San Joaquin Valley, the South Coast, and several desert areas are nonattainment for the federal PM10 standard. The U.S. EPA has issued preliminary PM2.5 national designation recommendations, with final designations to occur by December 31, 2004. Preliminary national PM2.5 nonattainment areas include the San Joaquin Valley, the South Coast, and San Diego. Further information on State and national designations can be found at:

<http://www.arb.ca.gov/desig/desig03/desig03.htm>

and

<http://www.arb.ca.gov/desig/pm25desig/pm25desig.htm>

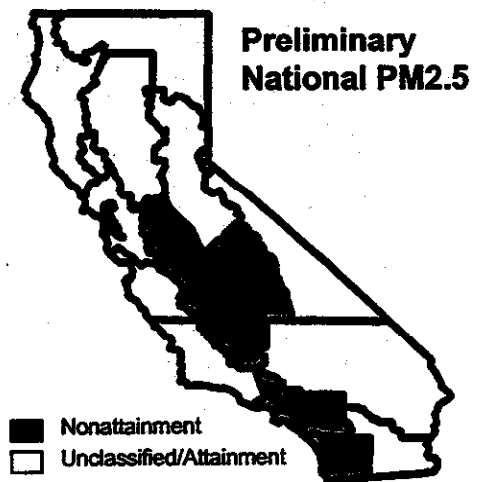
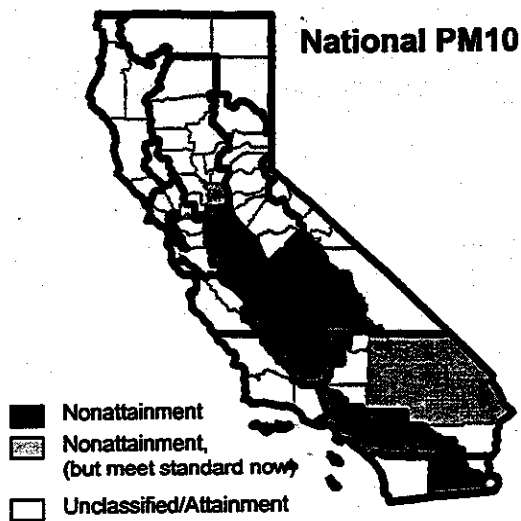
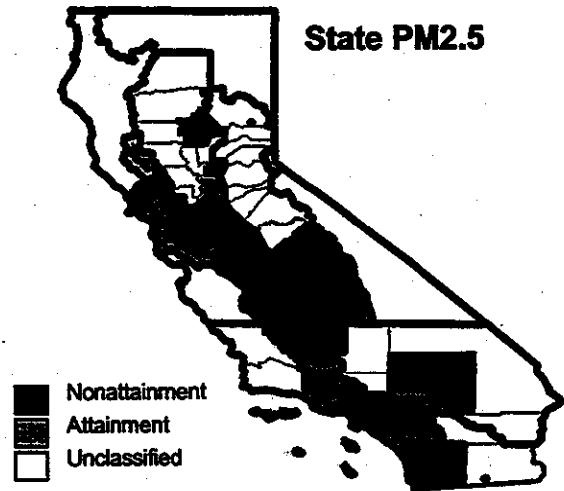
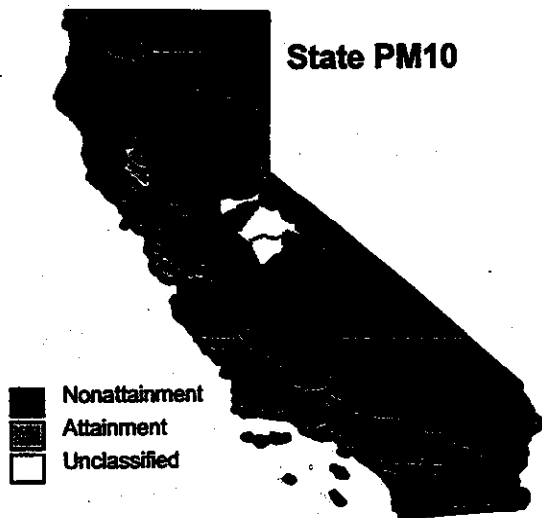
As discussed above, almost every area in California experiences PM concentrations above the level of the State standards. SB 656 therefore sets forth a framework for the implementation of measures to provide near-term reductions in PM throughout California, especially in those areas that have not been subject to federal planning requirements. This will ensure continuing focus on PM and progress towards attaining California's health protective standards.

In addition to the State PM standards, in 1998, the ARB identified PM emitted from diesel-fueled engines as a toxic air contaminant. Diesel PM contributes approximately 70 percent of the cancer risk associated with all currently identified toxic air contaminants in the State. Measures to reduce diesel PM are ARB's highest priority.

2. *Nature of PM in California*

Ambient PM is comprised of both directly emitted PM such as dust or soot, known as primary PM, as well as PM formed in the atmosphere from the reactions of precursor gases, known as secondary PM. These precursor gases

Figure 1. State and National Designations for Particulate Matter Standards



include nitrogen oxides (NO_x), sulfur oxides (SO_x), volatile organic compounds (VOC), and ammonia. NO_x, SO_x, and ammonia combine to form secondary ammonium nitrate and sulfate. VOC can form secondary organic aerosols, as well as participate in the production of secondary ammonium nitrate. NO_x and VOC are also precursors of ambient ozone. Sources of ambient PM include combustion sources such as trucks and passenger cars, off-road equipment, industrial processes, residential wood burning, and forest and agricultural burning; fugitive dust from paved and unpaved roads, construction, mining and agricultural activities; and ammonia from sources such as livestock operations, fertilizer application, and motor vehicles. In general, combustion processes form fine particles, whereas emissions from dust sources tend to be predominantly coarse particles.

The size, concentration, and chemical composition of PM vary by season and by region depending upon the mix of contributing sources and meteorology. A number of areas exhibit strong seasonal patterns. Other areas have a much more uniform distribution – PM concentrations remain high throughout the year. In yet other areas, isolated PM exceedances can occur at any time of the year.

For example, in the San Joaquin Valley, the San Francisco Bay Area, and the Sacramento Valley, there is a strong seasonal variation in PM, with higher PM₁₀ and PM_{2.5} concentrations in the fall and winter months. In the winter, PM₁₀ and PM_{2.5} concentrations can remain elevated for extended periods. The PM_{2.5} size fraction drives the PM concentrations, and a major contributor to high levels of ambient PM_{2.5} in these regions in the winter is the secondary formation of ammonium nitrate from precursors emitted by stationary and mobile combustion sources. Increased activity for some emission sources (e.g. wood-combustion in stoves and fireplaces) and meteorological conditions are conducive to the build-up of PM.

In the South Coast region, PM concentrations remain high throughout the year. The more consistent activity patterns of emission sources, as well as less variability in weather patterns in the South Coast, leads to this more uniform concentration pattern. In other areas, high PM can be more episodic than seasonal. For example, in Owens Lake in the Great Basin Valleys Air Basin, episodic fugitive dust events lead to very high PM₁₀ levels, with soil dust as the major contributor to ambient PM₁₀.

The relative contribution of primary versus secondary PM will also vary by region and season. Throughout the State, on an annual basis, the fraction of PM_{2.5} comprised of secondary ammonium nitrate and sulfate can range between 10 and 60 percent of the PM_{2.5} mass (with ammonium nitrate contributing between 5 and 50 percent and ammonium sulfate contributing between 5 and 25 percent of the PM_{2.5} mass). The fraction contributed by secondary ammonium nitrate and ammonium sulfate can be even higher on a 24-hour basis. Only limited information is available on how much of the measured PM_{2.5}

organic carbon component is secondary organic aerosols. In most areas, the majority of organic carbon is primary, and has been directly emitted from sources such as wood combustion, mobile sources, and commercial cooking. However, available studies suggest that in the South Coast on an annual average basis, secondary organic aerosols may constitute 6 to 16 percent of PM_{2.5}, and in urban areas of the San Joaquin Valley during the winter, secondary organic aerosols may contribute up to an average of 8 percent of PM_{2.5}.

Because the challenges vary from area to area as outlined above, each air district will need to consider a different mix of measures to address the unique nature of the PM problem in their region.

II. LIST DEVELOPMENT

A. Overview

Section 39614 (b) of the H&SC requires the ARB to develop and adopt a list of the most readily available, feasible, and cost-effective proposed control measures, based on rules, regulations, and programs existing in California as of January 1, 2004. To meet this requirement, ARB staff has developed a proposed list of readily available, feasible, and cost-effective air measures that could be adopted by air districts to make progress towards attainment of the State and federal standards. For information purposes, we also provide a summary of measures that ARB has adopted prior to January 1, 2004. We also provide a summary of measures that ARB is considering for development as part of our *State Implementation Plan obligation for PM₁₀ and ozone, as well as our Diesel Risk Reduction Program.*

In preparing the Staff Report, ARB staff worked with air districts through conference calls with the California Air Pollution Control Officers Association planning managers and rule development committees, as well as with individual air districts. ARB staff also sought public input through a workshop held on May 6, 2004 in Sacramento, providing the opportunity to present both oral and written comments on a draft version of the air district list and summary of ARB measures released on April 22, 2004, and through follow-up meetings with various stakeholders.

Appendices A and B include an informational summary of ARB measures. Appendix C includes the proposed SB 656 list of air district measures. The H&SC describes broad authority for emissions control, with ARB having the primary jurisdiction over mobile sources, and air districts having primary jurisdiction over stationary sources. However, there are areas where cross-over can occur, such as ARB authority to develop airborne toxic control measures which can address both mobile and stationary sources. Therefore, the air district list is primarily comprised of measures for stationary sources, area-wide sources, transportation-related programs, and incentive programs.

As mentioned previously, ambient PM is comprised of both directly emitted PM such as dust or soot, as well as PM formed in the atmosphere from the reactions of precursor gases such as secondary ammonium nitrate or secondary organic aerosols. These precursor gases include NO_x, SO_x, VOC, and ammonia. Therefore, to address the full scope of possible PM problems, measures to address both directly emitted PM as well as precursor gases are included in the summaries of ARB measures and in the list of measures for air districts. It is important to note that these summaries and list are a compendium of measures that reflect the scope of the diverse nature of the different types of PM problems across the State. Air districts however, select an appropriate subset of measures from the air district list based on the severity and nature of the PM problem, and a feasibility and cost-effectiveness assessment specific to their area and sources.

B. ARB Measures

As described above, for information purposes, we prepared two summaries of ARB rules, regulations, and programs that reduce PM. The first is a summary of measures adopted from 1998 through January 1, 2004 (Appendix A). 1998 was selected as the starting point to take advantage of a recently developed compendium of ARB measures adopted within the past five years. Many measures adopted prior to 1998 were updated during this five-year period. Therefore, using the period of 1998 onward reflects the most current version of adopted measures. Some of these measures have future implementation dates. The summary includes measures in the following categories: 1) diesel-fueled engines and vehicles, 2) smoke management, 3) non-diesel mobile sources, 4) non-diesel fuels, 5) consumer products, 6) vapor recovery, and 7) distributed generation guidelines for electrical generation technologies. Some of the diesel measures have been adopted as airborne toxic control measures (ATCMs) to directly reduce the diesel component of PM as part of the Diesel Risk Reduction Program. As part of the toxic air contaminant control program, the ARB has also adopted ATCMs for asbestos from various sources (e.g., quarrying, mining), outdoor residential waste burning, medical waste incinerators, and chrome plating. While these measures are not included on the summary because their primary purpose was to reduce air toxics, they may provide additional PM reductions. Further information on these airborne toxic control measures can be found at:

<http://www.arb.ca.gov/toxics/atcm/atcm.htm>

The second summary describes measures that ARB has proposed for development as part of our State Implementation Plan obligation for PM₁₀ and ozone, as well as our Diesel Risk Reduction Program (Appendix B).

C. SB 656 List of Air District Measures

Appendix C contains the proposed SB 656 list of air district measures. The list was compiled from a number of sources. These sources included recent rule assessments conducted by the California Air Pollution Control Officers Association for stationary and non-stationary sources, a best available control measure analysis performed for the 2003 San Joaquin Valley Air Pollution Control District PM10 State Implementation Plan, and review of air district rulebooks. The list comprises measures in the following categories: 1) wood-burning fireplaces and heaters, 2) non-agricultural open burning, 3) fugitive dust, 4) stationary combustion sources, 5) composting and related operations, 6) storage, transfer, and dispensing operations, 7) leaks and releases, 8) product manufacturing, 9) coatings, 10) solvent cleaning and degreasing, 11) miscellaneous activities, 12) general rules to reduce directly emitted PM, and 13) programs to reduce PM emissions from mobile sources (transportation-related programs and incentive programs).

All rules that had been adopted prior to January 1, 2004 were initially considered as readily available, feasible, and cost-effective due to their adoption by at least one air district within the State. However, many measures previously adopted by air districts, as well as rule assessments prepared by the California Air Pollution Control Officers Association, were developed for ozone planning purposes. While ozone and PM have common precursors, further evaluation of measures was conducted for the purpose of selecting a group of measures most appropriate for reducing ambient PM. Measures not included on the list from a PM perspective however, may still warrant consideration under different mechanisms such as ozone transport mitigation and other ozone planning requirements.

The review was conducted within the context of the legislation's criteria specifying measures that were the most readily available, feasible, and cost-effective from the perspective of attaining the PM standards, as well as an assessment of the types of measures that best reflect the nature of different PM source contributions on a statewide basis. No single criterion was given precedence in the review. Instead, the combined impact of all criteria was considered in selecting measures for inclusion on the list. In some cases, selected rules may operate under alternative compliance mechanisms such as the South Coast's RECLAIM program. However, their feasibility and availability were evaluated independently of these programs and rules were not eliminated simply on the basis of their eligibility to operate under this type of program. Measures that would have limited applicability, or which were already addressed through other statewide regulations were not included in the list. Setting opacity limits for wood burning fireplaces and heaters and requirements to cover haul vehicles are examples of such measures.

ARB staff identified measures that generally represent the best levels of emission control that have been adopted within the context of the screening procedures identified above. This serves to provide a list with the potential for the greatest degree of health protection, as well as providing adequate measures for areas in the State with the most severe nonattainment problems. Assessment of the level of emission control included examination of rule requirements such as emission limits, performance requirements, and the scope of source activities addressed. However, in a number of cases, several different control options for a given source category are presented where a number of individual source types are included within a single rule (such as the combustion and solvent use categories), or where different approaches to control can be equally effective depending upon the nature of the PM problem. For example, measures to reduce residential green waste burning include approaches that limit burning based on availability of green waste pickup, lot size, or population. In addition, alternative rules are included in cases where a rule has future implementation dates that are dependent on expected demonstration of technology. While rules with future implementation limits may not be necessary in many areas of the State, they are offered for consideration in air districts with more severe PM problems that may require more stringent emission limits. Finally, in several cases, similar rules or programs may have been adopted by multiple air districts, but in general only one has been listed as a representative example. Many air districts, for example, have adopted measures to require the sale and installation of only U.S. EPA-certified Phase II woodstoves. The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other air district rules which may also represent similar, suitable levels of control.

Given the diversity of PM problems throughout the State, as well as the range in the relative severity of nonattainment, the list of air district measures compiled by the ARB is necessarily broad in the scope of possible measures and the range of cost-effectiveness. The cost-effectiveness of a particular measure will also vary from air district to air district. With some exceptions, H&SC section 39614 requires each air district to adopt an implementation schedule for the measures from the list of air district measures that are the most cost-effective measures for that air district. Since the law leaves the final decision to each air district as to which measures are the most cost-effective measures, ARB is not drawing a firm line as to which measures are the most cost-effective measures from a "first-cut" or statewide perspective. Instead, ARB is presenting a more comprehensive list of measures along with guidance and supporting information in order to provide cost-effectiveness information to the air districts. Listing of a measure on the ARB list does not imply that the measure is a "most cost-effective" measure for every air district. Each air district should review the list together with the supporting information as the air district makes its determination as to which are the most cost-effective measures for the air district. The list therefore provides a starting point, or menu of control strategy options to address the many different types of PM problems. Air districts will select appropriate measures from this list

based on a local assessment of air quality conditions, feasibility, and cost-effectiveness. This process is discussed in further detail in Section III.

III. AIR DISTRICT IMPLEMENTATION PROCESS

Once the Board adopts the initial list, air districts must adopt implementation schedules by July 31, 2005 at a noticed public meeting and after at least one public workshop. The implementation schedules identify the selected subset of measures, and the dates for final adoption, implementation, and sequencing of selected control measures. In developing the implementation schedule, H&SC section 39614 (d)(2) specifically requires each air district to prioritize measures that the air district is considering from the list based on the effect individual measures will have on public health, air quality, emission reductions, and cost-effectiveness. Consideration is also given to the impact of selected measures on other criteria pollutants, as well as to the benefits accruing from measures adopted as part of ongoing ARB statewide efforts.

Air district implementation begins with an assessment of the nature and severity of the PM problem in each area. This is followed by an evaluation of the cost-effectiveness of a subset of measures appropriate to the specific needs of the area. Finally, an air district will select and prioritize a list of measures designed to most cost-effectively make progress towards attaining the PM standards.

Each air district will tailor its implementation schedule to its individual PM problem. For example, although most air districts do not meet the State PM10 standards, some are closer to attainment than others. In addition, the size (coarse versus fine) and chemical composition of PM varies by region and season. In some areas, fugitive dust events may lead to high PM concentrations. In other areas, the major contributors may be the secondary formation of PM2.5 caused by the reaction of precursor gases. Therefore, in adopting an implementation schedule, each air district will first characterize the major components of PM in their area to determine the most appropriate level and type of control approach. To assist air districts in evaluating the nature of their PM problem, the ARB is preparing the resources described in Section IV Part A. Within this context, air districts then prioritize and select the most cost-effective subset of measures appropriate to their local situation to make progress towards attaining the PM standards. For example, rules addressing VOC sources may only need to be considered in areas where there are significant contributions from secondary organic aerosols, or where VOCs are a key precursor for reducing ammonium nitrate concentrations. Other areas where wood smoke causes significant impacts may in contrast focus on residential wood combustion control measures. As a starting point, ARB has prepared the suggested list of basic control measures for different types of PM problems described in Section IV Part B.

In selecting and prioritizing the most cost-effective measures for their implementation schedules, H&SC section 39614 (a), (d)(1), and (d)(2) provide that air districts should follow the standards and process described in H&SC section 40922 which sets forth California Clean Air Act (CCAA) measure ranking procedures for ozone. H&SC section 40922 states that air districts shall determine the cost-effectiveness of available and proposed control measures and then prepare a list that ranks the control measures from least cost-effective to most cost-effective. In adopting an implementation schedule, air districts will also consider technological feasibility, emission reduction potential, rate of reduction, public acceptance, and enforceability, in addition to cost-effectiveness. H&SC section 39614 (d)(2) specifically requires each air district to prioritize measures that the air district is considering under the SB 656 program from the list of air district measures based on the effect individual control measures will have on public health, air quality, and emissions reductions and on cost-effectiveness. H&SC section 39614 (d)(1) provides that after the air district goes through the prioritization, the air district must adopt a prioritized implementation schedule for the most cost-effective measures (unless a statutory exception applies). Therefore, it is the air district's discretion to select, based on the magnitude and nature of their PM problem, a subset of measures to most cost-effectively address their specific PM problem.

It is important to recognize that not all rules are equally cost-effective or appropriate in all areas of the State. Cost-effectiveness and feasibility will vary depending upon the number, size, and configuration of sources within a jurisdiction, and the contribution of that source to local PM concentrations. Cost-effectiveness is also dependent upon the existing degree of control for a given source type. Therefore, cost-effectiveness will vary depending upon the baseline or starting point in each air district. Each air district will estimate the local cost-effectiveness when prioritizing potential control measures.

As a starting point for air district analysis, the ARB has compiled the available cost-effectiveness information for each measure. This information was developed based on ARB and air district review of district Board hearing materials, staff reports published to support rule adoption, air district Clean Air Plans or Air Quality Management Plans required under the CCAA, and State Implementation Plans. Table 2 summarizes the air district measures in each major program or major emission source category organized by increasing cost-effectiveness range. The supporting data for this table are presented in Appendix D. Cost-effectiveness is grouped into six bins. The first bin includes savings to no-cost; the next five bins include cost-effectiveness ranges increasing by \$5,000/ton of pollutant reduced, with the last bin representing cost-effectiveness values greater than \$20,000/ton of pollutant reduced. For some control measures, the cost-effectiveness figures span a large range. Table 2 includes short comments on factors leading to large cost-effectiveness ranges. For example, boiler, steam generator, and process heater control measures apply to different types of units in significantly different sizes, with a mix of

previous control levels, accomplished by a variety of control methods or technology. Therefore, within a single rule, some types of units may be more cost-effective to control than others. Therefore, in selecting the most cost-effective measures under the SB 656 program, an air district should adopt and implement the rule for the types of units or source types for which the measure is a most cost-effective measure for that individual air district.

In adopting an implementation schedule, air districts will also consider other ongoing programs such as measures being adopted to meet federal air quality standards or the State ozone planning process. Additionally, the implementation schedule may not include any measures that are substantially similar to one already adopted by an air district, or scheduled for adoption within two years of adoption of the implementation schedule. While the measures selected to fulfill the requirements of SB 656 must be different from any measures already planned to meet other requirements, the legislation does not require that any planned measure be accelerated. Air districts may modify their implementation schedules if circumstances change with respect to attainment status, the nature of sources, or the effects of ongoing control programs.

Air districts are not required to adopt a measure to further regulate emissions from any source that operates under, or that requires an air district to modify, either a market-based incentive program, or an interchangeable emission reduction credit program. The legislation provides flexibility to air districts in assessing whether there are alternative readily available, feasible, and cost-effective measures that would achieve equivalent or better emission reductions that could be included on the air district's implementation schedule in lieu of a measure on the list in Appendix C. The measures included on the air district list represent guidance on the scope and level of emission control for each source category, accompanied by a reference to a specific air district rule or rules. These rules are referenced with specific rule language as adopted. However, air districts do not need to incorporate the exact language of the referenced rules, but rather should match the scope and emission limits within the context and structure of their local rulebooks and the nature of sources within their air district.

Although the list of air district measures provides a retrospective look at measures adopted prior to January 1, 2004, footnotes have been provided in cases where rules have been amended subsequent to this date. While not part of the list, ongoing rule development and rule amendments can be reviewed for additional approaches to reduce PM.

Table 2: Cost-Effectiveness of Proposed Air District Measures

| Category | Measure | Cost-Effectiveness (\$ in thousands /ton of pollutant reduced) | | | | | | Comments |
|--|---|---|-----|------|-------|-------|-----|----------|
| | | <0 | 0-5 | 5-10 | 10-15 | 15-20 | >20 | |
| Miscellan. | ▪ Solid waste landfills | X | | | | | | |
| Wood Burning Fireplaces and Heaters | ▪ Public awareness program ▪ Curtailment programs ▪ Require installation of U.S. EPA certified stoves ▪ Limit number of heaters in new and exiting properties ▪ Control wood moisture content ▪ Prohibit fuel types | X | X | | | | | |
| Coating Operations | ▪ Glass ▪ Metal parts and products ▪ Paper, fabric, and film ▪ Plastic and rubber ▪ Spray booth facilities ▪ Wood flat stock ▪ Wood products | X | X | | | | | |
| Product Manufacture | ▪ Food manufacturing and processing ▪ Polyester resin operations | X | X | | | | | |
| Fugitive Dust | ▪ Apply water during construction, operations (earthmoving, demolition, grading) ▪ Apply water during bulk material handling ▪ Clean up carryout and trackout ▪ Street sweeping | | X | | | | | |
| Combustion Sources | ▪ Commercial charbroiling operations ▪ Lime kilns ▪ Cement kilns | | X | | | | | |
| Miscellan. | ▪ Woodworking operations | | X | | | | | |
| Coating Operations | ▪ Adhesives and sealants | X | X | X | | | | |
| Combustion Sources | ▪ Furnaces | | X | X | | | | |
| Fugitive Dust | ▪ Apply chemical stabilizers or pave shoulders on paved roads ▪ Apply water or chemical stabilizers on unpaved roads, ▪ Pave unpaved roads | | X | X | | | | |

Table 2: Cost-Effectiveness of Proposed Air District Measures

| Category | Measure | Cost-Effectiveness (\$ in thousands /ton of pollutant reduced) | | | | | | Comments |
|--|---|---|-----|------|-------|-------|-----|--|
| | | <0 | 0-5 | 5-10 | 10-15 | 15-20 | >20 | |
| Product Manufacture | ▪ Fiberboard | | X | X | | | | |
| Fugitive Dust | ▪ Apply water at disturbed open areas | | | X | | | | |
| Coating Operations | ▪ Architectural coatings ▪ Graphic arts | | | X | | | | |
| Solvent Cleaning and Degreasing | ▪ Use of solvents | | | X | | | | |
| Composting | ▪ Chipping and grinding | | | X | | | | |
| Wood Burning Fireplaces and Heaters | ▪ Replace non-certified appliances | X | X | X | X | | | ▪ Considering long term energy savings leads to lower CE ▪ CE also depends on appliance type |
| Fugitive Dust | ▪ Apply water, chemical stabilizer, gravel, or pave unpaved parking lots ▪ Apply water, chemical stabilizer, gravel, or pave unpaved roads adjacent to agricultural fields | | X | X | X | | | |
| Leaks and Releases | • Equipment leaks (valves and flanges) | | X | X | X | | | |
| Product Manufacture | ▪ Polymeric products | | | X | X | | | |
| Non-Agricultural Open Burning | ▪ Prohibit burning in highly populated areas | | X | X | X | X | | |
| Combustion Sources | ▪ Turbines | | X | X | X | X | | Depends on unit size and control method |
| Combustion Sources | ▪ Residential water heaters | | X | X | X | X | | Depends on emission limit |
| Storage, Transfer, & Dispensing Operations | ▪ Organic liquid storage | | X | | X | X | | Depends on equipment type to be controlled |
| Combustion Sources | ▪ Boilers, steam generators, and process heaters | X | X | X | X | X | X | Depends on unit size, operating capacity factor, and emission limits compared to the current limit |

Table 2: Cost-Effectiveness of Proposed Air District Measures

| Category | Measure | Cost-Effectiveness (\$ in thousands /ton of pollutant reduced) | | | | | | Comments |
|---------------------------------|--|---|-----|------|-------|-------|-----|---|
| | | <0 | 0-5 | 5-10 | 10-15 | 15-20 | >20 | |
| Solvent Cleaning and Degreasing | ▪ Degreasing operations | X | X | X | X | X | X | Depends on equipment and control type |
| Combustion Sources | ▪ IC Engines | | X | X | X | X | X | Depends on burn type (rich burn-lower CE; lean burn-higher CE), power output, and original level of emissions (higher emissions-lower CE) |
| Fugitive Dust | ▪ Set controls at roads to avoid carryout and track-out | | | X | X | X | X | Depends on extent of road control (devices installed at access points, length of interior road being paved) and traffic amount on road |
| Miscellan. | ▪ Soil decontamination | | | X | X | X | X | Depends on soil disposition method |
| Fugitive Dust | ▪ Apply water to stored bulk materials | | | | | | X | |
| Non-Agricultural Open Burning | ▪ Mandatory curtailment ▪ Control smoke production ▪ Performance standards | | | | | | | NE or NA |
| Mobile Sources | ▪ Incentive Programs | | | | | | | NA |
| Mobile Sources | ▪ Transportation-related programs | | | | | | | NA |

NE = Not estimated

NA = Not applicable (emission reductions cannot be estimated accurately)

IV. RESOURCES FOR AIR DISTRICTS

A. Characterization of Ambient PM by Air Basin

To assist air districts in evaluating the nature of their PM problem, the ARB has prepared an initial evaluation of PM in each of the State's 15 air basins. This assessment evaluates the role of PM_{2.5} versus PM₁₀, the magnitude of the PM problem, seasonality, significant sources of directly emitted PM, and the contribution of secondary PM. The current version of this assessment document can be found at:

<http://www.arb.ca.gov/pm/pm.htm>.

This assessment will be updated by January 1, 2005 with the most recent data available from both routine monitoring sites and special purpose monitoring studies.

B. Basic Measures for Different Types of PM Problems

The list of air district measures is comprehensive in scope, and, as discussed in Section III, air districts will select an appropriate subset of measures from the list. As a starting point, the ARB staff has prepared a suggested list of basic measures that air districts may want to consider in developing and prioritizing measures for their implementation schedules. Table 3 includes measures for those PM sources that generally represent the largest emission contributions and are the most ubiquitous throughout the State. The table contains suggested measures grouped by different types of PM problems. For example, areas with a winter wood smoke problem may want to target the core measures listed in the first section of the table, whereas areas with fugitive dust problems may focus on the different measures in the dust section.

In each section, a general description of the types of basic proposed measures are included, along with a reference to the specific measure on the full list of air district measures contained in Appendix C. While some areas that are closer to attainment may be able to select from the shorter list contained in Table 3, other areas with more severe problems, or with contributions from more unique sources, may need to consider the broader group of measures in Appendix C.

C. Cost-Effectiveness Documentation Clearinghouse

As discussed previously, a specific cost-effectiveness estimate associated with a previously adopted rule by an air district does not necessarily apply to a similar rule being considered by another air district. Each air district will need to review the information provided in this report and determine the applicability for their situation, and calculate air district-specific cost-effectiveness values as appropriate. Therefore, as an additional resource for air districts, the ARB staff is also developing a clearinghouse of the staff reports and cost-effectiveness

Table 3: Proposed Set of Basic Air District Measures for Different Types of Particulate Matter Problems

| PM Problem Type | Measures | Measure Number* |
|---|---|--|
| Smoke from Wood-Burning Fireplaces and Heaters | <ul style="list-style-type: none"> ▪ Establish a public awareness program; ▪ Set a voluntary curtailment during periods with predicted high PM levels (or update to mandatory); ▪ Require all woodstoves and fireplace inserts installed be U.S. EPA certified or equivalent; ▪ Limit number of wood-burning fireplaces and heaters in new developments; ▪ Replace non-certified units upon property sale; ▪ Control wood moisture content; ▪ Prohibit burning of materials not intended for use in wood-burning appliance. | <p style="text-align: center;">1 2 (3) 4 7 10a 12 13</p> |
| Smoke from Non-Agricultural Burning | <ul style="list-style-type: none"> ▪ Establish mandatory curtailment during periods with predicted high PM levels; ▪ Set performance standards for allowed burns. | <p style="text-align: center;">17 20-22</p> |
| Dust from <ul style="list-style-type: none"> ▪ Construction ▪ Paved Roads ▪ Unpaved Roads ▪ Windy Conditions ▪ Agricultural Operations | <ul style="list-style-type: none"> ▪ Establish requirements for earthmoving, demolition, and grading operations (e.g., applying water or chemical stabilizers/dust suppressants). ▪ Establish requirements for new and modified public and private roads (e.g., paved shoulders, curbing, chemical suppressants); ▪ Establish requirements for sweeping existing roads. ▪ Set control requirements for unpaved roads (e.g., watering, graveling, applying suppressants, vegetating, paving, setting speed limits). ▪ Establish requirements to suppress windblown dust from construction/earthmoving operations, disturbed areas, and bulk material storage piles (e.g., ceasing active operations, watering, applying chemical stabilizers). ▪ Set requirements for agricultural sources (e.g., treating unpaved roads, watering, and other dust-reducing measures). | <p style="text-align: center;">24-26 32 33 36 38-41 43</p> |

Table 3: Proposed Set of Basic Air District Measures for Different Types of Particulate Matter Problems

| PM Problem Type | Measures | Measure Number* |
|--|--|-----------------------------|
| Direct PM from Combustion Sources | Set requirements for commercial charbroiling operations (e.g., emission control device) | 51 |
| Direct PM from Sources Not Covered under Any Other Specific Rule | <ul style="list-style-type: none"> ▪ Set visible emission limits (e.g, opacity). ▪ Set PM emission limits from combustion sources. | 87 88-89 |
| Ammonium Nitrate (NOx measures) | Set NOx emission limits for: <ul style="list-style-type: none"> ▪ Boilers, steam generators, and process heaters ▪ Turbines; ▪ IC engines; ▪ Residential central furnaces; ▪ Residential water heaters. | 44 45 46 49b 50 |
| Ammonium Nitrate and Secondary Organic Aerosols (VOC measures) | <ul style="list-style-type: none"> ▪ Set requirements for architectural coatings (e.g., limiting VOC content in coatings); ▪ Set VOC emission limits from solvent use (e.g., limiting VOC content of products used, through operation requirements). | 66 81-83 |

* Measure number from Appendix C – Proposed List of Air District Measures to Reduce Particulate Matter

evaluations prepared by the air districts in support of adopting the rules contained in the list of air district measures. This information will be made available via the web to facilitate air district evaluations of local cost-effectiveness and emission reduction potential considerations.

V. ISSUES

During the development of the list, several issues were raised by various stakeholders. The key issues and a summary of how they were addressed is provided below.

A number of comments were received on the need for presentation of cost-effectiveness information, both for understanding the selection of control measures included on the list, and to provide a resource for air districts in prioritizing control measures during the air district implementation process. In response, as described in Section IV above, the ARB worked with air districts to compile the cost-effectiveness information developed for each rule as adopted by the air district. This information is presented in Table 2 and Appendix D. The methodology used by air districts to calculate cost-effectiveness may differ, and cost-effectiveness values will also vary depending upon the baseline level of control. In addition, the base year for the economic calculation will vary depending upon when the rule was adopted. No normalization of the data was conducted. However, information relevant to understanding this variability is presented in Appendix D and in the accompanying staff reports that will be included in the clearinghouse. Notwithstanding these caveats, the information presented in Table 2 and Appendix D provides useful information on the relative cost-effectiveness of different types of control programs and serves as a launching point for initial selection of measures and local cost-effectiveness evaluation.

Another comment was that ARB should specify a threshold for cost-effectiveness, above which measures would not be deemed cost-effective. Such measures would not be included for consideration either on the initial list of air district measures prepared by ARB, or in the implementation schedules to be prepared by the air districts. As discussed earlier, given the breadth of PM problems in the State, their complexity, and their severity, ARB believes that it is not appropriate or feasible to establish a cost-effectiveness threshold. Depending upon the rules already adopted in an air district and the nature and severity of the problem, what is considered cost-effective will vary among air districts. The list of air district measures presented in Appendix C, accompanied by the cost-effectiveness information presented in Table 2 and Appendix D, serves to establish a "master" list of the most readily available, feasible, and cost-effective measures for subsequent air district use in developing implementation schedules. Air districts, during the implementation schedule development process, will develop the most cost-effective solution to reducing PM in their

region, following the guidance specified in the legislation as described in Section III of this report.

Finally, several commenters suggested that transportation control measures be included on the list. These types of measures are not addressed here because transportation control measures are generally adopted and implemented by local transportation control agencies, rather than by air districts. However, air districts are not precluded from working with other agencies in assessing the benefits of additional non-air district programs and pursuing these types of programs as appropriate as part of an air district's overall efforts to attain the PM standards.

FOREWORD TO APPENDICES

Appendices A and B summarize ARB measures that reduce PM. Appendix C provides the SB 656 list of air district measures. The appendices include measures that reduce directly emitted particulate matter (PM) and measures that reduce gaseous precursors that react in the atmosphere to form secondary PM. Pollutants reduced by each of the listed measures are indicated in parenthesis. For measures that reduce directly emitted PM₁₀, the listing of "PM₁₀, PM_{2.5}" indicates that while the measure reduces both PM_{2.5} and PM₁₀, reductions occur primarily in the fine fraction. In contrast, a listing of "PM₁₀" indicates the measure reduces primarily the coarse fraction. Precursors reduced by listed measures include nitrogen oxides (NO_x), volatile organic compounds (VOC), and sulfur oxides (SO_x). NO_x and VOC are also precursors of ambient ozone. Different measure descriptions may also refer to VOC as reactive organic gases (ROG), hydrocarbons (HC), non-methane hydrocarbons (NMHC), or non-methane organic gases (NMOG).

In each of these appendices, the listed measures are grouped by major program or by major emission source category. Appendix A also indicates the date of the public ARB hearing when the measure was adopted. Appendix B includes the proposed date for Board consideration of measures proposed for development. Appendix C indicates the air district that adopted the listed measure, the rule identification number, and the date when the district adopted or most recently amended the rule. The source type column specifies if the listed measure applies to new, existing, or modified sources. The specific rule language for each listed rule can be found in ARB's air district rule logbook at:

<http://www.arb.ca.gov/drdb/drdb.htm>

Appendix D lists the cost-effectiveness of each air district control measure as reported by the air district at the time the rule was adopted or amended. Cost-effectiveness is expressed in dollars per ton of pollutant reduced. The measures are organized by major program or by emission source category. The list indicates the air district that adopted the listed measure, the rule identification number, and the date when the district adopted or most recently amended the rule. For some rules, the cost-effectiveness numbers represent overall rule cost-effectiveness (e.g., average cost-effectiveness), while for other rules, cost-effectiveness is presented as a range. The cost-effectiveness (C.E.) notes column includes information related to the cost-effectiveness numbers listed such as pollutant(s) considered in the cost-effectiveness estimates, explanations of reference document dates, and specific equipment and operation scenarios leading to cost-effectiveness ranges.

APPENDIX A

Adopted ARB Measures that Reduce Particulate Matter

Adopted ARB Measures that Reduce Particulate Matter (PM)

The following are measures adopted from 1998 through December 2003 under the ARB Diesel Risk Reduction Plan (DRRP), as part of Ozone and PM State Implementation Plans (SIP), and additional measures adopted to make progress towards the attainment of ambient ozone standards.

| A. Diesel-Fueled Engines and Vehicles | | |
|--|---|---------------------|
| | Strategy | Adoption Date* |
| | <p>Emission Standards for New On-Road Heavy Duty Diesel (HDD) Engines (PM10, PM2.5, NOx, VOC)</p> | |
| 1. | <p>HDD Engines 2004 and Later Model Year Requires HDD engines, exclusive of urban bus engines, to certify to a 0.10 grams per brake horsepower-hour (g/bhp-h) PM standard and a 4.0 g/bhp-hr NOx standard. Urban bus engines produced for sale in California have been subject to more stringent emission standards sooner than other classes of HDD engines – 0.05 g/bhp-hr PM and 4.0 g/bhp-hr NOx standards since 1996. <i>Reference: http://www.arb.ca.gov/regact/2004/2004.htm</i></p> | 4/23/98 |
| 2. | <p>Supplemental Test Procedures for HDD Engine Certification Includes the Not-to-Exceed and the EURO III European Stationary Cycle Emission Tests in the required California certification process for 2005 and subsequent model year HDD engines and in 2007 for “ultra-small volume” and “urban buses”. The supplemental tests ensure that engine exhaust emissions are controlled over the range of operating conditions. <i>Reference: http://www.arb.ca.gov/regact/NTEtest/ntetest.htm</i></p> | 12/7/00 |
| 3. | <p>HDD Engines 2007 and Later Model Year Aligns ARB with U.S. EPA’s emission standards – 0.01 g/bhp-hr PM, 0.20 g/bhp-hr NOx, and 0.14 g/bhp-hr NMHC – and phase-in schedule based on model year. The 2007 standards require aftertreatment-based technologies for all HDD engines and vehicles in conjunction with very low-sulfur diesel fuel. The standards also apply to natural gas-fueled engines and liquefied petroleum gas-fueled engines derived from the diesel-cycle engine. <i>Reference: http://www.arb.ca.gov/regact/HDDE2007/HDDE2007.htm</i></p> | Revised 10/25/01 |

*Date of public Board hearing when the measure was adopted.

| | Strategy | Adoption Date* |
|----|---|----------------|
| 4. | <p>Emission Standards for New Off-Road Diesel Engines (PM10, PM2.5, NOx, VOC, CO)</p> <p>Requires new off-road compression ignition engines (CI) to meet several tiers of PM, NOx, HC, and CO emission standards, phased-in by sales date and engine power. U.S. EPA standards aligned with ARB's Tier 1 standards beginning with 1996 model year engines, and ARB harmonized with U.S. EPA Tier 2 and Tier 3 requirements beginning in 2000. Tier 3 standards are to be phased-in through 2008 and will only apply to 50-750 hp engines. ARB does not have authority to regulate new farm and construction equipment under 175 hp. Only U.S. EPA can set emission standards for these preempt engines.</p> <p>Reference: http://www.arb.ca.gov/regact/ciengine/ciengine.htm</p> | 1/27/00 |
| 5. | <p>California Diesel Fuel Regulations (PM10, PM2.5, SOx)</p> <p>Includes the following: 1) sets the maximum permissible sulfur content in vehicular diesel fuel to 15 ppmw starting in mid-2006 (very low sulfur), 2) sets requirements for certification of alternative diesel fuel formulations, 3) sets sulfur specification for certification of diesel fuel for light- and medium-duty vehicles that is identical to U.S. EPA's, 4) sets new specifications for equivalency to the aromatic hydrocarbon limit for California diesel fuel, 5) establishes standards for diesel fuel lubricity, 6) requires the use of vehicular diesel fuel in all non-vehicular diesel engines except engines used to power locomotives and marine vessels, and 7) establishes a method for testing low sulfur diesel.</p> <p>Reference: http://www.arb.ca.gov/regact/ulsd2003/usld2003.htm</p> <p>Use of very low-sulfur diesel fuel reduces PM and SOx emissions and enables the use of aftertreatment technologies which can reduce NOx, PM, and ROG. For examples of measures requiring use of low-sulfur diesel fuel, refer to the following measures on this list:</p> <ul style="list-style-type: none"> 3. HDD Engines 2007 and Later Model Year 7. Transit Bus Fleet Rule 9. On-Road Heavy Duty Solid Waste Collection Vehicles Air Toxic Control Measure (ATCM) <p>Additional measures can be found on the list of ARB measures proposed for development:</p> <ul style="list-style-type: none"> 13. Transport Refrigeration Units ATCM 16. Portable Engines ATCM 24. Stationary Compression Ignition Engines ATCM | 7/24/03 |

*Date of public Board hearing when the measure was adopted.

| | Strategy | Adoption Date* |
|----|--|---------------------------------|
| 6. | <p>Procedures to Verify Diesel Retrofit Strategies for Existing Engines (PM10, PM2.5)</p> <p>Establishes procedures to verify emission control strategies by ARB that can be applied to various diesel-fueled engines and vehicle model years to significantly reduce diesel PM emissions. Strategies verified to "level 1" achieve at least 25% PM reduction (e.g., diesel oxidation catalysts or DOC); those verified to "level 2" achieve at least 50% PM reduction; and those verified to "level 3" achieve at least 85% PM reduction or reduce PM levels to no more than 0.01 g/bhp-hr (e.g., diesel particulate filter or DPF). In addition, verification procedures require, starting January 1, 2007, NO₂ emissions from an engine employing a diesel emission control strategy not to exceed 20% of the engine's baseline NO_x emissions.</p> <p>Note: This measure was amended on February 26, 2004. Reference: http://www.arb.ca.gov/regact/diesel/rv/dieselrv.htm</p> | 5/16/02 |
| 7. | <p>Fleet Rule for Transit Agencies and Emission Standards for New Urban Bus Engines (PM10, PM2.5, NO_x)</p> <p>The Urban Bus Engine Exhaust Emission Standards rule requires new diesel urban engines to meet a 0.01 g/bhp-h PM standard in October 2002, a 0.5 g/bhp-h NO_x standard in 2004, and a 0.2 g/bhp-hr NO_x standard in 2007. Recently adopted amendments allow engine manufacturers to certify 2004 to 2006 model year diesel hybrid electric buses at 0.01 g/bhp-hr for PM and 1.8 g/bhp-hr for NO_x for sale to select transit agencies. The Fleet Rule for Transit Agencies requires transit agencies to: 1) reduce emissions of NO_x to a fleet average from all engines of 4.8 g/bhp-h NO_x as of October 1, 2002, 2) phase-in fleet PM emission reductions from diesel engines beginning in 2004, 3) use very low sulfur diesel fuel as of July 1, 2002, and 4) for larger transit agencies, demonstrate and eventually purchase zero emission buses. Recently adopted amendments allow diesel path transit agencies to purchase hybrid electric buses certified to 0.01 g/bhp-hr for PM and 1.8 g/bhp-hr for NO_x, provided they offset the difference between the 1.8 g/bhp-hr NO_x standard and the diesel bus engine standard of 0.5 g/bhp-hr NO_x.</p> <p>Note: Amendments to this measure were adopted at the June 24, 2004 Board meeting. Reference: http://www.arb.ca.gov/msprog/bus/bus/htm</p> | 1/27/00; amended 10/24/02 |

*Date of public Board hearing when the measure was adopted.

| | Strategy | Adoption Date* |
|-----|--|--------------------------------|
| 8. | <p>Diesel PM Air Toxic Control Measures (ATCMs) (PM10, PM2.5)</p> <p>School Bus Idling and Idling at Schools Limits school bus idling and idling of public transit and charter type buses and heavy-duty vehicles while operating on or near school grounds. The ATCM is intended to reduce diesel PM and other pollutants from these vehicles' exhaust. Enforcement implemented since April 2004. <i>References:</i> http://www.arb.ca.gov/regact/sbidling/sbidling.htm and http://www.arb.ca.gov/toxics/idling/idling.htm</p> <p>On-Road New and In-Use Heavy Duty Solid Waste Collection Vehicles Mandates the reduction of diesel PM emissions through the application of best available control technology (BACT) to 1960-2006 model year residential and commercial in-use solid waste collection vehicles. Four options are offered to fleet owners and operators to meet the requirement to use BACT: 1) use of a diesel engine or power system that is certified to the 0.01 g/bhp-hr PM standard, 2) use of an engine certified to 0.01 g/bhp-hr PM in combination with the highest applicable verified diesel emission control strategy, 3) use of an alternative fuel engine or a heavy-duty pilot ignition engine, or 4) application of a diesel emission control strategy or system verified by ARB that reduces diesel PM emissions by the greatest amount possible for that engine and application. The requirement to install BACT will be phased-in between 2005 and 2010 by engine model year group. <i>Reference:</i> http://www.arb.ca.gov/msprog/swcv/swcv.htm</p> | <p>12/12/02</p> <p>9/25/03</p> |
| 10. | <p>Statewide Portable Equipment Registration Program (PM10, PM2.5, NOx, VOC)</p> <p>This statewide registration program currently allows portable-engine owners to voluntarily register their new and existing certified engines with the ARB in lieu of obtaining operating permits from the air districts. Certified portable engines are engines that meet U.S. EPA/ARB off-road engine emission standards. On February 26, 2004, the Board approved an amendment that will allow any portable engine, certified or not, and operating in California before 2003, to register into the program until December 31, 2005. After this date, only certified portable engines can register in the program. In addition, the program will require, by January 1, 2010, non-certified engines that are registered into the program to be replaced with certified engines. Note: This measure was amended on February 26, 2004. <i>Reference:</i> http://www.arb.ca.gov/perprev/perprev.htm</p> | <p>Revised 12/10/98</p> |

*Date of public Board hearing when the measure was adopted.

| | Strategy | Adoption Date* |
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| <p>11.</p> | <p>Inspection Programs (PM10, PM2.5) Ensure that in-use engines continue to have functional controls and proper maintenance.</p> <p>Periodic Smoke Inspection Requires fleets with two or more HDD trucks or buses to perform annual smoke inspections to ensure compliance with ARB approved smoke opacity limits and to repair failing vehicles. <i>Reference: http://www.arb.ca.gov/msprog/hdvip/hdvip.htm</i></p> <p>Heavy Duty Roadside Inspection Inspectors conduct random roadside tests of diesel trucks to ensure that smoke emissions are within acceptable levels and that emission control devices have not been tampered with. The program was adopted in 1990 and ran from 1990-1993, when it was suspended. A revised program was adopted in December 1997. In 2001, ARB staff began conducting inspections in mixed-use communities (residential/commercial/industrial areas), as part of an environmental inspections program. In 2003, ARB increased the frequency of truck and bus highway inspections in conjunction with community-based inspections in the South Coast Air Basin. <i>Reference: http://www.arb.ca.gov/msprog/hdvip/hdvip.htm</i></p> | <p>Implemented 7/1/98</p> <p>Implemented 6/1/98, augmented 2003</p> |
| <p>13.</p> | <p>Incentive Programs (PM10, PM2.5, NOx) An annual funding source is needed in order to rely on incentive programs.</p> <p>Carl Moyer This grant program provides grants to pay for the extra cost of replacing in-use diesel equipment and engines by retrofitting with ARB-certified technology or by purchasing new cleaner diesel engines or engines powered by alternative fuels or electricity. The implementation of this program has resulted in cleaner heavy-duty trucks, buses, marine vessels, harbor craft, and agricultural equipment. ARB has the responsibility to establish program guidelines, oversee the program, and report program benefits. Air districts implement the program and work with public and private participants. <i>Reference: http://www.arb.ca.gov/msprog/moyer/moyer.htm</i></p> <p>(continued on next page)</p> | <p>Starting Date</p> <p>1999</p> |

*Date of public Board hearing when the measure was adopted.

| | Strategy | Adoption Date* |
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| 14. | <p>Incentive Programs (continuation)</p> <p>Lower Emission School Bus Program The new bus purchase component of the program, intended to replace high-polluting pre-1987 buses, provides grants to public school districts to assist with the purchase of new lower-emitting alternative-fuel school buses or new lower-emitting diesel school buses that use ultra-low sulfur diesel fuel. The in-use diesel bus retrofit component pays for the full purchase and installation of ARB-verified retrofit devices for use on eligible 1991 and later model year engines. A portion of the program funds are targeted in areas to directly benefit low-income communities and communities of color. <i>Reference: http://www.arb.ca.gov/msprog/schoolbus/schoolbus.htm</i></p> | 2001 |
| 15. | <p>Alternative Diesel Fuel Under this program, ARB distributed \$500,000 - allocated for fiscal years 2000/2001 through 2002/20003 by the passage of Assembly Bill 2061, (Lowenthal) in 2000 - to air districts (BAAQMD, SMAQMD, and SCAQMD) to offset the incremental operating costs of alternative diesel fuel, or emulsified diesels, used in on-road and off-road heavy-duty vehicles and equipment. Emulsified diesel can reduce NOx emissions over 10% and PM emissions over 60%. <i>Reference: none</i></p> | 2000 |
| B. Smoke Management Program | | |
| 16. | <p>Statewide Guidelines for Prescribed Burning and Agricultural Burning (PM10 and PM2.5, but as an added benefit also reduce NOx and VOC)</p> <p>Smoke Management Guidelines were originally adopted in 1971 and were revised in 2000 to address expected increases in prescribed burning while minimizing or preventing smoke impacts to protect public health. The Guidelines emphasize effective planning, coordination among burners, and use of most technically advanced air quality and meteorology burn management tools. An important element is the consideration of alternatives to open burning. Requires air districts to develop their smoke management programs for ARB review and approval. The Guidelines contain three basic components: 1) requirements for a burn authorization system, 2) requirements for smoke management plans by prescribed burners, and 3) requirements for burn, no burn, and marginal burn days. <i>Reference: http://www.arb.ca.gov/regact/aqburn/aqburn.htm</i></p> | Revised 3/23/00 |

*Date of public Board hearing when the measure was adopted.

| C. Non-Diesel Mobile Source Measures | | |
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| | Strategy | Adoption Date* |
| | <p>Low Emission Vehicle (LEV) Program for New Light- and Medium-Duty Vehicles (NOx, VOC)</p> <p>The LEV regulations are the cornerstone of ARB efforts to reduce emissions from light and medium-duty vehicles. The original LEV I program was adopted in 1990, and LEV II in November 1998. Both LEV I and LEV II include four primary elements: 1) increasingly stringent exhaust emission standards for specific categories of low-emission vehicles, 2) an increasingly stringent annual fleet average standard for NMOG that requires each manufacturer to phase-in a progressively clean mix of vehicles from year to year, 3) banking and trading provisions, and 4) a requirement that a specified percentage of passenger cars and lighter light-duty trucks be zero emission vehicles (ZEV). The LEV I program established the ZEV program and set forth increasingly stringent vehicle tailpipe NMOG and NOx standards from 1994 through 2003, establishing four low emission vehicle categories: Transitional LEV (TLEV), LEV, Ultra LEV (ULEV), and Super Ultra LEV (SULEV). <i>Reference: http://www.arb.ca.gov/msprog/levprog/levprog.htm</i></p> | |
| 17. | <p>LEV II Program</p> <p>LEV II regulations run from 2004 through 2010, setting more stringent emission requirements and phasing in these requirements during 2004-2007 model years. LEV II also requires sport utility vehicles (SUV) and pickup trucks that are now being used primarily as passenger cars (meaning all light-duty trucks and medium-duty vehicles having a gross vehicle weight, GVW of less than 8,500 pounds) to meet the same NMOG and NOx emission requirements as passenger cars. LEV II also reduces further evaporative NMOG emissions. <i>Reference: http://www.arb.ca.gov/msprog/levprog/levprog.htm</i></p> | <p>11/5/98 Latest Amendment 12/12/02</p> |
| 18. | <p>Zero Emission Vehicle (ZEV) Program (NOx, VOC)</p> <p>Vehicle Requirements</p> <p>Requires the large and intermediate volume auto manufacturers to produce ZEVs beginning with model year 2005. Starting with model year 2005, ZEVs are to comprise 10% of vehicles offered for sale in California. The ZEV program allows: 1) extremely clean conventional vehicles to meet a portion of the pure ZEV requirements (these are partial zero emission vehicles or PZEVs), 2) manufacturers to generate credit toward their ZEV requirement with vehicles that have advanced components (advanced technology partial zero emission vehicles or AT PZEVs), 3) additional credits for ZEVs placed in transportation</p> | <p>1990 Last Updated 12/19/03</p> |

*Date of public Board hearing when the measure was adopted.

| | Strategy | Adoption Date* |
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| | <p>Zero Emission Vehicle (ZEV) Program (continuation)</p> <p>systems such as station car programs, and 4) additional credits for grid-connected hybrid electric vehicles. The program includes phased-in ZEV requirements for larger trucks and SUVs.</p> <p>Large volume auto manufacturers can fulfill their ZEV obligation by either: 1) using a formula allowing a vehicle mix of 2% pure ZEVs, 2% AT PZEVs and 6% PZEVs or 2) producing their market share of 250 fuel cell vehicles by 2008, plus producing 4% AT PZEVs and 6% PZEVs. The required number of fuel cell vehicles will increase to 2,500 from 2009-2011, 25,000 from 2012-2014, and 50,000 from 2015-2017. Automakers can substitute up to 50% of their fuel cell requirements with battery electric vehicles. The program also allows manufacturers to receive credit for fuel cell vehicles placed in other states that have adopted California's LEVII program. Intermediate volume auto manufacturers may meet the ZEV requirement entirely with PZEVs. Reference: http://www.arb.ca.gov/regact/zev2003/zev2003.htm</p> | |
| 19. | <p>Federal Tier 2 Exhaust Emission Standards for Heavy-Duty Gasoline Vehicles and Engines (NOx, VOC)</p> <p>The regulation reduces emissions of NMHC+NOx from the current 4.0 g/bhp-hr standard to 1.0 g/bhp-hr, beginning with the 2005 model year, harmonizing California's standards with those adopted by U.S. EPA in 2000. In 2001, U.S. EPA implemented more stringent standards for 2008 and later model years – 0.14 g/bhp-hr NMHC and 0.2 g/bhp-hr NOx. In 2002, ARB harmonized standards with the new federal standards. Reference: http://www.arb.ca.gov/regact/levhdq02/levhdq02.htm</p> | 12/10/98 Latest Amendment 12/12/02 |
| 20. | <p>Exhaust Emission Standards for On-Road Motorcycles (NOx, VOC)</p> <p>In 1998, ARB adopted a new set of emission standards for new 280 cc and larger motorcycles. HC and NOx are combined into a single standard to give manufacturers flexibility to lower emissions. Requires HC+NOx emissions to be reduced to 1.4 g/km for the 2004 year and 0.8 g/km for the 2008 model year. Reference: http://www.arb.ca.gov/regact/motorcyc/motorcyc.htm</p> | 12/10/98 |

*Date of public Board hearing when the measure was adopted.

| | Strategy | Adoption Date* |
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| 21. | <p>On-Board Diagnostic (OBD) II (NOx, VOC)</p> <p>OBD II requirements were amended in 2002 to improve their effectiveness. The program requires all 1996 and newer vehicles less than 14,000 lbs. (e.g., passenger cars, pickup trucks, sport utility vehicles) be equipped with OBD II systems, which are California's second generation of OBD requirements. OBD systems are self-diagnostic systems incorporated into the computers of new vehicles. The OBD II system monitors virtually every component that can affect the emission performance of the vehicle to ensure that the vehicle remains as clean as possible over its entire life, and assists repair technicians in diagnosing and fixing problems with the computerized engine controls. If a problem is detected, the OBD II system illuminates a warning lamp on the vehicle instrument panel to alert the driver. This warning lamp typically contains the phrase Check Engine or Service Engine Soon. The system will also store important information about the detected malfunction so that a repair technician can accurately find and fix the problem.</p> <p>Reference: http://www.arb.ca.gov/msprog/obdprog/obdregs.htm</p> | <p>Amended 4/25/02</p> |
| 22. | <p>Voluntary Accelerated Vehicle Retirement (VAVR) Programs (NOx, VOC) (Also referred to as scrap, clunker, or old vehicle buy back programs)</p> <p>Reduces NOx and NMOG emissions through voluntary retirement of older, higher-emitting vehicles. Provides for privately-operated, market-based VAVR enterprises that purchase and retire eligible vehicles mobile source emission reduction credits.</p> <p>Reference: http://www.arb.ca.gov/regact/scrap/scrap.htm and http://www.arb.ca.gov/regact/vavr/vavr.htm</p> | <p>12/10/98 & 2/21/02</p> |
| 23. | <p>Off-Road Vehicle Emission Standards (PM10, PM2.5, NOx, VOC, CO) Small Off-Road Engine (SORE) Regulations</p> <p>a) The SORE category consists of off-road spark-ignition engines less than or equal to 19 kilowatt (25 horsepower), including handheld engines and equipment such as weed trimmers, leaf blowers, and chainsaws and non-handheld small engines and equipment such as lawnmowers. ARB has adopted HC+NOx and CO emission standards for 1995 and later SORE, along with a 1.5 g/bhp-hr PM emission standard for 0-65 cc two-stroke engines starting with model year 2000. The standards differ by engine size.</p> <p>(continued on next page)</p> | <p>3/26/98</p> |

*Date of public Board hearing when the measure was adopted.

| | Strategy | Adoption Date* |
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| | <p>Off-Road Vehicle Emission Standards (continuation)</p> <p>b) The latest regulatory revision established evaporative emission standards for 2007 and later model year engines and equipment and new exhaust emission standards starting with 2005 through 2008 model years, depending on engine size. For engines less than or equal to 80 cc, the new exhaust standards align California's standards with the most stringent federal standards for similar engines. For engines above 80 cc, the new exhaust emission standards are based on the use of catalytic converters. The evaporative emission standards are designed to control HC emissions from the fuel lines and fuel tanks of equipment, as well as diurnal and running loss emissions. <i>Reference: http://www.arb.ca.gov/regact/sore03/sore03.htm</i></p> | 9/25/03 |
| 24. | <p>Off-Road Large Spark-Ignition (LSI) Engine Regulations</p> <p>The off-road LSI category consists of engines above 25 horsepower, typically fueled by gasoline or liquefied petroleum gas (LPG). A small number are fueled by compressed natural gas (CNG), and some have dual fuel capability. LSI engines are most commonly found in forklifts, specialty vehicles, portable generators, pumps, compressors, farm equipment, and construction equipment. U.S. EPA has the sole authority to control new farm and construction equipment engines less than 175 horsepower. Exhaust standards of 3.0 g/bhp-hr HC+NOx and 37 g/bhp-hr CO for LSI engines with engine displacement of greater than 1.0 liter were phased in beginning with model year 2001 with more stringent durability based compliance starting in 2004. For LSI engines with engine displacement equal to or less than 1.0 liter, exhaust standards of 9.0 g/bhp-hr HC+NOx and 410 g/bhp-hr CO apply to 2002 and subsequent model years. <i>Reference: http://www.arb.ca.gov/regact/lore/lore.htm</i></p> | 10/22/98 |
| 25. | <p>Off-Highway Recreational Vehicles and Engines</p> <p>In 1994, the ARB approved off-highway recreational vehicle regulations (including off-road motorcycles and all terrain vehicles or ATVs) that established HC and CO exhaust emission standards and test procedures. The regulations also provided specific coding requirements of the vehicle identification number to distinguish an emission-compliant vehicle. In 1998, the regulations were amended to link vehicle registration and usage to compliance with California's exhaust emission standards. Those in compliance are eligible for off-highway vehicle (OHV) green sticker registration that allows year-round operation in designated off-road areas. Those not in compliance are eligible for OHV red sticker registration that allows operation only during designated months when ozone levels are low. The regulations apply to engines greater</p> <p>(continued on next page)</p> | 12/10/98 |

*Date of public Board hearing when the measure was adopted.

| | Strategy | Adoption Date* |
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| 26. | <p>Off-Road Vehicle Emission Standards (continuation)</p> <p>than 90 cc built in 1997 and later. The same standards also apply to engines of 90 cc or less built in 1999 and later. Engines built pre-1997 and pre-1999, respectively, are not subject to this regulation. <i>Reference: http://www.arb.ca.gov/regact/recreact/recreat.htm</i></p> <p>Recreational Marine Engines</p> <p>a) Requires outboard and personal watercraft engine manufacturers to meet HC+NOx standards starting with model year 2001. The standards range from 47 grams per kilowatt hour (g/kW-hr) to 16 g/kW-hr, depending on the engine model year. The regulation also sets emission parts warranty requirements, consumer label requirements, and production line and in-use testing requirements.</p> <p>b) Requires inboard and sterndrive engine manufacturers to cap combined HC+NOx emissions at 16 g/kW-hr, and later to reduce combined HC+NOx emissions from new engines to 5 g/kW-hr for at least 480 hours of use. The cap is effective beginning in 2003. Beginning in 2007, manufacturers are required to comply with the 5 g/kW-hr requirement on 45% of product sales, but the number of complying engines ramps to 75% in 2008 and 100% in 2009 and later. Beginning in 2007, new engines complying with the 5 g/kW-hr HC+NOx standard will be required to possess an integrated on-board diagnostics system. <i>Reference: http://www.arb.ca.gov/msprog/marine/marinectp/marinectp.htm</i></p> | <p>12/10/98</p> <p>7/26/01</p> |
| 27. | <p>Aftermarket Parts for Off-Road Engines (NOx, VOC)</p> <p>Establishes procedures for exempting aftermarket add-on and modified parts from off-road vehicles, engines, and equipment from the anti-tampering prohibitions to ensure these parts do not reduce the effectiveness of any required emission control device and do not cause the modified vehicle, engine, or equipment to exceed applicable standards. This program has been implemented since September 29, 2000. <i>Reference: http://www.arb.ca.gov/regact/afteroff/afteroff.htm</i></p> | <p>11/19/98</p> |

*Date of public Board hearing when the measure was adopted.

| D. Non-Diesel Fuel Measures | | |
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| | Strategy | Adoption Date* |
| 28. | <p>California Reformulated Gasoline (CaRFG) (PM10, PM2.5, NOx, VOC, SOx, CO, toxic air contaminants)</p> <p>In 1991, ARB adopted the California Phase II reformulated gasoline (CaRFG2) regulations which contained a comprehensive set of specifications for eight fuel properties designed to achieve the maximum reductions in ROG, NOx, SOx, PM, CO, and toxic air emissions starting in 1996. In 1999, ARB adopted the Phase III cleaner burning gasoline regulations to enable refiners to produce MTBE-free gasoline while preserving the air quality benefits of existing gasoline. The regulations prohibited the addition of MTBE to California gasoline after 2002 and reduced the sulfur and benzene content of gasoline. The MTBE phase out was extended until 12/31/2003.</p> <p>Note: Amendments to this measure are scheduled for consideration at the November 18, 2004 Board Hearing.</p> <p>Reference: http://www.arb.ca.gov/fuels/gasoline/cbgmtbe.htm and http://www.arb.ca.gov/fuels/gasoline/meeting/2002/mtg2002.htm</p> | <p>12/9/99 7/25/02 12/12/02</p> |
| 29. | <p>Gasoline Deposit Control Additive (NOx, VOC)</p> <p>Requires that all commercial gasoline formulations be certified to contain effective levels of detergent additives to control deposits.</p> <p>Reference: http://www.arb.ca.gov/regact/ccd/ccd.htm</p> | 9/24/98 |
| 30. | <p>Liquefied Petroleum Gas (LPG) Specifications for In-Use Motor Vehicle Fuels (NOx, VOC)</p> <p>Finalized the interim content limit for LPG of 10% per volume propene, increased the combination of butanes, butenes and heavier constituents to 5% per volume of LPG, and decreased the sulfur content to 80 ppmv. LPG component content limits were originally adopted in 1992 and were applied to fuel supplied since January 1, 1993. LPG combustion produces some PM and sulfur emissions, but yields less NMOG and NOx emissions than gasoline combustion.</p> <p>Reference: http://www.arb.ca.gov/regact/lpgspecs/lpgspecs.htm</p> | 12/10/98 |

*Date of public Board hearing when the measure was adopted.

| E. Non-Diesel Stationary and Area Source Measures | | |
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| | Strategy | Adoption Date* |
| | <p>Consumer Products Regulations (VOC)</p> <p>Sets ROG emission limits affecting 83 categories of consumer products. A consumer product is defined as a chemically formulated product used by household and institutional consumers. Consumer products include, but are not limited to: detergents, cleaning compounds, polishes, floor finishes, cosmetics, personal care products such as antiperspirants and hairsprays, home, lawn and garden products, disinfectants, sanitizers, automotive specialty products, and aerosol paints. ARB has adopted five regulations affecting consumer products: 1) antiperspirants and deodorants in 1989, 2) first phase regulations for 16 other consumer products categories in 1990 (which have been amended several times, including Midterm Measures), 3) Alternative Control Plan (ACP) in 1994, 4) Aerosol Coatings in 1995, and 5) Hairspray Credit Program in 1997. The ACP, the Hairspray Credit Program, and the Innovative Products Exemption are market-based components of the consumer products program intended to provide manufacturers with compliance flexibility.</p> | |
| 31. | <p>Midterm Measures II</p> <p>Added product category definitions and VOC limits for two new categories, more stringent VOC limits for fifteen existing categories, and additional subcategories for some of the existing product categories with separate VOC limits for each subcategory. The new or modified VOC limits became effective from December 31, 2002, to December 31, 2004, depending on the product category. Includes reporting requirements for manufacturers. Reference: http://www.arb.ca.gov/regact/midterm2/midterm2.htm</p> | 10/28/99 |
| 32. | <p>Antiperspirants and Deodorants</p> <p>Amendments to this regulation require high volatility organic compounds be limited to 40% by weight, beginning January 1, 2001. A 10% content limit for medium volatility organic compounds has been in effect since February 27, 1991. Includes reporting requirements for manufacturers. Reference: http://www.arb.ca.gov/regact/conspro/00apdo/00apdo.htm</p> | Amended 10/26/00 |

*Date of public Board hearing when the measure was adopted.

| | Strategy | Adoption Date* |
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| 33. | <p>Consumer Products Regulations (continuation)</p> <p>Aerosol Adhesives Sets 75% by weight as sole limit of VOC content for aerosol adhesives (in effect since January 1, 1995), and sets VOC limits for 3 new categories of aerosol adhesives (mist spray, web spray, and special purpose spray adhesives). Includes labeling requirements and requirements to facilitate compliance and enforcement of the new standards. Effective January 1, 2002, the proposed regulatory action also prohibits the use of methylene chloride, perchloroethylene, and trichloroethylene, which are toxic air contaminants, in aerosol adhesives manufactured for use in California. <i>Reference:</i> http://www.arb.ca.gov/regact/conspro/aeroadh/aeroadh.htm</p> <p>Aerosol Coating Products Replaces the January 1, 2002, VOC limits for aerosol coatings with equivalent reactivity-based limits. The units of the limits are in grams of ozone per gram of product using the maximum incremental reactivity (MIR) scale. MIR-based limits became effective June 1, 2002, for the six general coating product categories, and January 1, 2003, for the 29 specialty coating categories. Because the chemical mechanism used to calculate the MIR values is evolving and improving, updates to the MIR scale were adopted in 2003. Manufacturers will be able to use the updated MIR values until June 1, 2007 to calculate VOC content in products. The aerosol coatings regulations, effective since 1995, contained VOC limits for the 35 aerosol coating on a percent-by-weight basis. <i>Reference:</i> http://www.arb.ca.gov/regact/conspro/aerocoat/aerocoat.htm</p> | <p>5/25/00</p> <p>6/22/00</p> |
| 35. | <p>Portable Fuel Container Spillage Control Regulation (VOC)</p> <p>Requires containers sold after December 31, 2000 to meet four performance standards (automatic closure, automatic shut-off, one opening, and permeation). <i>Reference:</i> http://www.ar.ca.gov/regact/spillcon/spillcon.htm</p> | <p>9/23/99</p> |

*Date of public Board hearing when the measure was adopted.

| | Strategy | Adoption Date* |
|-----|--|-----------------------------|
| 36. | <p>Enhanced Vapor Recovery (EVR) (VOC)</p> <p>Requires more stringent standards and new equipment specifications for both Phase I and Phase II vapor recovery systems. The new standards reduce spillage and gasoline evaporation from gasoline nozzles, make vapor recovery systems compatible with the on-board refueling vapor recovery systems on motor vehicles, and require computerized monitoring equipment for vapor recovery systems to self-diagnose and alert operators when repairs are needed. These requirements are being phased-in over several years (7/15/01 to 10/1/08). One of the EVR standards (post-refueling drops) was amended in 2002. Phase I vapor recovery is applied to gasoline transfer operations involving cargo tank trucks. Phase II vapor recovery controls emissions resulting from gasoline transfer from the gasoline dispensing facility to vehicles. Reference: http://www.arb.ca.gov/regact/evrtech/evrtech.htm</p> | <p>3/23/00 12/12/02</p> |
| 37. | <p>Distributed Generation (DG) Guidelines and Regulations (PM10, PM2.5, NOx, VOC, CO)</p> <p>Sets two levels of PM, NOx, VOC, CO emissions standards and certification requirements for electrical generation technologies (DG technologies) that are exempted from air district permit requirements, and provides guidance to the air districts on the permitting of electrical generation technologies that are subject to their regulatory jurisdiction. The first set of standards became effective January 1, 2003, and reflects the best performance achieved in practice by existing DG technologies that are exempt from air district permitting requirements. The second set of standards becomes effective January 1, 2007 and is equivalent to the level determined by the ARB to be Best Available Control Technology (BACT) for permitted central station power plants in California. The regulation also includes labeling requirements, testing procedures, record keeping requirements, recertification requirements, and payment of fees for technologies subject to the certification program. Reference: http://www.arb.ca.gov/regact/dg01/dg01.htm</p> | <p>11/15/01</p> |

*Date of public Board hearing when the measure was adopted.

APPENDIX B

**ARB Measures Proposed for Development that Reduce
Particulate Matter**

ARB Measures Proposed for Development that Reduce Particulate Matter

The following are measures under development by the ARB as part of the 2003 State and Federal Strategy and the 2000 Diesel Risk Reduction Plan (DRRP). Some of these measures have already been adopted. For the measures that have not yet been adopted, the descriptions represent our current concept, however this may change as each rule is developed.

| A. On-Road Motor Vehicle Measures | | |
|--|--|--|
| | Strategy | Proposed Date for Board Consideration |
| 1. | <p>Replace or Upgrade Emission Control Systems on Existing Passenger Vehicles – Pilot Program (NOx, VOC)</p> <p>ARB is currently performing a test program to evaluate the potential benefits of mandatory replacement of catalysts, oxygen sensors and evaporative emission carbon canisters on older passenger cars. The decision on whether to proceed with a mandatory program is expected to occur in 2004, with regulations to follow in 2005, if the pilot program shows the potential for significant benefits (NOx and ROG emission reductions) at reasonable cost and funding can be identified.</p> | 2005 |
| 2. | <p>Capture and Control Vapors from Gasoline Cargo Tankers (VOC)</p> <p>Gasoline cargo tanks are equipped with a vapor recovery system that returns and collects gasoline vapor during the loading at terminals or bulk plants and unloading at service stations respectively. Cargo tanks utilize hoses and fittings during the process of delivering gasoline and collecting gasoline vapor. The proposed measure would require: 1) control technologies to reduce ROG emissions from gasoline evaporated from the transfer hoses and connections on the tanks after the delivery is completed (the control technology necessary to implement this measure is currently available), 2) a monthly inspection and maintenance program to check the vapor connections and hoses on the fuel cargo tankers, 3) cargo tanks to be purged using an approved method prior to any maintenance or repair being performed, and 4) development of performance specifications and standards for individual components of gasoline cargo tanks and methodology for testing and certifying these components.</p> | 2006 |

| | Strategy | Proposed Date for Board Consideration |
|----|---|---------------------------------------|
| | <p>Pursue Approaches to Clean Up the Existing and New Truck /Bus Fleet (PM10, PM2.5, NOx, VOC)</p> | |
| 3. | <p><i>On-Road Public Heavy Duty Vehicle Fleets</i> Publicly owned or operated fleets include dump trucks, street sweepers, shuttles, and other non-transit buses. The regulation would require the reduction of diesel PM emissions through the application of best available control technology (BACT) to 1960-2006 model year vehicles. Four options would be offered to meet the requirement to use BACT: 1) use of a diesel engine or power system that is certified to the 0.01 g/bhp-hr PM standard, 2) use of a diesel engine certified to 0.1 g/bhp-hr PM along with application of the highest applicable diesel emission control system, 3) use of an alternative fuel engine, or a heavy-duty pilot ignition engine, and 4) application of a diesel emission control strategy or system verified by ARB that reduces diesel PM emissions by the greatest amount possible for that engine and application. This is both a NOx control and a diesel risk reduction measure.</p> | 2005 |
| 4. | <p><i>Transit Bus Fleets</i> Future revisions to the existing Transit Bus Fleet Rule would require transit agencies to reduce emissions from non-urban buses they own or operate. This is both a NOx control and a diesel risk reduction measure.</p> | 2005 |
| 5. | <p><i>On-Road Private Heavy Duty Vehicle Fleets</i> Examples of on-road private fleets include goods movement carriers, long haul trucks, charter buses, and tourism buses. Owners would be offered four options: 1) use an engine certified to 0.01 g/bhp-hr PM, 2) use an engine certified to 0.1 g/bhp-hr PM plus a highest applicable verified diesel emission control strategy, 3) use an alternative fuel engine, or 4) apply a verified diesel emission control strategy and install a hardware-based retrofit system. This is both a NOx control and a diesel risk reduction measure.</p> | 2006 |

| | Strategy | Proposed Date for Board Consideration |
|----|--|---------------------------------------|
| 6. | <p>Pursue Approaches to Clean Up the Existing and New Truck /Bus Fleet (continuation)</p> <p>Heavy Duty Diesel Engine Software Upgrade (Also known as chip reflash or engine recalibration)</p> <p>Software upgrade installations reduce NOx emissions from trucks, school buses, and motor homes. Under California's voluntary program, engine manufacturers have agreed to provide, at no charge, low NOx software for heavy-duty diesel vehicles with certain 1993 through 1998 model year engines. These vehicle owners are encouraged to install the low NOx software to reduce "off-cycle" emissions. "Off-cycle" NOx emissions are greater than the emissions allowed in the engine certification process. The voluntary program goals for software installation are: 1) 35% of California registered heavy-duty diesel vehicles by November 2004, 2) 60% by June 2005, 3) 80% by February 2006, and 4) 100% by 2008.</p> <p>If the Board determines that the voluntary program has not met the first goal by November 2004 or the progress does not appear sustainable, low NOx software installations will be required by a regulation. The regulation requires software upgrades to be installed between April 30, 2005, and December 31, 2006, depending on the model year of the engine. In general, the engine software upgrade reduces NOx emissions by eliminating advanced computer controls – "defeat devices" – that produce excess off-cycle NOx emissions during steady-state vehicle operation, such as on-highway driving. Engine manufacturers were required to develop and provide the software under federal Consent Decree/California Settlement Agreements. Note: This measure was adopted at the March 25, 2004 Board hearing.</p> | 2004 |
| 7. | <p>Engine Manufacturer Diagnostics</p> <p>Specifies interim requirements for on-road heavy-duty diesel and gasoline engines to be equipped with diagnostic systems to detect malfunctions of the fuel system, exhaust gas recirculation system, and particulate matter trap. This is both a NOx control and a diesel risk reduction measure. Note: This measure was adopted at the May 20, 2004 Board hearing.</p> | 2004 |

| | Strategy | Proposed Date for Board Consideration |
|-----|---|---------------------------------------|
| | <p>Pursue Approaches to Clean Up the Existing and New Truck /Bus Fleet (continuation)</p> | |
| 8. | <p><i>On-Board Diagnostics (OBD)</i> Requires comprehensive OBD systems on on-road heavy-duty diesel vehicles to detect malfunctions of virtually every component that can cause emission increases before the emissions exceed a specified level. OBD requirements would also apply to new heavy-duty gasoline engines. This is both a NOx control and a diesel risk reduction measure.</p> | 2005 |
| 9. | <p><i>California Motor Vehicle Service Information Rule</i> The applicability of the existing rule was extended to heavy-duty vehicles, since ARB is currently in the midst of developing requirements for heavy-duty vehicles to be equipped with OBD systems. Requires vehicle manufacturers to make available all emission-related information about their vehicles, including service manuals, technical service bulletins, OBD II descriptions, and diagnostic tools for 1996 and later model years. The majority of this information must be made available for download from the Internet. Note: The applicability of this rule was extended at the January 22, 2004 Board hearing.</p> | 2004 |
| 10. | <p><i>Manufacturer-Required In-Use Vehicle Testing</i> Would require heavy-duty engine manufacturers to in-use test a specific number of engines per engine family the manufacturer procured at various mileage intervals. If vehicles do not meet applicable emission standards (including PM and NOx), an engine recall may be required. The program would also include mechanisms to streamline the engine certification process to ease manufacturer's engine testing burden. A fully implemented and enforceable manufacturer-run in-use compliance program will meet both ARB and U.S. EPA requirements.</p> | 2005 |
| | <p>(continued on next page)</p> | |

| | Strategy | Proposed Date for Board Consideration |
|------------|---|---------------------------------------|
| <p>11.</p> | <p>Pursue Approaches to Clean Up the Existing and New Truck /Bus Fleet (continuation)</p> <p><i>Reduced Idling of New Heavy-Duty Diesel Trucks</i> May require engine manufacturers to install electronic idle controls that automatically turn the engine off after 5 minutes of continuous idle operation. These requirements would be applicable to post-2007 model year on-road heavy-duty diesel engines and vehicles. The system must be tamper resistant and non-adjustable. This rule may allow the use of alternative idle reduction devices/strategies in order to provide heating and air conditioning for cab comfort, engine oil heating for easy engine start-up in cold ambient conditions, and electric power to charge batteries and for on-board accessories. These devices include on-board auxiliary devices such as fuel-fired heaters and auxiliary power units (APU), battery packs with inverter/charger systems, and truck stop electrification equipment. The measure may also include an optional idling emission standard for the main engine. A vehicle certified to the optional idling emission standards would be able to continue to operate the main engine at idle for more than the specified idle time limit. In addition, the measure may include an optional lower emission standard for diesel-fueled APUs that are used as alternatives to idling the main engine. This is both a NOx and PM control measure.</p> | <p>2005</p> |
| <p>12.</p> | <p><i>Reduced Idling of In-Use Heavy-Duty Diesel Trucks</i> Would limit idling off all vehicles with 10,000 pounds gross weight to 5 minutes per location (school bus idling is regulated under a previously adopted diesel PM air toxic control measure). Idling limits would become effective December 31, 2008 for vehicles equipped with sleeping berths at times when berthing is used for resting or sleeping. Idling is limited to 5 min for all buses in transit without passengers and to 10 minutes before passenger boarding. When passengers are on board a bus, for passenger comfort, idling limits would not apply. This is both a NOx control and a diesel risk reduction measure. Note: This measure was adopted a the July 22, 2004 Board hearing.</p> <p>(continued on next page)</p> | <p>2004</p> |

| | Strategy | Proposed Date for Board Consideration |
|--|---|--|
| 13. | <p>Pursue Approaches to Clean Up the Existing and New Truck /Bus Fleet (continuation)</p> <p>Transport Refrigeration Units (TRU) Air Toxic Control Measure Requires in-use TRU engines that operate in California to meet specific performance standards that vary by horsepower range. The performance standard requirements are based on proposed Tier 4 emission standards for non-road engines and will be phased in from 2008 through 2020. The requirements can be met by retrofitting TRU engines with certified retrofit technology or replacing the engines, replacing entire units, or by using approved alternative technologies such as electrification or cryogenic refrigeration systems. The ARB is scheduled to conduct technology reviews in 2007 and 2009 to ensure that technologies are ready to meet the performance standard compliance schedule.</p> <p>Note: This measure was adopted at the February 26, 2004 Board hearing.</p> | 2004 |
| B. Off-Road Engine and Vehicle Measures | | |
| 14. | <p>Lower Emission Standards for New Off-Road Engines (PM10, PM2.5, NOx, SOx)</p> <p>U.S. EPA has proposed a 4th Tier of diesel exhaust standards, which will require the use of aftertreatment technology and 15 ppm sulfur diesel fuel for most off-road engines in the 2011-2015 time frame. ARB intends to adopt similar standards for California's off-road diesel engines after the U.S. EPA rule has been finalized.</p> | 2004 |
| 15. | <p>Pursue Approaches to Clean Up the Existing Heavy-Duty Off-Road Equipment (PM10, PM2.5, NOx, ROG, SOx)</p> <p>Strategies that operators select would have ARB-verified emission reductions or involve use of ARB-certified engines and must meet the emission reduction targets specified by the rules. Strategies that operators could potentially use to reduce PM emissions include installation of hardware-based retrofits (e.g., diesel particulate filters), replacement of older, dirtier engines with new certified ones (engine re-power), retirement of old vehicles/equipment or replace with new lower-emissions models. Depending on the strategy chosen, use of low-sulfur diesel may be an integral strategy component.</p> | 2005-2006 |

| | Strategy | Proposed Date for Board Consideration |
|-----|--|--|
| 16. | <p>Portable Engines Air Toxic Control Measure (PM10, PM2.5, NOx)</p> <p>Requires all portable engines 50 hp and larger to be certified to Tier 1, 2, or 3 U.S. EPA/ARB off-road engine standards by 2010, and meet more stringent fleet-average emissions limits in 2013 and 2017. In 2020, all engines must meet Tier 4 standards or use diesel retrofits that achieve 85% diesel PM emission reductions. The ATCM also aims to achieve NOx reductions through expedited engine replacement.</p> <p>Note: This measure was adopted at the February 26, 2004 Board hearing.</p> | 2004 |
| 17. | <p>Implement Registration and Inspection Program for Existing Off-Road Equipment (PM10, PM2.5, NOx)</p> <p>As ARB develops off-road control measures to reduce in-use emissions (including PM and NOx), registration and inspection programs will be incorporated as a component of each regulation. The most cost-effective registration and inspection programs would be tailored to the type of equipment, application, and type of control proposed. These programs are a means of ensuring that the chosen control strategies remain effective over the lifetime of the engine or equipment.</p> | 2006-2009 |
| 18. | <p>Set Lower Emission Standards for New Off-Road Non-Preempt Gas Engines (NOx, VOC)</p> <p>Adopts exhaust emission standards for new non-preempted engines, in alignment with the federal Tier 2 standards beginning with the 2007 model year. In 2002, U.S. EPA adopted these emission standards based on catalyst durability testing co-sponsored by U.S. EPA, ARB, and the South Coast Air Quality Management District.</p> | 2005 |
| 19. | <p>Clean Up Existing Off-Road Gas Equipment Fleet (NOx, VOC)</p> <p>Reduces emissions from both existing and new large spark-ignition (LSI) engine fleets through a multi-faceted approach including:</p> <p>1) retrofit of existing engines to achieve an 80% reduction in exhaust emissions or meet emission levels equivalent to 3.0 g/bhp-hr HC+NOx (the retrofit technology would include a three-way catalyst and, on some engines, closed loop fuel control systems) and 2) new emission standards to increase use of near-zero and zero-emission forklifts (e.g., electric forklifts).</p> | 2005 |

| | Strategy | Proposed Date for Board Consideration |
|-----------------|--|--|
| 20. | <p>Pursue Approaches to Clean Up the Existing Harbor Craft (PM10, PM2.5, NOx, VOC)</p> <p>Emission reduction options for in-use harbor craft engines (commercial marine vessels) would include: 1) use of add-on control equipment (e.g., diesel particulate filters, diesel oxidation catalyst, selective catalytic reduction, or a combination of systems), 2) repowering of existing vessels or early introduction of new vessels, and 3) use of cleaner fuels such as California on-road low sulfur diesel, emulsified diesel fuels, biodiesel, compressed natural gas, or liquefied natural gas. Due to the diversity within the harbor craft category, specific emission reduction proposals may vary with the type of vessels, industry, or other factors.</p> | 2005 |
| 21. | <p>Pursue Approaches to Reduce Land-Based Port (PM10, PM2.5, NOx, VOC)</p> <p>Strategies to reduce PM, NOx, and ROG emissions may include: 1) early introduction of cleaner new vehicles and equipment, 2) expanded use of alternative fuels, 3) repowering with cleaner new engines, 4) add-on control equipment, 5) electrification of diesel equipment, 6) public education programs, and 7) operational changes such as idling limits.</p> | 2005 |
| C. Fuels | | |
| 22. | <p>Diesel Fuel for Intrastate Locomotives and Harbor Craft (PM10, PM2.5, NOx, SOx)</p> <p>Requires the use of California low sulfur motor vehicle diesel fuel in locomotives operating exclusively within the State, and with commercial and recreational marine vessels. ARB is working to develop an implementation schedule, with consideration being given to SIP commitments in the SCAQMD, as well as to diesel fuel supply impacts.</p> | 2004 |
| 23. | <p>Set Additives for Diesel Fuel to Control Engine Deposits (PM10, PM2.5, NOx, VOC, CO)</p> <p>Requires the use of deposit control additives in diesel fuel. The fuel would be certified upon passing engine tests that demonstrate that the fuel keeps injectors, cylinders, valves, and other engine parts free of combustion deposits.</p> | 2006-2009 |

| D. Stationary and Area Sources | | |
|---------------------------------------|---|--|
| | Strategy | Proposed Date for Board Consideration |
| 24. | <p>Stationary Compression Ignition Engines Air Toxic Control Measure (PM10, PM2.5, NOx, VOC)</p> <p>Stationary diesel engines remain in one location at a facility for more than 12 months. Sets emission standard requirements, operating hour limitations, fuel requirements, and record-keeping/reporting requirements for new (installed after 1/1/05) and existing (installed before 1/1/05) stationary diesel-fueled compression ignition engines.</p> <ul style="list-style-type: none"> - The new and existing prime (non-emergency) engines (e.g., remote power generation, cranes, sand and gravel processing, and fluid pumping) must meet a stringent PM standard of 0.01 g/bhp-hr beginning in 2005. - New emergency standby engines (e.g., those that provide power during power outages, emergency pumping of water during floods or fire suppression, or power airport runway lights under low visibility) must meet a PM standard of 0.15 g/bhp beginning in 2005. Existing emergency standby engines must limit maintenance and testing hours depending on the baseline emission level of the engine beginning in 2005. - New stationary diesel engines used in agricultural operations must limit PM emissions to 0.15 g/bhp-hr beginning in 2005. - To control criteria pollutants, all of these engines must meet the Off-Road Compression Ignition Engine Standards applicable to engines of the same size and model year. - Sets requirements for demand response programs, remotely located engines, and emergency standby engines located near schools. <p>Note: This measure was adopted at the February 26, 2004 Board hearing</p> | 2004 |
| 25. | <p>Stationary Diesel Agricultural Engine Air Toxic Control Measure (ATCM) (PM10, PM2.5, NOx)</p> <p>ARB is working with the air districts and the agricultural community to develop an ATCM that will reduce diesel PM emissions from existing stationary compression ignition engines used in agricultural operations.</p> | 2005 |

| | Strategy | Proposed Date for Board Consideration |
|-----|---|--|
| 26. | <p>Set New Consumer Products Limits in 2004, 2006, and 2008 (VOC)</p> <p>Targets previously unregulated categories or regulated categories that ARB staff has not evaluated for further emissions reductions during the last five years. Additional reductions may be achieved through both mass-based and reactivity-based limits. Products under evaluation include various unregulated solvent categories that may contain up to 100% ROG and many of the smaller regulated or currently unregulated categories of consumer products. To adopt new limits for consumer products in 2006 and 2008, ARB staff will need to update inventories detailing product ingredients and product sales by conducting surveys in 2004 and 2006.</p> <p>Note: New 2004 limits were adopted at the June 24, 2004 Board hearing.</p> | 2004-2008 |
| 27. | <p>Increase Recovery of Fuel Vapors from Aboveground Storage Tanks (VOC)</p> <p>Applies as many of the current enhanced vapor recovery (EVR) standards as feasible to gasoline aboveground storage tanks (ASTs), including an increase in overall system efficiency from 90 to 95% vapor recovery. Current EVR regulations, including Phase I regulating gasoline transfer from cargo tank to dispensing facility storage tank, and Phase II regulating transfer from the dispensing facility to the motor vehicle apply to underground storage tanks, but do not apply to ASTs. The regulation would address the increasing number of AST dispensing systems used at private and public facilities and some retail sites.</p> | 2004-2005 |
| 28. | <p>Reduce Fuel Permeation Through Gasoline Dispenser Hoses (VOC)</p> <p>Would review current permeation requirements for gasoline dispenser hoses and, if feasible, establish lower permeation requirements. Gasoline dispensing hoses used at marinas have stricter standards for hose permeability due to water quality concerns. The goal of this measure is to determine the applicability of the permeability standard for marine gasoline hoses to dispenser hoses at service stations.</p> | 2005 |

References:

<http://www.arb.ca.gov/planning/sip/stfed03/stfed03.htm>
<http://www.arb.ca.gov/diesel/dieselrrp.htm>
<http://www.arb.ca.gov/diesel/documents/rrpapp.htm>

APPENDIX C

SB 656 List of Air District Measures that Reduce Particulate Matter

SB 656 List of Air District Measures that Reduce Particulate Matter

| A. Wood-Burning Fireplaces and Wood-Burning Heaters (wood-burning heaters include woodstoves and fireplace inserts) | | | |
|---|---|--------------------------|---|
| Measures reduce directly emitted PM10 and PM2.5, and as an added benefit reduce NOx, VOC, CO, and air toxic emissions. | | | |
| | Strategy | Source Type | District, Rule, and Adoption Date* |
| 1. | <p>Public Awareness Program</p> <p>Informs the public about the indoor wood combustion control program. The program covers three areas: program effectiveness and tracking; key program elements; and communication strategy. The goal is to inform the public about potential health hazards of wood smoke and to encourage better wood burning practices or use of heating devices (e.g. some programs recommend use of manufactured firelogs instead of wood in fireplaces).</p> | Existing | SJVAPCD Rule 4901 7/17/03 |
| 2. | <p>Curtailment During Periods with Predicted High PM Levels</p> <p>Mandatory</p> <p>a) Restricts use of wood-burning fireplaces and heaters during periods when atmospheric conditions and the level of wood burning activity are predicted to result in high PM concentrations. Exempts households that use wood as primary sole source of heat and households in areas where natural gas service is not available.</p> <p>b) Prohibits use of wood-burning appliances during periods when atmospheric conditions and the level of wood burning activity are predicted to result in high PM concentrations. Exempts U.S. EPA certified wood-burning appliances. A secondary source of heat is required in all dwellings.</p> | Existing Existing | SJVAPCD Rule 4901 7/17/03 GBUAPCD for the Town of Mammoth Lakes Rule 431 12/07/90 |
| 3. | <p>Voluntary</p> <p>Informs the public about periods predicted to have high PM concentrations and encourages public to refrain from using wood-burning fireplaces and heaters during such periods. Some air districts exempt U.S. EPA certified wood-burning appliances from curtailment.</p> | Existing | SCAQMD, YSAQMD SLOAPCD Programs |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| | Strategy | Source Type | District, Rule, and Adoption Date* |
|----|--|------------------|--|
| | Require All Specified Wood-Burning Devices Installed be U.S. EPA-Certified, Phase II or Equivalent | | |
| 4. | Wood-Burning Heaters Prevents the sale and installation of wood-burning heaters that are not U.S. EPA-certified or equivalent. These wood-burning heaters must meet Phase II standards established in Subpart AAA of Part 60 of Title 40 of the Code of Federal Regulations. Phase II devices are designed to achieve more efficient combustion and lower particulate emissions than conventional devices. | New and modified | SJVAPCD Rule 4901 7/17/03 |
| 5. | Wood-Burning Heaters and Wood-Burning Fireplaces Prevents the sale and installation of wood-burning heaters and wood-burning fireplaces that emit PM in higher concentrations than specified for U.S. EPA certified Phase II wood heaters. Allowable wood-burning appliances must be air district or U.S. EPA certified. The requirement also applies to masonry fireplaces. | New and modified | NSoCAPCD Reg. 4-1-400 2/2/93 and SLOAPCD Rule 504 10/19/93 |
| 6. | Prohibits the Installation of Non-EPA Certified Wood-Burning Appliances & Wood-Burning Fireplaces (except pellet stoves) Prohibits the installation of any non-U.S. EPA certified wood-burning appliance in dwellings, except for pellet stoves. Prohibits the installation of wood-burning fireplaces, including low emission fireplaces that are exempt from U.S. EPA testing. | New and modified | GBUAPCD for the Town of Mammoth Lakes Rule 431 12/07/90 |
| | Number of Units | | |
| 7. | New Residential Developments Limits the number of wood-burning fireplaces and wood-burning heaters that may be installed in new residential developments. | New | SJVAPCD Rule 4901 7/17/03 |
| 8. | New Nonresidential Properties Limits the number of wood-burning appliances that may be installed in new nonresidential properties. | New | GBUAPCD for the Town of Mammoth Lakes Rule 431 12/07/90 |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| | Strategy | Source Type | District, Rule, and Adoption Date* |
|-----|---|--------------------------------------|---|
| 9. | <p>Number of Units (continuation)</p> <p>Additional Units in Existing Properties Limits the number of additional wood-burning appliances that may be installed in existing residential and nonresidential properties.</p> | New | GBUAPCD for the Town of Mammoth Lakes Rule 431 12/07/90 |
| 10. | <p>Replacement of Non-Certified Appliances Upon Sale of Property</p> <p>a) Assures that each wood-burning heater included in real property upon sale or transfer is U.S. EPA Phase II certified or equivalent. Non-complying devices must be removed or rendered inoperable.</p> <p>b) Requires replacing, removing or rendering inoperable any non-U.S. EPA certified wood-burning appliance upon sale of a dwelling (excluding pellet stoves, but including fireplaces).</p> | Existing Existing | SJVAPCD Rule 4901 7/17/03 GBUAPCD for the Town of Mammoth Lakes Rule 431 12/07/90 |
| 11. | <p>Control of Wood Moisture Content Sets moisture standard for "seasoned wood" offered for sale, since burning dry wood increases heating performance.</p> | New, existing, and modified | SJVAPCD Rule 4901 7/17/03 |
| 12. | <p>Prohibit Fuel Types Prohibits the burning of materials not intended for use in wood-burning fireplaces and wood-burning heaters (e.g., garbage, treated wood, and plastic products).</p> | New, existing, and modified | SJVAPCD Rule 4901 7/17/03 |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| B. Non-Agricultural Open Burning Measures reduce directly emitted PM10 and PM2.5, and as an added benefit reduce VOC, NOx, CO, and air toxic emissions. | | | |
|---|--|--------------------|--|
| | Strategy | Source Type | District, Rule, and Adoption Date* |
| 13. | Prohibition of Residential Open Burning <i>Of All Outdoor Residential Open Burning</i> Prohibits outdoor residential open burning. Limits open burning to permitted activities (e.g., agricultural burning, infectious disease, wildland vegetation management) or exempted activities (ceremonial fires, recreational fires, cooking fires, etc.) | Existing | SJVAPCD Rules 4103 & 4106 6/21/01 |
| 14. | <i>Where Waste Service is Available</i> Prohibits burning of greenwaste if served by an organized waste disposal service. No other residential waste may be burned anywhere. | Existing | MBUAPCD Rule 438 4/16/03 |
| 15. | <i>In Specified Highly Populated Areas</i> Prohibits outdoor burning of green waste in populated areas in specified geographical locations. | Existing | SMAQMD Rule 407 6/4/98 |
| 16. | <i>Within Small Lots and Setbacks</i> Prohibits outdoor burning of natural vegetation from the premises on lots smaller than one acre in size, where the burn pile is less than 100 feet from neighboring residence, or where greenwaste collection is offered by a franchise hauler. | Existing | LCAQMD Rule 433 10/15/02 |
| 17. | Mandatory Curtailment of Non-Agricultural Open Burning <i>During Periods with Predicted High PM or Ozone Levels</i> Prohibits planned burning or further ignitions during days when atmospheric conditions and the level of open burning are predicted to result in high PM or ozone concentrations (can prohibit additional burns on burn days). | Existing | MBUAPCD Rule 438 4/16/03 |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| | Strategy | Source Type | District, Rule, and Adoption Date* |
|-----|---|--------------------------|--|
| | Control Smoke Production | | |
| 18. | Limits during Burn Days in Smoke Sensitive Areas Requires Fire Chief to grant permit and limit burns to 25 per day in specific Smoke Sensitive Area (defined by rule); permit is only valid with daily authorization number. | Existing | MBUAPCD Rule 438 4/16/03 |
| 19. | Emission Limits for Mechanized Burners Sets emission limits for mechanized burners not to equal or exceed No. 1 on Ringelmann Chart published by the U.S. Bureau of Mines for periods aggregating more than 30 minutes in any eight-hour period. Requires burning permit. | Existing | ShCAQMD Rule 2.6 9/24/02 |
| | Performance Standards for Allowed Burns | | |
| 20. | Drying Times Establishes minimum drying times for any green waste to be burned and pile size limits. Sets bounds on time of day for ignition and completion. | Existing | BAAQMD Regulation V 11/2/94 |
| 21. | Burn Duration Restricts ignition hours and requires smoldering fires to be extinguished. | Existing | LCAQMD Rules 431- 433.5 10/15/02 |
| 22. | Preparation of Fuels & Management of Burns a) Sets requirements for burn piles (e.g. stack to ignite quickly, burn with minimum of smoke, ignite only for burn within same day, avoid public nuisance) prior and during burning. b) Sets requirements for burns on land to be cleared for residential or commercial development. APCO can restrict or prohibit the burning of poison oak | Existing Existing | MaCAPCD Rule 300 et. seq. 7/19/88 MBUAPCD Rule 438 4/16/03 |
| 23. | Permits Required Requires permits for all types of outdoor burning. | Existing | NCUAQMD Regulation 2 7/18/02 |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| C. Fugitive Dust | | | |
|--|---|--------------------|---|
| Measures reduce directly emitted PM10. | | | |
| | Strategy | Source Type | District, Rule, and Adoption Date* |
| 24. | Construction: Earthmoving | | |
| | <p>a) Requires water or chemical stabilizers/dust suppressants be applied, in conjunction with optional wind barriers, to limit visible dust emissions (VDE) to 20% opacity. Specifies that a Dust Control Plan must be submitted for areas of 40 acres or larger where earth movement of 2500 cubic yards or more on at least 3 days is intended. Note: This rule was amended August 19, 2004.</p> <p>b) Prohibits VDE beyond property line and an upwind/downwind PM10 differential of more than 50 $\mu\text{g}/\text{m}^3$. Requires implementation of Best Available Control Measures (BACM) for all sources such that visible emissions do not exceed this limit 100 feet from the point of origin of earth-moving activities. List of BACM is contained in the Rule 403 Implementation Handbook. Specifies that a Dust Control Plan or a commitment to implement Table 1 and 2 control measures through a large operation notification (LON) is required for large operations projects with a disturbed surface area 100 acres or larger, or projects with daily earth movement of 10,000 cubic yards or more. Note: This rule was amended April 2, 2004. The amendments incorporate a new list of BACM and implements new requirements (project signage, dust control supervisor) for large operations (now defined as 50 acres or 5,000 cubic yards of daily earth-movement).</p> | Existing | SJVAPCD Rule 8021 11/15/01 |
| 25. | Construction: Demolition | | |
| | <p>a) Requires application of dust suppressants to limit VDE to not more than 20% opacity. Sets bulk material and track-out requirements. Note: This rule was amended August 19, 2004.</p> <p>b) Prohibits VDE beyond property line. Requires application of BACM. Specifies that upwind-downwind PM10 levels must not exceed 50 $\mu\text{g}/\text{m}^3$. Sets track-out requirements. Note: This rule was amended April 2, 2004. The amendments require track-out control device for projects greater than 5 acres or 100 cubic yards of daily</p> | Existing | SJVAPCD Rule 8021 11/15/01 |
| | | Existing | SCAQMD Rule 403 2/14/97 |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| | Strategy | Source Type | District, Rule, and Adoption Date* |
|-----|---|---------------------------------|--|
| | <p>Construction: Demolition (continuation)</p> <p>import/export and lowers track-out clean-up prohibitions from 50 to 25 feet.</p> | | |
| 26. | <p>Construction: Grading Operations</p> <p>a) Requires pre-watering to limit VDE to 20% opacity. Requires phasing of work to reduce disturbed soil. Note: This rule was amended August 19, 2004.</p> <p>b) Requires water application to increase moisture content to proposed cut, and grading each phase separately to coincide with the construction phase. Specifies that chemical stabilizers are to be applied to graded areas where construction will not begin for more than 60 days after grading. Note: This rule was amended April 2, 2004. The amendments require new Table 1 BACM (e.g., pre-application of water to depth of proposed cuts, reapplication of water as necessary to ensure that visible emissions do not extend more than 100 feet from the sources, and stabilization of soils once earth-moving is complete).</p> | <p>Existing</p> <p>Existing</p> | <p>SJVAPCD Rule 8021 11/15/01</p> <p>SCAQMD Rule 403 2/14/97</p> |
| 27. | <p>Inactive Disturbed Land</p> <p>a) Requires restricting vehicle access. Specifies that water/dust suppressants must be applied to meet stabilized surface definition; if area is greater than 0.5 acres and the area is inactive more than 7 days, must comply with stabilized soil definition. Note: This rule was amended August 19, 2004</p> <p>b) Prohibits VDE beyond property line and an upwind/downwind PM10 differential of more than 50 $\mu\text{g}/\text{m}^3$. Requires BACM (e.g., chemical stabilization, frequent watering, and revegetation) at all times and high wind measures (e.g., chemical stabilization to maintain a stabilized surface or watering three times per day) under high wind conditions. Note: This rule was amended April 2, 2004. The amendments clarify new Table 1 BACM.</p> | <p>Existing</p> <p>Existing</p> | <p>SJVAPCD Rule 8021 11/15/01</p> <p>SCAQMD Rule 403 2/14/97</p> |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| | Strategy | Source Type | District, Rule, and Adoption Date* |
|-----|--|-------------|------------------------------------|
| 28. | <p>Bulk Materials: Handling/Storage</p> <p>a) Establishes wind barrier and watering or stabilization requirements to limit VDE to 20% opacity. Specifies bulk materials must be stored in accordance with the definition for stabilized surface. Requires outdoor materials be covered with tarps, plastic, etc. Note: This rule was amended August 19, 2004.</p> <p>b) Prohibits VDE beyond property line and an upwind/downwind PM10 differential of more than 50 $\mu\text{g}/\text{m}^3$. Requires use of BACM (e.g., wind sheltering, watering, chemical stabilizers, altering load-in/load-out procedures, or coverings). Note: This rule was amended April 2, 2004. The amendments establish new Table 1 BACM (control measures 09-1 through 09-5) for importing/exporting of bulk materials.</p> | Existing | SJVAPCD Rule 8031 11/15/01 |
| | | Existing | SCAQMD Rule 403 2/14/97 |
| 29. | <p>Carryout and Track-out</p> <p>a) Requires track-out removal at the end of the workday, if the track-out is less than 50 feet; or removal as soon as possible if the track-out exceeds 50 feet. Specifies a track-out control device must be installed at all access points to public roads. Requires maintaining sufficient length of paved interior roads to allow dirt/mud to drop off before leaving site and mud/dirt removal from interior paved roads with sufficient frequency to prevent track-out Note: This rule was amended August 19, 2004.</p> <p>b) Requires removing any track-out within one hour; or selecting a Table 3 track-out prevention option and removing track-out at the end of the workday, if the track-out is less than 50 feet, and removing track-out as soon as possible, if it exceeds 50 feet. Table 3 track-out options include road surface paved or chemically stabilized from point of intersection with a public paved road to distance of at least 100 feet by 20 feet, or installation of track-out control device from point of intersection with a public paved road to a distance of at least 25 feet by 20 feet. Note: This rule was amended April 2, 2004. Beginning January 1, 2005, the amendments require sites greater than five acres or those with more than 100 cubic yards of daily import/export to install a track-out control device (four options provided) and prohibits material from .</p> | Existing | SJVAPCD Rule 8041 11/15/01 |
| | | Existing | SCAQMD Rule 403 2/14/97 |

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| | Strategy | Source Type | District, Rule, and Adoption Date* |
|-----|--|--------------------------|---|
| | <p>Carryout and Track-out (continuation)</p> <p>extending more than 25 feet from a site entrance</p> | | |
| 30. | <p>Carryout and Track-out: Clean-Up Methods</p> <p>Requires manual sweeping; sweeping with a rotary brush/broom with sufficient wetting to limit VDE to 20% opacity; or operating a PM10 street sweeper with 80% efficiency per SCAQMD Rule 1186.</p> <p>Note: This rule was amended August 19, 2004.</p> | Existing | SJVAPCD Rule 8041 11/15/01 |
| 31. | <p>Disturbed Open Areas</p> <p>a) Applies to non-agricultural areas of 3 acres or larger which have been unused for 7 days or more. Requires water/dust suppressants application to unvegetated areas sufficient to limit VDE to 20% opacity. Specifies vegetation must be established to limit VDE to 20% opacity. Requires paving, applying gravel, or applying stabilizers to limit VDE to 20% opacity. Upon evidence of trespass, requires posting of "no trespass" signs or installing barriers to prevent access to area.</p> <p>Note: This rule was amended August 19, 2004.</p> <p>b) Applies to non-agricultural areas of one-half acre or larger for residential use; and all non-residential areas. Requires application of chemical stabilizers; watering with sufficient frequency to establish a surface crust, or establishing drought-resistant vegetation as quickly as possible.</p> <p>Note: This rule was amended April 2, 2004. The amendments clarify new Table 1 BACM and remove exemption for residential properties less than one-half acre.</p> | Existing Existing | SJVAPCD Rule 8051 11/15/01 SCAQMD Rule 403 2/14/97 |
| 32. | <p>Paved Road Dust: New/Modified Public and Private Roads</p> <p>a) Requires paved shoulders for all roads with average daily vehicle trips (ADVT) of 500 or more. If ADVT is 500-3000, then average shoulder width is at least 4 feet. If ADVT is greater than 3000, then average shoulder width is at least 8 feet. Curbing adjacent to and contiguous with a paved lane or shoulder can be used in lieu of shoulder width requirements. Intersections, auxiliary entry and exit lanes may be constructed adjacent to and</p> | Existing | SJVAPCD Rule 8061 11/15/01 |

*Date when rule was adopted or last amended

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| | Strategy | Source Type | District, Rule, and Adoption Date* |
|-----|--|-------------|------------------------------------|
| | <p>Paved Road Dust: New/Modified Public and Private Roads (continuation)</p> <p>contiguous with a paved roadway in lieu of shoulder requirements. Specifies if ADVT is 500 or greater, and medians are part of the roadway, then medians are to be constructed with minimum 4-foot shoulder widths adjacent to traffic lanes. Where speed limits are below 45 mph, medians are to be constructed with curbing. Specifies medians are to be landscaped to meet stabilized surface requirements. As an option to shoulder paving or vegetation requirements, oils or chemical dust suppressants can be used, according to the specified widths, and must be maintained to limit VDE to 20% opacity. Specifies requirements for contingency notification.</p> <p>Note: This rule was amended August 19, 2004.</p> <p>b) Establishes curbing or paved shoulder requirements in the event of a contingency notification: For ADVT of 500 or more, curbing or paved shoulders are required, for ADVT of 500-3000, shoulder widths shall be at least 4 feet, for ADVT greater than 3000, shoulder widths shall be at least 8 feet. Establishes median requirements in the event of a contingency notification. For medians with ADVT of 500 or more, must pave median area with typical roadway materials, unless speed limits less than 45 mph, or medians are landscaped with ground cover and there is curbing, or medians are treated with chemical stabilizers to maintain stabilized surface.</p> <p>Note: This rule was amended April 2, 2004. The amendments invoke contingency requirements for new / widened roads, beginning January 1, 2006.</p> | Existing | SCAQMD Rule 1186 2/14/97 |
| 33. | <p>Paved Road Dust: Street Sweeping</p> <p>Requires use of certified PM10 efficient street sweepers by governmental agencies or their street sweeping contractors where the contract date, purchase date, or lease date is after January 1, 2000. Specifies certified sweepers are to be used for all routine street sweeping except roads with curbs, paved road shoulders greater than 4 feet width, within 1000 feet of an unpaved road, and provided documentation of such is provided. Certified sweepers are to be maintained according to</p> | Existing | SCAQMD Rule 1186 9/10/99 |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| | Strategy | Source Type | District, Rule, and Adoption Date* |
|-----|---|--------------------|---|
| | <p>Paved Road Dust: Street Sweeping (continuation)</p> <p>manufacturer's specifications.</p> <p>Note: This rule was amended April 2, 2004. The amendments remove certified equipment exemption.</p> | | |
| 34. | <p>Paved Road Dust: Street Sweeping Sand & Cinders Used for Anti-skid Material on Icy Roads, VMT Limit, & Free Bus</p> <p>Requires vacuum-street sweeping on roads to remove sand and cinders that were placed on the road during winter storms as an anti-skid material. Street sweeping is required after the roads dry sufficiently for the street sweepers to remove the material. This rule also limits the peak daily VMT (vehicle miles traveled) projected with future development, and encourages the use of a free bus system to reduce VMT.</p> | Existing | GBUAPCD for the Town of Mammoth Lakes Rule 431 12/07/90 |
| 35. | <p>Unpaved Parking Lots/Staging Areas</p> <p>Requires, for days with 75 or more vehicle trips, limiting VDE to 20% opacity and implementing at least one of the following control measures: 1) applying water, 2) applying uniform layer of washed gravel, 3) applying chemical/organic dust suppressant, 4) using vegetative materials, 5) paving, 6) using any other method to limit VDE to 20% opacity.</p> <p>Requires, for days with 100 or more vehicle trips, limiting VDE to 20% opacity, complying with requirements for stabilized surface, or implementing at least one of the following control measures: 1) applying water, 2) applying chemical/organic dust suppressant, 3) applying road mix, 4) paving, 5) using any other method that results in a stabilized surface.</p> <p>Sets as an option to the above, obtaining a Fugitive PM10 Management Plan that: 1) achieves at least 50% control efficiency, 2) describes location, length, and area of unpaved traffic areas, 3) describes traffic conditions (vehicle trips per unit time, types of vehicles), 4) describes control measures used and application details, and 5) describes expected results of road surface condition.</p> <p>Note: This rule was amended August 19, 2004.</p> | Existing | SJVAPCD Rule 8061 11/15/01 |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| | Strategy | Source Type | District, Rule, and Adoption Date* |
|-----|--|--------------------|---|
| 36. | <p>Unpaved Roads: Control Requirements</p> <p>a) Requires, for days with 75 or more vehicle trips, limiting VDE to 20% opacity and implementing at least one of the following control measures: 1) applying water, 2) applying uniform layer of washed gravel, 3) applying chemical/organic dust suppressant, 4) using vegetative materials, 5) paving, or 6) using any other method to limit VDE to 20% opacity.</p> <p>Requires, for days with 100 or more vehicle trips, limiting VDE to 20% opacity, complying with requirements for stabilized surface, or implementing at least one of the following control measures: 1) applying water, 2) applying chemical/organic dust suppressant, 3) applying roadmix, 4) paving, or 5) using any other method that results in stabilized surface.</p> <p>Sets as option to above, obtaining a Fugitive PM10 Management Plan that: 1) achieves at least 50% control efficiency, 2) describes location, length, and area of unpaved traffic areas, 3) describes traffic conditions (vehicle trips per unit time, vehicle types), 4) describes controls measures used and application details, and 5) describes expected results of road surface condition. Note: This rule was amended August 19, 2004.</p> <p>b) Sets applicability standard: unpaved road must be more than 50 feet wide at all points or must not be within 25 feet of property line, or have more than 20 vehicle trips per day. Specifies all roads with ADT greater than the average ADT of all unpaved roads within its jurisdiction must be treated. Requires annual treatment of unpaved public roads beginning in 1998 and continuing for each of 8 years thereafter by implementing one of the following: 1) paving at least one mile with typical roadway material, 2) applying chemical stabilizers to at least two miles to maintain stabilized surface, 3) implementing at least one of the following on at least three miles of road surface: a) installing signage at ¼ mile intervals limiting speed to 15 mph, b) installing speed control devices every 500 feet, or c) maintaining roadway in a manner which limits speed to 15 mph.</p> | Existing | <p>SJVAPCD Rule 8061 11/15/01</p> <p>SCAQMD Rule 1186 2/14/97</p> |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| | Strategy | Source Type | District, Rule, and Adoption Date* |
|-----|--|--------------------|---|
| | <p>Unpaved Roads: Control Requirements (continuation)</p> <p>Note: This rule was amended April 2, 2004. The amendments clarify 20% opacity standard that was previously in the definition of a stabilized surface and reference test methods in Rule 403 Implementation Handbook.</p> | | |
| 37. | <p>Weed Abatement Activities</p> <p>a) Sets pre-activity requirements: 1) pre-watering to limit VDE to 20% opacity, or 2) phasing work to reduce amount of disturbed surface area. Requires, during active operations, applying water to limit VDE to 20% opacity. Sets stabilization requirements during periods of inactivity: 1) restricting vehicle access to area, or 2) applying water or chemical stabilizers to meet conditions of a stabilized surface.</p> <p>Note: This rule was amended August 19, 2004.</p> <p>b) Specifies weed abatement activities are subject to standards of Rule 403, unless: 1) mowing or cutting is used, instead of discing, and stubble is maintained at least three inches above the soil, or 2) if discing is used, there is a determination of a potential fire hazard. Specifies that after discing, the requirement for taking action on disturbed surface areas applies.</p> <p>Note: This rule was amended April 2, 2004. The amendments require pre-application of watering if disking for weed abatement.</p> | Existing | <p>SJVAPCD Rule 8021 11/15/01</p> <p>SCAQMD Rule 403 7/9/93</p> |
| 38. | <p>Windblown Dust: Definitions</p> <p>Defines windblown dust as any visible emissions from any disturbed surface area which is generated by wind action alone. Specifies wind gusts as maximum instantaneous wind speed.</p> <p>Note: This rule was amended April 2, 2004 to specify that high wind conditions are when instantaneous wind speeds exceed 25 mph.</p> | Existing | <p>SCAQMD Rule 403 7/9/93</p> |
| 39. | <p>Windblown Dust: Construction/Earth Moving</p> <p>Requires, for earthmoving, ceasing all active operations, applying water to soil not more than 15 minutes prior to moving such soil if subject to large operation requirements or if seeking an exemption from property line or upwind/downwind standard. Requires, for unpaved roads at construction sites, applying chemical stabilizers</p> | Existing | <p>SCAQMD Rule 403 2/14/97</p> |

*Date when rule was adopted or last amended

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| | Strategy | Source Type | District, Rule, and Adoption Date* |
|-----|---|--------------------------|--|
| | <p>Windblown Dust: Construction/Earth Moving (continuation)</p> <p>prior to a wind event, applying water twice per hour during active operations, stopping all vehicular traffic if subject to large operation requirements or if seeking an exemption from property line or upwind/downwind standard.</p> <p>Note: This rule was amended April 2, 2004.</p> | | |
| 40. | <p>Windblown Dust: Disturbed Areas</p> <p>Requires, if operations remain inactive for not more than 4 consecutive days, application of water and chemical stabilizers in sufficient concentrations to maintain a stabilized surface for 6 months traffic if subject to large operation requirements or if seeking an exemption from property line or upwind/downwind standard. Requires application of chemical stabilizers prior to wind event; applying water 3 times per day; if evidence of wind driven fugitive dust, increasing watering to 4 times per day; or establish vegetative ground cover within 21 days after active operations have ceased traffic if subject to large operation requirements or if seeking an exemption from property line or upwind/downwind standard.</p> <p>Note: This rule was amended April 2, 2004.</p> | Existing | SCAQMD Rule 403 2/14/97 |
| 41. | <p>Windblown Dust: Bulk Materials/Storage Piles</p> <p>a) Requires application of water twice per hour or installation of temporary coverings if subject to large operation requirements or if seeking an exemption from property line or upwind/downwind standard.</p> <p>Note: This rule was amended April 2, 2004.</p> <p>b) Additional bulk material control requirements for Coachella Valley sources.</p> <p>Note: This rule was amended April 2, 2004.</p> | Existing Existing | SCAQMD Rule 403 2/14/97 SCAQMD Rule 403.1 1/15/93 |

*Date when rule was adopted or last amended

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| | Strategy | Source Type | District, Rule, and Adoption Date* |
|-----|--|--|---|
| 42. | <p>Wind Blown Dust: Open Areas</p> <p>Requires 50% vegetation cover, or 75% wet or saturated water cover, or 4-inch deep gravel on open areas that may cause or contribute to an exceedance of the federal PM-10 standard.</p> | Existing | GBUAPCD for Owens Lake Board Order #981116-01 11/16/98 |
| 43. | <p>Agricultural Operations</p> <p>a) Limits fugitive dust from off-field agricultural sources such as unpaved roads with more than 75 trips/day and bulk materials handling by requiring producers to draft and implement a Fugitive Dust Management Plan with district approved control methods. Note: This rule was amended September 16, 2004.</p> <p>b) Producers that voluntarily implement district approved conservation practices and complete and maintain the self-monitoring plan can maintain an exemption from the Rule 403 general requirements. Note: This rule was amended April 2, 2004, extending applicability to the Coachella Valley.</p> <p>c) Cease tilling/mulching activities when wind speeds are greater than 25 mph (Coachella Valley). Note: This rule was amended April 2, 2004. The program is implemented through Rule 403.</p> <p>d) Limits fugitive dust from paved and unpaved roads and livestock operations by requiring: 1) ceasing all hay grinding activities between 2 and 5 p.m. if visible emissions extend more than 50 feet from a hay grinding source, and 2) treating all unpaved access connections to livestock operations and unpaved feed lane access areas with either pavement, gravel (maintained to a depth of 4 inches), or asphaltic road-base. Note: This rule was amended April 2, 2004.</p> <p>(continued on next page)</p> | Existing Existing Existing Existing | SJVAPCD Rule 8081 11/15/01 SCAQMD Rule 403 2/14/97 SCAQMD Rule 403.1 1/5/93 SCAQMD Rule 1186 2/14/97 |

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| | Strategy | Source Type | District, Rule, and Adoption Date* |
|--|--|--|--|
| | Agricultural Operations (continuation) e) Reduces fugitive dust from livestock feed yards by requiring a dust plan that contains procedures assuring moisture factor between 20% and 40% for manure in the top three inches of occupied pens and outlines manure management practices, including removal. | Existing | ICAPCD Rule 420 8/13/02 |
| D. Combustion Sources Measures reduce NOx, VOC, CO, or PM10 and PM2.5. | | | |
| 44. | Boilers, Steam Generators, and Process Heaters (NOx) a) Limits NOx emissions from gaseous fuel or liquid fuel fired boilers, steam generators, or process heaters with a total rated heat input greater than 5 million Btu/hr to between 5-40 ppmv depending on fuel type, use, and burner capacity. b) Limits NOx emissions from gaseous fuel or liquid fuel fired boilers, steam generators, or process heaters with a total rated heat input greater than 5 million Btu/hr to between 30-40 ppmv depending on fuel type. c) Limits NOx emissions from gaseous, liquid, or solid fossil fuel fired boilers, steam generators, or process heaters with a total rated heat input starting at 2 million Btu/hr up to 5 million Btu/hr used in any industrial, institutional, or commercial operation to 30 ppmv or 0.037 pounds per million Btu of heat input. d) Limits NOx emissions from any boilers, steam generators, or process heater with a total rated heat input starting at 1 million Btu/hr up to 5 million Btu/hr to 30 ppmv. (continued on next page) | New, existing and modified New, existing and modified New, existing and modified New, existing and modified | SJVAPCD Rule 4306 9/18/03 SMAQMD Rule 411 7/22/99 and SCAQMD Rule 1146 11/17/00 SCAQMD Rule 1146.1 5/13/94 VCAPCD Rule 74.15.1 6/13/00 |

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| | Strategy | Source Type | District, Rule, and Adoption Date* |
|-----|--|---|--|
| | <p>Boilers, Steam Generators, and Process Heaters (continuation)</p> <p>e) Limits NOx emissions from new and existing natural gas-fired large (commercial) water heaters, small (industrial) boilers, and process heaters that have a rated heat input starting at 75,000 Btu/hr up to and including 2 million Btu/hr to between 30-55 ppmv depending on burner size. Exempts residential and low use units.</p> <p>f) Limits NOx emissions from new natural gas-fired large (commercial) water heaters, small (industrial) boilers, and process heaters that have a rated heat input starting at 75,000 Btu/hr up to and including 2 million Btu/hr to between 30-55 ppmv depending on burner size. Exempts residential and low use units.</p> | <p>New, existing and modified</p> <p>New</p> | <p>SCAQMD Rule 1146.2 1/9/98</p> <p>SBAPCD Rule 360 10/17/02 and VCAPCD Rule 74.11.1 9/14/99</p> |
| 45. | <p>Turbines (NOx)</p> <p>a) Limits NOx emissions to the atmosphere from the operation of stationary gas turbines to between 9-65 ppmv depending on turbine operating capacity, yearly run time, and fuel type. Exemptions include emergency standby and laboratory units.</p> <p>b) Limits NOx emissions to the atmosphere from the operation of stationary gas turbines to between 3-65 ppmv depending on turbine operating capacity, yearly run time, and fuel type. Exemptions include emergency standby and laboratory units.</p> <p>c) Limits NOx emissions from the operation of gas turbines to 9-25 ppm for turbines in size range of 2.9 to 10 MW.</p> <p>Note: Ammonia slip limits for gas turbines in power plants are listed in: 1) ARB's May 2004 Report to the Legislature on Gas-Fired Power Plant NOx Emission Controls and Related Environmental Impacts Reference: http://www.arb.ca.gov/energy/noxlegprt.htm 2) ARB's September 1999 Guidance for Power Plant Siting and Best Available Control Technology Reference: http://www.arb.ca.gov/energy/powerpl/guidocfi.pdf</p> | <p>New, existing and modified</p> <p>New, existing and modified</p> <p>New and existing</p> | <p>SMAQMD Rule 413 5/1/97</p> <p>SJVAPCD Rule 4703 4/25/02</p> <p>SCAQMD Rule 1134 08/08/97</p> |

*Date when rule was adopted or last amended

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| | Strategy | Source Type | District, Rule, and Adoption Date* |
|-----|---|---|--|
| 46. | <p>IC Engines (NOx, VOC)</p> <p>a) Limits NOx emissions from gaseous- and liquid-fueled stationary and portable engines over 50 bhp to 36 ppm or higher and VOC to 250 ppm or higher depending on use category of engine (i.e. portable, stationary, oil field, fired by sewage digester gas, etc.)</p> <p>b) Limits NOx emissions from spark ignited internal combustion engines over 50 bhp to 25-75 ppmv, VOC emissions to 250-750 ppmv, and CO emissions to 2000 ppmv depending on engine type and size.</p> <p>c) Limits NOx emissions from spark ignited internal combustion engines over 50 bhp from 25-125 ppmv depending on engine type and size and NMHC to 250-750 ppmv depending on engine size.</p> | <p>New, existing and modified</p> <p>New, existing and modified</p> <p>New, existing and modified</p> | <p>SCAQMD Rule 1110.2 11/14/97</p> <p>SJVAPCD Rule 4702 8/21/03</p> <p>SMAQMD Rule 412 6/1/95</p> |
| 47. | <p>Lime Kilns (NOx)</p> <p>Limits NOx emissions from lime kilns to between 0.10-0.20 lbs/MM Btu depending on fuel type.</p> | New, existing and modified | SJVAPCD Rule 4313 3/27/03 |
| 48. | <p>Cement Kilns (NOx, PM10, PM2.5)</p> <p>a) Limits NOx emissions from cement kilns during periods of operation other than start-up or shut-down to between 6.4-7.2 lb/ton clinker produced averaged over a 30 day period depending on kiln type. Additional limits are specified for start-up and shut-down periods.</p> <p>b) Limits NOx emissions from cement kilns to 11.6 lbs/ton of clinker produced averaged over any 24 consecutive hour period and to 6.4 lbs/ton of clinker produced averaged over a 30 day period.</p> <p>c) Limits PM emissions to 30 pounds per hour for kiln feed rates of 75 tons per hour or greater. Limits PM emissions to 0.40 pound per ton of kiln feed for kiln feed rates less than 75 tons per hour.</p> | <p>New, existing, and modified</p> <p>New and existing</p> <p>New and existing</p> | <p>MDAQMD Rule 1161 3/25/02</p> <p>KCAPCD Rule 425-3 10/13/94</p> <p>SCAQMD Rule 1112.1 02/07/86</p> |

*Date when rule was adopted or last amended

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| | Strategy | Source Type | District, Rule, and Adoption Date* |
|-----|--|---|---|
| 49. | <p>Furnaces (NOx)</p> <p>a) Glass Melting Furnaces Sets NOx emission limits of 4.0 pounds per ton of glass pulled for glass melting furnaces.</p> <p>Sets NOx emission limits of 5.5 pounds per ton of glass pulled for glass melting furnaces.</p> <p>b) Central Furnaces Sets a NOx emission limit of 40 ng/joule for gas fired residential units with rating less than 175,000 Btu/hr.</p> | <p>New and existing</p> <p>New and existing</p> <p>New and existing</p> | <p>SCAQMD Rule 1117 1/06/84</p> <p>BAAQMD Rule 9-12 1/19/94</p> <p>SCAQMD Rule 1111 07/08/83 and SDAPCD Rule 69.6 6/17/98</p> |
| 50. | <p>Residential Water Heaters (NOx)</p> <p>a) Limits NOx emissions from water heaters with heat input rates equal to or less than 75,000 Btu per hour to 20 ng/joule of heat output and sets future limit to 10 ng/joule of heat output.</p> <p>b) Limits NOx emissions from water heaters with heat input rates equal to or less than 75,000 Btu per hour to 40 ng/joule of heat output.</p> | <p>New</p> <p>New</p> | <p>SCAQMD Rule 1121 12/10/99</p> <p>SJVAPCD Rule 4902 6/17/93</p> |
| 51. | <p>Commercial Charbroiling Operations (VOC, PM10, PM2.5)</p> <p>Requires new and existing chain driven charbroilers to be equipped with a catalytic oxidizer control device.</p> | <p>New and existing</p> | <p>SJVAPCD Rule 4692 3/21/02 and SCAQMD Rule 1138 11/14/97</p> |

*Date when rule was adopted or last amended

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| E. Composting and Related Operations Measures reduce ammonia and VOC. | | | |
|---|---|-----------------------------|---|
| | Strategy | Source Type | District, Rule, and Adoption Date* |
| 52. | General Administrative Requirements Requires composting and chipping and grinding facilities to register and provide facility and throughput information including, general facility information, type and amount of feedstock, products generated and process description. Annual updates also required. | New, existing, and modified | SCAQMD Rule 1133 1/10/03 |
| 53. | Chipping and Grinding Operations (Ammonia, VOC) Prevents inadvertent decomposition associated with stockpiling of green and/or food wastes by establishing holding or processing time requirements for chipping and grinding activities. | New, existing, and modified | SCAQMD Rule 1133.1 1/10/03 |
| 54. | Composting (Ammonia, VOC) Requires co-composting operations (biosolids and/or manure combined with bulking agents) to reduce VOC and ammonia emissions by 80% by conducting active composting within a total permanent enclosure and conducting curing using an aeration system that operates under negative pressure for a least 90% of its operating cycle and venting of VOC and ammonia emissions to a control device (biofilter). As an alternative, facilities subject to this rule may also submit a compliance plan that presents and demonstrates an alternative method of compliance. The rule requires recordkeeping and source testing which includes the submittal of a testing protocol. Exemptions are also provided for facilities that meet certain specific requirements. | New, existing, and modified | SCAQMD Rule 1133.2 1/10/03 |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| F. Storage, Transfer, and Dispensing Operations Measures reduce VOC. | | | |
|--|---|---|--|
| | Strategy | Source Type | District, Rule, and Adoption Date* |
| 55. | Gasoline Transfer and Dispensing Facilities Limits emissions of VOC from gasoline dispensing facilities through equipment and operational requirements. For equipment and testing requirements see ARB Executive Orders. | New, existing and modified | BAAQMD Rule 8-7 11/6/02 |
| 56. | Organic Liquid Storage a) Limits VOC emissions from storage tanks with a capacity of 264 gallons and greater through operational and equipment requirements. b) Limits VOC emissions from any above-ground stationary tank with a capacity of 75,00 liters (19,815 gallons) or greater used for storage of organic liquids, and any above-ground tank with a capacity between 950 liters (251 gallons) and 75,000 liter (19,815 gallons) used for storage of gasoline by setting tank roof, other performance, and self-inspection requirements. Sets forth conditions for the cleaning and degassing of aboveground and underground stationary tanks, reservoirs, or other containers storing or last used to store VOC. | New, existing and modified New, existing, and modified | BAAQMD Rule 8-5 11/27/02 SCAQMD Rule 463 3/11/94 in combination with Rule 1149 7/14/95 |
| G. Leaks and Releases Measures reduce VOC | | | |
| 57. | Equipment Leaks (Valves and Flanges) a) Limits VOC and methane emissions from leaking equipment at petroleum refineries, chemical plants, bulk plants, and bulk terminals including, but not limited to: valves, connectors, pumps, compressors, pressure relief devices, diaphragms, hatches, sight-glasses, fittings, sampling ports, meters, pipes, vessels, and refinery wastewater collection system components to between 100-500 ppm depending on equipment type. <i>Note: This rule was amended January 21, 2004.</i> | New, existing and modified | BAAQMD Rule 8-18 11/27/02 |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| | Strategy | Source Type | District, Rule, and Adoption Date* |
|---|--|-----------------------------|---|
| | Equipment Leaks (Valves and Flanges) (continuation) b) Limits VOC emissions from leaking equipment at petroleum facilities and chemical plants by setting forth leak standards and requirements for component identification, operator inspection, maintenance, and atmospheric pressure relief devices. | New, existing and modified | QMD 1173 12/6/02 |
| H. Product Manufacturing Measures reduce VOC. | | | |
| 58. | Coatings and Ink Manufacturing Sets forth operational and "housekeeping" requirements for coatings and ink manufacturing. | New, existing and modified | SCAQMD Rule 1141.1 11/17/00 |
| 59. | Fiberboard Manufacturing Limits VOC emissions from fiberboard manufacturing by requiring use of capture and control systems with specified efficiencies | New, existing, and modified | PCAPCD Rule 229 6/28/94 |
| 60. | Food Product Manufacturing and Processing Limits VOC emissions from solvents used in food product manufacturing and processing operations by limiting the VOC content of products used to between 120-400 g/l depending on product, or by the use of a control device. | New, existing and modified | SCAQMD Rule 1131 6/6/03 |
| 61. | Pharmaceuticals and Cosmetics Manufacturing Operations Sets forth equipment and operational requirements for pharmaceuticals and cosmetic manufacturing. | New, existing and modified | SCAQMD Rule 1103 3/12/99 |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| | Strategy | Source Type | District, Rule, and Adoption Date* |
|-----|---|-----------------------------|---|
| 62. | <p>Polyester Resin Operations</p> <p>Limits VOC emissions from all polyester resin operations that fabricate, rework, repair, or touch-up products through operational controls and by limiting the monomer content of products to between 28%-50% depending on product type.</p> | New, existing and modified | SCAQMD Rule 1162 11/9/01 |
| 63. | <p>Polymeric Cellular Products (Foam)</p> <p>a) Sets forth emission limits for polymeric cellular products manufacturing operations. All steps of the manufacturing operation and the storage of the final product for a maximum of 48 hours are subject to the requirements of this rule.</p> <p>b) Limits VOC emissions from the manufacture of foam products composed of polystyrene, polyethylene or polypropylene to between 2.4-2.8 lbs of VOC emissions per 100 lbs of product produced and by requiring emission abatement devices. A control device with at least 98% efficiency may be used in lieu of the above emissions requirements.</p> | New, existing, and modified | SCAQMD Rule 1175 5/13/94 BAAQMD Rule 8-52 7/7/99 |
| 64. | <p>Surfactant Manufacturing</p> <p>Requires the total emissions of VOC from the surfactant manufacturing equipment, before being vented to the atmosphere, be reduced to 0.5 pound per 1000 pounds of surfactant produced or by 95 percent (wt) or more; and all ports used for inspection, taking samples, or adding ingredients must be closed when not in use.</p> | New, existing and modified | SCAQMD Rule 1141.2 1/11/02 |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| I. Coating Operations Measures reduce VOC. | | | |
|--|---|---|--|
| | Strategy | Source Type | District, Rule, and Adoption Date* |
| 65. | <p>Adhesives and Sealants</p> <p>a) Reduces VOC emissions from the application of adhesives, adhesive primers, sealants, sealant primers, or any other primers through operational controls and by limiting the VOC content of products to between 30-850 g/l depending on product type. Emission control equipment can be used in lieu of meeting VOC limits.</p> <p>b) Reduces VOC emissions from the application of adhesives, adhesive primers, sealants, sealant primers, or any other primers through operational controls and by limiting the VOC content of products to between 30-850 g/l depending on product type. Emission control equipment can be used in lieu of meeting VOC limits. This rule has more stringent standards for a few categories than the rule above.</p> | <p>New, existing and modified</p> <p>New, existing and modified</p> | <p>VCAPCD Rule 74.20 9/9/03</p> <p>SCAQMD Rule 1168 10/23/03</p> |
| 66. | <p>Architectural Coatings</p> <p>Several districts have adopted regulations consistent with ARB's Suggested Control Measure (SCM) which limits the content of VOC in architectural coatings to between 100-730 g/l. ARB's SCM was adopted in June 22, 2000. For example see rules adopted by SJVAPCD, SDAPCD, SMAQMD, SBAPCD, TeCAPCD, MDAQMD, and AVAQMD.</p> <p>Note: The SCAQMD rule 1113 includes additional significantly more stringent future VOC limits.</p> | <p>New, existing and modified</p> | <p>AVAQMD Rule 1113 3/18/03</p> |
| 67. | <p>Glass Coatings</p> <p>Limits VOC emissions from the coating of glass products by limiting the VOC content of coating products to between 2.3-6.7 lbs/gal, depending on the product, or installing control equipment.</p> | <p>New, existing and modified</p> | <p>SJVAPCD Rule 4610 4/17/03</p> |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| | Strategy | Source Type | District, Rule, and Adoption Date* |
|-----|---|----------------------------|---|
| 68. | <p>Graphic Arts</p> <p>Limits VOC emissions from graphic arts operations by limiting the VOC content of products to between 150-300 g/l or by installing a control device.</p> | New, existing and modified | SCAQMD Rule 1130 10/8/99 |
| 69. | <p>Magnet Wire Coating Operations</p> <p>This rule applies to all coating operations on magnet wire, where the wire is continuously drawn through a coating applicator. Under this rule, any person shall not use or apply any magnet wire coating which contains more than 200 grams VOC per liter (1.67 lb/gal) of coating, less water and exempt compounds. The rule also provides for use of approved emission control systems.</p> | New, existing and modified | SCAQMD Rule 1126 1/13/95 |
| 70. | <p>Marine Coating Operations</p> <p>Applies to coating operations of marine and fresh water vessels, oil drilling platforms, navigational aids and component parts; and structures intended for exposure to a marine environment. Limits VOC emissions from marine coatings by limiting VOC content of coatings to between 275-650 g/l depending on product. Requires use of non-VOC materials for surface preparation and equipment cleaning. Allows use of specified air pollution control equipment which captures VOC emissions associated with coating, cleaning, and surface preparation, in lieu of use of low-VOC coatings and non-VOC materials used in cleaning and surface preparation.</p> | New, existing and modified | SDAPCD Rule 67.18 5/15/96 |
| 71. | <p>Metal Container, Closure, and Coil Coating Operations</p> <p>Limits VOC emissions from metal container, metal closure and metal coil coating operations through operational controls and by limiting the VOC content of products up to 660 g/l depending on product type.</p> | New, existing and modified | SCAQMD Rule 1125 1/13/95 |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| | Strategy | Source Type | District, Rule, and Adoption Date* |
|-----|---|----------------------------|---|
| 72. | Metal Parts and Products Coatings Limits VOC emissions from the coating of metal parts and products not regulated by other specific regulations by limiting coating VOC content to between 2.3-3.5 lbs/gal depending on process and coating type. | New, existing and modified | SCAQMD Rule 1107 11/9/01 |
| 73. | Motor Vehicle Assembly Line Coating Operations Sets forth VOC emission limits and VOC content of motor vehicle coatings. This rule applies to all assembly line coating operations conducted during the manufacturing of new motor vehicles. | New, existing and modified | SCAQMD Rule 1115 5/12/95 |
| 74. | Paper, Fabric, and Film Coating Operations This rule applies to all persons applying coatings or wash primers to paper, fabric, or film substrates. The drying and curing processes covered under this rule include, but are not limited to, heated, forced-air dried, and non-heated processes. The rule specifies VOC content of applicable coatings and sets forth application method and cleaning requirements. | New, existing and modified | SCAQMD Rule 1128 3/8/96 |
| 75. | Plastic, Rubber, and Glass Coatings Specifies VOC content of coatings used on plastic, rubber, and glass and sets forth transfer efficiency requirements. The rule allows for use of an approved emission control system in lieu of VOC content limits. | New, existing and modified | SCAQMD Rule 1145 2/14/97 |
| 76. | Screen Printing Operations Specifies VOC content of screen printing materials and applies to persons performing screen printing operations or who sell, distribute, or require the use of screen printing materials. | New, existing and modified | SCAQMD Rule 1130.1 12/13/96 |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| | Strategy | Source Type | District, Rule, and Adoption Date* |
|-----|---|----------------------------|---|
| 77. | <p>Spray Booth Facilities</p> <p>Further reduces VOC emissions from spray coating or laminating operations in high VOC-emitting facilities. This rule applies to any spray booth facility, except petroleum industry facilities, that uses VOC-containing materials that amount to more than 40,000 pounds (20 tons) per year of VOC emissions in any emission inventory year and requires that emissions be reduced by 65% beyond applicable rule requirements through the use of a control device or low VOC product.</p> | New, existing and modified | SCAQMD Rule 1132 1/19/01 |
| 78. | <p>Vehicle Refinishing</p> <p>Limits VOC emissions from coatings applied on Group I vehicles and equipment and Group II vehicles through operating requirements and by limiting VOC content of products to between 2.8-7.0 lbs/gal.</p> | New, existing and modified | SCAQMD Rule 1151 12/11/98 |
| 79. | <p>Wood Flat Stock Coatings</p> <p>Limits VOC content of coatings, inks, and adhesives applied to wood flat stock for the purpose of manufacturing a finished wood panel intended for attachment to the inside walls of buildings, including, but not limited to, homes and office buildings, mobile homes, trailers, prefabricated buildings and similar structures, boats and ships, or a finished exterior wood siding intended for use in construction to 250 g/l. A control device may be installed in lieu of the VOC requirement.</p> | New, existing and modified | SCAQMD Rule 1104 8/13/99 |
| 80. | <p>Wood Products Coatings</p> <p>Specifies VOC content of wood products coatings between 275-760 g/l depending on product. Requires wood strippers to have a maximum VOC content of 350 g/l or a maximum vapor pressure of 2mm Hg. The rule allows for use of an approved emission control system in lieu of VOC content limits and also includes an averaging provision. Exempts facilities that use less than one gallon of coatings per day.</p> | New, existing and modified | SCAQMD Rule 1136 6/14/96 |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| J. Solvent Cleaning and Degreasing Measures reduce VOC. | | | |
|---|---|--|--|
| | Strategy | Source Type | District, Rule, and Adoption Date* |
| 81. | <p>Cleaning Operations</p> <p>a) Limits VOC emissions from solvent cleaning operations and activities by reducing VOC content of cleaning products to between 25 g/l-900 g/l depending on process.</p> <p>b) Limits VOC emissions from solvent cleaning operations and activities by reducing VOC content of cleaning products to between 50 g/l-900 g/l depending on process.</p> | <p>New, existing, and modified</p> <p>New, existing and modified</p> | <p>SCAQMD Rule 1171 11/7/03</p> <p>SMAQMD Rule 466 5/23/03 and SJVAPCD 4663 12/20/01</p> |
| 82. | <p>Degreasing Operations</p> <p>a) Limits VOC emissions from cold cleaners and vapor degreasers by limiting product VOC content to 25 g/l. Air-tight and airless cleaning systems can be used in lieu of meeting the VOC limit.</p> <p>b) Limits VOC emissions from cold cleaners by limiting product VOC content to 25 g/l for (900g/l for exempted categories.)</p> <p>c) Limits VOC emissions from batch-loaded vapor degreasers by setting equipment and operating requirements.</p> <p>d) Limits VOC emissions from cold cleaners to 50 g/l. Limits VOC emissions from vapor degreasers by setting equipment requirements. Air-tight and airless cleaning systems can be used in lieu of meeting the VOC limit.</p> | <p>New, existing and modified</p> <p>New, existing, and modified</p> <p>New, existing, and modified</p> <p>New, existing, and modified</p> | <p>SCAQMD Rule 1122 12/6/02</p> <p>VCAPCD Rule 74.6 11/11/03</p> <p>VCAPCD Rule 74.6.1 11/11/03</p> <p>SMAQMD Rule 454 5/23/02</p> |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| | Strategy | Source Type | District, Rule, and Adoption Date* |
|--|--|-----------------------------|------------------------------------|
| 83. | <p>Use of Solvents (VOC)</p> <p>Limits VOC emissions from VOC containing materials or equipment not subject to VOC limits in any other, specific district regulation to no more than 833 lbs/month. A control device may be used in lieu of the monthly throughput limit.</p> | New, existing and modified | SCAQMD Rule 442 12/15/00 |
| <p>K. Miscellaneous Measures reduce VOC, SOX, ammonia, or PM10 and PM2.5.</p> | | | |
| 84. | <p>Soil Decontamination (VOC)</p> <p>a) Limits the emissions of organic compounds from soil that has been contaminated by organic chemical or petroleum chemical leaks or spills, and requires description of an acceptable procedure for controlling emissions from underground storage tanks during removal or replacement through the use of operational requirements and by limiting the amount of soil to be processed daily.</p> <p>b) Limits VOC emissions from excavating, grading, handling and treating VOC contaminated soil as a result of leakage from storage or transfer operations, accidental spillage, or other deposition by requiring that soil with VOC concentrations above 1000 ppm be containerized, sealed, and shipped away for disposal.</p> | New, existing and modified | BAAQMD Rule 8-40 12/15/99 |
| | | New, existing and modified | SCAQMD Rule 1166 5/11/01 |
| 85. | <p>Solid Waste Landfills (VOC)</p> <p>a) Limits VOC emissions from municipal solid waste landfills through installation of gas collection and control systems.</p> <p>b) Limits VOC emissions from the waste decomposition process at solid waste disposal sites through requirements for gas collection and control systems.</p> | New, existing, and modified | SCAQMD Rule 1150.1 3/17/00 |
| | | New, existing, and modified | BAAQMD Rule 8-34 10/6/99 |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| | Strategy | Source Type | District, Rule, and Adoption Date* |
|--|---|-----------------------------|---|
| 86. | <p>Woodworking Operations (PM10)</p> <p>Requires any woodworking facility that uses a pneumatic conveyance system connected to woodworking equipment to vent sawdust emissions to a PM10 emissions control device, such that there are no visible emissions; to cover sawdust storage bins at all times; and to take measures to prevent visible emissions from waste disposal activities from crossing any property line.</p> | New, existing, and modified | SCAQMD Rule 1137 2/1/02 |
| <p>L. General Rules to Reduce Directly Emitted PM from Stationary and Area Sources</p> <p>These rules are generic and apply to sources that may not be regulated through a specific rule or permit requirement. The rules are intended to reduce directly emitted PM10 and PM2.5.</p> | | | |
| 87. | <p>Visible Emission Limits (PM10, PM2.5)</p> <p>Prohibits discharges into the atmosphere from any single source of emission of any air contaminant for a period or periods aggregating more than 3 minutes in any 1 hour which is: 1) as dark or darker in shade as that designated as No. 1 on the Ringlemann Chart (20% opacity), as published by the United States Bureau of Mines, or 2) of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in 1). Provides the option of exempting permitted outdoor residential burns.</p> <p>Note: Several districts have adopted similar rules (e.g., SMAQMD, BAAQMD, SCAQMD, SDAPCD).</p> | New, existing and modified | MaCAPCD Rule 202 9/17/74 |
| 88. | <p>Combustion Contaminants (PM10, PM2.5)</p> <p>Prohibits discharges into the atmosphere from the burning of fuel of combustion contaminants exceeding 0.23 gram per cubic meter (0.1 grain per cubic foot) of gas calculated to 12% of carbon dioxide at standard conditions averaged over a minimum of 25 consecutive minutes.</p> | New, existing and modified | MDAQMD Rule 409 5/7/76 |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| | Strategy | Source Type | District, Rule, and Adoption Date* |
|---|--|----------------------------|---|
| 89. | <p>Grain Loading (PM10)</p> <p>Prohibits release or discharge into the atmosphere from any source or single processing unit, exclusive of sources emitting combustion contaminants only, PM emissions in excess of 0.1 grains per cubic foot of dry exhaust gas at standard conditions.</p> | New, existing and modified | MaCAPCD Rule 207 11/9/76 |
| <p>M. Programs that Reduce PM Emissions from Mobile Sources Measures primarily reduce directly emitted PM10, PM2.5, NOx, and VOC.</p> | | | |
| 90. | <p>Incentive Programs (PM10, PM2.5, NOx) A funding source is needed in order to rely on incentives programs.</p> <p>DMV Funds (AB 2766 Funds): Motor Vehicle Registration Fee Program (Many districts implement this program) State law authorizes air districts to assess motor vehicle registration fees of between \$2-\$4 (MV Fees) to reduce air pollution from motor vehicles and for related planning, monitoring, enforcement, and technical studies necessary for the implementation of the California Clean Air Act. Twenty-six air districts have implemented a motor vehicle registration fee program. ARB's guidance stresses funding cost-effective projects that help implement clean air plans and that reduce the most emissions per dollar spent. Example: SCAQMD's Mobile Source Air Pollution Reduction Review Committee; BAAQMD's Transportation Fund for Clean Air (vehicle buy-back clean school buses, vehicle incentives, etc.); SJVAPCD's REMOVE Program. Note: Legislation effective January 1, 2005, allows air districts to increase the fee to \$6. Spending of the additional \$2 is limited to four programs: 1) Carl Moyer, 2) Lower Emission School Buses, 3) accelerated vehicle retirement or repair program, and 4) previously unregulated agricultural sources.</p> <p>(continued on next page)</p> | New or modified | SCAQMD BAAQMD SJVAPCD Programs |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| | Strategy | Source Type | District, Rule, and Adoption Date* |
|-----|---|-----------------|-------------------------------------|
| | Incentive Programs (continuation) | | |
| 91. | <p>Heavy-Duty Engine Incentive Program a) Helps fleets pay for new lower emission heavy-duty engines, lower emission retrofits, and engine replacements. Public and private fleets are eligible if they use medium or heavy-duty on-road gas or diesel vehicles over 14,000 pounds gross weight or off-road commercial equipment including construction, agricultural, stationary agricultural water pump, commercial marine vessels, locomotives, forklifts, or airport ground support equipment. The program is funded by the air district and by the Carl Moyer Incentive Program sponsored by ARB. (continued on next page)</p> <p>b) Provides incentive funds for the differential cost associated with the reduced emission technology as compared with the cost of conventional technology. Eligible funding categories include heavy-duty on-road vehicles, off-road vehicles, locomotives, marine vessels, electric forklifts, electric airport ground support equipment and stationary agricultural irrigation pump engines. The SJVAPCD received \$25 million in State transportation funds from special legislation for the Valley Emergency Clean Air Program (VECAP). The air district added the VECAP funds to the Heavy Duty Engine Incentive Program.</p> | New or modified | SMAQMD Program |
| 92. | <p>Lower Emission School Bus Program The Lower-Emission School Bus Program provides financial incentives to school districts to replace older school buses using both air district and ARB grant funding.</p> | New or modified | BAAQMD VCAPCD SCAQMD Programs |
| 93. | <p>Moyer Program The Carl Moyer Memorial Air Quality Standards Attainment Program provides funds on an incentive-basis for the incremental cost of cleaner than required engines and equipment. Eligible projects include cleaner on-road, off-road, marine, locomotive and stationary agricultural pump engines, as well as forklifts, airport ground support equipment, and auxiliary power units. The program achieves near-term reductions in NOx and PM emissions. Most districts currently implement this program.</p> | New or modified | Most Districts |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| | Strategy | Source Type | District, Rule, and Adoption Date* |
|-----|---|-----------------|---|
| | Incentive Programs (continuation) | | |
| 94. | <p>Sacramento Emergency Clean Air Transportation (SECAT) Program Encourages cleanup of the existing HDD truck fleet by providing funds to pay for the cost of retrofitting existing engines with newer, cleaner engines or paying a significant amount of the cost of a newer vehicle. The goal is to reduce NOx emissions from HDD trucks by 3 tons per day by 2005 by upgrading 3,000 to 6,000 trucks. The program will disperse a total of \$70 million by 2005 (from State transportation funds under special legislation plus funds from the federal Congestion Mitigation and Air Quality Improvement (CMAQ) Program).</p> | New or modified | SMAQMD Program |
| 95. | <p>Light and Medium Duty Vehicle Program Provides incentives for certain new on-road original equipment manufacturer (OEM) alternative fuel vehicles with a Gross Vehicle Weight Rating (GVWR) up to 14,000 pounds, including passenger cars, pick-up trucks, small buses, and vans. Vehicles must be certified by the ARB as achieving standards for ULEV, SULEV, or ZEV vehicles. With the exception of hybrid electric vehicles, no vehicles with the ability to operate on gasoline or diesel fuel are funded.</p> | New | SJVAPCD Program |
| 96. | <p>Lawn Mower Buy Back Program Encourages trading of gasoline-powered mowers, by providing funds to offset the purchase cost of electric mowers (e.g., in early 2004, the SMAQMD participated in a program that paid 50% of the purchase price for 700 mowers).</p> | Existing | BAAQMD SJVAPCD SMAQMD SCAQMD Programs |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| | Strategy | Source Type | District, Rule, and Adoption Date* |
|-----|---|-----------------------------|------------------------------------|
| | Transportation Related Programs (PM10, PM2.5, NOx, VOC, CO) | | |
| 97. | <p><i>On-Road Motor Vehicle Mitigation Options</i> Requires employers who employ 250 or more employees to implement a program to reduce mobile source emissions generated from employee commutes and meet an annual emission reduction target (ERT) for their worksite. Provides employers with a menu of emission reduction options including: old-vehicle scrapping, clean on-road vehicles, clean off-road vehicles, pilot credit generation program, and other specified credit programs. As an alternative to meeting a worksite ERT, allows employers to implement an employee commute reduction program. This is the only program of this type with emission reduction mandates. Other districts programs are in place that require reporting of average vehicle ridership, but they have no emission reduction mandates. Note: This rule was amended February 6, 2004.</p> | New, existing, and modified | SCAQMD Rule 2202 1/1/02 |
| 98. | <p><i>Transportation Outreach Program</i> Requires employers with 100 or more employees to register with the air district annually and collect survey data on their employee's commute distances and ridesharing participation every two years. This rule allows the air district to devote resources and efforts in assisting employers with their voluntary trip reduction efforts.</p> | New, existing, and modified | VCAPCD Rule 211 8/11/98 |
| 99. | <p><i>Spare the Air Program</i> Many air districts have implemented public outreach programs to encourage the general public and employers to take actions to reduce transportation related emissions. SMAQMD, SJVAPCD, and BAAQMD have implemented Spare the Air Programs. Spare the Air is a voluntary, summertime effort aimed at reducing air pollution (specifically, ground-level ozone).</p> <p>(continued on next page)</p> | New, existing, and modified | SMAQMD, SJVAPCD, BAAQMD Programs |

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

| | Strategy | Source Type | District, Rule, and Adoption Date* |
|------|--|-----------------------------|---|
| | Transportation Related Programs (continuation) | | |
| 100. | <p>Public Awareness Programs Some air districts have implemented public awareness programs that: 1) support voluntary employer based trip reduction programs, 2) encourage alternative modes of transportation, 3) encourage cities and counties to incorporate air quality beneficial policies into local planning and development activities, 4) promote demonstrations of low emission vehicles and refueling infrastructure, and/or 5) continue public education by informing residents about air quality status, air pollutant health effects, sources of pollution, and actions individuals and communities can take to help improve air quality.</p> | Existing and modified | BAAQMD SCAQMD SMAQMD SJVAPCD Programs |
| 101. | <p>Leveraging Other Sources for Transportation Funding Some air districts apply for and receive money for transportation-related projects from federal, state, and local funding sources, the most notable being the federal Congestion Mitigation and Air Quality Improvement (CMAQ) program. The projects funded are usually small scale and include incentives, facilities, support services, and public awareness for carpools, vanpools, telecommuting, public transit, biking and walking.</p> | New, existing, and modified | BAAQMD SCAQMD SMAQMD SJVAPCD SDAPCD Programs |

Reference: District rules and regulations can be obtained at <http://www.arb.ca.gov/drdb/drdb.htm>

*Date when rule was adopted or last amended

Note: The specific air district rules included on the list represent guidance or appropriate example measures in terms of scope and level of emission control. There may be other district rules which may also represent similar, suitable levels of control.

APPENDIX D

Reported Cost-Effectiveness Numbers for Air District Measures

Reported Cost-Effectiveness Numbers for Air District Measures

| No. | Category | District | Rule # | Title | Date* | Date Notes | C.E. Notes | C.E. (\$/ton reduced) |
|-----|-------------------------------------|---------------------------|---------|--|----------|---------------------------|--|---|
| 1 | Wood Burning Fireplaces and Heaters | SJVAPCD | 4901 | Public Awareness Program | 7/17/03 | Amended (Adopted 7/15/93) | Program already in place when rule was updated | \$0 (emission reductions cannot be quantified) |
| 2 | Wood Burning Fireplaces and Heaters | SJVAPCD | 4901 | Curtailment - Mandatory | 7/17/03 | Amended (Adopted 7/15/93) | Voluntary program already in place when rule was updated | \$0 (emission reductions cannot be quantified) |
| 2 | Wood Burning Fireplaces and Heaters | GBVAPCD for Mammoth Lakes | 431 | Curtailment - Mandatory | 12/7/90 | Adopted | | Not estimated |
| 3 | Wood Burning Fireplaces and Heaters | SCAQMD, YSAQMD, SLOAPCD | | Curtailment - Voluntary | | | | \$0 (emission reductions cannot be quantified) |
| 4 | Wood Burning Fireplaces and Heaters | SJVAPCD | 4901 | Installed Wood-Burning Heaters must be U.S. EPA Phase II certified | 7/17/03 | Amended (Adopted 7/15/93) | Provision in previous rule version (Note: all new heaters produced in the U.S. now are U.S. EPA Phase II certified) | \$0 |
| 5 | Wood Burning Fireplaces and Heaters | NSoCAPCD | 4-1-400 | Wood-Burning Heaters and Wood-Burning Fireplaces must meet U.S. EPA Phase II certification | 2/2/93 | Adopted | | Not available |
| 5 | Wood Burning Fireplaces and Heaters | SLOAPCD | 504 | Wood-Burning Heaters and Wood-Burning Fireplaces must meet U.S. EPA Phase II certification | 10/19/93 | Adopted | <ul style="list-style-type: none"> • Installation in new homes. • Reduces PM10, NOx, and ROG by retrofitting existing stove or fireplace w/compliant appliance at point of home sale. (Clean Air Plan, Dec 1991, Appendix C) | <ul style="list-style-type: none"> • Very small • \$3,095 to \$5,216 (1991\$) |
| 6 | Wood Burning Fireplaces and Heaters | GBUAPCD for Mammoth Lakes | 431 | Prohibits Installation of Non-EPA Appliances | 12/7/90 | Adopted | Non-certified woodstoves are less efficient and would cost more to operate. Gas fireplaces are encouraged as they are more energy efficient. | Cost savings to \$0 |

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|------|-------------------------------------|---------------------------|--------------|--|----------|---------------------------|---|--|
| 7 | Wood Burning Fireplaces and Heaters | SJVAPCD | 4901 | Limits Number of Units in New Residential Developments | 7/17/03 | Amended | | \$0 to \$1,719 (2003\$) |
| 8 | Wood Burning Fireplaces and Heaters | GBUAPCD for Mammoth Lakes | 431 | Limits the Number of Units in New Non-Residential Properties | 12/7/90 | Adopted | No basis for cost provided | \$0 |
| 9 | Wood Burning Fireplaces and Heaters | GBUAPCD for Mammoth Lakes | 431 | Limits Number of Additional Units in Existing Properties | 12/7/90 | Adopted | No basis for cost provided | \$0 |
| 10 a | Wood Burning Fireplaces and Heaters | SJVAPCD | 4901 | Replacement of Non-Certified Appliances | 7/17/03 | Amended | | \$8,680 to \$12,060 (2003\$) |
| 10 b | Wood Burning Fireplaces and Heaters | GBUAPCD for Mammoth Lakes | 431 | Replacement of Non-Certified Appliances | 12/7/90 | Adopted | Cost to change out stoves without regard to savings (\$1,500 per stove, 20 year life, 5,946 stoves, \$1,865 lbs/day emission reduction). Woodstoves used for heating will result in savings after 5-12 years. | Cost savings to cost of \$5,240 (2003\$) |
| 11 | Wood Burning Fireplaces and Heaters | SJVAPCD | 4901 | Control of Wood Moisture Content | 7/17/03 | Amended (Adopted 7/15/93) | Provision in previous rule version | \$0 |
| 12 | Wood Burning Fireplaces and Heaters | SJVAPCD | 4901 | Prohibit Fuel Types | 7/17/03 | Amended (Adopted 7/15/93) | Provision in previous rule version | \$0 |
| 13 | Non-Agricultural Open Burning | SJVAPCD | 4103 4106 | Prohibit All Outdoor Residential Open Burning | 6/21/01 | Amended (Adopted 6/18/92) | 6/21/01 amendment: No significant costs associated w/rule implementation | Not estimated |
| 14 | Non-Agricultural Open Burning | MBUAPCD | 438 | Prohibit Burning Where Waste Service is Available | 4/16/03 | Adopted | | Not estimated |
| 15 | Non-Agricultural Open Burning | SMAQMD | 407 | Prohibit Burning in Specified Highly Populated Areas | 6/4/98 | Amended | | \$4,600 to \$19,800 (1996\$) |
| 16 | Non-Agricultural Open Burning | LCAQMD | 433 | Prohibit Burning within Small Lots and Setbacks | 10/15/02 | Amended | | Not estimated |

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|------|-------------------------------|----------|-------------|---|----------|--------------------------|---|---|
| 17 | Non-Agricultural Open Burning | MBUAPCD | 438 | Prohibit Burning during Periods with Predicted High PM or Ozone Levels | 4/16/03 | Adopted | | Not estimated |
| 18 | Non-Agricultural Open Burning | MBUAPCD | 438 | Control Smoke Production Limits During Burn Days in Smoke Sensitive Areas | 4/16/03 | Adopted | | Not estimated |
| 19 | Non-Agricultural Open Burning | ShCAQMD | 2.6 | Control Smoke Production - Emission Limits for Mechanized Burners | 9/24/02 | Amended (also on 3/9/04) | | Not estimated |
| 20 | Non-Agricultural Open Burning | BAAQMD | Reg. 5 | Drying Times | 11/2/94 | Amended | Socioeconomic analysis found cost below level of significance (total cost from \$2,400/year to \$10,600/year) | Not estimated |
| 21 | Non-Agricultural Open Burning | LCAQMD | 431 - 433.5 | Burn Duration | 10/15/02 | Amended | | Not estimated |
| 22 a | Non-Agricultural Open Burning | MaCAPCD | 300 | Preparation of Fuels & Management of Burns | 7/19/88 | Amended | | Not estimated |
| 22 b | Non-Agricultural Open Burning | MBUAPCD | 438 | Preparation of Fuels & Management of Burns | 4/16/03 | Adopted | | Not estimated |
| 23 | Non-Agricultural Open Burning | NCUAQMD | Reg 2 | Permits Required | 7/18/02 | Amended | Permit fee for: <ul style="list-style-type: none"> • Residential burn = \$12/year • Non-residential burn depends on acreage burned | Not applicable (emission reductions cannot be quantified) |
| 24 a | Fugitive Dust | SJVAPCD | 8021 | Construction: Earthmoving | 11/15/01 | Adopted | Watering (240 acre-month; 629 gal/acre) (Draft Report 9/27/01) | \$304 (2001\$) |
| 24 b | Fugitive Dust | SCAQMD | 403 | Construction: Earthmoving | 2/14/97 | Amended | RACM to BACM upgrade (Final Report 2/14/97) | \$197 (1996\$) |
| 25 a | Fugitive Dust | SJVAPCD | 8021 | Construction: Demolition | 11/15/01 | Adopted | | Not estimated |
| 25 b | Fugitive Dust | SCAQMD | 403 | Construction: Demolition | 2/14/97 | Amended | RACM to BACM upgrade (Final Report 2/14/97) | \$197 (1996\$) |

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|---------|---------------|----------|--------|---|----------|------------|--|---|
| 26 a | Fugitive Dust | SJVAPCD | 8021 | Construction: Grading Operations | 11/15/01 | Adopted | Pre-watering (Draft Report 9/27/01) | Not estimated |
| 26 b | Fugitive Dust | SCAQMD | 403 | Construction: Grading Operations | 2/14/97 | Amended | RACM to BACM upgrade (Final Report 2/14/97) | \$197 (1996\$) |
| 27 a | Fugitive Dust | SJVAPCD | 8021 | Inactive Disturbed Land | 11/15/01 | Adopted | | Not estimated |
| 27 b | Fugitive Dust | SCAQMD | 403 | Inactive Disturbed Land | 2/14/97 | Amended | RACM to BACM upgrade (Final Report 2/14/97) | \$197 (1996\$) |
| 28 a | Fugitive Dust | SJVAPCD | 8031 | Bulk Materials: Handling/Storage | 11/15/01 | Adopted | Watering (estimated emission reductions from handling >> storage) (Draft Report 9/27/01) | \$1,151(handling) to \$28,293 (storage) (2001\$) |
| 28 b | Fugitive Dust | SCAQMD | 403 | Bulk Materials: Handling/Storage | 2/14/97 | Amended | RACM to BACM upgrade (Final Report 2/14/97) | \$197 (1996\$) |
| 29 a | Fugitive Dust | SJVAPCD | 8041 | Carryout and Track-out | 11/15/01 | Adopted | (From Draft Report 9/27/01): <ul style="list-style-type: none"> • By manual sweeping (From 2003 SIP): • Purchase 1 efficient sweeper • Sweep once per month • Control devices installed at access points to public roads • Length of paved interior roads | <ul style="list-style-type: none"> • \$3,541 (2001\$) • \$792 • \$1,070 • \$13,700 to \$322,000 • \$7,930 to \$186,000 |
| 29 b | Fugitive Dust | SCAQMD | 403 | Carryout and Track-out | 2/14/97 | Amended | By construction, aggregate facilities, and landfills (Final Report 2/14/97) | < \$100 (1996\$) |
| 30 | Fugitive Dust | SJVAPCD | 8041 | Carryout and Track-out: Clean-up Methods | 11/15/01 | Adopted | | Not estimated |
| 31 a | Fugitive Dust | SJVAPCD | 8051 | Disturbed Open Areas | 11/15/01 | Adopted | Water application (5 acres) | \$7,020 (2001\$) |
| 31 b | Fugitive Dust | SCAQMD | 403 | Disturbed Open Areas | 2/14/97 | Amended | RACM to BACM upgrade (Final Report 2/14/97) | \$197 (1996\$) |

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|---------|---------------|---------------------------------|--------|--|----------|------------|---|---|
| 32 a | Fugitive Dust | SJVAPCD | 8061 | Paved Road Dust: New/Modified Public and Private Roads | 11/15/01 | Adopted | Paved shoulders (4 ft on 50% of highest ADVT existing roads) (From 2003 SIP) | \$7,290 to \$11,300 (2003\$) |
| 32 b | Fugitive Dust | SCAQMD | 1186 | Paved Road Dust: New/Modified Public and Private Roads | 2/14/97 | Adopted | Curb & gutter road shoulder (Final Report 2/14/97) | \$5,577 (1996\$) |
| 33 | Fugitive Dust | SCAQMD | 1186 | Paved Road Dust: Street Sweeping | 2/14/97 | Amended | <ul style="list-style-type: none"> • Price of PM10-efficient sweeper is \$37,000 over previous sweeper • Street sweeping • Post-event cleaning (Final Report 2/14/97) | <ul style="list-style-type: none"> • \$1,119 • < \$100 (Both in 1996\$) |
| 34 | Fugitive Dust | GBUAPCD for Mammoth Lakes | 431 | Paved Road Dust: Street Sweeping Sand & Cinders | 12/7/90 | Adopted | Capital cost = \$240,000; 10 year life time; \$15,000/year for O&M, cost is \$427/winter-day; 2,429 lb/day PM10 emission reductions at 34% control efficiency. | \$350 (1996\$) |
| 35 | Fugitive Dust | SJVAPCD | 8061 | Unpaved Parking Lots/Staging Areas | 11/15/01 | Adopted | Unpaved traffic areas: apply water, gravel, chemical or dust suppressant, or pave (150 trips/day; use 220 or 60 days/year) | \$344 to \$12,293 (2001\$) |
| 36a | Fugitive Dust | SJVAPCD | 8061 | Unpaved Roads: Control Requirements | 11/15/01 | Adopted | <ul style="list-style-type: none"> • Apply water, dust suppressant, gravel, pave (150 trips/day; use 220 or 60 days/year) • Paving (2003 SIP) | <ul style="list-style-type: none"> • \$56 to \$1,481 (2001\$) • \$2,160 to \$5,920 (2003\$) |

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|---------|---------------|------------------------------|---------------------------------|---|----------|------------|---|----------------------------|
| 36 b | Fugitive Dust | SCAQMD | 1186 | Unpaved Roads: Control Requirements | 2/14/97 | Amended | (Final Report 2/14/97) | \$956 (1996\$) |
| 37 a | Fugitive Dust | SJVAPCD | 8021 | Weed Abatement Activities | 11/15/01 | Amended | | Not estimated |
| 37 b | Fugitive Dust | SCAQMD | 403 | Weed Abatement Activities | 7/9/93 | Amended | | Not estimated |
| 38 | Fugitive Dust | SCAQMD | 403 | Windblown Dust: Definitions | 2/14/97 | Amended | | Not applicable |
| 39 | Fugitive Dust | SCAQMD | 403 | Windblown Dust: Construction/Earthmoving | 2/14/97 | Amended | • RACM to BACM upgrade (Final Report 2/14/97) | \$197 (1996\$) |
| 40 | Fugitive Dust | SCAQMD | 403 | Windblown Dust: Disturbed Areas | 2/14/97 | Amended | • RACM to BACM upgrade (Final Report 2/14/97) | \$197 (1996\$) |
| 41 a | Fugitive Dust | SCAQMD | 403 | Windblown Dust: Bulk Materials/Storage Piles | 2/14/97 | Amended | • RACM to BACM upgrade (Final Report 2/14/97) | \$197 (1996\$) |
| 41 b | | SCAQMD | 403.1 | Windblown Dust: Bulk Materials/Storage Piles | 1/15/93 | Adopted | Dft Staff Report 12/92 | \$325 to \$462 (1992\$) |
| 42 | Fugitive Dust | GBUAPCD for Owens Lake | Board Order 981116- 01 | Windblown Dust: Open Areas | 11/16/98 | Adopted | Annualized capital cost over 25 years = \$29 MM; O&M = \$27MM; annual cost = \$56MM; annual emission reductions = 80,400 tons of PM10. (Owens Valley PM10 SIP 2003). | \$697 (2003\$) |
| 43 a | Fugitive Dust | SJVAPCD | 8081 | Agricultural Operations | 11/15/01 | Adopted | | Not estimated |
| 43 b | Fugitive Dust | SCAQMD | 403 | Agricultural Operations | 2/14/97 | Amended | 12/11/98 amendment: High wind tilling prohibition & stabilization of fallow fields | \$134 (1996\$) |
| 43 c | Fugitive Dust | SCAQMD | 403.1 | Agricultural Operations | 1/15/93 | Adopted | Dft Staff Report 12/92 | \$8 (1992\$) |

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|---------|--------------------|----------|---------|--|----------|---------------------------|--|--|
| 43 d | Fugitive Dust | SCAQMD | 1186 | Agricultural Operations | 2/14/97 | Amended | Livestock operations - unpaved roads (Final Report 2/14/97) | \$958 (1996\$) |
| 43 e | Fugitive Dust | ICAPCD | 420 | Agricultural Operations | 8/13/02 | Amended | | Data pending |
| 44 a | Combustion Sources | SJVAPCD | 4306 | Boilers, Steam Generators, and Process Heaters | 9/18/03 | Amended | (NOx) W/ultra low NOx burners <ul style="list-style-type: none"> • Small gas-fuel burners 30 ppmv • 20MM Btu/hr or less (reduce from 30 to 15 ppmv, 100% to 25% capacity factor (C.F.)) • Steam generators (reduce 30 to 15 ppmv, 100% to 25% C.F.) • Greater than 20 MMBtu/hr (reduce from 30 to 9 ppmv, 100% to 5% C.F.) • Refinery units >110MM Btu/hr (to 5 ppmv w/SCR) (Final Report 9/18/93) | <ul style="list-style-type: none"> • \$2,807 to \$8,070 • \$9,531 to \$178,235 • savings of \$770 to cost of \$49,029 • \$5,712 to \$23,277 • \$4,177 to \$10,381 (All in 2003\$) |
| 44 b | Combustion Sources | SMAQMD | 411 | Boilers, Steam Generators, and Process Heaters | 7/22/99 | Amended (Adopted 2/2/95) | (NOx) | \$1,300 to \$11,260 (1995\$) |
| 44 b | Combustion Sources | SCAQMD | 1146 | Boilers, Steam Generators, and Process Heaters | 11/17/00 | Amended | Amended 40 ppmv to 30 ppmv | \$7,000 |
| 44 c | Combustion Sources | SCAQMD | 1146.1 | Boilers, Steam Generators, and Process Heaters | 10/5/90 | Adopted | (NOx) | \$11,100 |
| 44 d | Combustion Sources | VCAPCD | 74.15.1 | Boilers, Steam Generators, and Process Heaters | 6/13/00 | Amended (Adopted 5/11/93) | (NOx) <ul style="list-style-type: none"> • Overall CE = \$3.20/lb • Range of cost savings to cost of \$10.53/lb | <ul style="list-style-type: none"> • Overall \$6,400 • Range of cost savings to cost of \$21,060 (1993\$) |

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|---------|--------------------|----------|---------|--|----------|---------------------------|---|--|
| 44 e | Combustion Sources | SCAQMD | 1146.2 | Boilers, Steam Generators, and Process Heaters | 1/9/98 | Adopted | (NOx) Uncontrolled to 30 or 55 ppmv | Savings of \$2,900 to cost of \$8,400 |
| 44 e | Combustion Sources | SBAPCD | 360 | Boilers, Steam Generators, and Process Heaters | 10/17/02 | Adopted | (NOx) Gas-fired equipment (VCAPCD's Report for Rule 74.11.1) | \$5,333 to \$13,393 (1999\$) |
| 44 e | Combustion Sources | VCAPCD | 74.11.1 | Boilers, Steam Generators, and Process Heaters | 8/31/99 | Adopted | (NOx) Gas-fired equipment | \$5,333 to \$13,393 (1999\$) |
| 45 a | Combustion Sources | SMAQMD | 413 | Turbines | 5/1/97 | Amended | (NOx) | \$3,800 to \$8,600 (1997\$) |
| 45 a | Combustion Sources | SJVAPCD | 4703 | Turbines | 4/25/02 | Adopted | (NOx) Depending on turbine size (3.5-75 MW), control method, and level of use | \$4,296 to \$18,032 (2002\$) |
| 45 b | Combustion Sources | SCAQMD | 1134 | Turbines | 8/4/89 | Adopted | (NOx) • Non-SCR • SCR (1989 Report) | • \$3,500 to \$11,500 \$20,000 |
| 46 a | Combustion Sources | SCAQMD | 1110.2 | IC Engines | 11/14/97 | Amended (Adopted 8/13/90) | (NOx) • 8/90 • 11/97 | • 2,600 to \$7,900 • \$4,800 to \$9,500 |

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|---------|--------------------|----------|--------|--------------------------|----------|---------------------------|---|--|
| 46 b | Combustion Sources | SJVAPCD | 4702 | IC Engines | 8/21/03 | Adopted | (NOx) <ul style="list-style-type: none"> • Rich Burn (from 50 to 25 ppmv) • Rich Burn (from 640 to 25 ppmv) • Rich Burn (from 300 to 50 ppmv) • Lean Burn (from 75 to 65 ppmv) • Lean Burn (from 740 to 65 ppmv) Also depends on horsepower, capacity factor, and on type of control used | <ul style="list-style-type: none"> • \$497 to \$14,470 • \$262 to \$8,415 • \$394 to \$20,702 • \$2,093 to \$50,494 • \$1,467 to \$24,593 |
| 46 c | Combustion Sources | SMAQMD | 412 | IC Engines | 6/1/95 | Adopted | (NOx) | \$19,400 (1995\$) |
| 47 | Combustion Sources | SJVAPCD | 4313 | Lime Kilns | 3/27/03 | Adopted | (NOx) (Final Draft Report 2/10/93) | \$423 (2003\$) |
| 48 a | Combustion Sources | MDAQMD | 1161 | Cement Kilns | 3/25/02 | Amended (Adopted 6/28/95) | (NOx) Depends on kiln type: <ul style="list-style-type: none"> • Low NOx burner • Mid-kiln firing | <ul style="list-style-type: none"> • \$830 to \$1,330 • \$470 to \$610 (Both in 1995\$) |
| 48 b | Combustion Sources | KCAPCD | 425-3 | Cement Kilns | 10/13/94 | Adopted | (NOx) Low NOx Burner | \$830 to \$1,330 (1994\$) |
| 48 c | Combustion Sources | SCAQMD | 1112.1 | Cement Kilns | 2/7/86 | Adopted | (NOx) | Not estimated |
| 49 a | Combustion Sources | SCAQMD | 1117 | Furnaces (glass melting) | 1/8/84 | Adopted 2/5/82 | (NOx) | \$5,500 |
| 49 b | Combustion Sources | BAAQMD | 9.12 | Furnaces (glass melting) | 1/19/94 | Adopted | (NOx) For SCR | \$1,800 to \$2,400 (1994\$) |
| 49 c | Combustion Sources | SCAQMD | 1111 | Furnaces (central) | 7/8/83 | Adopted 12/1/78 | (NOx) | Not available |
| 49 c | Combustion Sources | SDAPCD | 69.6 | Furnaces (central) | 6/17/98 | Adopted 6/17/98 | (NOx) \$6,800/ton is for worst case scenario (Socioeconomic Impact Report 6/17/98) | From minimal cost to \$6,800 (1998\$) |

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| 50 a | Combustion Sources | SCAQMD | 1121 | Residential Water Heaters | 12/10/99 | Amended | (NOx) <ul style="list-style-type: none"> • For 20 ng/joule • For 10 ng/joule (based on ceramic burner, expected to be closer to the lower end) | <ul style="list-style-type: none"> • \$2,000 to \$5,400 (2002\$) • \$4,400 to \$16,000 (2005\$) |
| 50 b | Combustion Sources | SJVAPCD | 4902 | Residential Water Heaters | 6/17/93 | Adopted | (NOx) | Not available |
| 51 | Combustion Sources | SJVAPCD | 4692 | Commercial Charbroiling Operations | 3/21/02 | Adopted | (PM10 and VOC combined) Use of Flameless Catalytic Oxidizer | \$3,017 (2002\$) |
| 51 | Combustion Sources | SCAQMD | 1138 | Commercial Charbroiling Operations | 11/14/02 | Adopted | (PM10 and VOC combined) | \$1,680 to \$2,500 (Both in 1997\$) |
| 52 | Composting and Related Operations | SCAQMD | 1133 | General Administrative Requirements | 1/10/03 | Adopted | (VOC and NH3 combined) | \$8,700 to \$10,000 |
| 53 | Composting and Related Operations | SCAQMD | 1133.1 | Chipping and Grinding Operations | 1/10/03 | Adopted | | |
| 54 | Composting and Related Operations | SCAQMD | 1133.2 | Composting | 1/10/03 | Adopted | | |
| 55 | Storage, Transfer, and Dispensing Operations | BAAQMD | 8.7 | Gasoline Transfer and Dispensing Facilities | 11/6/02 | Amended | (VOC) Requires testing to ensure compliance w/ARB's vapor recovery program | Not applicable |

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|---------|--|----------|--------|--|-----------|--------------------|--|--|
| 56 a | Storage, Transfer, and Dispensing Operations | BAAQMD | 8.5 | Organic Liquid Storage | 11/27/02 | Amended | (VOC) <ul style="list-style-type: none"> • 2002: Increase monitoring of seals and filters on floating roof tanks • 1999: Requirements for slotted guidepoles and seals on internal roof tanks • 1993: Requirements for other equipment | <ul style="list-style-type: none"> • \$11,600 (2002\$) • \$1,250 • \$13,000 to \$15,700 |
| 56 b | Storage, Transfer, and Dispensing Operations | SCAQMD | 463 | Organic Liquid Storage | 3/11/94 | Amended | (VOC) | Data pending |
| 56 b | Storage, Transfer, and Dispensing Operations | SCAQMD | 1149 | Storage Tank Degassing | 7/14/95 | Amended | (VOC) | Data pending |
| 57 a | Leaks and Releases | BAAQMD | 8.18 | Equipment Leaks (Valves and Flanges) | 11/27/02 | Amended | (VOC) <ul style="list-style-type: none"> • 2003: Valve requirements • 1998: Other equipment requirements | <ul style="list-style-type: none"> • \$320 to \$1,600 (2003\$) • \$1,600 (1998\$) |
| 57 b | Leaks and Releases | SCAQMD | 1173 | Equipment Leaks (Valves and Flanges) | 12/6/02 | Amended | (VOC) Implementation or enhancement of leak detection and repair programs | \$48 to \$10,712 average = \$157 |
| 58 | Product Manufacturing | SCAQMD | 1141.1 | Coatings and Ink Manufacturing | 11/17/00 | Amended | (VOC) | Data pending |
| 59 | Product Manufacturing | PCAPCD | 229 | Fiberboard Manufacturing | 6/28/94 | Adopted | (VOC) For fiber dryers and fiberboard press vents, depending on level of VOC control achieved | \$4,000 to \$6,000 (1994\$) |
| 60 | Product Manufacturing | SCAQMD | 1131 | Food Product Manufacturing and Processing | 6/6/03 | Adopted 9/15/00 | (VOC) | \$4,732 (2000\$) |
| 61 | Product Manufacturing | SCAQMD | 1103 | Pharmaceuticals and Cosmetics Manufacturing Operations | 3/12/1999 | Amended | (VOC) | Data pending |

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| 62 | Product Manufacturing | SCAQMD | 1162 | Polyester Resin Operations | 11/9/01 | Amended | (VOC) | Cost savings to cost of \$719 |
| 63 a | Product Manufacturing | SCAQMD | 1175 | Polymeric Cellular Products | 5/13/94 | Amended | (VOC) | Data pending |
| 63 b | Product Manufacturing | BAAQMD | 8.52 | Polymeric Cellular Products | 7/7/99 | Adopted | (VOC) | \$8,000 to \$11,000 |
| 64 | Product Manufacturing | SCAQMD | 1141.2 | Surfactant Manufacturing | 1/11/02 | Amended (Adopted 7/8/84) | (VOC) | Data pending |
| 65 | Coating Operations | VCAPCD | 74.20 | Adhesives and Sealants | 9/9/03 | Amended | (VOC) | Cost savings of \$1,060 to \$0 |
| 65 | Coating Operations | SCAQMD | 1168 | Adhesives and Sealants | 10/23/03 | Amended | (VOC) | Data pending |
| 66 | Coating Operations | AVAQMD | 1113 | Architectural Coatings | 3/18/03 | Adopted | (VOC) Referenced ARB's 6/6/00 SCM Staff Report: \$2.70/lb to \$3.90/lb; average = \$3.20/lb | \$5,400 to \$7,800 Average = \$6,4000 (All in \$2000\$) |
| 67 | Coating Operations | SJVAPCD | 4610 | Glass Coatings | 4/17/03 | Amended | (VOC) - 2002 amendment | \$1,050 to \$2,900 |
| 68 | Coating Operations | SCAQMD | 1130 | Graphic Arts | 10/8/99 | Amended | (VOC) | \$8,600 |
| 69 | Coating Operations | SCAQMD | 1126 | Magnet Wire Coating Operations | 1/13/95 | Amended | (VOC) | Data pending |
| 70 | Coating Operations | SDAPCD | 67.18 | Marine Coating Operations | 5/15/96 | Amended (Effective 7/3/90) | (VOC) | Not available |
| 71 | Coating Operations | SCAQMD | 1125 | Metal Container, Closure, and Coil Coating Operations | 1/13/95 | Amended | (VOC) | Data pending |

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*Date when rule was adopted or last amended.

Reported Cost-Effectiveness Numbers for Air District Measures

| No. | Category | District | Rule # | Title | Date* | Date Notes | C.E. Notes | C.E. (\$/ton reduced) |
|------|---------------------------------|----------|--------|--|-----------|---------------------------|---|------------------------------------|
| 72 | Coating Operations | SCAQMD | 1107 | Metal Parts and Products Coatings | 11/9/2001 | Amended (Adopted 6/1/79) | (VOC) | Data pending |
| 73 | Coating Operations | SCAQMD | 1115 | Motor Vehicle Assembly Line Coating Operations | 5/12/95 | Amended | (VOC) | Data pending |
| 74 | Coating Operations | SCAQMD | 1128 | Paper, Fabric, and Film Coating Operations | 3/8/96 | Amended (Adopted 5/4/79) | (VOC) | Data pending |
| 75 | Coating Operations | SCAQMD | 1145 | Plastic, Rubber, and Glass Coating | 2/14/97 | Amended (Adopted 7/8/83) | (VOC) | Data pending |
| 76 | Coating Operations | SCAQMD | 1130.1 | Screen Printing Operations | 12/13/96 | Amended (Adopted 8/2/91) | (VOC) | Data pending |
| 77 | Coating Operations | SCAQMD | 1132 | Spray Booth Facilities | 1/19/01 | Adopted | (VOC) | \$5,484 |
| 78 | Coating Operations | SCAQMD | 1151 | Vehicle Refinishing | 12/11/98 | Amended (Adopted 1988) | (VOC) | Data pending |
| 79 | Coating Operations | SCAQMD | 1104 | Wood Flat Stock Coatings | 8/13/99 | Amended | (VOC) | \$1,800 (1999\$) |
| 80 | Coating Operations | SCAQMD | 1136 | Wood Products Coatings | 6/14/96 | Amended | (VOC) • Waterborne • Acetone | • \$1,933 to \$2,972 • \$1,600 |
| 81 a | Solvent Cleaning and Degreasing | SCAQMD | 1171 | Cleaning Operations | 11/7/03 | Amended (also 10/8/99) | (VOC) | \$264 to \$2,570 |
| 81 b | Solvent Cleaning and Degreasing | SMAQMD | 466 | Cleaning Operations | 5/23/02 | Amended (Adopted 5/23/02) | (VOC) • 2004 Ozone Plan for Sac Metro Region (Rules 454 and 466) • 5/23/03 Staff Report | • \$0 to \$4,200 • Cost savings |

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Reported Cost-Effectiveness Numbers for Air District Measures

| No. | Category | District | Rule # | Title | Date* | Date Notes | C.E. Notes | C.E. (\$/ton reduced) |
|---------|---------------------------------|----------|--------|-----------------------|----------|--------------------------|---|--|
| 81 b | Solvent Cleaning and Degreasing | SJVAPCD | 4663 | Cleaning Operations | 12/20/01 | Adopted | (VOC) Draft Report 12/6/01 <ul style="list-style-type: none"> • Scenario 1 • Scenario 2 | <ul style="list-style-type: none"> • Savings of \$990 to • Cost of \$2,167 (Both in 2000\$) |
| 82 a | Solvent Cleaning and Degreasing | SCAQMD | 1122 | Degreasing Operations | 12/6/02 | Amended (Adopted 1979) | (VOC) Dft Report 12/6/01 | \$92 (2000\$) |
| 82 b | Solvent Cleaning and Degreasing | VCAPCD | 74.6 | Degreasing Operations | 11/11/03 | Amended | (VOC) Cold Cleaners | Cost savings of \$3,320 to cost of \$12,940 |
| 82 c | Solvent Cleaning and Degreasing | VCAPCD | 74.6.1 | Degreasing Operations | 11/11/03 | Adopted | (VOC) <ul style="list-style-type: none"> • Retrofit w/automated parts • Chillers | <ul style="list-style-type: none"> • \$500 to \$103,140 • \$3,100 to \$10,040 |
| 82 d | Solvent Cleaning and Degreasing | SMAQMD | 454 | Degreasing Operations | 5/23/02 | Amended (Adopted 6/5/79) | (VOC) <ul style="list-style-type: none"> • 2004 Ozone Plan for Sac Metro Region) (Rules 454 and 466) • 5/23/03 amendment | <ul style="list-style-type: none"> • \$0 to \$4,200 • Cost savings |
| 83 | Solvent Cleaning and Degreasing | SCAQMD | 442 | Use of Solvents | 12/15/00 | Amended | (VOC) | \$7,050 |
| 84 a | Miscellaneous | BAAQMD | 8.40 | Soil Decontamination | 12/15/99 | Amended | (VOC) Depends on soil disposition method (off-site treatment has lowest CE; in-situ vapor extraction has highest CE) | \$7,100 to \$86,900 |
| 84 b | Miscellaneous | SCAQMD | 1166 | Soil Decontamination | 5/11/01 | Amended (Adopted 1988) | (VOC) | Data pending |
| 85 a | Miscellaneous | SCAQMD | 1150.1 | Solid Waste Landfills | 3/17/00 | Amended (Adopted 4/5/85) | (VOC) | Data pending |
| 85 b | Miscellaneous | BAAQMD | 8.34 | Solid Waste Landfills | 10/6/99 | Amended | (VOC) 1996 amendment | Cost savings |

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Reported Cost-Effectiveness Numbers for Air District Measures

| No. | Category | District | Rule # | Title | Date* | Date Notes | C.E. Notes | C.E. (\$/ton reduced) |
|---------|--|-------------------------------|--------|---|---------|------------|---------------|--|
| 86 | Miscellaneous | SCAQMD | 1137 | Woodworking Operations | 2/1/02 | Adopted | (PM10) | \$3,200 (2001\$) |
| 87 | General Rules to Reduce Directly Emitted PM from Stationary and Area Sources | MaCAPCD | 202 | Visible Emission Limits | 9/17/74 | Adopted | (PM10, PM2.5) | Not applicable (emission reductions cannot be quantified) |
| 88 | General Rules to Reduce Directly Emitted PM from Stationary and Area Sources | MDAQMD | 409 | Combustion Contaminants | 5/7/76 | Adopted | (PM10, PM2.5) | Not applicable (emission reductions cannot be quantified) |
| 89 | General Rules to Reduce Directly Emitted PM from Stationary and Area Sources | MaCAPCD | 207 | Grain Loading | 11/9/76 | Adopted | (PM10) | Not Applicable (emission reductions cannot be quantified) |
| 90 | Programs that Reduce PM Emissions from Mobile Sources | SCAQMD, BAAQMD, SJVAPCD | | Incentive Programs - DMV Funds (AB 2766 Funds) | | | | Not applicable |
| 91 a | Programs that Reduce PM Emissions from Mobile Sources | SMAQMD | | Incentive Programs - Heavy Duty Engine Incentive Programs | | | | Not applicable |
| 91 b | Programs that Reduce PM Emissions from Mobile Sources | SJVAPCD | | Incentive Programs - Heavy Duty Engine Incentive Programs | | | | Not applicable |
| 92 | Programs that Reduce PM Emissions from Mobile Sources | SCAQMD, BAAQMD, VCAPCD | | Incentive Programs - Lower Emission School Bus Program | | | | Not applicable |

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Reported Cost-Effectiveness Numbers for Air District Measures

| No. | Category | District | Rule # | Title | Date* | Date Notes | C.E. Notes | C.E. (\$/ton reduced) |
|-----|---|---------------------------------|--------|--|---------|----------------------------|------------|-----------------------|
| 93 | Programs that Reduce PM Emissions from Mobile Sources | Most | | Incentive Programs - Moyer Program | | | | Not applicable |
| 94 | Programs that Reduce PM Emissions from Mobile Sources | SMAQMD | | Incentive Programs - Sacramento Emergency Clean Air Transportation (SECAT) | | | | Not applicable |
| 95 | Programs that Reduce PM Emissions from Mobile Sources | SJVAPCD | | Incentive Programs - Light and Medium Duty Vehicle Program | | | | Not applicable |
| 96 | Programs that Reduce PM Emissions from Mobile Sources | SJVAPCD, SMAQMD, BAAQMD, SCAQMD | | Incentive Programs - Lawn Mower Buy Back Program | | | | Not applicable |
| 97 | Programs that Reduce PM Emissions from Mobile Sources | SCAQMD | 2202 | Transportation Related - On-Road Motor Vehicle Mitigation Options | 1/11/02 | Amended (Adopted 12/18/95) | | Data pending |
| 98 | Programs that Reduce PM Emissions from Mobile Sources | VCAPCD | 211 | Transportation Related - Transportation Outreach Program | 8/11/98 | | | Not applicable |
| 99 | Programs that Reduce PM Emissions from Mobile Sources | SMAQMD, SJVAPCD, BAAQMD | | Transportation Related - Spare the Air Program | | | | Not applicable |
| 100 | Programs that Reduce PM Emissions from Mobile Sources | SJVAPCD, SMAQMD, BAAQMD, SCAQMD | | Transportation Related - Public Awareness Programs | | | | Not applicable |

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Reported Cost-Effectiveness Numbers for Air District Measures

| No. | Category | District | Rule # | Title | Date* | Date Notes | C.E. Notes | C.E. (\$/ton reduced) |
|-----|---|---|--------|--|-------|------------|------------|-----------------------|
| 101 | Programs that Reduce PM Emissions from Mobile Sources | SJVAPCD, SMAQMD, BAAQMD, SCAQMD, SDAPCD | | Transportation Related - Leveraging Other Sources for Transportation Funding | | | | Not applicable |

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No written material available at time of electronic book creation.